FACULTY OF PHARMACY
UNIVERSITAS GADJAH MADA

ABSTRACT BOOK

THE 7 ICPAPS 2021 AND THE 12 ANNUAL CONFERENCE OF ISCC

"The Contribution of Advanced Pharmacy Research and Pharmaceutical Care during the COVID-19 Pandemic Era"

Virtually on November 2-4, 2021

ABSTRACT BOOK

THE 7 ICPAPS 2021 AND THE 12 ANNUAL CONFERENCE OF ISCC

"The Contribution of Advanced Pharmacy Research and Pharmaceutical Care during the COVID-19 Pandemic Era"

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General information for participant/Guidelines

The Faculty of Pharmacy Universitas Gadjah Mada, partnering with the Indonesian Society for Cancer Chemoprevention, is organizing the 7th International Conference on Pharmacy and Advanced Pharmaceutical Sciences (ICPAPS 2021) and the 12th Annual Conference of the Indonesian Society for Cancer Chemoprevention (ISCC 2021). Established in 2009, the ICPAPS alone is a biennial event aiming to facilitate expert meeting and knowledge sharing among pharmacists and pharmaceutical scientists. Meanwhile, the ISCC Conference occurs annually as a forum for showcasing research and education in cancer chemoprevention.

The ICPAPS-ISCC 2021 is arranged along the line with a broad theme focused on the Contribution of Advanced Pharmacy Research and Pharmaceutical Care during the COVID-19 Pandemic Era. This worth-noting theme currently reflects the public demand to accelerate the COVID-19 therapies, which becomes a priority in pharmaceutical research and pharmaceutical care. To address various research interests, five symposia are organized in specific topics of Pharmacology, Pharmaceutical Chemistry and Pharmaceutical Biotechnology (PPCP); Pharmacy Education, and Social and Administrative Pharmacy, Clinical Pharmacy (PESC); Pharmaceutics & Drug Delivery System (PDDS); Herbal Medicine and Natural Products (HMNP); and Cancer Chemoprevention (CCP).

The conference is scheduled to take place virtually from November 2 to 4, 2021. It will bring together researchers, academia, students, practitioners in health institutions and industries, and policymakers in corresponding fields from all over the world to exchange and share their experiences and findings concerning the pharmacy, pharmaceutical sciences, and cancer chemoprevention.

Rector's Remark for ICPAPS

Opening speech from Rector of Universitas Gadjah Mada

Dear Distinguished Keynote Speaker
Distinguished Plenary Speakers, Invited Speakers and Participants,
The Committee,
Ladies and Gentlemen.

Good morning, good afternoon, and good evening

On behalf of Universitas Gadjah Mada, it is my pleasure and privilege to welcome you all to the 7th International Conference on Pharmacy and Advanced Pharmaceutical Sciences and the 12th Annual Conference of the Indonesian Society for Cancer Chemoprevention (ICPAPS-ISCC 2021) hosted by the Faculty of Pharmacy Universitas Gadjah Mada partnering with the Indonesian Society for Cancer Chemoprevention. First of all, I would like to extend my gratitude to the distinguished keynote speaker, Dr. Ir. Penny Kusumastuti Lukito, MCP, as the Head of the National Agency of Drug and Food Control, Republic of Indonesia. I would also like to use this opportunity to express my sincere appreciation to the plenary speakers, invited speakers, and partners of the ICPAPS-ISCC 2021.

As a pioneering university, the history of UGM's education has opened the boundaries between academics and professionals worldwide to discover critically scientific inventions as the precious roots of knowledge for the benefit of humankind. This conference also has a role in disseminating information and updating research and technologies in pharmacy, pharmaceutical sciences, and cancer chemoprevention.
Today, we still have the grand challenges, which are parts of the big problem in global health, such as deadly diseases, the lack of access to medical care, and uncertainty of adequate resources. As scientists with tremendous encouragement, we could critically remove the obstacles to more rapid progress against the global health problem. We are also walking on the trajectory of the disruption era and connecting with the fourth industrial revolution. Besides the grand challenges, the pandemic of COVID-19 also requires us to adapt to the current situation. The pandemic has changed many habits of human life, but we believe that this situation cannot diminish our intellectual ability to contribute knowledge and make a good cause consistently. The theme of the ICPAPS-ISCC 2021 on the Contribution of Advanced Pharmacy Research and Pharmaceutical Care during the COVID-19 Pandemic Era presently resonates with the public demand to accelerate the COVID-19 therapies, which have become a priority in pharmaceutical research and pharmaceutical care.

Although ICPAPS-ISCC 2021 cannot be held physically, the integrity and quality of the research and content will remain and now be experienced in the virtual environment. This conference is bridging the gap among disciplines to bring and share their innovation, research, and ideas about our scientific issues today. UGM is proud to be leading the way in facilitating the interdisciplinary research dissemination of cutting-edge information sharing in diverse subjects.

We are honored and humbled by many experts who have attended this year's conference. We thank the speakers for their expertise and knowledge to a great discussion during the conference. Special thanks are also extended to the organizing committee members in the ICPAPS-ISCC 2021 preparation for their hard work. And finally, I would like to thank all the conference participants who contributed to making this truly the most memorable ICPAPS-ISCC 2021. I wish you all to enjoy this conference and, above all, a successful ICPAPS-ISCC 2021.

Thank you for your kind attention.
Rector of Universitas Gadjah Mada,

Remark Dean Faculty of Pharmacy

Assalamu'alaikum Wr. Wb.

Dear distinguished delegates, guests, ladies, and gentlemen,

First of all, let us thank Allah SWT for the blessings He has given us so that we have the opportunity to participate in the 7th International Conference on Pharmacy and Advanced Pharmaceutical Sciences and the 12th Annual Conference of the Indonesian Society for Cancer Chemoprevention (ICPAPS-ISCC 2021). I am delighted to extend my warmest greetings to all of the participants of the ICPAPS-ISCC 2021. The COVID-19 pandemic has forced us to improvise the way we host conferences, including the ICPAPS-ISCC 2021, which is held virtually from November 2 to 4, 2021. However, I am hopeful that remote participation will not lessen our enthusiasm for sharing knowledge and research experience in the fields of pharmacy, pharmaceutical sciences, and cancer chemoprevention.

The ICPAPS is a biennial conference organized by the Faculty of Pharmacy UGM with the aim to facilitate meetings among pharmacists and pharmacy scientists to share their knowledge and showcase their research. It is understood that pharmacy is a broad field in health-related sciences which is dynamic and rapidly growing. Therefore, collaborations within and with other disciplines are critical to discovering and developing new drugs and therapies. This year, the ICPAPS collaborated with the Indonesian Society for Cancer Chemoprevention (ISCC), a forum for education, cooperation, and research dissemination among researchers in cancer chemoprevention. I hope the collaboration will result in a solid networking and valuable exchange of information that can improve community health and well-being.

The ICPAPS-ISCC 2021 is arranged along the line with a broad theme focused on "the Contribution of Advanced Pharmacy Research and Pharmaceutical Care during the COVID-19 Pandemic Era". This worth-noting theme currently reflects the public demand to accelerate the COVID-19 therapies, which have become a priority in pharmaceutical research and pharmaceutical care. In addition, to address various research interests among the participants, the ICPAPS-ISCC 2021 offered five symposia in specific topics of Pharmacology, Pharmaceutical Chemistry and Pharmaceutical Biotechnology (PPCP); Pharmacy Education, Social and Administrative Pharmacy, Clinical Pharmacy (PESC); Pharmaceutics & Drug Delivery System (PDDS); Herbal Medicine and Natural Products (HMNP); and Cancer Chemoprevention (CCP).

Finally, on behalf of the Faculty of Pharmacy UGM, I offer my highest appreciation to the keynote speaker, plenary speakers, invited speakers, partners, and sponsors of the ICPAPS-ISCC 2021 for their support and contribution. This conference would not have been possible without solid teamwork among the steering and organizing committee members. Last but not least, I convey my very best wishes to all of the participants for a fruitful meeting and successful results.

Wassallamu'alaikum Wr. Wb.

Sincerely,

Prof. Dr. apt. Satibi, M.Si.
Dean, Faculty of Pharmacy Universitas Gadjah Mada

Welcome Message from the Committee

Remarks from Conference Chair

Assalamu'alaikum warrahmatullahi wabarakatuh.

It is with great pleasure for me to welcome you to the 7th International Conference on Pharmacy and Advanced Pharmaceutical Sciences (ICPAPS) and the 12th Annual Conference of the Indonesian Society of Cancer Chemoprevention (ISCC), which is held online during the 2nd-4th November 2021 as part of the 15th Lustrum activity series of the Faculty of Pharmacy UGM. This conference is held with the support of the former Dean of Faculty of Pharmacy UGM, Prof Dr. Agung Endro Nugroho, and the present Dean Prof. Dr. Satibi.

Our program is varied with 1 keynote speech, 7 plenary lectures, 17 invited talks, 130 scientific presentations, and 5 finalists from a total of 18 participants of 3-minutes presentation competition. Topics were presented in 6 different symposia covering all aspects of pharmaceutical sciences including drug development, formulation, social pharmacy, clinical pharmacy, and cancer chemoprevention (in conjunction with ISCC). The participants and speakers mostly are our colleagues from all over Indonesia and our partner institutions from Thailand, Malaysia, Vietnam, Philippines, Japan, Iran, Netherlands, and Germany. Moreover, the Faculty of Pharmacy UGM-Timmerman Awards final will be held on the last day of the conference, with 5 finalists from total 10 participants. The finalists are the young scientists from Airlangga University, Sanata Dharma University, Bandung Institute of Technology, and Universitas Gadjah Mada.

Many people contributed to the successful organization of this conference. In particular, we thank all the speakers, moderators, judges, and participants for their contribution to this event, the steering committee for their advice and suggestions, Prof Edy Meiyanto, and all ISCC members for their great contributions and support on this event, Prof Timmerman and Prof. Vermeulen from Vrije Universiteit Amsterdam, as the co-host of the Faculty of Pharmacy UGM-Timmerman Awards who continuously advocate the development of pharmaceutical science research in Indonesia, our partner journals: Indonesian Journal of Pharmacy, Indonesian Journal of Cancer Chemoprevention, Traditional Medicine Journal, Journal of Management and Pharmacy Practice, Majalah Farmaseutik, and Pharmacy Reports which are openly welcoming regular submission of the participants' manuscripts. We also thank our sponsors: Bank Mandiri, Bank BNI, PT. Sinde Budi Sentosa, PT. Konimex, PT. Kairos Jaya Sejahtera, and PT. PP. Special thanks to all the organizing committee members who are very dedicated and have given their utmost effort.

We hope all participants will participate well and make the event truly successful. Again, on behalf of the organizing committee, I would like to welcome all of you to the 7th ICPAPS and the 12th Annual Conference of ISCC.

Thank you, and Wassalamualaikum Wr Wb.

Dr. apt. Riris Istighfari Jenie, M.Si
Chairman of 7th ICPAPS and the 12th Annual Meeting of ISCC

Foreword from Indonesian Society for Cancer Chemoprevention (ISCC)

Dear colleagues,

Following the success of last year virtual event, this year, Indonesian Society for Cancer Chemoprevention (ISCC) is organizing the annual conference and congress in partnership with the Faculty of Pharmacy Universitas Gadjah Mada (UGM).

On behalf of ISCC, I am honored to welcome all participants to the 7th International Conference on Pharmacy and Advanced Pharmaceutical Sciences (ICPAPS 2021) and the 12th Annual Indonesian Society for Cancer Chemoprevention Conference (ISCC 2021).
ISCC consistently facilitates the annual scientific forum to disseminate information and updates the recent scientific progress in the field of cancer chemoprevention, as well as to facilitate idea and technology sharing and to develop networking and communication among participants. In line with this aim, ICPAPS accelerates expert meeting and knowledge sharing among pharmacist and pharmaceutical scientists biannually. Indeed, pharmacy and pharmaceutical are indispensable area in cancer chemoprevention. Working hands in hands, this year event brought "Contribution of Advanced Pharmacy Research and Pharmaceutical Care during the COVID-19 Pandemic Era" as the highlight. Held as a hybrid meeting for the second time, we believe the quality of this conference is not lessen. In fact, the online platform makes this event much more efficient and accessible globally.

We wish that all of the newest knowledge presented in this conference through five symposia (Pharmacology, Pharmaceutical Chemistry and Pharmaceutical Biotechnology; Pharmacy Education, and Social and Administrative Pharmacy, Clinical Pharmacy; Pharmaceutics & Drug Delivery System; Herbal Medicine and Natural Products; and Cancer Chemoprevention, would be useful as a comprehensive understanding to improve our academic, research, and professional activities. We encourage all participants to take as much as advantage through this scientific meeting.

Indonesian Society for Cancer Chemoprevention

Chairman,

Prof. Dr. apt. Edy Meiyanto, M.Si.

ORGANIZING COMMITTEE OF THE 7th INTERNATIONAL CONFERENCE ON PHARMACY AND ADVANCED PHARMACEUTICAL SCIENCES (ICPAPS 2021)

Person in Charge	:	Prof. Dr. apt. Agung Endro Nugroho, M.Si.
Steering Committee	:	Dr.rer.nat. apt. Endang Lukitaningsih, M.Si.
		Prof. Dr. apt. Edy Meiyanto, M.Si.
		Prof. Dr. apt. Zullies Ikawati
Chairman of Organizing Committee	:	Dr. apt. Riris Istighfari Jenie, M.Si.
Vice of Committee	:	Dr. Sylvia Utami Tunjung Pratiwi, M.Si.
Secretary	:	apt. Marlyn Dian Laksitorini, M.Sc., Ph.D.
Sponsorship	:	Dr. apt. Dwi Endarti, M.Sc.
		Dr. apt. Fita Rahmawati, Sp.FRS.
Event	:	drh. Retno Murwanti, M.P., Ph.D
		Dr. Artania Adnin Tri Suma, S.Si.
		apt. Farida Nur Aziza, M.GMP.
Symposium	:	apt. Adhyatmika, M.Biotech. Ph.D
		Dr. apt. Susi Ari Kristina, M.Kes.
		Dr. apt. Muhammad Novrizal Abdi Sahid, M.Eng.
Scientific Presentation	:	apt. Eka Noviana, M.Sc. Ph.D
		apt. Anna Wahyuni Widayanti, M.P.H., Ph.D.
		apt. Puguh Indrasetiawan, M.Sc., Ph.D.
Timmerman Awards		Dr. Sylvia Utami Tunjung Pratiwi, M.Si.
		apt. Marlyn Dian Laksitorini, M.Sc., Ph.D.
3-MT Competition	:	apt. Soni Siswanto, M.Biomed. Ph.D
		Agustina Ari Murti Budi Hastuti, M.Sc. Ph.D

SCHEDULE

Tuesday, November 2, 2021 – Day I		
08.00-08.30	**Opening Ceremony**	
	Opening Speech:	1. Committee 2. Dean of the faculty of Pharmacy UGM 3. Rector of UGM
08.00-10.45	**PLENARY SESSIONS**	
08.30	**Keynote Speaker**	**Dr. Ir. Penny Kusumastuti Lukito, MCP.**
	Title	
09.15	**Plenary Talk-1**	**Prof. dr. Amin Soebandrio, Ph.D., Sp.MK.**
	Title	Updates in Covid-19
09.50	**Plenary Talk-2**	**Dr. Syamhanin Adnan**
	Title	The Pandemic COVID-19 and the Auspicious Role of Frontier Pharmacists against This Global Threat
10.20		**Q&A**
10.35	**Closing Plenary Session 1**	
12.30-13.45	**INVITED SESSIONS**	
	ROOM 1	
10.45	**Speaker**	**Prof. M. Yusuf**
	Title	Structural Bioinformatics for Covid-19 Vaccine, Diagnostics, and Therapeutics Design
11.15	**Speaker**	**Dr. Fadilah, S.Si., M.Si.**
	Title	Whole Genome Sequencing of SARS-CoV-2 for Drug Design Against COVID19: Molecular Interaction Approach
11.45		**Q&A**
	ROOM 2	
10.45	**Speaker**	**Assoc. Prof. Veysel Kayser, Ph.D.**
	Title	Novel Monoclonal Antibody Based Cancer Therapeutics
11.15	**Speaker**	**Dr. apt. Neni Nuraeny**
	Title	Development of Therapeutic Monoclonal Antibody against Cancer in Indonesia: An Industrial Perspective
11.45		**Q&A**
	ROOM 3	
10.45	**Speaker**	**Prof. Dr. apt. Gemini Alam**
	Title	Potential Active compounds Isolated from Indonesian Medicinal Plant
11.15	**Speaker**	**Assoc. Prof. Dr. Chuda Chittasupo**
	Title	Peptide Based-Targeted Drug Delivery Systems
11.45		**Q&A**
	ROOM 4	
10.45	**Speaker**	**Prof. Dr. apt. Ediati Sasmito, S.E.**
	Title	Noni (*Morinda citrifolia* L.) Polysaccharides as Natural Immunomodulator

11.15	**Speaker**	**Dr. Masteria Yunovilsa Putra**
	Title	Secondary Metabolites and Their Biological Activities from Indonesian Marine Organisms
11.45		**Q&A**
	ROOM 5	
10.45	**Speaker**	**Prof. apt. Junaidi Khotib, S.Si., M.Kes., Ph.D.**
	Title	Pharmaceutical Research Ecosystem in Accelerating Drug Development for Covid-19
11.15	**Speaker**	**Dr. Raymond R. Tjandrawinata, MS, MBA, FRSC**
	Title	The Future of Life Science: The Biopharmaceutical Story
11.45		**Q&A**
Wednesday, November 3, 2021 – Day II		
07.45	**Opening Ceremony**	
07.45-09.15	**PLENARY SESSIONSd**	
08.00	**Plenary Talk-3**	**Prof. Shawn Hsiang-Yin Chen, Pharm.D.**
	Title	Extending Clinical Pharmacy Practice by New Technologies
08.30	**Plenary Talk-4**	**Assoc. Prof. Dr. Hasniza Zaman Huri**
	Title	Pharmaceutical Care in COVID 19: Clinical Pharmacists' Role in Optimizing Disease Management
10.20		**Q&A**
10.35		**Closing Plenary Session 1**
09.30-12.30	**ORAL PRESENTATION**	
14.15-15.30	**INVITED SESSIONS**	
	ROOM 1	
14.15	**Speaker**	**Assoc. Prof. Dr. E (Eelco) Ruijter**
	Title	Discovery and optimization of new anti-tuberculosis leads
14.45	**Speaker**	**Prof. Dr. apt. Sardjiman, M.Si.**
	Title	How to learn Organic Chemistry via Iqro' Method
15.15		**Q&A**
	ROOM 2	
14.15	**Speaker**	**Alireza Mosavi Jarrahi, MSPH., Ph.D.**
	Title	The Burden of Exposure to Established Carcinogens Exposure in Asia
14.45	**Speaker**	**Dr. apt. Susi Ari Kristina, M.Kes.**
	Title	Estimating Tobacco-Related Cancers Deaths and Costs of Productivity Loss In Indonesia 2018
15.15		**Q&A**
	ROOM 3	
14.15	**Speaker**	**Prof. Dr. apt. Abdul Rohman, M.Si.**
	Title	The use of chemometrics in conjunction with instrumental techniques in pharmaceutical analysis
14.45	**Speaker**	**Prof. Dr. Ibrahim Jantan**
	Title	Phyllanthus Amarus and Its Major Constituents Modulate Inflammation-Associated Cell Signaling Pathways: Potential Role in the Prevention and Treatment of Inflammation and Cancer
15.15		**Q&A**

	ROOM 4	
14.15	**Speaker**	**Prof. apt. Muchtaridi, M.Si., Ph.D.**
	Title	Design of Radiopharmaceutical of Alpha Mangostin for Breast Cancer Theragnostic
14.45	**Speaker**	**Prof. Dr. Evamarie Hey-Hawkins**
	Title	Carbonares and Metallacarbonares as Building Blocks for the Design of Novel Anti-Tumour Agents
15.15		**Q&A**

Thursday, November 4, 2021 – Day III		
08.00	**FP-Timmerman Award** **ISCC Meting**	
12.30	**3-MP Competition**	
13.40	**Break**	
14.00	**Plenary Talk-5**	**Prof. Jackson Chieh-His Wu**
	Title	Preclinical Evaluation of Sclareol as an Adjuvant Therapy for Cisplatin Resistance in Non–Small Cell Lung Cancer
14.30	**Plenary Talk-6**	**Prof. Dr. apt. Daryono Hadi Tjahjono, M.Sc.Eng.**
	Title	The Role of Computational Method in Discovering Lead Compounds and Repurposing of Existing Molecules
15.00	**Plenary Talk7**	**Prof. dr. W.J. (Wim) Quax**
	Title	Designed receptor specific TNF ligands to fight cancer and fibrosis
15.30		**Q&A**
16.05		**Closing Plenary Session 1**

Oral Presentation Schedules		
Day 1-Tuesday, November 2, 2021		
Cartenz Room: **Pharmacology, Pharmaceutical Chemistry and Pharmaceutical Biotechnology (PPCP) Symposium** **13.00-15.00 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Nunung Yuniarti** **2. Dr. Firzan Nainu**		
Code	**Name**	**Title**
PPCP-1	Yuliet	Immunomodulatory Potential of Stem Bark Pepolo Extract (Bischofia javanica Blume) Against Phagocytosis Activity of Macrophage Cells on Balbc/C Male Mice
PPCP-2	Purwaniati	Molecular Docking Study and Molecular Dynamics Simulation of Spice Metabolites against Main Protease Enzymes and NSP3 Macrodomain SARS CoV-2
PPCP-3	Purwaniati	Molecular Docking, Molecular Dynamics, And Chemical Compound Toxicity Testing In Curcuma Longa As An Alternative Anti-inflammation Against Cyclooxygenase Enzyme
PPCP-4	Ruswanto	Synthesis and in silico study of Bis-(1-(4-hexylbenzoyl)-3-methylthiourea) Cobalt (III) complex as anticancer candidate
PPCP-5	Salsa Lina Agustin	Admet Prediction of Acyl Pinostrobin Derivatives Based on In Silico Study
		Q&A (15 min)
PPCP-9	Helmi	Caesalpinia sappan L. and brazilin enhance spatial memory in scopolamine-induced memory impairment in mice
PPCP-10	Natasia	Effect of Lemongrass (Cymbopogon citratus (DC. EX Nees) S.), Avocado (Persea americana M.), and Eggplant (Solanum melongena L.) in the treatment of disease leading causes of death in Indonesia: A literature study
PPCP-11	Asri Dwi Endah Dewi Pramesthi	Bitter Gourd (Momordica charantia L.) Affects the Pharmacokinetics Profile of Metformin in Rabbits Plasma
PPCP-13	Yudy Tjahjono	The potential analgesic, anti-inflammatory, and anti-platelet activity of 2-((3-(chloromethyl)-benzoyl)oxy)benzoic acid
PPCP-14	Vivi Asfianti	Determination of Total Flavonoid Content, Total Phenol Content and Antioxidant Activity of Ethanol Extract of Macrosolen cochinchinensis (Lour.) V. Tiegh
		Q&A (15 min)

Oral Presentation Schedules		
Day 1-Tuesday, November 2, 2021		
Merapi Room: **Cancer Chemoprevention (CCP) Symposium** **13.00-15.08 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Sarmoko** **2. Anugerah Budipratama Adina, MHSC**		
Code	**Name**	**Title**
CCP-1	Salma Nur Azizah Azzahra	A Bioinformatic Analysis Predicts Five Critical Gene Targets of Glycyrrhizic Acid Linked to Tamoxifen Resistance in Breast Cancer
CCP-2	Wilfan Ibadurrahman	Functional Network Analysis to Reveal the Potential of Oleanolic acid in Overcoming Tamoxifen Resistance in Breast cancer
CCP-3	Skolastika	Identification of Honokiol Target Proteins in the Inhibition of Breast Cancer Stem Cells by Bioinformatics Study
CCP-4	Febri Wulandari	Bioinformatic study uncover candidate target genes of a new PGV-1 derivative, CCA-1.1, encompassed in DMH-colorectal carcinogenesis
CCP-5	Endah Puspitasari	Antiproliferative activity of Ethanolic Extract of Kembang Bulan (Tithonia diversifolia) Leaf on HeLa Cervical Cancer Cell Lines
CCP-6	Zulfikar Ali	Bioinformatics Analysis Uncovers Targets and Mechanism of Borneol in Overcoming Breast Cancer Resistance to Tamoxifen
	Q&A (15 min)	
CCP-7	Dhania Novitasari	Integrative Bioinformatic Analysis Reveal CCA-1.1 Targets Mitosis Regulatory in Breast Cancer
CCP-8	Fauziah Rifai	Cytotoxic Analysis of Hesperidin and PGV-1 for HepG2 Hepatocellular Carcinoma Cells: Bioinformatics and In-Vitro Study
CCP-9	Anggraini Nafiatussholikha	Secondary Metabolite of Mango Peels Extracts Induces G1/S Phases Cell Cycle Arrest in Breast Cancer Cells Through The Regulation of Cyclin B1
CCP-10	Fauzian Sekar Indrasyah	Potential of Citrus Flavonoids as an inducer of colorectal cancer cell apoptotic targeting DNMT1 based on bioinformatics studies
CCP-11	Khor Poh Yen	Structure-Activity Relationship (SAR) of Asymmetric Curcumin Derivatives as Promising Anti-Cancer Agent against Triple-Negative Breast Cancer (TNBC) Cells
	Q&A (15 min)	

Oral Presentation Schedules		
Day 1-Tuesday, November 2, 2021		
Kerinci Room: **Pharmacy Education, and Social and Administrative Pharmacy, Clinical Pharmacy (PESC) Symposium** **13.00-15.08 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Fita Rahmawati** **2. Dr. Dwi Endarti**		
Code	**Name**	**Title**
PESC-1	Pratiwi Wikaningtyas	The satisfaction level of telemedicine application: ITB pharmacy students perspective
PESC-2	Hesty Ramadaniati	E-Health Literacy and Adherence to Health Protocols in COVID-19 Patients Undergoing Self-Isolation in a Sub-district in West Java
PESC-3	Leonny Hartiadi	Drug Use Evaluation of Rivaroxaban on Out-Patient with Atrial Fibrillation at a Heart Centre in Indonesia
PESC-4	Alexxander	Development and evaluation of an elective course for third-year pharmacy students on pharmacy health coaching in Indonesia
PESC-5	Elida Zairina	The effectiveness of Education Session by Pharmacists for Asthma Management
PESC-6	Agustina Nila Yuliawati	Correlation of Medication Adherence and Quality of Life also its Related Factors in End-Stage Renal Disease Patients with Hypertension and Receiving Hemodialysis
Q&A (15 min)		
PESC-7	Pande Made Desy Ratnasari	Correlation of Knowledge with Medication Adherence and Quality of Life Among End-Stage Renal Disease Patients in Dialysis Unit of Private Hospital Denpasar Bali
PESC-8	I Putu Yuda Pratama	Relationship Between Blood Glucose Control Achievement And Covid-19 Severity
PESC-9	Putri Dina Mahera Laily	Antibiotics Therapy in Treatment COVID-19 at RSUP Dr. Sardjito Yogyakarta Indonesia
PESC-10	Erza Genatrika	Observational Study of Compounding Sterile Preparations in "X" Hospital Purwokerto City, Indonesia
PESC-11	Bhekti Pratiwi	The Role of Agent of Change (AoC) Pharmacists in Supporting the Covid-19 Vaccine Program
Q&A (15 min)		

Oral Presentation Schedules		
Day 1-Tuesday, November 2, 2021		
Galunggung Room: **Pharmaceutics & Drug Delivery System (PDDS) and Pharmacology, Pharmaceutical Chemistry and** **Pharmaceutical Biotechnology (PPCP) Symposia** **13.00-15.00 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Prof. Akhmad Kharis Nugroho** **2. Dr. Khadijah**		
Code	**Name**	**Title**
PDDS-1	Deni Anggraini	Eutectic Mixture of Fenofibric Acid With Nicotinic Acid For Improving its Dissolution Profile
PDDS-3	Erika Yuda Colatama	Development And Optimization Of Oleic Acid Nanoemulgel Loaded Dexamethason Based On Its Physical Properties
PDDS-5	Angi Bestari	Development of The Oral Disintegrating Film Containing Diclofenac Potassium with Gelatin and Xanthan Gum as The Polymers
PDDS-6	Nining Sugihartini	Optimization of the Composition of Oleic Acid and Propylene Glycol as Enhancer of Essential Oil of Clove (Syzygium aromaticum) in Hydrocarbon Ointment with the Simplex Lattice Design Method
PDDS-7	Larasati	Pt(IV) Prodrugs and Metal-Organic Frameworks for Enhanced Cancer Therapy
Q&A (15 min)		
PDDS-13	Miftahus Sa'adah	The Effect of Polysorbate 20 and Sucrose Concentration Variation as Stabilizer against Protein Aggregation
PPCP-6	Isti Daruwati	Physicochemical Characteristics of 131I-AMB10 And Its Internalization of The T-47D Human Cell Line As A Theranostics Radiopharmaceutical Candidate For Breast Cancer
PPCP-7	Wiwit Nurhidayah	Stability and In Vitro Study of 131I-Alpha Mangostin as Radiopharmaceutical Candidate for Breast Cancer
PPCP-12	Wening Lestari	Physico-chemical Properties of Technetium-99m-Macroaggregated Albumin (99mTc-MAA) Radiopharmaceutical
PPCP-16	Hadifa Achria Permata Zain	Formulation and Antioxidant Activity of Cream Marine Sponge Extract (Axinella carteri) by Using the DPPH Method(1.1-Diphenyl-2-Picrylhydrazyl)
Q&A (15 min)		

Oral Presentation Schedules		
Day 1-Tuesday, November 2, 2021		
Krakatau Room: **Herbal Medicine and Natural Products (HMNP) Symposium** **13.00-15.00 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Purwanto** **2. Sisca Ucche, M.Pharm.Sc.**		
Code	**Name**	**Title**
HMNP-2	Sri Andriyani	Potential of Compounds in Moringa Leaves on Cellular Senescence Activity through Bioinformatics-based p21 Inhibition and In Silico Approach
HMNP-3	I Made Wisnu Adhi Putra	The combination of Coccinia grandis and Blumea balsamifera extracts with enhanced antioxidant properties: in vitro synergistic effect
HMNP-4	Khoirun Nisyak	Antinephrolithiasis activity of ethanolic extract of Uncaria gambir Roxb leaves
HMNP-5	Putu Yudhistira Budhi Setiawan	Anti-inflammatory effects of Curcuma xanthorrhiza and Physalis angulata extract on lipopolysaccharide stimulated RAW 264.7 cells through inhibition of cytokine
HMNP-6	Verawati Verawati	In vitro determination of Sun Protection Factor of Elephantopus mollis extract
Q&A (15 min)		
HMNP-7	Putu Oka Samirana	TLC-Densitometry Profile of Supernatant and Mycelium Extract from Fungi Trichoderma reesei TV221
HMNP-8	Jeannifer Rebecca	Determination of Specific and Non-specific Parameters of Ethanol Coriander (Coriandrum sativum) Leaves Extract and Its Antioxidant Activity
HMNP-9	Putri Helena Junjung Buih	Validation of The Analytical Method of Assay of eugenol in The Formulation OW Creams of Essential Oil of Clove by High Performances Liquid Chromatography
HMNP-10	Sulaiman Zubair	LC-MS/MS Analysis, Docking and Molecular Dynamics Approaches to Identify Potential SARS-CoV-2 3-Chymotrypsin-like Protease Inhibitors from n-hexane extract of Zingiber officinale Roscoe
HMNP-11	Annisa Krisridwany	The In Vitro Antibacterial Activity Of Combination Of Muntingia calabura Fruit With Yogurt Against Escherichia coli BACTERIA
Q&A (15 min)		

Oral Presentation Schedules		
Day 1-Tuesday, November 2, 2021		
Rinjani Room: **Herbal Medicine and Natural Products (HMNP) Symposium** **13.00-15.00 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Indah Purwantini** **2. Puguh Novi Arsito, M.Sc.**		
Code	**Name**	**Title**
HMNP-12	Andre Marolop Siahaan	Turmeric Yields Neuroprotective Effect In Animal Model Of Repetitive Traumatic Brain Injury Via Erk/Nrf2 Pathway
HMNP-13	Puji Astuti	Endophytic Fungi, A potential Source of Bioactive Compounds
HMNP-14	Iis Nur Azizah	Immunomodulator Activity Of Tin Fruit Ethanol Extract (Ficus Carica Liin) Against Phagocytosis Macrophages And Lymphocyte Proliferation In Vitro
HMNP-16	Arif Nur Ikhsan	Biological Activities Found in Black Rice Lead Promising Functional Food and Natural Cosmetics : A Review
HMNP-17	Indah Hairunisa	Phytochemical Screening And Antioxidant Activity Of Black Ginger (Kaempferia parviflora) And Black Turmeric (Curcuma caesia)
	Q&A (15 min)	
HMNP-18	Denny Satria	The Effect of Extraction Methods towards Antioxidant Activity, Total Phenolic Content and Total Flavonoid Content of Clitoria ternatea L. Flower
HMNP-19	Leticia Annalisa	Antioxidant Activity Evaluation Of Sambiloto (Andrographis Paniculata (Burm.F.) Nees): In Vitro Approach
HMNP-20	Monika Wisda Herisman	In Vitro Antioxidant Activity Of Temu Mangga (Curcuma Mangga Val.)
HMNP-21	Pasha Lulu Isnianingtyas	Anticovid Drug Candidate In Bay Leaf (Syzygium polyanthum (Wight) Walp).) Targeted Main Protease And Ace-2 Receptors As Well Reduced Comorbid Diseases
HMNP-22	Putri Anggraini Budianto	Cellular Senescence Prevention via CD36 Inhibition by Cinnamomum verum Active Compounds: An In Silico Study with Molecular Docking and Knime
	Q&A (15 min)	

Oral Presentation Schedules		
Day 2-Wednesday, November 3, 2021		
Cartenz Room: **Pharmacology, Pharmaceutical Chemistry and Pharmaceutical Biotechnology (PPCP) Symposium** **09.30-11.46 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Dyaningtyas Dewi Pamungkas Putri** **2. Dr. Setyowati Triastuti Utami**		
Code	**Name**	**Title**
PPCP-8	Akhmad Kharis Nugroho	NLMIXR, a powerful open-source tool for population-based pharmacokinetic modeling
PPCP-15	Rohmad Yudi Utomo	Discovery of Curcumin-Based Compounds as Amyloid ß Inhibitors and Application to MRI Contrast Agents for Alzheimer's Disease
PPCP-17	Ni Nyoman Wahyu Udayani	ANTI INFLAMMATORY ACTIVITY OF THE BLACK TURMERIC (Curcuma caesia Roxb.) ETHANOL EXTRACT IN CARRAGEENAN INDUCED MALE WISTAR STREAM RATS
PPCP-19	Tania Hamdhani	INTERACTION BETWEEN ACTIVE COMPOUNDS FROM Crocus sativus L. AS ANTI RHEUMATOID ARTHRITIS TARGETED SIRTUIN 1, MAPK14, and IκB
PPCP-20	Vedo Kinata	MOLECULAR DOCKING COMPOUNDS OF EXTRACT SAFFRON (Crocus Sativus L.) AS ANTI-CYTOKINE STORM POTENTIAL WITH TARGET PROTEINS IKK-ß AND MAPK
PPCP-21	Hari Purnomo	Design and Synthesis of 1,3 bis(p-hydroxyphenyl)urea as an Alzheimer's drug
Q&A (15 min)		
PPCP-22	Nur Fitriana Muhammad Ali	Agaricus bisporus Supplementation Decreased Parasitaemia In Plasmodium berghei-Infected Mice
PPCP-23	Enade Perdana Istyastono	PDB2PLIF-assisted Identification of Sandwich Interaction Between MMP9 and CC27
PPCP-24	Peni Indrayudha	Activity Of Active Protein Of Soursop Seed (Annona Muricata L.) On 4T1 And T47D Cells
PPCP-25	Marlyn Laksitorini	Examination of Wnt/ß-catenin signaling activity on human cerebral microvessels endothelial cells (hCMEC/D3) following treatment of lithium-atypical antipsychotic combination.
PPCP-26	Aliffian Farhan Wahyudi	Molecular Docking Betasianin Compound on Red Beetroot (Beta Vulgaris L.) Targeted Protein DHFR CA9 CA12 and SRC as Breast Cancer Supporty Theraphy"
PPCP-27	Elsy Rahimi Chaldun	Physicochemical Properties of Sodium Alginate from Brown Alga Sargassum aqualifolium and Sargassum cinereum
Q&A (15 min)		

Oral Presentation Schedules		
Day 2-Wednesday, November 3, 2021		
Merapi Room: **Cancer Chemoprevention (CCP) Symposium** **09.30-11.38 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Denny Satria** **2. Annisa Khumaira, M.Biotech.**		
Code	**Name**	**Title**
CCP-12	Ahmad Syauqy Tafrihani	ROCK1 in metastatis as the target of Caesalpinia sappan L. Heartwood Compounds: a virtual metabolomic study
CCP-13	Eunike Soesanto	Galangal (Alpinia galanga) Potential as Immune Checkpoint Inhibitor Targeting CTLA-4 Protein: Bioinformatic and Chemometric Studies
CCP-14	Muhammad Fandy Noor Aziz	The Potency of Gelsolin Inhibition in Epithelial-Mesenchymal Transition Using Active Compounds of Caesalpinia sappan through Virtual Proteomics Approach
CCP-15	Anik Sri Ernawati	Metabolomic Analysis of Piper nigrum Essential Oil and Its Potential as co-chemotherapy Agent for Prostatic Cancer through JAB1 Inhibition: A Virtual Proteomics Study
CCP-16	Ratih Kurnia Wardani	THE POTENCY OF CITRUS FLAVONOID AS A CHEMOPREVENTIVE TARGETING GGPS1 IN LIVER CANCER: A BIOINFORMATIC STUDY
CCP-17	Rifki Febriansah	Culture Optimization of Streptomyces sp. GMY01 Bacteria as Anticancer Agent by Chemometric Analysis
	Q&A (15 min)	
CCP-18	Binar Asrining Dhiani	2-Benzoxazolinone from Acanthus ilicifolius Leaves Potential for MCF-7 Breast Cancer Cell Inhibition via Estrogen Receptor
CCP-19	Salsabila Milando Pradani Zuriagesty	Chemopreventive Activity of Gnetum gnemon L. Ethyl Acetate Fraction on Colon Cancer Cells Line
CCP-20	Rahmawati	Antioxidant and Anticancer Activity of Dillenia serrata Thunb Ethanol Extract Against Breast Cancer Cell Line MCF-7
CCP-21	Midori Adisusilo	The Potency of Sappan Wood (Caesalpinia sappan L.) as Co-chemoterapy Agent in Ovarian Cancer Targeting SUMO1 Protein
CCP-22	Devi Rahmawati	Cytotoxic Activity of Melinjo Seed Ethanol Fraction (Gnetum gnemon L.) for HeLa Cells and Bioinformatics Assay Targeted Cervical Cancer Regulatory Proteins
	Q&A (15 min)	

Oral Presentation Schedules		
Day 2-Wednesday, November 3, 2021		
Kerinci Room: **Pharmacy Education, and Social and Administrative Pharmacy, Clinical Pharmacy (PESC) Symposium** **09.30-11.46 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Susi Ari Kristina** **2. Dr. Elida Zairina**		
Code	**Name**	**Title**
PESC-12	Dirga	The Effect Of Knowledge And Adherence To Clincal Outcome In Type 2 Diabetes Mellitus Patients In Several Health Centers In Bandar Lampung
PESC-13	Alexxander	3 Co-TEAM: A logic model for pharmacy health coaching among substance use disorders patients
PESC-14	Sonlimar Mangunsong	PEMBERIAN INJEKSI ANTIBIOTIK PADA PASIEN DI RUANG PERAWATAN PENYAKIT DALAM DI RUMAH SAKIT PALEMBANG (PROVISION OF ANTIBIOTIC INJECTIONS TO THE PATIENT CARING IN INTERNAL DISEASE INPATIENT AT PALEMBANG HOSPITAL)
PESC-15	Vinci Mizranita	The Management of Minor Ailments Scope and Curricula across Indonesian Pharmacy Schools
PESC-16	Nadia Husna	The Role Of Antibiotics And Antivirals On Clinical Improvement Of Covid-19 Patients In Yogyakarta
PESC-17	Nanda Puspita	Identifying Beers Criteria Medications among Older Outpatients in Harapan Kita National Heart Center
Q&A (15 min)		
PESC-18	Mariska Sri Harlianti	Evaluation of The Use of Pain Relievers through Self-Medication and Potential Drug Interaction in The Pharmacy X Magetan Regency
PESC-19	Sabarudin	The Impact of The Covid-19 Pandemic on The Drug Management and Drug Availability In Three Public Health Centers In Kendari City
PESC-20	Fathul Muin	Compliance to Health Protocols among Pharmacy Technician in Community Pharmacies
PESC-21	Diyan Rossetyowati	Antibiotic Use to Meningoencephalitis Bacterial at Regional Hospital of Central Java
PESC-22	Nguyen Truong Le Thuy	Severe neutropenia and transaminitis in acute lymphoblastic leukemia children treated with FRALLE-2000 protocol
PESC-23	Fita Rahmawati	The Development of "DOSING GAMA": An Application for Dose Adjustment in Patients with Renal and Hepatic Impairment
Q&A (15 min)		

Oral Presentation Schedules		
Day 2-Wednesday, November 3, 2021		
Galunggung Room: **Pharmaceutics & Drug Delivery System (PDDS) Symposium** **09.30-10.30 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Ronny Martien** **2. Miftahus Sa'adah M.Si.**		
Code	**Name**	**Title**
PDDS-8	Dyera Forestryana	Formulation Of Wound Healing Hydrogel From 70% Ethanol Extract Kelakai Roots (Stenochlaena palustris (Burm. F.) Bedd) with Polymer Combination Of Pva And Hpmc
PDDS-9	Witri Lestari	Surface Modification of MIL-100(Fe) with Mesoporous Silica Nanoparticles for Slow Release of Curcumin
PDDS-12	Ungsari Rizki Eka Purwanto	Optimization Polysorbate 80 And Sorbitan Monooleate 80 As Emulsifier In Cosmetic Foundation Containing Ethyl Cinnamate
PDDS-14	Desak Gede Sri Andayani	Nanoencapsulated formulation of antibacterial metabolites by N. niigatensis TP5 Strain with Ionic gelation technique using Na alginate
PDDS-15	Desak Gede Sri Andayani	Nanoencapsulated formulation of antibacterial metabolites by soil actinomycete, Nocardia sp. TP5 from Tangkuban Perahu Mountain, West Java, Indonesia with the ionic gelation technique using Na alginate
PDDS-16	Vania Santika Putri	Quercetin Nano-emulsion Preparation: A Preliminary Optimization
Q&A (15 min)		

Oral Presentation Schedules		
Day 2-Wednesday, November 3, 2021		
Krakatau Room: **Herbal Medicine and Natural Products (HMNP) Symposium** **09.30-11.30 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Djoko Santosa** **2. Joko Tri Wibowo, M.Sc.**		
Code	**Name**	**Title**
HMNP-23	Fitriana Hayyu Arifah	A bibliometric analysis of preclinical trials of Tinospora crispa (L.) Hook.f. & Thomson on diabetes mellitus
HMNP-24	Mahatir Muhammad	Optimization extraction of curcumom from Curcuma domestica Vahl. rhizome with microwave-assisted extraction technique
HMNP-25	Arnida	IDENTIFICATION OF CHEMICAL COMPOUNDS AND HEME POLYMERIZATION INHIBITION ASSAY OF n-HEXANE FRACTION OF MANURAN (Coptosapelta tomentosa Valeton ex K. Heyne) STEM FROM KOTABARU SOUTH KALIMANTAN
HMNP-26	Dennaya Kumara	Anti-aging Properties of Citronella Essential Oil by Targeting PTGS2, CYP19A1, and HMGCR in Cellular Senescence Pathway
HMNP-27	Riska Amalia	Secang Wood Extract (Caesalpinia sappan) Prevents Aging Trough Inhibition Of Cellular Senescence
HMNP-28	Poppy Arifin	Analgesic Activity of Herbal Extract Combinations for Common Cold
	Q&A (15 min)	
HMNP-29	Marianne	ANTIDEPRESSANT ACTIVITY of Coffea canephora Pierre ex A. Froehner SEED EXTRACT
HMNP-30	Christina Mutiara Putri Gono	Galangal Essential Oil As An Alternative For Cancer Immunotherapy Through Sting Activation
HMNP-31	Hanaan Emilia Adi Hastuti	The Minimum Potency of Sappanwood (Caesalpinia Sappan L.) as Anti- metastatic Agent in Cervical Cancer Targeting MMP-9 Protein
HMNP-32	Dharmastuti Fatmarahmi	Analysis of Synthetic Drugs Adulterant in Herbal Medicine Product Using FTIR Spectroscopy and Multivariate Analysis
HMNP-33	Anif Nur Artanti	Antioxidant Activity of Single-Dose and Combined-Dose of Nanoparticles from Soursop Leaves (Annona muricata L.) and Sappan wood (Caesalpinia sappan L.)
	Q&A (15 min)	

Oral Presentation Schedules		
Day 2-Wednesday, November 3, 2021		
Rinjani Room: **Herbal Medicine and Natural Products (HMNP) Symposium** **09.30-11.30 (Jakarta time, GMT +7) (7 min for each presenter)** **Moderators:** **1. Dr. Yosi Bayu Murti** **2. Candra Dwipayana Hamdin, M.Sc.**		
Code	**Name**	**Title**
HMNP-34	Dwi Hartanti	Pharmacognostic Standards, Antioxidant Activity, and Hepatic Safety Profile of An Indonesian Antidiabetic Polyherbal Formulation
HMNP-35	Nasri	The potential of *Vernonia amygdalina* Delile Leaves as Antibiofilm and Stimulation of Membrane Leakage on Salmonella typhi
HMNP-36	Jovie Mien Dumanauw	Purple Sweet Potato Leaf Extract (*Ipomoea batatas* var Ayamurasaki) Reduce Blood Glucose Levels on Wistar Rats (*Rattus norvegicus*)
HMNP-37	Yos Banne	Anti-Inflammatory Effects Of The N-Hexan Fraction Of Papaya Flower (Carica papaya L.) In White Rats (Rattus novergicus)
HMNP-38	Krisna Kharisma Pertiwi	Analgesic Activity and Toxicity of Methanol Fraction from Breadfruit Leaf (*Samanea saman* (Jacq.) Merr.)
Q&A (15 min)		
HMNP-39	Fadilah	Phytochemistry and Cytotoxicity Test of Kemang (Mangifera kemanga) Peel Extract against T47D Breast Cancer Cell Proliferation
HMNP-40	Surya Dwira	Phytochemical Analysis, Total Phenol, Total Flavonoids, and In-vitro Test of Kunto Dewo (Kigelia pinnata) Flesh and Skin Fruit Ethyl Acetate Extract on HeLa Cells
HMNP-41	Nuha Haifa Arifin	Molecular Docking Study of Ciplukan Herb (*Physalis angulata* L.) As Antivirus Covid-19
HMNP-42	Ihsan Muchsin	Virtual screening and molecular docking studies of fungal secondary metabolites to identify potential Human Cytomegalovirus pUL145 inhibitors
HMNP-43	Paula Mariana Kustiawan	Phytochemical, Antioxidant and Antibacterial Activity of *Spatholobus hirsutus* From East Kalimantan
Q&A (15 min)		

Speakers Curriculum Vitae

Dr. Ir. Penny Kusumastuti Lukito, MCP.

Affiliation : Head of The National Agency of Drug and Food Control, Republic of Indonesia

Email :penny.lukito@yahoo.com, penny.lukito@pom.go.id

Short Bio Sketch

Dr. Ir. Penny K. Lukito, MCP is the Head of the National Agency of Drug and Food Control, Republic of Indonesia who was inaugurated by President Joko Widodo since July 2016. During his 30-year career, she has held several leadership level positions in the Ministry of National Development/BAPPENAS, Urban and Rural Director, Inspector for Institutional Performance, Director of the Environment, Director of Development Performance Evaluation and Reporting Systems, and Main Planning Functional Officers, before being assigned as Head of BPOM RI.

Penny Lukito completed his undergraduate degree in Environmental Engineering at ITB in 1988, earned his Master of City Planning (MCP) in Environmental Planning and Policy from the Massachusetts Institute of Technology (MIT) in 1994. He earned a Ph.D., a Doctoral degree with a Major in the field of Environmental Engineering (Environmental Engineering), and a Minor in City and Regional Planning from the University of Wisconsin-Madison, the USA in 2000.

Some of the papers produced include a book entitled “Embracing Transparency and Accountability of Public Sector Performance: Future Challenges of Democracy” published by PT. Gramedia, and several articles in print media. In 2018, he wrote an article entitled “In Search of Halal Vaccines and Access to Medicines” published in The Jakarta Post 15 November 2018, and “Encouraging Drug and Vaccine Independence” in Kompas Newspaper 17 November 2018. In 2019, Penny Lukito wrote about his achievements while serving as Head of the POM Agency in the book “The POM Agency Comes to Work Together for the Nation”.

Penny Lukito started his career as a civil servant in 1990. Received the SATYA LENCANA WIRAKARYA award from the President of the Republic of Indonesia based on Presidential Decree No. 043/TK/2006 of 2006 concerning Service in Urban and Rural Development Planning. Received the XXX YEAR SATYA LENCANA KARYA award from the President of the Republic of Indonesia in 2020 after serving 30 years as a Civil Servant (26 years at BAPPENAS and 5 years as Head of BPOM)

Prof. dr. Amin Soebandrio. Ph.D, Sp.MK.

Affiliation : Eijkman Institute for Molecular Biology, Jakarta, Indonesia; Department of Microbiology, University of Indonesia
Skill and Expertise : Infectious Disease Medicine

Short Bio Sketch :

Professor Amin Soebandrio, graduated from the Medical Faculty University of Indonesia, obtain the Clinical Microbiology Specialization from the same institution, and awarded PhD in Immunogenetics by the Osaka University/Kobe University Japan. Has research interest in Emerging and Re-emerging Infectious Diseases and Antimicrobial Resistance. Served as Chairman of Expert Panel of the National Committee for Zoonotic Diseases from 2009 until 2017. From 2000 until 2013 served as Senior Advisor and then Deputy Minister at the Ministry of Research and Technology. Currently act as the Chairman of Steering Committee, Asian Partnership for Emerging Infectious-diseases Research (APEIR), Board Chairman of CORDS (Coordinating Organization for Regional Diseases Surveillance), Member of Expert Panel of Indonesian GHSA (Global Health Security Agenda) Committee, Member of National Committee for Bioethics, and Member of Expert Committee of Covid-19 Special Task Force. Member of Indonesian Technical Advisory Group for Immunization (ITAGI). Chairman of Eijkman Institute for Molecular Biology 2014 - 2021. Chairman, Ministry of Health Committee for Stem Cell Development, since 2021.

Selected Publications:

1. Stability of Zika Virus Antibodies in Specimens from a Retrospective Serological Study (July 2021)
2. Characteristics of Children with Confirmed SARS-CoV-2 Infection in Indonesia (June 2021)
3. Spatiotemporal Heterogeneity of Zika Virus Transmission in Indonesia: Serosurveillance Data from a Pediatric Population (May 2021)
4. New Approach for the identification of potentially toxigenic Corynebacterium sp. using a multiplex PCR assay (March 2021)
5. Biofilm-Producing Bacteria and Risk Factors (Gender and Duration of Catheterization) Characterized as Catheter-Associated Biofilm Formation (February 2021)
6. Identification of viral etiology of acute respiratory tract infections in children and adults in Tabanan, Bali, Indonesia (March 2020)
7. Rickettsia felis identified in two fatal cases of acute meningoencephalitis (February 2020)
8. Growth Characteristics of Chikungunya Virus Isolate from Indonesia in Various Human Cell lines in vitro (March 2019)
9. Endemicity of Zika virus in Indonesia: serological evidence in pediatric population (February 2019)
10. Laboratory parameters for predicting Salmonella bacteraemia: a prospective cohort study (September 2017).

Assoc. Prof. Dr. Hasniza Zaman Huri

Affiliation : Faculty of Pharmacy, Universiti of Malaya
E-mail Address **:** hasnizazh@um.edu.my
Position Title : Dean, Faculty of Pharmacy, Universiti Malaya
Skills and Expertise : Diabetology, Clinical Pharmacy and Pharmacogenomics

Short Bio Sketch

Dr Hasniza Zaman Huri is an Associate Professor of Clinical Pharmacy and Pharmacogenomics in the Department of Clinical Pharmacy and Pharmacy Practice, Universiti Malaya, Malaysia. She is the founder Dean of the Faculty of Pharmacy, a newly established and the 13th faculty in the Universiti Malaya since 1 September 2019. Associate Professor Dr Hasniza and Type 2 Diabetes is inseparable. Her research covers optimal management, biomarkers, insulin resistant study, and all areas of Type 2 Diabetes, and clinical pharmacy encompasses associations of drug response and related factors, drug-related problems and pharmaceutical care issues, general biomarkers study, pharmacogenomics pharmacodynamics study, gene-disease-drug response associations and PK-PD study. She has published more than 70 papers indexed in WOS in her area of expertise. She held various critical administrative posts, among others the Manager of Clinical Investigation Centre (CIC) from 2012-2015 and later appointed as the Director/Head of CIC (2015-2019). CIC, Universiti Malaya Medical Centre (UMMC) is a world-class, reputable, and multi-winning clinical trial centre. Under her tenure, CIC has won many accolades at the international levels, procured around 590 clinical trials, and worked with 300 pharmaceutical sponsors and CROs worldwide. CIC recognized as the first Prime Site for Quintiles (now is IQVIA) in Asia, the first Strategic Alliance Site for Parexel Inc in Malaysia and the first Pfizer's INSPIRE (Investigator Networks, Site Partnerships and Infrastructure for Research Excellence) Site in Malaysia and many more. Previously, Associate Professor Dr Hasniza was also leading the research thrust of UMMC strategic planning. At present, she is also the Honorary Visiting Consultant at CIC and a permanent member of the Drug Control Authority (DCA) Ministry of Health, Malaysia.

Selected Publications:

1. Associations between Socio-Demographic Factors and Hypertension Management during the COVID-19 Pandemic: Preliminary Findings from Malaysia (September 2021)
2. Retinol-Binding Protein-4—A Predictor of Insulin Resistance and the Severity of Coronary Artery Disease in Type 2 Diabetes Patients with Coronary Artery Disease (September 2021)
3. Single Nucleotide Polymorphism rs17173608 in the Chemerin Encoding Gene: Is It a Predictor of Insulin Resistance and Severity of Coronary Artery Disease in Non-Obese Type 2 Diabetes? (May 2021)
4. Pharmacometabolomics of Meformin Demonstrated Insulin Sensitivity Related Pathways at Peak Plasma Concentration on Healthy Volunteers – Preliminary Results (May 2021)
5. Association of YKL-40 Encoding Gene CHI3L1 rs946263 with Insulin Resistance and Severity of Coronary Artery Disease in Type 2 Diabetes Mellitus Patients (March 2021)
6. Patient-Centred Communication in the Use of Antidepressants among People with Depression: A Scoping Review (January 2021)
7. Clinical and genetic markers of erythropoietin deficiency anemia in chronic kidney disease (predialysis) patients (August 2020)
8. Prevalence of Depression among Undergraduate Pharmacy Students in Malaysia (July 2020)
9. Heart Failure With Type 2 Diabetes Mellitus: Association Between Antihyperglycemic Agents, Glycemic Control, and Ejection Fraction (July 2020)
10. Clinical and genetic predictors of secondary sulfonylurea failure in Type 2 diabetes patients: the SUCLINGEN study (May 2020)

Prof. dr. W.J. (Wim) Quax

Affiliation : Pharmaceutical Biology Group, University of Groningen
Skills and Expertise : Recombination, Phage Display, Protein Engineering

Selected Publications:

1. Proteolysis Targeting Chimera (PROTAC) for Macrophage Migration Inhibitory Factor (MIF) Has Anti-proliferative Activity in Lung Cancer Cells (May 2021)
2. Proteolysis Targeting Chimera (PROTAC) for Macrophage Migration Inhibitory Factor (MIF) Has Anti-proliferative Activity in Lung Cancer Cells (May 2021)
3. Engineering of Multiple Modules to Improve Amorphadiene Production in Bacillus subtilis Using CRISPR-Cas9 (April 2021)
4. RANKL contributes to lung tissue repair via promoting type II epithelial cell proliferation (March 2021)
5. High Level Production of Amorphadiene using Bacillus subtilis as an Optimized Terpenoid Cell Factory (October 2020)
6. Positioning Bacillus subtilis as Terpenoid Cell Factory (October 2020)
7. 7-Hydroxycoumarins Are Affinity-Based Fluorescent Probes for Competitive Binding Studies of Macrophage Migration Inhibitory Factor (September 2020)
8. RANKL contributes to lung tissue repair via promoting type II epithelial cell proliferation (September 2020)
9. Artemisinin Derivatives Stimulate DR5-Specific TRAIL-Induced Apoptosis by Regulating Wildtype P53 (September 2020)
10. Sortase mutants with improved protein thermostability and enzymatic activity obtained by consensus design (July 2020)

Speakers Curriculum Vitae

Dr. Syamhanin Adnan

Affiliation : Infectious Disease Center, Department of Pharmacy, Hospital Sungai Buloh, Malaysia
Skills and Expert : Infectious Disease, Antibiotics, Antimicrobial Resistance

Selected publications:

1. Global Antimicrobial Stewardship with a Focus on Low- and Middle-Income Countries (2020)
2. Antimicrobial de-escalation in the critically ill patient and assessment of clinical cure: the DIANA study (2020)
3. An UHPLC-MS/MS method for the simultaneous determination of ampicillin and sulbactam in human plasma and urine (2015)
4. Select critically ill patients at risk of augmented renal clearance: experience in a Malaysian intensive care unit (2014)
5. Ampicillin/sulbactam: Its potential use in treating infections in critically ill patients (2013)

Prof. Shawn Hsiang-Yin Chen, Pharm.D.

Affiliation : Department of Clinical Pharmacy, Taipei Medical University, Taiwan
E-mail : shawn@tmu.edu.tw
Skills and Expertise : Clinical Pharmacokinetics and Pharmacogenomics, Pharmacy Administration/Management

Education:

- 1998 Pharm.D. University of Iowa
- 1996 M.S. University of Iowa
- 1993 B.S. Taipei Medical University

Academic Experience:

- 2017.05.01- Professor, Department of Clinical Pharmacy, Taipei Medical University
- 2012.02.01-2017.01.31 Associate Professor, Department of Clinical Pharmacy, Taipei Medical University
- 2005.02.01-2012.01.31 Assistant Professor, Department of Clinical Pharmacy, Taipei Medical University
- 1998.08.01-2005.01.31 Instructor, Department of Clinical Pharmacy, Taipei Medical University

Other Experiences:

- Pharmacy Director, Wanfang Medical Center
- Board member, Committee of Medication Evaluation, National Health Insurance Administration, Taiwan
- Board member, Committee of Injury from Medication Use, Ministry of Health and Welfare, Taiwan
- Board member, Committee of Unexpected Response from Health Food, Ministry of Health and Welfare, Taiwan
- Board member, The Pharmaceutical Society of Taiwan

Selected Publications:

1. Comparison of the predictive outcomes for anti-tuberculosis drug-induced hepatotoxicity by different machine learning techniques (2020)
2. Where and How Centenarians Die? The Role of Hospice Care (2019)
3. Current impact and application of abuse-deterrent opioid formulations in clinical practice (2017)
4. Preliminary physician and pharmacist survey of the National Health Insurance PharmaCloud system in Taiwan (2017)
5. The effect of medication therapy management service combined with a national PharmaCloud system for polypharmacy patients (2016)

Speakers Curriculum Vitae

Prof. Dr. Evamarie Hey Hawkins

Affiliation	: Faculty of Chemistry and Mineralogy, Leipzig University, Germany
Skills and Expertise	: Organometallics, Inorganic, Synthesis, Synthetic Chemistry, Nuclear Magnetic Resonance
Research Focus	: Homogeneous Catalysis with Mono- and Multinuclear Transition Metal Complexes, Medicinal Chemistry with Inorganic Compounds, Precursors for Materials Science
E-mail	: hey@uni-leipzig.de

Short Bio Sketch

Evamarie Hey-Hawkins has been the Chair in Inorganic Chemistry at Leipzig University, Germany, since 1993. She has held positions at universities in the UK, Australia and Germany and visiting professorships in several countries. Her scientific interests are manifold and comprise inorganic/organometallic chemistry, organophosphorus chemistry, biologically active boron and transition metal compounds, heterometallic transition metal complexes and catalysis. She has published more than 550 papers and given about 370 lectures worldwide. More than 85 doctoral students have already graduated from her group.

She has received several awards including the "Distinguished Woman in Chemistry and Chemical Engineering" award by IUPAC (2013), the Nenitescu Medal (2016), two honorary doctoral degrees, the Order of Merit of the Free State of Saxony, Germany (2017), the Leipzig Science Award (2019), and the University Medal of Leipzig University (2018). Is an elected fellow of the European Academy of Sciences since 2018 and the European Academy of Sciences and Arts since 2021. In 2021, she received the prestigious Karl Ziegler Prize of the Karl Ziegler Foundation (managed in trust by the GDCh).

From 2007 to 2017, she has been the Speaker and since 2018, she is the Vice-Speaker of the Graduate School "Building with Molecules and Nano-objects" (BuildMoNa). From 2008 to 2013, she has been the Chair of the EU-COST Action CM0802 "European Phosphorus Sciences Network" (PhoSciNet), and from 2013 to 2018, she has chaired a COST Action on "Smart Inorganic Polymers" (CM1302, SIPs). Presently, she is the vice president of the German Society on Boron Neutron Capture Therapy and Chair of the Working Group on Phosphorus Chemistry under the umbrella of the German Chemical Society (GDCh).

Selected Publications:

1. Synthesis, characterization, and cellular investigations of porphyrin– and chlorin–indomethacin conjugates for photodynamic therapy of cancer (July 2021)
2. Preparation of Cobalt Nanoparticles (July 2021)
3. Ruthenacarborane and Quinoline: A Promising Combination for the Treatment of Brain Tumors (June 2021)
4. Cyclooligophosphanes and their coordination chemistry (June 2021)
5. Palladium Goes First: A Neutral Asymmetric Heteroditopic N , P Ligand Forming Pd-3d Heterobimetallic Complexes (June 2021)
6. Reductive Rearrangement of a 1-Phospha-2-azanorbornene (May 2021)
7. Modulation of γ-Secretase Activity by a Carborane-Based Flurbiprofen Analogue (May 2021)
8. life Theranostics in Boron Neutron Capture Therapy (April 2021)
9. Modular Synthetic Approach to Carboranyl–Biomolecules Conjugates (April 2021)
10. Synthesis, structure and in vitro anticancer activity of ruthenium(II) and platinum(II) complexes with chiral aminophosphine ligands (April 2021)

Chuda Chitasupho

Affiliation : Department of Pharmaceutical Sciences, Chiang Mai University, Thailand
Skills and Expertise : Nanoparticles, targeted drug delivery, nanomaterials
Email : chuda.c@cmu.ac.th

Selected Publications :

1. Suppression of Intracellular Reactive Oxygen Species in Human Corneal Epithelial Cells via the Combination of Quercetin Nanoparticles and Epigallocatechin Gallate and In Situ Thermosensitive Gel Formulation for Ocular Drug Delivery (July 2021)
2. Fighting against Severe Acute Respiratory Syndrome: A Systematic Review on Plant Foods and Natural Products as Complementary Herbal Medicines Correspondence (March 2021)
3. Targeted dendrimers for antagonizing the migration and viability of NALM-6 lymphoblastic leukemia cells (Feb 2021)
4. Dataset of 1H-Nuclear Magnetic Resonance and Mass spectra of Surface Modified Poly(amidoamine) Dendrimers with LFC131 Peptide (Feb 2021)
5. Chemical Composition of Essential Oil from Piper sarmentosum Fruit and Neuroprotective Activity (March 2021)
6. Moringa oleifera Seed Oil Formulation Physical Stability and Chemical Constituents for Enhancing Skin Hydration and Antioxidant Activity (Dec 2020)
7. Enhanced oral bioavailability and biodistribution of atractylodin encapsulated in PLGA nanoparticle in cholangiocarcinoma (Dec 2020)
8. The Cannabis Terpenes (Dec 2020)
9. Hydroxypropyl Methylcellulose E15: A Hydrophilic Polymer for Fabrication of Orodispersible Film Using Syringe Extrusion 3D Printer (Nov 2020)
10. Enhanced oral bioavailability and biodistribution of atractylodin encapsulated in PLGA nanoparticle in cholangiocarcinoma (Nov 2020)

Speakers Curriculum Vitae

Assoc. Prof. Dr. Eelco Ruijter

Affiliation : Department of Chemistry and Pharmaceuticals Science, Vrije Universiteit Amsterdam
E-mail : e.ruijter@vu.nl
Skills and Expertise : Organic Synthesis, Asymmetric Synthesis, Cross Coupling
Education:

- 1 May 2001 → 30 Jun 2004: Organic Chemistry, PhD, Leibniz Institute of Plant Biochemistry
- 1 Mar 2000 → 30 Apr 2001: Organic Chemistry, PhD, Vrije Universiteit Amsterdam
- 1 Sep 1995 → 31 Mar 2000: Chemistry, Master, Vrije Universiteit Amsterdam

Research Experience:

- December 2006 - Present: Professor (Assistant) at Department of Chemistry and Pharmaceutical Sciences, Vrije Universiteit Amsterdam, Netherlands
- August 2004 - December 2006: PostDoc at Division of Medical Chemistry and Chemical Biology, Utrecht University, Utrecht, Netherlands
- Mau 2001 - June 2004: PhD Student at Department of Bioorganic Chemistry, Leibniz Institute for Plant Biochemistry, Halle, Germany

Short Bio Sketch:
Eelco Ruijter studied Chemistry at the Vrije Universiteit Amsterdam (VUA) and subsequently earned his PhD under the supervision of Prof Dr. L. A. Wessjohann at the VUA and the Leibniz Institute of Plant Biochemistry (Halle/Saale, Germany) on the synthesis of natural product analogues. In 2004, he returned to the Netherlands to join the group Prof. Dr. R. M. J. Liskamp at Utrecht University as a postdoctoral fellow working on chemical proteomics. In 2006, he returned to the VUA to become an assistant professor of organic chemistry in the group of Prof. Dr. R. V. A. Orru. He was promoted to associate professor in 2018 and to full professor in 2021. His research interest involve the development of new synthetic methodology for the synthesis of medicinally relevant compounds (including natural products) using cascade reactions, formal cycloadditions and new catalytic transformations, as well as the application of the developed synthetic expertise in medicinal chemistry
Selected Publications:

1. Palladium-Catalyzed Cascade to Benzoxepins by Using Vinyl-Substituted Donor–Acceptor Cyclopropanes (June 2021)
2. Expanding the radiochemist's toolbox: carbon-11 labelled formamides and isocyanides for PET tracer synthesis (May 2021)
3. Synthesis of Carbazoles by a Diverted Bischler-Napieralski Cascade Reaction (April 2021)
4. Recent Advances in Palladium-Catalyzed Isocyanide Insertions (October 2020)
5. Diastereoselective Synthesis of β-Lactams by Ligand-Controlled Stereodivergent Intramolecular Tsuji-Trost Allylation (June 2020)
6. Synthesis of Quinazolin-4-ones by Copper Catalyzed Isocyanide Insertion (May 2020)
7. Base Metal Catalyzed Isocyanide Insertions (Jan 2020)
8. Zinc (II)-Mediated Diastereoselective Passerini Reactions of Biocatalytically Desymmetrized Renewable Inputs (January 2020)
9. Synthesis of Densely Functionalized Pyrimidouracils by Nickel(II)-Catalyzed Isocyanide Insertion (January 2020)
10. Catalytic Asymmetric Synthesis of Diketopiperazines by Intramolecular Tsuji-Trost Allylation (August 2019)

Prof. Dr. Abdul Rohman, M.Si., Apt.

Affiliation	: Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Gadjah Mada
Skills and Expertise	: Medical and Health Sciences, Pharmaceutical Analytical Chemistry, Pharmaceutical Chemistry
Research Focus	: Analysis of Halal Products, Analytical Chemistry, Antioxidant
E-mail	: abdul_kimfar@ugm.ac.id

Selected Publications :

1. Application of Spectroscopic and Chromatographic Methods for the Analysis of Non-halal Meats in Food Products
2. Identification and Quantification of Metamizole in Traditional Herbal Medicines using Spectroscopy FTIR-ATR combined with Chemometrics
3. Development of pitavastatin-loaded super-saturable self-nano emulsion: a continues screening and optimization approach using statistical technique
4. The Employment of Real-Time Polymerase Chain Reaction Using Species-Specific Primer Targeting on D-Loop Mitochondria for Identification of Porcine Gelatin in Soft Candy
5. Characterization of Kacang Goat skin Pepsin Soluble Collagen (Psc) and Their Potency as an Antioxidant
6. The Combination of Vibrational Spectroscopy and Chemometrics for Analysis of Milk Products Adulteration
7. Application of FTIR Spectroscopy and Chemometrics for the Prediction of Radical Scavenging Activities of Fish oils
8. Data Fusion of UV-Vis and FTIR Spectra Combined with Principal Component Analysis for Distinguishing of Andrographis paniculata Extracts Based on Cultivation Ages and Solvent Extraction
9. Issues related to animal blood into food products: a review paper
10. The combination of simplex lattice design and chemometrics in the formulation of green tea leaves as transdermal matrix patch

Speakers Curriculum Vitae

Prof. apt. Junaidi Khotib, S.Si., M.Kes., Ph.D.

Affiliation : Department of Clinical Pharmacy, Universitas Airlangga, Surabaya, Indonesia
E-mail : junaidi-k@ff.unair.ac.id
Expertise : Clinical pharmacology

Short Bio Sketch:

Khotib is a professor at the Faculty of Pharmacy Universitas Airlangga with expertise in Biopharmaceuticals. He completed his Bachelor of Pharmacy, Professional Program, and Master's Program at Universitas Airlangga. Then, his doctoral program has completed at Hoshi University School of Pharmacy and Pharmaceutical Sciences Japan in 2004. At the University, he also had the opportunity to take a postdoctoral program. Currently, he teaches pharmacology, molecular pharmacology, and biopharmaceutical products for undergraduate, master, and doctoral programs. He is also active in conducting research on drug development, pharmacological testing, evaluation of drug effectiveness, and bioequivalence studies. Various research grants were received from the Ministry of Education, Culture, Research, and Technology and the pharmaceutical industries, both national and multinational. He has published his research results in an accredited national journal and reputable international scientific journals. In addition, he is a member of the expert team in the standardization of medicinal products at the National Food and Drug Agency. Furthermore, it is still recording to provide consultation on the development of drug products in the pharmaceutical industry in Indonesia, Japan, and Korea. In 2010 he was appointed as Deputy Dean for Human Resources and Finance at the Faculty of Pharmacy. In 2015-2020, he had trusted to be the Vice-Rector for Business Development and Alumni Networks. Currently, he is serving as the dean of the Faculty of Pharmacy Universitas Airlangga.

Selected Publications:

1. Predicting the molecular mechanism of glucosamine in accelerating bone defect repair by stimulating osteogenic proteins (July 2021)
2. Molecular docking studies of Nigella sativa L and Curcuma xanthorrhiza Roxb secondary metabolites against histamine N-methyltransferase with their ADMET prediction (July 2021)
3. Signaling Pathway and Transcriptional Regulation in Osteoblasts during Bone Healing: Direct Involvement of Hydroxyapatite as a Biomaterial (June 2021)
4. Fabrication and characterization of bovine hydroxyapatite-gelatin-alendronate scaffold cross-linked by glutaraldehyde for bone regeneration (June 2021)
5. The impact of glutaraldehyde on the characteristics of bovine hydroxyapatite-gelatin based bone scaffold as gentamicin delivery system (June 2021)
6. Knowledge, attitudes, and practices (KAP) towards COVID-19 among university students in Pakistan: a cross-sectional study (June 2021)
7. The effect of various high-fat diet on liver histology in the development of NAFLD models in mice (June 2021)
8. Bovine Hydroxyapatite-Based Bone Scaffold with Gentamicin Accelerates Vascularization and Remodeling of Bone Defect (May 2021)
9. Molecular Docking Studies for Protein-Targeted Drug Development in SARS-CoV-2 (May 2021)
10. Structure-based virtual screening of bioactive compounds from Indonesian medical plants against severe acute respiratory syndrome coronavirus-2 (April 2021)

Prof. Dr. apt. Ediati Sasmito, S.E.

Affiliation : Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Gadjah Mada
E-mail : ediati_far@ugm.ac.id
Skills and Expertise : Cancer Chemoprevention

Selected Publication :

1. Penggunaan Metode Hybrid e-Learning untuk Praktikum Imunologi Farmasi di Fakultas Farmasi Universitas Gadjah Mada (February 2021)
2. Immunomodulatory effect of Standardized Polysaccharide Fraction syrup from Noni fruit (Morinda citrifolia) on Cytokines level (IL-2 and IFN-γ) and Its Histological Evaluation in rats Vaccinated with Hepatitis-B (February 2020)
3. IN SILICO STUDY OF MONOSACCHARIDE COMPOUNDS EFFECT ON B CELL RECEPTORS (BCR) FROM NONI FRUIT (MORINDA CITRIFOLIA) (Nov 2019)
4. Caesalpinia sappan L. heartwood ethanolic extract exerts genotoxic inhibitory and cytotoxic effects (Nov 2018)
5. Reveal Cytotoxicity and Antigenotoxicity of Piper nigrum L. Ethanolic Extract and its Combination with Doxorubicin on CHO-K1 Cells (February 2018)
6. Combinational effects of non n-Hexane Fractions of ant-plant (Myrmecodia tuberosa Jack) hypocotyl with doxorubicin against lymphocyte and cancer cells (September 2017)
7. Evaluation of The Genotoxicity of Three Food Additives using CHO-K1 Cells under in vitro Micronucleus Flow Cytometry Assay (June 2017)
8. SMEDDS of Citrus hystrix ethanolic extract improves cardiac and hepar histopathology profile on doxorubicin-induced rats (January 2017)
9. Polysaccharide-Rich Fraction of Noni Fruit (Morinda citrifolia L.) as Doxorubicin Co-Chemotherapy: Evaluation of Catalase, Macrophages, and TCD8+ Lymphocytes (February 2016)
10. Acute Toxicity of Non-Hexane Fraction of Ethanolic Extract of Ant-Plant (Myrmecodia tuberose (Jack) Bl.) Hypocotyls in Rats (January 2016)

Prof. Dr. apt. Daryono Hadi Tjahjono, M.Sc.Eng.

Affiliation : School of Pharmacy, Bandung Institute of Technology
Skills and expertise : Medical chemistry, analytical chemistry, pharmaceutical analysis, molecular modelling, molecular dynamic simulation, drug design
Selected Publication :

1. Reactivity and Stability of Metalloporphyrin Complex Formation: DFT and Experimental Study (September 2020)
2. The accelerated use of online learning during the COVID-19 pandemic (September 2020)
3. Cyclin-Dependent Kinase 4 and 6 Inhibitors in Cell Cycle Dysregulation for Breast Cancer Treatment (July 2021)
4. In silico study of 1-benzoyl-3-methylthiourea derivatives activity as epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor candidates (June 2021)
5. molecules Molecular Dynamics of Cobalt Protoporphyrin Antagonism of the Cancer Suppressor REV-ERBβ (May 2021)
6. In Silico Studies of Green Tea Catechins Against HER-2 Receptor in Breast Cancer (May 2021)
7. Virtual screening of curcumin analogues as DYRK2 inhibitor: Pharmacophore analysis, molecular docking and dynamics, and ADME prediction (May 2021)
8. Molecular Modeling Study on Inhibitor Binding Site Behavior of Sirtuin 7 and Other Sirtuin Isoforms (May 2021)
9. Molecular Modeling on the Identification of Potential Janus Kinase 3 (JAK3) Inhibitors Based On The Indonesian Medicinal Plant Database (December 2020)
10. Ligand-Based Pharmacophore Modeling, Molecular Docking, and Molecular Dynamic Studies of Dual Tyrosine Kinase Inhibitor of EGFR and VEGFR2 (October 2020)

Prof. apt. Muchtaridi, M.Si., Ph.D.

Affiliation	: Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran
E-mail	: muchtaridi@unpad.ac.id
Skills and Expertise	: Computer Aided Drug Design, Molecular Docking, Herbal Drug Development, Medicinal and Pharmaceutical Chemistry, Pharmaceutical Development

Short Bio Sketch:

Muchtaridi is a full professor and Departmental Chair at the Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Indonesia. He obtained his PhD from the School of Pharmaceutical Sciences, Universiti Sains Malaysia in 2013. His main research interests involve drug discovery of natural products, including bioassay-guided isolation combined with in silico, i.e., virtual screening and design (antibreast cancer and anti-influenza). His current research interest involves the potential activity of natural compounds as anti-cancer agents, based on CADD and in vitro testing. He also design of radiopharmaceutical agents from natural product compound as cancer targeted.

Selected Publications:

1. α-Mangostin/γ-Cyclodextrin Inclusion Complex: Formation and Thermodynamic Study (August 2021)
2. α-Mangostin Nanoparticles Cytotoxicity and Cell Death Modalities in Breast Cancer Cell Lines (August 2021)
3. The interaction of alpha-mangostin and its derivatives against main protease enzyme in COVID-19 using in silico methods (July 2021)
4. METHODS FOR IMPROVING ALPHA-MANGOSTIN SOLUBILITY: A REVIEW (july 2021)
5. Encapsulation mechanism of α-mangostin by β-cyclodextrin: Methods of molecular docking and molecular dynamics (July 2021)
6. Decaffeination and Neuraminidase Inhibitory Activity of Arabica Green Coffee (Coffea arabica) Beans: Chlorogenic Acid as a Potential Bioactive Compound (june 2021)
7. Chitosan-Based Nanoparticles of Targeted Drug Delivery System in Breast Cancer Treatment (May 2021)
8. The Potential Cytotoxic Activity Enhancement of α-Mangostin in Chitosan-Kappa Carrageenan-Loaded Nanoparticle against MCF-7 Cell Line (May 2021)
9. Molecular Docking Study of Mangosteen (Garcinia mangostana L.) Xanthone-Derived Isolates as Anti Androgen (March 2021)
10. Molecular Dynamic Simulation of Asiatic Acid Derivatives Complex with Inducible Nitric Oxide Synthase Enzyme as an Anti-Inflammatory (March 2021)

Speakers Curriculum Vitae

dr. Fadilah, S.Si., M.Si.

Affiliation : Department of Medical Chemistry, Faculty of Medicine, Universitas Indonesia. Bioinformatics Core Facilities, IMERI-FKUI.
E-mail : fadilah.msi@ui.ac.id

Skills and Experts : Bioinformatics, Biochemistry, Pharmaceutical chemistry, molecular design

Short Bio Sketch:

I have 10 years of experience in bioinformatics and in silico research in Indonesia. My research to date has been centered on the bioinformatics analysis includes metagenomic, metabolomic, antimicrobial resistance genes identification, reverse vaccinology and SNP mutation analysis related to phenotype. My key experience as Responsible Investigator and Co-investigator of several research projects on genomics analysis in Indonesia such as:

a. Whole Genome Sequencing Surveillance of SARS-CoV-2 in Indonesia
b. Whole genome sequencing of Escherichia coli isolated from bloodstream infection patients in dr. Cipto Mangunkusumo National Central General Hospital, Jakarta - Indonesia
c. Reverse vaccinology: T-Cell epitope vaccine design for breast cancer
d. Immunoinformatics studies, design, and activity assay for multi-epitope peptide vaccine for breast cancer and SARS-CoV-2
e. Characterization and genomic profiling of AMH genes in insufficiency primary ovarium with sex chromosome as IOP marker candidate
f. Drug design and drug development for cancer therapy using molecular modeling and in vitro approach

Selected publications :

1. Network Pharmacology Integrated Molecular Docking Based Prediction of Active Compounds and Potential Targets in Tinospora crispa Linn. as Insulin Sensitizer (May 2021)
2. Active constituents and Molecular Analysis of Psidium guajava Against Multiple Protein of SARS-CoV-2 (March 2021)
3. Synthesis and in vitro Activity of Eugenyl Benzoate Derivatives as BCL-2 Inhibitor in Colorectal Cancer with QSAR and Molecular Docking Approach (August 2020)
4. Identification by docking simulation and in vivo effect of essential oil from Cinnamomum burmannii as anti-obesity with leptin receptor in the olfactory system of mice Balb C (2018)
5. In silico study of centella asiatica active compounds as anti-inflammatory agent by decreasing IL-1 and IL-6 activity, promoting IL-4 activity (2018)
6. In silico, in vitro and in vivo tests of ficus deltoidea jack leaves extract as inhibitor for β-catenin expression in colon carcinogenesis model (2018)
7. In vitro cytotoxicity of the synthesized gallic acid derivatives (N-Alkyl Gallamide) against breast MCF-7 cancer cells (2018)
8. Structure activity relationship analysis of antioxidant activity of simple benzene carboxylic acids group, based on multiple linear regression (2018)
9. Synthesis and anticancer effect of 3,4,5-n-alkyl-benzamides on colon carcinoma HCT- 116 cells (2018)
10. Synthesis and in vitro antimalarial activity of alkyl esters of gallate as a growth inhibitor of plasmodium falciparum (2018)

Prof. Dr. apt. Sardjiman, M.S.

Affiliation : Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Gadjah Mada
E-mail : sardjiman@ugm.ac.id
Skills and Expertise : Medical and health sciences, medicinal chemistry, pharmaceutical chemistry, Research Interest: Pharmacochemistry, Physical organic chemistry, Synthetical Organic chemistry
Selected publications :

1. Evaluation of benzylidene-acetone analogues of curcumin as antituberculosis (2018)
2. Chemopreventive properties of curcumin analogues, hexagamavunone-0 and gamavutone-0, in rat colorectal cancer model (2017)
3. Potency of tetrahydropentagamavunon-0 (Thpgv-0) and tetrahydropentagamavunon-1 (thpgv-1) as antifungal agents (2016)
4. Curcumin and its analogues (PGV-0 and PGV-1) enhance sensitivity of resistant MCF-7 cells to doxorubicin through inhibition of HER2 and NF-kB activation (2014)
5. Hepatoprotective and antioxidant activity of pentagamavunon-0 against carbon tetrachloride-induced hepatic injury in rats (2013)
6. In vitro and in silico studies on curcumin and its analogues as dual inhibitors for cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2) (2012)
7. Inhibitory effect of 2,5-bis(4-hydroxy-3-methoxybenzylidene) cyclopentanone on mast cell histamine mediated-rat paw edema (2010)
8. Effects of benzylidenecyclopentanone analogues of curcumin on histamine release from mast cells (2009)

Speakers Curriculum Vitae

Dr. apt. Susi Ari Kristina, M.Kes.

Affiliation : Department of Management and Community Pharmacy, Faculty of Pharmacy, Universitas Gadjah Mada
E-mail : susiari_k@ugm.ac.id

Skills and Expertise : Medical and health sciences, pharmaceutical management and social pharmacy, pharmaceutics
Research Interest : Public health pharmacy, cost of illness study, pharmacy practice, pharmacy education

Short Bio Sketch

Dr. Susi Ari Kristina, MPH, Pharmacist is a researcher and lecturer at Gadjah Mada University's Faculty of Pharmacy, where she has been a faculty member since 2004. Susi earned a doctorate in social, economic, and administrative pharmacy in 2015 from Mahidol University in Thailand. Susi is an undergraduate and graduate instructor in the social and economics of pharmacy. Her research interests included cost of illness studies, pharmacy practice, and pharmacy education. Her research articles have been published in peer-reviewed international journals on a variety of topics, including the burden of tobacco-related diseases in Indonesia and other Asian countries, the premature mortality costs of tobacco, the impact of smoking on disease treatment costs in the era of universal health coverage, the quality of life of smokers in Indonesia, and the effectiveness of pharmacist training in smoking cessation.

Selected Publications:

1. Availability of Essential Medicines for Obstetric Care at Selected Primary Health Facilities in Central Java Province, Indonesia (2020)
2. Readiness to provide immunization services among community pharmacists in Yogyakarta, Indonesia (May 2021)
3. Systematic Review A Systematic Review On Self-Reported Questionnaires To Assess Medication Adherence In Diabetic Patients (August 2021)
4. Building Patient Loyalty in Pharmacy Service: A Comprehensive Model (June 2021)
5. Estimasi Premature Mortality Cost (PMC) Penyakit Kanker Akibat Perokok Pasif di Indonesia (April 2021)
6. Hubungan Karakteristik, Kepatuhan, dan Outcome Klinis Pasien Tuberkulosis Paru Di Puskesmas Kabupaten Bantul (April 2021)
7. Health burden of overweight and obesity: Mortality and years of life lost (YLL) of diseases in Indonesia (April 2021)
8. Health Coaching in Pharmacy Practice: A Systematic Review (April 2021)
9. Educational Program to Improve Hypertension Knowledge by a Community Pharmacist in a Rural District in Indonesia (March 2021)
10. Knowledge, empathy, and willingness to counsel patients with HIV among Indonesian pharmacists: a national survey of stigma (February 2021)

Dr. apt. Neni Nurainy

Affiliation : Division of Translational Development of Biopharmaceutical Product, PT Biofarma
E-mail : nur.ainy@biofarma.co.id
Skill and Expertise : Vaccine development

Selected publications :

1. Convalescent plasma therapy in patients with moderate-to-severe COVID-19: A study from Indonesia for clinical research in low- and middle-income countries (June 2021)
2. Integration Stability of sHBsAg-Multi Expression Cassettes in Pichia pastoris GS115 during Methanol Induction (October 2020)
3. The Use of α-MF Signal Peptide Without Spacer for Producing Insulin Aspart Precursor in Pichia pastoris KM71 (March 2020)
4. Improvement of mammalian cells performance by addition of glucose for the expression of erythropoietin with 2 additional link in CHO-DG44 cells (February 2020)
5. Methotrexate gene amplification for development of erythropoietin with 2 additional N-link producing cell lines (February 2020)
6. Karakteristik Reverse Transcriptase Gen Polymerase Virus Hepatitis B Pada Penderita Hepatitis B Kronis Asimptomatik Pra-Pengobatan (January 2018)
7. Pengembangan Vaksin Hepatitis B Generasi Ke Tiga dan Vaksin Terapi Berbasis Protein Rekombinan Subunit Indonesia (December 2017)
8. Cloning and Expression of Small Hepatitis B Surface Antigen (sHBsAg) In Hansenula polymorpha (December 2016)
9. Cloning, Intracellular Expression, and Characterization of Recombinant mHBsAg from Hepatitis B Virus Isolate Indonesia in Pichia pastoris (November 2015)
10. Construction, Expression and Characterization of Multi Cassettes Encoding Indonesian Small Hepatitis B Surface Antigen (s-HBsAg) in Methylotropic Yeast Pichia pastoris (October 2015)

Speakers Curriculum Vitae

Dr. Masteria Yunovilsa Putra

Affiliation : Department of Research Center for Biotechnology, Indonesian Institute of Sciences
E-mail : mast001@lipi.go.id, masteria.yunovilsa@gmail.com
Skills and Expertise : Chemical analysis, natural products
Education :

- 2009 - 2012 : Ph.D degree in Marine Biology and Ecology, UniversitÃ Politecnica delle Marche, Ancona, Italy.
- 2007 - 2009 : Master degree in Tropical Marine Biodiversity and Bioactive Molecules (Cum laude), Universita Politecnica delle Marche, Ancona, Italy
- 2003 - 2007 : Bachelor of Science degree in Chemistry Andalas University, Padang, Indonesia.

Selected publications:

1. Antioxidant and antibacterial activities in 21 species of Indonesian sea cucumbers (February 2021)
2. Chemical Diversity and Biological Activity of Secondary Metabolites Isolated from Indonesian Marine Invertebrates (March 2021)
3. Macroalgae-derived Rare Sugars: Applications and Catalytic Synthesis (April 2021)
4. Cembranoids of Soft Corals: Recent Updates and Their Biological Activities (April 2021)
5. Current prospects of nutraceutical and pharmaceutical use of sea cucumbers (July 2021)
6. Molecular docking of secondary metabolites from Indonesian marine and terrestrial organisms targeting SARS-CoV-2 ACE-2, M pro , and PL pro receptors (July 2021)
7. Detection of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in clinical samples using Real-Time Reverse Transcription Polymerase Chain Reaction (qRT-PCR) (May 2021)
8. Characterization, antioxidant and antibacterial activity of cultivated sea cucumbers from Bali, Indonesia (April 2021)
9. Anti-Infective and Antiviral Activity of Valinomycin and Its Analogues from a Sea Cucumber-Associated Bacterium, Streptomyces sp. SV 21 (February 2021)
10. Unique Polyhalogenated Peptides from the Marine Sponge Ircinia sp. (January 2021)

Dr. Muhammad Yusuf, M.Si., Ph.D

Affiliation	: Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran
Skills and Expertise	: Molecular modelling, computational chemistry
E – mail	: m.yusuf@unpad.ac.id

Short Bio Sketch :

Muhammad Yusuf is an assistant professor at the Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. He graduated from bachelor and master programs in chemistry from Universitas Padjadjaran. In 2015, Yusuf obtained a Ph.D. degree from the School of Pharmaceutical Sciences, Universiti Sains Malaysia, under the supervision of Prof. Habibah Wahab. Since 2017, he has been a secretary of the Research Center for Molecular Biotechnology and Bioinformatics, Universitas Padjadjaran. Furthermore, he was assigned as the head of a vocational program of Industrial Technology of Chemistry, Universitas Padjadjaran, from 2020. Currently, he is a vice-chairman of the Indonesian Society for Bioinformatics and Biodiversity (MABBI). His research is mainly on applying structural bioinformatics to the development of biotechnology products such as enzymes, vaccines, therapeutics, and diagnostics.

Selected Publications:

1. Exploring the Potency of Nigella sativa Seed in Inhibiting SARS-CoV-2 Main Protease Using Molecular Docking and Molecular Dynamics Simulations (October 2021)
2. Potential SARS-CoV-2 3CLpro Inhibitors from Chromene, Flavonoid and Hydroxamic Acid Compound based on FRET Assay, Docking and Pharmacophore Studies (September 2021)
3. Characterization and Investigation of Stigmasterol Isolated from Rodent Tuber Mutant Plant (Typhonium flagelliforme), Its Molecular Docking as Anticancer on MF-7 Cells (July 2021)
4. Nutrition profile and potency of RGD motif in protein hydrolysate of green peas as an antifibrosis in chronic kidney disease (June 2021)
5. Modeling and Molecular Dynamic Simulation of F(ab') 2 Fragment of Nimotuzumab for Lung Cancer Diagnostics (March 2021)
6. Development of lateral flow assay based on anti-IBDV IgY for the rapid detection of Gumboro disease in poultry (February 2021)
7. Molecular Dynamics Simulation of T10609C and C10676G Mutations of Mitochondrial ND4L Gene Associated With Proton Translocation in Type 2 Diabetes Mellitus and Cataract Patients (December 2020)
8. α-Mangostin and its derivatives against estrogen receptor alpha (November 2020)
9. Phylogeny and In Silico Structure Analysis of Major Capsid Protein (L1) Human Papillomavirus 45 from Indonesian Isolates (September 2020)
10. Characterization of Anti-HER2 scFv Gene Expression as Intracellular Protein in Escherichia coli BL21 (DE3) (June 2020)

Speakers Curriculum Vitae

Dr. Alireza Mosavi Jarrahi, MSPH, Ph.D.

Affiliation : Asian Pacific Organization for Cancer Prevention
E-mail : rmosavi@yahoo.com
Skills and Expertise : Epidemiology

Short Bio Sketch

Dr. Mosavi-Jarrahi received his Ph.D. in epidemiology from the University of Texas in 1996. Upon graduation, He began his post-doctoral research at the University of Texas Health Science Center. In 1998, he joined the Cancer Institute in Tehran, Iran, working as a research associate and at the same time he received a joint appointment as an assistant professor at the Medical School, Shahid Beheshti University of Medical Sciences Tehran, Iran. In 2011, he joined the Faculty of Health Sciences (FHS), Simon Fraser University as an adjunct professor of epidemiology. He has published more than 60 papers in peer-reviewed journals and received several grants from different funding agencies such as Terry Fox Foundation (international), World Health Organization. He is a founding member of the Iranian Epidemiological Association and served as its first general secretary for two terms. He is a member of several scientific journals' editorial board. In July 2016, he was appointed as the Editor-in-Chief of the Asia Pacific Journal of Cancer Prevention. In April 2018, Dr. Mosavi jarrah was appointed as the President of Asian Pacific Organization for Cancer Prevention (APOCP) for a duration of two years.

Selected Publications:

1. The effect of glutamine supplementation on inflammatory markers in critically ill patients supported with enteral or parenteral feeding
2. Index of Nutritional Quality (INQ) and the Risk of Obesity in Male Adolescents: a Case-Control Study
3. The status of dietary fatty acids intake in the autistic children: a case-control study
4. The Impact of COVID-19 on Cancer Care in the Post Pandemic World: Five Major Lessons Learnt from Challenges and Countermeasures of Major Asian Cancer Centres
5. Review on the Oncology Practice in the Midst of COVID-19 Crisis: The Challenges and Solutions
6. Incidence and Mortality Worldwide Common cancers in males and Human Development Index (HDI).
7. A pro-inflammatory diet increases the likelihood of obesity and overweight in adolescent boys: a case–control study
8. Cancer Care Delivery Challenges Amidst Coronavirus Disease – 19 (COVID-19) Outbreak: Specific Precautions for Cancer Patients and Cancer Care Providers to Prevent Spread
9. Cancer Care Delivery Challenges Amidst Coronavirus Disease – 19 (COVID-19) Outbreak: Specific Precautions for Cancer Patients and Cancer Care Providers to Prevent Spread
10. Association between FTO gene polymorphisms and breast cancer: the role of estrogen

Prof. Jackson Chieh-Hsi Wu

Affiliation : Department of Pharmaceutical Sciences, Taipei Medical University
E-mail : chhswu@tmu.edu.tw
Education :

- 1994 Ph.D. (Pharmacology), Ohio State University, USA
- 1986 Bachelor, School of Pharmacy, Taipei Medical University

Research interests:

- Pathological mechanisms involved in restenosis progression
- Evaluation of bioactive compounds in treatment of restenosis and cancer (angiogenesis and chemotherapy resistance)
- Development of drug-eluted stent

Selected publications:

1. Circulating level of microRNA-142-5p is a potential biomarker for predicting in-stent restenosis: a case–control study (2021)
2. Pathological role of phosphoglycerate kinase 1 in balloon angioplasty-induced neointima formation (2021)
3. Probiotic Supplementation Facilitates Recovery of 6-OHDA-Induced Motor Deficit via Improving Mitochondrial Function and Energy Metabolism (2021)
4. Preventive Effect and Mechanism of Crossostephium chinense Extract on Balloon Angioplasty-Induced Neointimal Hyperplasia (2021)
5. Sclareol ameliorated ERCC1-mediated cisplatin resistance in A549 human lung adenocarcinoma cells and a murine xenograft tumor model by suppressing AKT-GSK3β-AP1/Snail and JNK-AP1 pathways (2020)
6. Efficacy Assessment and Mechanism Exploration of Kruppel-Like Factor 2-Targeting Intervention Strategy for Non-Small Cell Lung Cancer Therapy (2020)
7. Oxidative stress-induced cellular senescence desensitizes cell growth and migration of vascular smooth muscle cells through down-regulation of platelet-derived growth factor receptor-beta (2019)
8. Suppression of cell growth, migration and drug resistance by ethanolic extract of antrodia cinnamomea in human lung cancer A549 cells and C57BL/6J allograft tumor model (2018)
9. Suppressive activities and mechanisms of ugonin J on vascular smooth muscle cells and balloon angioplasty-induced neointimal hyperplasia (2018)
10. Pharmacokinetics and tissue distribution of five major triterpenoids after oral administration of Rhizoma Alismatis extract to rats using ultra high-performance liquid chromatography–tandem mass spectrometry (2017)

Speakers Curriculum Vitae

Prof. Dr. apt. Gemini Alam

Affiliation : Department of Pharmacognosy Phytochemistry, FAculty of Pharmacy, Universitas Hasanuddin

Skill and Expertise : Active Pharmaceutical Ingredients, antioxidants

Selected publications :

1. Paliasanines A-E, 3,4-Methylenedioxyquinoline Alkaloids Fused with a Phenyl-14-oxabicyclo[3.2.1]octane Unit from Melochia umbellata var. deglabrata (September 2020)
2. Application of FTIR Spectroscopy and HPLC Combined with Multivariate Calibration for Analysis of Xanthones in Mangosteen Extracts (August 2020)
3. A review on phytochemical constituents, role on metabolic diseases, and toxicological assessments of underutilized part of Garcinia mangostana L. fruit (July 2020)
4. Fluid milk consumption behaviour of urban households: Evidence from Mymensingh city (June 2020)
5. The digestive and physiological visceral organs of male Bali cattle were fed with cocoa bean shell (June 2020)
6. Response of cocoa pod borer to chlorogenic acid (may 2020)
7. Prostaglandin level of primary dysmenorrhea pain sufferers (march 2020)
8. Ajwa date fruit (Phoenix dactylifera L.) in increasing hemoglobin (Hb) level to teenage girl (march 2020)
9. The effect of combination ethanol extracts of bitter melon leaves, white turmeric rhizome and bangle rhizome on the sgot-sgpt levels and the liver histopathology profile of rats (October 2019)
10. Paliasa (Kleinhovia hospita L.) Hepatoprotector “Tea Bag” preparation as supporting therapy in the use of fixed-dose combination of antituberculosis drugs (October 2019)

Dr. Raymond R. Tjandrawinata, MS, MBA, FRSC.

Affiliation : Dexa Medica
Skill and Expertise : Pharmacoeconomics, Drug Discovery, Strategic management, Molecular pharmacology, biotechnology
Research experiences :

- January 2011- present : Faculty of Biotechnology, Atma Jaya Catholic University of Indonesia
- May 2005 - present : Research Laboratories of New drug discovery and development, Dexa Laboratories of Biomolecular Sciences (DLBS)
- May 2000 - present : Director of Corporate Development, Dexa Medica
-

Selected publications:

1. Antidiarrheal Effect of DLBS1Y62, a Bioactive Fraction of Uncaria gambir Roxb. Dried Sap Extract, in Wistar Rats (July 2021)
2. Molecular mechanism of DLBS3733, a bioactive fraction of Lagerstroemia speciosa (L.) Pers., on ameliorating hepatic lipid accumulation in HepG2 cells (September 2021)
3. Potential Anti Aging Effects of DLBS1649, a Centella asiatica Bioactive Extract (August 2021)
4. Prediction of the Mannose-Binding Site in the Agaricus bisporus Mannose-Binding Protein (May 2021)
5. Effect of DLBS1033 on Functional Outcomes for Patients with Acute Ischemic Stroke: A Randomized Controlled Trial (April 2021)
6. Molecular docking of Subtilisin K2, a fibrin-degrading enzyme from Indonesian moromi, with its substrates (February 2021)
7. Functional Bignay Ciders Inhibit Key Enzymes Linked to Obesity And Diabetes For Metabolic Syndrome Protection (February 2021)
8. Administration of Cinnamon and Lagersroemia speciosa Extract on Lipid Profile of Polycystic Ovarian Syndrome Women with High Body Mass Index (January 2021)
9. Cosmeceutical potency of functional ripe buni cider (November 2020)
10. Molecular analysis of a fibrin-degrading enzyme from Bacillus subtilis K2 isolated from the Indonesian soybean-based fermented food moromi (November 2020)

Speakers Curriculum Vitae

Prof. Dr. Ibrahim Jantan

Affiliation : Institute of System Biology (INBIOSIS), Universiti Kebangsaan Malaysia
E-mail : profibj@gmail.com

Skill and Expertise : Medicinal chemistry, natural product, pharmacological activities of natural product

Short Bio Sketch:

Dr. Ibrahim Jantan graduated from University of Mansoura, Egypt with BPharm (Hons) degree in 1981, obtained his MSc in Medicinal Chemistry from University of Minnesota, USA in 1985 and his PhD degree in Natural Products Chemistry from the University of Malaya in 1993. He is currently an honorary professor at Institute of Systems Biology (INBIOSIS), Universiti Kebangsaan Malaysia (UKM). Prior to his present position, he was a professor at Taylor's University, Malaysia, from 2018-2020. He was with the Faculty of Pharmacy UKM from 1996-2018 and was the founding dean from 2008 to 2015. Dr. Ibrahim started his research career at the Forest Research Institute of Malaysia (FRIM) in 1986. He was the President of the Malaysian Natural Products Society (2010-2020), member of the Malaysian Herbal Council, board member of Asian Association School of Pharmacy and Malaysian Focal Point for Medicinal Plants of Malaysia for Indian Ocean Rim Association. Recently, he was appointed as Research Advisor of Nan Yang Academy of Sciences (Singapore) and Scientific Advisor of Human Life Advancement Foundation, Malaysia. He has more than 34 years of research experiences in natural products and medicinal chemistry and pharmacological activities of natural products. His research interests are identification of natural bioactive compounds, their derivatives and analogues as chemical leads for specific therapeutic efficacy (cardiovascular protective, immunomodulatory, anti-inflammatory, PAF antagonist & antimicrobial activities) leading to the development of new drug candidates against complex and challenging drug targets prior to clinical trials, and herbal research to develop high quality, safe and effective herbal products. He has published more than 200 papers in ISI-indexed journals, 73 papers in proceedings, 2 books and 5 chapters in books. His Scopus H-index is 34 He was listed as World Top 2% Influencing Researcher 2019 based on SCOPUS 2019 Citation Impact. He has been invited to deliver many keynote, plenary and invited lectures in local and international conferences. He is a reviewer of manuscripts in ISI-indexed journals such as Phytomedicine, Phytotherapy Research, Phytochemistry, Journal of Ethnopharmacology, Pharmaceutical Biology, Drug Design Development and Therapy, Frontiers in Pharmacology, BMC Complementary and Alternative Medicines. He was recipients of many awards including Medicine Srinakharinwirot University (MEDSWU) Honorable Award 2010, Thailand, Prof. Dr. A. Hisham Endowment Award, India, Distinguished Researcher Award (Tokoh Penyelidik) 2013, UKM Medical Center, and the Darjah Setia Bakti Negeri Sembilan (DBNS) which carries the title Dato'.

Selected publications:

1. Christia vespertilionis extract inhibits monocyte adherence to endothelial cells through inhibition of pro-atherogenic adhesion molecules expression. (June 2021)
2. Immunomodulatory Effects and Mechanisms of Curcuma Species and Their Bioactive Compounds: A Review (April 2021)
3. Anti-Allergic Rhinitis Effects of Medicinal Plants and Their Bioactive Metabolites via Suppression of the Immune System: A Mechanistic Review (April 2021)
4. Dietary polyphenols suppress chronic inflammation by modulation of multiple inflammation-associated cell signaling pathways (March 2021)
5. Chemical Constituents and Biological Activities of Mitrella Kentii (Blume) Miq. Leaf Oil (January 2021)

6. Sinensetin: An Insight on Its Pharmacological Activities, Mechanisms of Action and Toxicity (January 2021)
7. Gynura procumbens ethanol extract improves vascular dysfunction by suppressing inflammation in postmenopausal rats fed a high-fat diet (January 2021)
8. Inhibitory and Anti-Biofilm Effects of Orthosiphon aristatus Against Candida albicans (December 2020)
9. Induction of Cell Death and Modulation of Annexin A1 by Phytoestrogens in Human Leukemic Cell Lines (December 2020)
10. Antioxidant and Anti-Inflammatory Effects of Genus Gynura: A Systematic Review (November 2020)

Speakers Curriculum Vitae

Associate Professor Veysel Kayser

Affiliation : Sydney School of Pharmacy, The University of Sydney
E-mail : veysel.kayser@sydney.edu.au
Position Title : Associate Professor

Short Bio Sketch:
Veysel Kayser is an Associate Professor in the Sydney Pharmacy School. He completed his Ph.D. at the University of Leeds (UK), undertook post-doctoral fellowships at the Max-Planck Institute (Germany) and at MIT (US). He was a senior staff scientist at MIT prior to taking up his current position. For periods, he served as the Associate Dean (Research), HDR coordinator, member of the Advisory Board for The Marie Bashir Institute and other committees.
His research interests focus on biologics, biosimilars, vaccines, and their formulations. He currently supervises five PhD and one honours students, has six patents, published four book chapters and over fifty research papers, and serves as an editor or is on editorial boards of various journals. He can be contacted at veysel.kayser@sydney.edu.au .

Selected Publications:
1. Advances and Limitations of Antibody Drug Conjugates for Cancer (July 2021)
2. Pivotal Biology, Chemistry, Biochemistry, and Biophysical Concepts of Biologics and Biosimilars (December 2020)
3. Major Classes of Biotherapeutics (December 2020)
4. Enhancing the stability of adalimumab by engineering additional glycosylation motifs (April 2020)
5. Synthesis and In Vitro Anticancer Evaluation of Some Benzimidazolium Salts (August 2019)
6. Synthesis and Enhanced Cellular Uptake In Vitro of Anti-HER2 Multifunctional Gold Nanoparticles (June 2019)
7. Current Advancements in Addressing Key Challenges of Therapeutic Antibody Design, Manufacture, and Formulation (June 2019)
8. Monoclonal antibody therapy of solid tumors: Clinical limitations and novel strategies to enhance treatment efficacy (May 2019)
9. Analysis of the interaction of para-sulfonatocalix[8]arene with free amino acids and a six residue segment of β-amyloid peptide as a potential treatment for Alzheimer's disease (April 2019)
10. Preparation-free method can enable rapid surfactant screening during industrial processing of influenza vaccines (February 2019)


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BNI


KONIMEX


PP
CONSTRUCTION & INVESTMENT

Keynote Speaker

Dr. Ir. Penny Kusumastuti Lukito, MCP

Plenary Talk-1

Updates in Covid-19

Amin Soebandrio

PRBM Eijkman

Abstract.

There are more than 200 types of Corona Virus, most of them are animal viruses, especially wild animals, such as bats, forest rats, pangolins etc. Animal viruses can become human viruses after years of adaptation. There are currently seven Corona viruses that can cause infection in humans, four of which only cause mild flu symptoms. The last three corona viruses are the SARS virus, the MERS virus, and the SARS-CoV-2 virus or Covid-19 virus. The Covid-19 virus infects humans through the upper respiratory tract (nose, mouth, and eyes), and if it manages to overcome the body's defenses, it can infect the lungs, and possibly other organs, and cause severe clinical symptoms. After being infected with the Covid-19 virus, the body will form an immune response, both a humoral response marked by the formation of antibodies, as well as a cellular response that activates T cells and so on.

We need vaccination because vaccines can prevent infectious diseases. When most people in a community are vaccinated against a disease, the ability of the pathogen to spread is limited. This is called 'herd' or 'indirect' or 'population' immunity. When many people have immunity, this also indirectly protects people who cannot be vaccinated, such as very young babies and those who have compromised immune systems. There are several platforms of Covid-19 vaccine: whole inactivated virus vaccine, protein-based vaccine, viral vector vaccine, and nucleic acid vaccine (DNA and mRNA). While most of the vaccines are delivered by injection, some researchers are developing vaccine delivered through nasal route. Effectiveness of vaccine in affected by host factors, vaccine factors, and virus factors. The virus factors are mostly influenced by mutation and development of lineages and variants.

A variant is categorized as Variants of Concern if there is evidence of increased transmission, more severe disease (e.g., increased hospitalizations and deaths), a significant decrease in neutralization ability by antibodies produced after infection or vaccination, decreased effectiveness of treatment or vaccine, or failure of diagnostic detection. Variant of Interest is a variant with specific genetic markers related to changes in receptor binding, potentially decreased neutralization ability by antibodies produced after infection or vaccination, decreased drug effect, failed diagnostics, or was suspected to be more infectious or more clinically severe. Indonesia has submitted more than 8000 Whole Genome Sequences to GISAID. Currently, the Covid-19 virus circulating in Indonesia is dominated by Delta variant, which is also true for the whole world. There is no gender difference in people infected by Delta variant, however, most of them belong to productive age, ranging from 19 to 50 years old.

Plenary Talk-2

The Pandemic COVID-19 and the Auspicious Role of Frontier Pharmacists against This Global Threat

Syamhanin Adnan, Pharmacy Department, Hospital Sungai Buloh, Malaysia

Abstract

On 10th March 2020, Sungai Buloh Hospital (HSgB), which is the National Infectious Disease Reference Center in Malaysia, was declared as a medical center dedicated to treating COVID-19 cases. In an effort to address this pandemic, the HSgB Pharmacy Department plays a role as one of the important COVID-19 treatment support teams in terms of procurement, monitoring and supply of medical consumables and drugs. Pharmacy Department consists of 7 main units: Logistics Pharmacy, Inpatient Pharmacy, Specialist Clinic Pharmacy (FKP), National Leprosy Control Center Pharmacy (PKKN), Resource and Information Center Pharmacy, Production Pharmacy and Clinical Pharmacy. In order to ensure effective disease management in dealing with unforeseen constraints from time to time, pharmacy staff has undertaken several modifications in the existing services. To adapt the service to the Covid-19 pandemic threat, several new services have been implemented in addition to changes to the work process, namely COVID Response & Assist Co-action Telepharmacy (COVACT), this service is provided by our ambulatory service, which facilitates patients to obtain medication supplies from the nearby UiTM Specialist Medical Center (PPP), COVID Rescue Park & Take (CR -PT), this is an innovation from PKKN Pharmacy for patients to get their medicine according to the appointment date through the counter that has been provided without patient having to wait, with special parking provided. We have also create PPE team, Distribution, Inspection & Warehousing (PPE-DIW) team to screen Personal Protective Equipment (PPE) that we received and later distribute it to our medical personnel, EZtelCOVID project, an initiative from our Inpatient Pharmacy to conduct counseling to patients via smartphones and also Cyber Clerking Initiative (CCI), where our clinical pharmacist remotely do their duty in pharmaceutical care monitoring of our patients. This project is an original idea and creativity from Pharmacy Department of HSgB as COVID-19 is the first pandemic experienced by our country. Furthermore, HSgB is a hospital declared as a medical center dedicated to treating COVID-19 cases. The innovations implemented have been successful in reducing the risk of infection by reducing the exposure of Pharmacists to COVID-19 patients and hence the risk of being infected with COVID-19. These innovations can be replicated in external or private treatment centers without incurring high costs. In addition, this innovation can also be adapted by treatment centers abroad because this epidemic is a challenge experienced by the rest of the world. During the COVID-19 pandemic, the highest priority was placed on the safety of patients and health workers when dealing with COVID-19 patients while ensuring that services could be provided without compromising the quality of services. Ensuring the safety of frontline workers is very important as they are the backbone of the national health system. In this daunting challenge, the production of innovation is seen as an urgent need in implementing new norms.
This innovation has successfully benefited not only patients but the pharmacy staff and the entire frontline healthcare personnel. The services provided become more customers friendly and facilitate patients. This innovation was also recognized when it was given the Outstanding Initiative Award during the state level Innovation Carnival and was awarded a bronze medal during the Malaysia Technology Expo 2021.

INVITED SPEAKER (PPCP)

Structural Bioinformatics for Covid-19 Vaccine, Diagnostics, and Therapeutics Design

Muhammad Yusuf[1,2,3,*], Shinta Kusumawardani[1,3], Ari Hardianto[1,2,3], Umi Baroroh[3], Ade Rizqi Ridwan Firdaus[3], Taufik Ramadhani[3], Fauzian Giansyah[3], Wanda Destiarani[3], Fiddy Semba Prasetiya[3], Rega Saputra[3], Yeni Hartati[2], Neni Nurainy[4], Toto Subroto[1,2,3]

[1]*Center of Excellence for Halal Vaccine and Biotechnology, Universitas Padjadjaran*
[2]*Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran*
[3]*Research Center for Molecular Biotechnology and Bioinformatics, Universitas Padjadjaran*
[4]*Division of Translational Development of Biopharmaceutical Products, PT Bio Farma*

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ABSTRACT

Structural bioinformatics, including protein modeling and molecular dynamics simulation, is a powerful tool to design valuable molecules, especially in fighting Covid-19. Bioinformatics has been an essential part of biotechnology product development, such as vaccines, diagnostics, and therapeutics. For example, we have employed protein design to develop a subunit vaccine for Covid-19, based on the antigen structure of the previous coronavirus, SARS-CoV-1. Despite the limited information on the SARS-CoV-2 structural properties at the early time of the pandemic, now this protein showed immunogenicity to induce a specific anti-spike antibody in mice. Also, as part of the genomic surveillance, molecular simulation was employed to study the mutation effects on the structural properties of the virus. The simulation showed that some mutations, including D614G, decreased spike protein's compactness, which may increase the virus's transmissibility. Furthermore, structural bioinformatics was utilized to design a bioreceptor based on the antibody fragment to capture the SARS-CoV-2 virus for diagnostics purposes. This designed protein fragment was applied on electrochemical-based immunosensing and paper-based immunochromatography to detect the presence of viral antigen in the sample. Computational techniques were also applied to determine the best pH for the most efficient antibody adsorption on the gold nanoparticles for lateral flow assay development. Lastly, bioinformatics was also used to screen some natural compounds from *Nigella sativa* Seed and microalgae, such as SARS-CoV-2 main protease and ACE-2 inhibitors. The selected compound showed a nanomolar binding, implying that the compound can be explored further for Covid-19 therapy.

Keywords: bioinformatics, covid-19, vaccine, diagnostics, therapeutics

INVITED SPEAKER (PPCP)

Whole Genome Sequencing of SARS-CoV-2 for Drug Design Against COVID-19: Molecular Interaction Approach

Fadilah[1,2,3]

[1]Department of Medical Chemistry, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia
[2]Bioinformatics Core Facilities, Indonesian Medical Education and Research Institute IMERI, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia
[3]Master Programme in Biomedical Sciences, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia

Abstract

COVID-19 has infected over 244 million people with death cases over 4 million individuals and resulted in a difficult situation for the global population. Characterization of spike glycoproteins, polyproteins, and other viral proteins is important drug development. SARS-CoV-2 mutation rate which enhances genome variability is a major concern that made the therapeutics design difficult. Traditional Indonesian Medicine (TIM) from HerbalDB database has proven to be advantageous in clinical treatment and disease prevention. Molecular interaction with network pharmacology approach is utilized to understand the active ingredients and therapeutics mechanisms underlying COVID-19. In this study, we identified conserved genes and population variants from the SARS-CoV-2 genome sequence. Protein/gene targets were analyzed by performing protein-protein interaction, Gene Ontology (GO), and Kyoto Encyclopaedia of Genes and Genomes (KEGG) enrichment assays visualized with Cytoscape. We found that TIM formulas played a positive role in preventing COVID-19 and further application. The comprehensive network pharmacology approach successfully identified 1377 active ingredients in HerbalDB and generate 5 potential hit compounds related to COVID-19. In summary, a molecular interaction method was used in our current study to investigate the effectiveness of TIM for COVID-19. However further research is necessary to investigate their potential medicinal use.

Keywords: *COVID-19, HerbalDB, Molecular Interaction, Traditional Indonesian Medicine (TIM), Whole Genome Sequencing*

INVITED SPEAKER (CCP)

Novel Monoclonal Antibody Based Cancer Therapeutics

Veysel Kayser [1]

[1]Sydney Pharmacy School, Faculty of Medicine and Health, The University of Sydney, NSW 2006, Australia,
Corresponding email: veysel.kayser@sydney.edu.au

Abstract

Globally, therapeutic monoclonal antibodies (mAbs) have become the top-selling class of medicines mainly due to their unmatched target specificity and efficacy in treating a variety of diseases, including different types of cancer. They present dissimilar but generally fewer side effects compared to traditional cancer therapies such as chemotherapy. Recently developed new modalities of antibody based medicines include antibody-drug-conjugates (ADCs), bispecifics and antibody- nanoparticle complexes. These medicines exploit target specificity of antibodies while providing additional benefits. For example, ADCs have a toxic payload while bispecifics can bind to and recruit an immune cell as well as bind to a cancer specific receptor simultaneously, leading to a better outcome for the patient. This talk will provide a summary of the current state-of-play of mAbs as well as other antibody-based therapies and provide new advancements mainly from our own lab. These include ADCs, bispecifics and nanoparticle-mAb complexes. New strategies to enhance formulation stability will also be mentioned.

Keywords: *Biologics, Monoclonal Antibodies (mAbs), Formulation, Antibody-Drug-Conjugates, Bispecifics, Protein Aggregation.*

INVITED SPEAKER (CCP)

Development of Therapeutic Monoclonal Antibody against Cancer in Indonesia: An Industrial Perspective

Neni Nurainy

Head of Translational Development of Biopharmaceutical Products Division
PT Bio Farma, Bandung, Indonesia

Abstract

Biosimilar is a biological therapeutic drug that is similar in term of quality, safety and efficacy to the already license reference biotherapeutic product. Biosimilars are very important on medicine because the reducing cost of development compared to innovation biologics due to opportunities of the originator products patent expiry; the significantly condensed timelines on the regulatory pathway and the cost saving of treatment. The key challenges remain are complexity of technology and demonstrating comparability and high similarity based on in-depth analytics as outlined in a number of guidance documents, changing on the regulatory environment and competitiveness of the market due to the busy pipeline.

Bio Farma as a life science industry currently developing therapeutic monoclonal antibody for cancer treatment as its priority in biosimilars development. The product will be indicated for treatment of breast and gastric cancers as the most cancer cases found in Indonesia. The strategies to address the challenges in industrial perspective of biosimilar development will be discussed.

In this presentation will also mention the transformative approach to cancer treatment using existing monoclonal antibody that conjugated to cytotoxic agent as an Antibody-drug conjugates (ADCs). The molecule are complex engineered therapeutics consisting of monoclonal antibodies, directed toward tumour-associated antigens, to which highly potent cytotoxic agents are attached using chemical linkers. The opportunity the emerging clinical data with ADCs increasing the research into improved cancer treatments utilizing this approach.

Keywords: *Biosimilar, Monoclonal Antibody, Cancer Therapy, Antibody Drug Conjugates*

INVITED SPEAKER (PESC)

Potential Active compounds Isolated from Indonesian Medicinal Plant

Gemini Alam, Muhammad Raihan and Abdul Rahim

Faculty of Pharmacy, Hasanuddin University, Makassar, Indonesia

Abstract

The area of Indonesian tropical forests covers 143 million hectares and it is inhabited by approximately 80% of the worlds' medicinal plants. The richness of the Indonesian tropical forests is ranked second in the world after the Amazon forests of Brazil. It is estimated that there are about 28.000 species of plants in the Indonesian tropical forest; and about only 1.000 species of them are currently known and used as medicinal plants. In Indonesia, utilised medicinal plants are more specifically classified as herbal products, standardized traditional medicine, and 'phytopharmaca' or clinically approved traditional medicine. In this presented talk, some recent studies related to the developments of medicinal natural products from South Sulawesi (Indonesia) will be provided. These includes diterpene compounds from *Caesalpinia crista* with antimalarial activities, alkaloids isolated from *Lunasia amara* with potent aphrodisiac activities, and several compounds from *Vitex trifolia* such as vitexicarpin, viteosin-A, and vitetrifolin-E. Moreover, Paliasa (*Kleinhovia hospita* L.) have been developed as a traditional medicine for protecting liver damages but more recent studies revealed that some of the isolated compounds have a potency to be developed as an anticancer agent. Extract with potent biological activities will also be presented including *Carthamus tinctorius* extract which exhibited immunostimulant potency and *Boehmeria virgata* extract with anticancer activity. Example of natural products from aquatic species and marine natural products will also be delivered, particularly to that related to the studies developing active pharmaceutical ingredients and excipients.

Keywords: *Indonesia medicinal plants, bioactivities, natural products, marine natural products*

INVITED SPEAKER (PESC)

Peptide based-targeted drug delivery systems

Chuda Chittasupho

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E-mail: chuda.c@cmu.ac.th

Abstract

Peptide targeted drug delivery has emerged a promising method to achieve improved therapeutic effect of the drugs by increasing solubility of the drugs, reducing systemic adverse reaction, controlling drug release, and targeting drug to the site of action. Peptide ligands have moderate size, therefore they are low immunogenic and can penetrate better than protein ligands. Peptides have larger size than small molecules, thus possessing larger binding interfaces, higher binding affinity and specificity. Large scale synthesis of peptides is easy and economic. In addition, peptides have a variety of functional groups for conjugation with nanoparticles. Several current strategies are used for the discovery of targeting peptides including biomimetic design, phage display technology, and chemical peptide library screening. Different conjugation chemistries are available to install peptide ligands to the drug nanocarriers. These reactions include carbodiimide chemistry, maleimide conjugation, click chemistry, and physical adsorption. Challenges of peptide targeted drug delivery and future perspectives will be covered in this presentation.
Keywords: *Nanotechnology; Active targeting; Drug delivery system.*

INVITED SPEAKER (HMNP)

Noni (*Morinda citrifolia* L.) polysaccharides as natural immunomodulator

Ediati Sasmito

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Abstract

The therapeutic effects of plant extracts are often attributed to their wide array of immunomodulatory effects and their effects on the immune system. Phytochemicals such as flavonoids, polysaccharides, lactones, alkaloids, diterpenoids and glycosides found in various plants have been reported to be responsible for immunomodulating properties.
One of the plants that has the high potential to be developed as an immunomodulator is *Morinda citrifolia* L., or also known as noni, which is widely found all over the country in Indonesia. Since thousands of years ago noni has been used by the community for the treatment of various diseases. Noni fruits are rich in polysaccharides which are practically safe and non-toxic. In Indonesia, noni fruit has been used empirically to enhance the immune system.
Started in 2012, we have been researching the benefits of polysaccharide fraction from noni fruits. The results of our researches have been published in seminars and journals, both national and international. Here on ICPAPS 2021, we summarize the results of our research on noni as an immunomodulator. We cover *in vitro* and *in vivo* studies along with molecular aspects. We also include the formulation study of noni fruits' polysaccharide fraction, aiming to accelerate its development as a ready-to-consume product.

INVITED SPEAKER (HMNP)

Secondary Metabolites and Their Biological Activities from Indonesian Marine Organisms

Masteria Yunovilsa Putra

Researh Center for Biotechnology, Research Organization Life Science, National Research and Innovation Agency (BRIN) Jl. Raya Jakarta-Bogor Km. 46, Cibinong, Jawa Barat, Indonesia 16911

Abstract

In the past years, there has been an increasing interest on marine organism as a target source of bioactive marine natural products because many consider them among the world's greatest untapped resources for new biodiversity as well as chemodiversity. Studies reported that Indonesia has remarkable yet underexplored marine natural products, with a high chemical diversity and a broad spectrum of biological activities In our ongoing project on the search for bioactive compounds from Indonesian marine organism, we have focused mainly on marine organisms such as sponges, soft coral, tunicates and bacteria. Several new secondary metabolites, including diterpenoid, steroids, alkaloids, glycosides and peptides have been isolated from these marine invertebrates. The structures of the compounds were elucidated by extensive analysis of 1D and 2D NMR. Some of the isolated compounds displayed interesting in vitro biological activities such as anti-inflammatory, neuroactive and cytotoxicity against a panel of human cancer cell lines.

INVITED SPEAKER (PDDS)

Pharmaceutical Research Ecosystem in Accelerating Drug Development for Covid-19

Junaidi Khotib

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Jln Mulyorejo Kampus C Surabaya 60115, East Java, Indonesia

Abstract

It has been almost two years since the Covid-19 pandemic. Statistical data shows that the number of people who died has increased along with the high rate of infected people, particularly in the peak season of the pandemic, both in the first and second waves. The impact is not only limitary on health problems but also economic problems. Various strategies have overcome the massive spread through a preventive approach with adherence to health protocols, supplements, vitamins, and herbs to increase immunity and vaccination. In addition, Therapeutic intervention using antiviral, convalescent plasma, and specific antibodies emphasizes the increasing healing rate. Indeed, in such circumstances, research and innovation in handling Covid-19 are developing exceptionally and very fast. Unfortunately, this remarkable improvement is less accompanying with satisfying research and innovation management. Therefore, this gab will have an impact on accelerated obstacles in providing some advances.

Faculty of Pharmacy Universitas Airlangga has developed pharmaceutical research management through a pharmaceutical research ecosystem to manage upstream and downstream research. In this unit, various groups in the health cluster such as pharmacists, medical doctors, chemists, and molecular experts affiliate in unity. All expertise synergistically conducts studies ranging from in-silico to clinical trials of several thousand compounds to obtain compounds with high affinity and activity against the surface protein spike glycoprotein of the SARS-CoV-2 virus. Also, a chemical analog can inhibit the RdRp enzyme at the viral replication step. The in-silico study obtained ten compounds with excellent activity with the lowest predicted risk or side effects. This compound was tested in-vivo on animals and obtained Unair 1-5 compounds with dominant activity. After ensuring safety and effectiveness can be precisely determined, the compounds are switch to the pharmaceutical industry for production. Currently, it is producing Unair-1 and -3 compounds and is subsequently used for testing in humans following the provisions of clinical trials. Likewise, developing a national vaccine based on domestic viral genetics has reached the trial stage on primates at the BSL 3 facility. Pilot-scale products produced by the pharmaceutical industry will be used in clinical trials on humans at Universitas Airlangga Hospital and Dr. Hospital. Soetomo Surabaya. The critical thing in this management is cooperation with various parties, both government and pharmaceutical industry partners. Likewise, intensive communication between them at the Pharmaceutical Industry Hub must be an effective and well-managed means.

Thus, it can conclude that controlled management of pharmaceutical research and innovation will accelerate the downstream for several benefits. In addition, this is an effort to pave the way to facilitate the availability of raw materials and pharmaceutical products in the country.

INVITED SPEAKER (PDDS)

The Future of Life Science: The Biopharmaceutical Story

Raymond R. Tjandrawinata

Dexa Laboratories of Biomolecular Sciences Jababeka, Indonesia

Abstract

During this COVID pandemic, we are experiencing changes in the field of new drug discovery. This presentation discusses the discovery of new drugs derived from human genomics and sequencing of the human genome. Many drugs have been discovered based on validated targets. The use of biotechnological techniques in the discovery of new drugs allows us to obtain various biological-based drugs, such as monoclonal antibodies, RNA-based therapy to CRISPR in the future. The use of AI in the discovery of new drugs to the use of robotics in the manufacturing area will be discussed by the progress of this Industry 4.0 era.

Plenary Talk-3

Extending Pharmacy Practice by New Technologies

Shawn Hsiang-Yin Chen, Pharm.D.

Professor and Associate Dean College of Pharmacy Taipei Medical University
November 3, 2021

Abstract

New technologies have been applying to medical and pharmacy research and practice to accelerate the progress with breakthrough results. Artificial intelligence (AI) helped reading medical images including magnetic resonance imaging. (MRI) or computed tomography (CT) for cancer diagnosis, optical coherence tomography (OCT) for differentiation of ophthalmologic diseases, or electroencephalography (EEG) for classification of epilepsy. Prediction of cancer occurrence with genomic features is aware by publics. The application of AI in lead compound findings speeds up the progression of new drug development. Using the excellent computation capacity of machine learning and deep learning, predicting the occurrence of adverse drug reaction in patients could help clinical pharmacists to provide alternative pharmacotherapy to avoid unwanted effect. Computerized medication management system further helps the clinical pharmacists optimal the medication management cycle to better medication safety. Automation can largely change the pharmacy practice by reducing the need of pharmacy manpower in dispensing burden. The saving in pharmacist time can facilitate the pharmacy management leaders to create more positions for clinical pharmacists to provide direct patient care and communicate with medical teams to optimize the prescription. Providing medication consultation and patient education through videos and social media gives the pharmacists great opportunity to explain the content in an easier method. There are a plenty of possibilities to apply new technologies in clinical pharmacy to extend and excel our practice in the future.

Plenary Talk-4

Pharmaceutical Care in COVID 19: Clinical Pharmacists' Role in Optimizing Disease Management

Assoc. Prof. Dr. Hasniza Zaman Huri

Abstract

COVID 19 is a debilitating disease, infected a hundred million of the world population and, up until now, caused close to 5 million deaths around the globe. The disease caused by SAR CoV-2 in 2019 resulted in pandemics and chaos in the delivery of healthcare systems in many countries worldwide. Clinical pharmacists provide direct patient medical needs via pharmaceutical care. Pharmaceutical Care is the provision of drug therapy delivered to achieve definite outcomes that improve a patient's quality of life. Managing drug-related problems is a cornerstone in Pharmaceutical Care. COVID-19 disease is rather complex to manage, especially when the patients with multiple comorbidities enter stages 4 and 5. Clinical Pharmacists could do wonders in the COVID 19 and non-COVID 19 management by identifying, resolving, and preventing drug-related problems. Beyond hospitalization, pharmacists educate society to prevent and manage the disease that would make an overall impact to combat the disease globally.

INVITED SPEAKER (PPCP)

Discovery and Optimization of New Anti-Tuberculosis Leads

Mark K. Rong,[a,b,c] Alex Speer, [b,c] **Eelco Ruijter**[a] and Wilbert Bitter[b,c]

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Abstract

Tuberculosis (TB) is the largest single cause of death due to bacterial infection, with an estimated annual 1.5 million deaths and >1 billion latent infections worldwide. Being a bacterial infection, TB can be cured by treatment with antibiotics. Alarmingly, however, resistance has been observed against virtually all available treatment options. Combined with the fact that only very few new effective antibiotics against TB have been discovered over the past 50 years, the development of novel drugs against TB is of the utmost urgency and importance. A major factor in antibiotic resistance is the fact that Mycobacterium tuberculosis, the causative agent of TB, is a highly unusual bacterium, protected from its environment by a highly impermeable cell envelope, making it insensitive to commonly used antibiotics, such as penicillins and other β-lactams. To facilitate nutrient uptake and protein export, mycobacteria have developed specialized secretion systems known as type VII secretion (T7S) systems. Virulent mycobacteria such as M. tuberculosis have up to fıve type of these secretion systems, known as ESX-1 – ESX-5. We developed a high-throughput screening assay for the activity of ESX-5, which is both essential for survival and required for virulence in M. tuberculosis. After screening a library of 32,000 compounds, our multidisciplinary team ranked the most prominent hits by activity, drug-likeness, and amenability to structural optimization. We then synthesized a large number of structural analogues of the highest ranked hit compound, resulting in the identifıcation of two promising leads showing >16-fold improved activity compared to the original hit and signifıcantly enhanced metabolic stability. Moreover, these lead compounds show negligible toxicity in a zebrafıish embryo model and are very well tolerated in mice.

INVITED SPEAKER (PPCP)

How to Learn Org Chem via Iqro' Method

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Abstract

Organic Chemistry is a basic science that must be understood at the initial semester level in college. Considering the syllabus or RPKPS (Semester Learning Activity Program Plan) at universities, especially the Faculty of Pharmacy, UGM Yogyakarta, has skyrocketed at the molecular level involving molecular orbital theory, the valence bond theory used to explain the basics of organic chemistry qualitatively neglected.

Therefore, I suggest studying organic chemistry with the Iqro' method and recommend it to be included in the organic chemistry learning process in Senior High Schools (SMTA) and can also be introduced at the Junior High School (SMTP) level.

INVITED SPEAKER (CCP)

The Burden of Exposure to Established Carcinogens Exposure in Asia

Alireza Mosavi jarrahi

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Chief Executive Officer, West Asia Organization for Cancer Prevention- West Asia Chapter
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Abstract

Several environmental hazards and carcinogens are spread across many regions and countries of Asia exposing a large portion of the inhabitant either through indoor and occupational setting or outdoor and ambient environment. The exposed inhabitants are at risk of developing various types of cancers. Among the chief carcinogens imposing a big burden on the population in Asia are Arsenic and disinfection by-products in drinking water, ultraviolet rays from the sun, and agricultural chemicals, ozone, and asbestos.

The International Agency for Research on Cancer (IARC) has evaluated more than 900 agents and classified more than 400 as known or suspected carcinogens. Of these, 168 individual agents and 18 exposure situations (particular jobs or industries) are found in environments. Accordingly, much epidemiological study of the carcinogenic properties of various agents occurs in occupational settings, where exposures are often higher than in the general environment. In both occupational and environmental settings, exposure to known and suspected carcinogens is modifiable, and measures aimed at reducing or eliminating exposures will contribute to a lower risk of developing cancer in the future.

There were an estimated 349 000 deaths and 7.2 million DALYs lost to exposure to known carcinogens. Asbestos, secondhand smoke, silica, diesel engine exhaust, pm2, and ultraviolet contribute to large portion of the cancer burden in Asia. Among the many cancer causing death related to known carcinogens, lung cancer accounted for 86%, mesothelioma for 7.9% and laryngeal cancer for 2.1% (all attributed to exposure to known carcinogens).

INVITED SPEAKER (CCP)

Estimating Tobacco-Related Cancers Deaths and Costs of Productivity Loss in Indonesia 2018

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Abstract

There is widely known that the smoking economic burden has a significant impact on the country's health expenditure as well as society. This study aimed to estimate the mortality of major cancers associated with tobacco smoking in Indonesia and the cost of productivity lost due to mortality in 2018. This study employed a prevalence-based epidemiological study design. The death rate of major cancers due to tobacco smoking among adults by gender was obtained from Globocan 2018 database. Smoker prevalence was obtained from the Basic Health Research 2018. The life expectancy of Indonesian was taken from the WHO Life Tables, while the average income of the Indonesian population was retrieved from National Statistics Bureau. The expected years to life and average wages among the active working population were used to estimate the cost of productivity loss due to smoking. The data analysis was conducted by Excel software. The largest of the smoking-attributable fraction (SAF) was lung cancer, as amount as 99.82% and 96.93% in men and women respectively. The highest number of deaths caused by smoking in men was lung cancer (16,541 deaths), while in women was lung cancer (4,572 deaths). The total mortality of cancers associated with tobacco was 43,913 deaths in men, compared to 30,729 deaths in women. The total cost of productivity loss of cancer caused by smoking was 4,287,141 million IDR, with lung cancers costs in the first rank. The cancer burden caused by smoking were significantly impacting on health and economy of the Indonesian government and community. This evidence can be useful in drawing up the strategy of intervention on prevention and control of tobacco use.
Keywords: *cancers, tobacco, mortality, cost of productivity lost.*

INVITED SPEAKER (PESC)

The Use of Chemometrics in Conjunction with Instrumental Techniques In Pharmaceutical Analysis

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Abstract

Pharmaceutical analyses are mainly focused in qualitative or quantitative analyses of drugs either in raw materials or pharmaceutical products. Pharmaceutical analysis involves determination of active pharmaceutical ingredients, excipients, impurities, content uniformity, solubility, dissolution rate and stability. The developments of analytical instruments such as chromatographs and spectrometers have led the generation of large dataset even from the single measurement. The application of chemometrics is a must to extract the chemical signals from spectroscopic and chromatographic measurements to get more understandable information. Chemometrics has been defined as the application of statistics and mathematics for the extraction of useful information from the instrumental measurements. Chemometric approaches can be used to analyze the data obtained from various molecular spectroscopies (UV-Vis, near infrared, attenuated total reflectance Fourier transform infrared 1H-NMR) and chromatographic-based methods (thin layer chromatography, high performance liquid chromatography and gas chromatography). The most commonly chemometrics techniques applied in pharmaceutical analysis included data pre-processing, exploratory data analysis, pattern recognition and multivariate calibrations. The combination of chemometrics and instrumental methods has been successfully used in qualitative and quantitative analyses of pharmaceuticals.

Keywords: *Chemometrics; Chromatographic; Spectroscopy; active pharmaceutical ingredients.*

INVITED SPEAKER (PESC)

Phyllanthus amarus and its major constituents modulate inflammation-associated cell signaling pathways: potential role in the prevention and treatment of inflammation and cancer

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Abstract

Modulation of the cell signaling pathways, such as those involving mitogen activated protein kinases (MAPKs), nuclear factor kappa β (NF-κB), phosphatidylinositol 3-kinase and protein kinase B (PI3K/Akt), and Wnt, and their outcomes plays a fundamental role in inflammation and cancer. Activation of these pathways can lead to various aspects of cancer-related inflammation. Targeting cell signaling pathways has been utilized as an innovative approach to discover drug leads from natural products. Phytochemicals are known to be able to modulate the cellular and molecular networks which are associated to chronic diseases including cancer-associated inflammation. Hence, compounds able to modulate inflammation-related molecular targets are sought after in anticancer drug development programs. In this report we focus on the flavonoids (astragalin, kaempferol, quercetin, rutin), lignans (phyllanthin, hypophyllanthin, and niranthin), tannins (corilagin, geraniin, ellagic acid, gallic acid), and triterpenes (lupeol, oleanolic acid, ursolic acid) of *Phyllanthus amarus*, which exert various anticancer and anti-inflammatory activities *via* perturbation of the NF-κB, MAPKs, PI3K/Akt, and Wnt signaling networks. The suppressive effects of the compounds on the multiple cell signaling pathways reveal their potential use in prevention and treatment of chronic inflammatory disorders. Understanding the underlying mechanisms involved may help future research to develop drug candidates for prevention and new treatment for cancer and inflammatory diseases.

INVITED SPEAKER (HMNP)

Design of Radiopharmaceutical of Alpha Mangostin for Breast Cancer Theragnostic

Muchtaridi M

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Abstract

Alpha Mangostin was known for a long time as one of the natural compounds that had potential pharmacological activities including antioxidant, antiproliferative, antimicrobial, antidiabetic, antiinflammatory, and anticarcinogenic. Based on several studies, alpha mangostin isolate was predicted to have the ability to bind to human estrogen receptor antagonists so that it can be used as a breast cancer drug. The high pharmacophore compatibility, the formation of hydrogen bonds with Thr347, Asp351, Met343, and Met421, and the absence of hydrogen bonds with His524 with a bond free energy value (ΔG) of 9.05 kcal/mol indicated that alpha mangostin had antagonistic activity against ER. Helix-12 from residues 536-544 in the macromolecular structure had an important role in the agonist and antagonistic activities of a ligand against hERα. Helix-12 will be closed when the antagonist ligand binds to the Ligand Binding Domain of hERα, and no hydrogen bonds were formed with His524. *In vitro* study of Cytotoxic tests with resazurin assay on MCF-7 cells showed that the IC_{50} of alpha mangostin was lower than tamoxifen by 0.044 and 0.1 g/mL, respectively. In the development of a new radiopharmaceutical, alpha mangostin has a chemical structure that can bind to the radionuclide Iodine-131 through an oxidation-reduction reaction. Radionuclide Iodine-131 has beta and gamma emission so that it can be used as a theragnostic radiopharmaceutical. Based on the pharmacopeia, the requirements for a new radiopharmaceutical including the percentage of radiochemical purity of more than 95% and meet the requirements of *in vitro* and *in vivo* studies. *In vitro* studies include plasma protein binding test, lipophilicity test, and radioligand binding assay. As a further step, pharmacokinetics, biodistribution, and toxicity tests were carried out. All of the studies were carried out to meet the requirements of a new radiopharmaceutical stage that was ready to be clinically tested on patients.

Keywords: *Alpha Mangostin, theragnostic radiopharmaceuticals, Breast Cancer, Estrogen Receptor Antagonist.*

INVITED SPEAKER (HMNP)

Carboranes and Metallacarboranes as Building Blocks for the Design of Novel Anti-Tumour Agents

Evamarie Hey-Hawkins[1,*], Marta Gozzi[1], Benedikt Schwarze[1], Menyhárt-Botond Sárosi[1], Danijela Maksimović-Ivanić[2], Sanja Mijatović[2]
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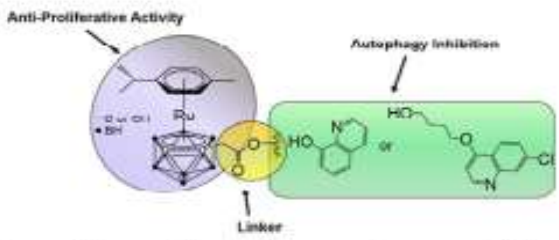
ABSTRACT

While the chemistry of carboranes has been studied extensively since the 1960ies, recent developments focus mainly on design and principles for application. Isosteric replacement strategies are applied linking the concepts of phenyl or cyclopentadienyl rings to carborane clusters (*closo*-$C_2B_{10}H_{12}$ or *nido*-$[7,8\text{-}C_2B_9H_{11}]^{2-}$) in drug design. Carborane clusters offer unique features, such as hydrophobicity, larger steric demand, special electronic structure, or site-specific derivatisation patter, which can be superior to those of their organic counterparts in view of a specific application.[1] Thus, implementation of the carboranyl moiety as a phenyl mimetic in biologically active molecules can result in compounds with improved biological stability and activity in comparison to their generic paradigms.[2]



Another aspect includes applications of metallacarboranes, [3-M-1,2-$C_2B_9H_{11}$], in biomedical chemistry.[3] This approach allows a symbiosis of the carborane features, the versatility of metals in biological systems and specific ligands, which can be selected according to their targets. In aqueous solutions, metallacarboranes spontaneously form self-assemblies in the nanometre range; their size can be efficiently controlled by formulation with bovine serum albumin (BSA).[4] These self-assembled nanoparticles might provide a selective drug delivery system, via exploitation of the well-known "enhanced permeability and retention" (EPR) effect.

The design and *in vitro* biological evaluation of specific carborane and metallacarborane derivatives[5] conjugated to selective vector system for targeted tumour therapy will be presented.

REFERENCES

[1] Stockmann, P; Gozzi, M.; Kuhnert, R; Sárosi, M. B.; Hey-Hawkins, E. *Chem. Soc. Rev.* **2019**, *48*, 3497.
[2] Buzharevski, A. et al. *ChemMedChem* **2019**, *14*, 315 and *ACS Omega* **2019**, *4*, 8824. Kuhnert, R. et al. *ChemMedChem* **2019**, *14*, 255.
[3] Hey-Hawkins, E.; Vinas, C. (eds.), *Boron-based Compounds: Potential and Emerging Applications in Medicine*, Wiley-VCH, **2018**, ISBN 9781119275558. Gozzi, M. et al. *ChemMedChem* **2021**, *16*, 1533.
[4] Schwarze, B.; Gozzi, M. et al. *J. Nanopart. Res.* **2020**, *22*, 24.
[5] Gozzi, M. et al. *ChemMedChem* **2019**, *14*, 2061. Schwarze, B. et al. *ChemMedChem* **2019**, *14*, 2075.

Plenary Talk-5

Preclinical Evaluation of Sclareol as an Adjuvant Therapy for Cisplatin Resistance in Non–Small Cell Lung Cancer

Jackson Chieh-Hsi Wu

Abstract

Cisplatin-based chemotherapy is a common first-line regimen for treating non–small cell lung cancer (NSCLC). However, drug resistance is still a major problem. The purposes of this study were to evaluate whether sclareol can reverse cisplatin resistance and to investigate its possible mechanisms. A549 cells, the human NSCLC cells with inherent cisplatin resistance, were used to investigate synergistic effect of sclareol with cisplatin in cell proliferation and migration as well as its regulatory mechanisms in expression of excision repair cross-complementation group 1 (ERCC1), a cisplatin resistance-associated molecule. Nude mice bearing subcutaneous A549 tumors were applied to investigate synergistic activity of sclareol in anti-tumor. As comparing to the cisplatin alone group, the treatment of cisplatin combined with sclareol significantly suppressed survival rate and cell migration of A549 cells. Besides, sclareol also exhibited suppression in ERCC1 expression by inhibiting AKT-GSK3β-AP1/Snail and JNK-AP1 pathways. Furthermore, the experimental data from in vivo study also demonstrated that the combination group of cisplatin and sclareol showed the greatest anti-tumor activity, whose effect could be partially attributed to sclareol-mediated decrease in intratumoral level of ERCC1 protein. Accordingly, sclareol has potential as an adjuvant for the treatment in NSCLC patients with cisplatin resistance.

Plenary Talk-6

The Role of Computational Method in Discovering Lead Compounds and Repurposing of Existing Molecules

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Abstract

In a traditional drug discovery and development, it has been known that for launching one molecule for treatment a disease needs 8-15 years and is estimated to be a staggering US$ 1.8 billion (1). Approximately 75% of the cost is due to failures that happen along the drug discovery and design pipeline. Thus, in the ten years later, global pharma companies have made a serious revitalization of their computation facilities to overcome the great lost in drug discovery. Pharmacophore modelling, molecular docking and molecular dynamic simulation have important role in supporting virtual screening. We have applied those molecular modelling in searching curcumin analogues as DYRK2 inhibitor (2), dual tyrosine kinase inhibitor of EGFR and VEGFR2 (3), as well as cyclin-dependent kinase 4/6 Inhibitors (4). A repurposing of existing molecules has also been performed, and the results will also be discussed.

References

1. S.M. Paul, et al., Nat. Rev. Drug Disc., 2010, 9(3), 203-214.
2. L. Aman, et.al., F1000Research, 2021, 10:39; doi.org/10.12688/f1000research.28040.1 3.
F. Sangande, et.al., Int. J. Mol. Sci., 2020, 21, 7779; doi:10.3390/ijms21207779 4. N.M.P.
Susanti, et.al., Molecules, 2021, 26, 4462; doi.org/10.3390/molecules26154462

Plenary Talk-7

Designed Receptor Specific TNF Ligands to Fight Cancer and Fibrosis

Wim J. Quax, Rita Setroikromo, Yizhou Wang, Xinyu Zhou, Fengshi Suo and Hidde Haisma
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Abstract

Tumor necrosis factor related apoptosis inducing-ligand (TRAIL) is attracting great interest as it selectively kills various types of cancer cells, and unlike other apoptosis inducing TNF-ligand family members, appears to be inactive against normal cells. TRAIL is a promiscuous ligand as it binds to five different cognate receptors of the TNF-receptor family: the death receptor 4 (DR4), death receptor 5 (DR5) both containing a cytoplasmic death domain that transmits an apoptotic signal and to the decoy receptor 1 (DcR1), decoy receptor 2 (DcR2) and the soluble secreted receptor OPG, that lack an intact death domain and therefore may act as antagonist receptors. Using the automatic design algorithm FOLD-X, we successfully generated DR5-selective TRAIL variants[1]. Nevertheless a monotherapy with TRAIL (-variants) often was found to lack efficacy. In a xenograft experiment using bioluminescent ovarian cancer cells the efficacy of the DR5-selective TRAIL variant in combination with cisplatin was demonstrated. Recently we have shown that the combination of TRAIL variants with artemisinin derivatives shows promising efficacy against colon cancer cells[2]. More applications will be discussed.

Also the related TNF ligand, RANK-L, shows a promiscuous activity, by interacting with both RANK and OPG receptors. It was found that in fibrotic tissue the interaction of RANK-L with OPG contributes to the formation of extracellular matrix and therefore augments fibrosis in lung and liver. Using a similar protein engineering approach we have designed a variant of RANK-L that does no longer interact with OPG and therefore potentially can be used to fight fibrosis[3].

[1] Van der Sloot, A. M., Tur, V., Szegezdi, E., Mullally, M. M., Cool, R. H., Samali, A., Serrano, L., Quax, W. J. (2006): Designed tumor necrosis factor-related apoptosis-inducing ligand variants initiating apoptosis via the DR5 receptor. *Proc. Natl. Acad. Sci. U.S.A* 103, 8634-8639.

[2] Zhou, X., Zijlstra, S.N., Soto-Gamez, A., Setroikromo, R and Quax, W.J. (2020) Artemisinin Derivatives Stimulate DR5-Specific TRAIL-Induced Apoptosis by Regulating Wildtype P53. *Cancers*, *12*(9), 2514.

[3] Wang, Y., Michiels, T., Setroikromo, R., van Merkerk, R., Cool, R.H., Quax, W.J. (2019) Creation of RANKL mutants with low affinity for decoy receptor OPG and their potential anti-fibrosis activity. *The FEBS Journal* 286, 3582–3593

PPCP-1

Immunomodulatory Potential of Stem Bark Pepolo Extract (*Bischofia javanica* Blume) Against Phagocytosis Activity of Macrophage Cells on Balbc/C Male Mice

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ABSTRACT

Background: Pepolo stem bark (*Bischofia javanica* Blume) is one of the plants that can be developed as an immunomodulatory. Pepolo stem bark contains compounds that can affect the immune system, including flavonoids. **Objective:** This study aims to determine the potential of immunomodulatory stem bark extract of pepolo in male mice balb/C strain against phagocytosis macrophages. **Method:** Test animals used male mice of the Balb/C strain and *Staphylococcus aureus* (ATCC 25293) as test bacteria. The test animals were randomly divided into five groups. Group 1 negative control is Na CMC 0.5%; group 2 positive control namely Stimuno® 19.5 mg/kg BW; group 3, 4 and 5 extracts with doses of 100, 200 and 300 mg/kg BW respectively. Treatment was given for seven days and on the eighth day, injected the suspension of *Staphylococcus aureus* bacteria intraperitoneally. Mice are dissected and taken peritoneal fluid to determine their macrophage activity. Analysis data with Kruskal-Wallis and post hoc Mann Whitney at a confidence level of 95%. **Results:** The results showed the percentage of macrophage activity of each negative control, positive control, extract doses of 100, 200, and 300 mg/kg BW respectively was 33.28%, 72.75%, 68.25%, 43.32%, and 31.75%. **Conclusion:** This study shows the contradictory effect of higher concentration of Pepolo stem bark extract which induces immunosuppressant effect, where at lower concentration induces immunomodulatory effect.

Keywords: *Bischofia javanica* Blume, phagocytosis, immunomodulator macrophages, immunosuppressants

PPCP-2

Molecular Docking Study and Molecular Dynamics Simulation of Spice Metabolites against Main Protease Enzymes and NSP3 Macrodomain SARS CoV-2

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ABSTRACT

Background: COVID-19 or coronavirus disease 2019 caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS CoV-2) is still a global outbreak. Its prevalence continues to increase. There is no specific antiviral drug for SARS CoV-2 yet. **Objective:** This study aims to find lead compounds from compounds derived from spices that can work as multitarget SARS CoV-2 antivirals. The target of drug action chosen in this study is the main protease enzyme and non-structural protein 3 (NSP3) macrodomain. Antiviral compounds that work on both targets are expected to be more potent. This antivirus will work to inhibit virus replication through main protease inhibition and increase innate immunity through NSP3 macrodomain inhibition. **Method:** Molecular docking and molecular dynamics simulation were chosen as the methods in this study. **Results:** Based on the molecular docking study, 7 test compounds were obtained that had a good affinity for both targets. The binding affinity values ranged from -7.29 to -10.31 kcal/mol in the main protease, and from -6.77 to -10.29 kcal/mol in the NSP3 macrodomain. The seven compounds were then further tested by molecular dynamics simulations, and 4 compounds were obtained which had stable interactions with the target. Namely: dauricine, rutin, xhantoangelol, and myricetin. **Conclusion:** Dauricine, rutin, xhantoangelol, and myricetin are potential antiviral lead compounds that act on the main protease and NSP3 macrodomain of SARS CoV-2.

Keywords: Main protease, NSP3 macrodomain, SARS CoV-2

PPCP-3

Molecular Docking, Molecular Dynamics, And Chemical Compound Toxicity Testing In Curcuma Longa As An Alternative Anti-inflammation Against Cyclooxygenase Enzyme

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ABSTRACT

Background: Turmeric is an ingredient commonly used in traditional medicine. Various studies have proven that one of its properties is anti-inflammatory. The content of curcuminoids and essential oils is thought to play a role in this activity. **Objective:** This study was conducted to find lead compounds in anti-inflammatory drugs that work by inhibiting the activity of the cyclooxygenase (COX) enzyme. This study involved COX-1 and COX-2. The target protein structure used is the COX structure obtained from PDB with ID 1EQG for COX-1, and 4PH9 for COX-2. **Method:** Molecular docking, molecular dynamics simulation, and in silico toxicity prediction were chosen as the methods in this study. **Results:** This study proves that there are at least 5 compounds in turmeric that can be lead compounds as anti-inflammatory. Cyclocurcumin and dihydrocurcumin provide stronger affinity than natural ligands for COX-1. Dihydrocurcumin is even predicted to have a better affinity than the comparison drug (ketorolac). Meanwhile, curcumin, demethoxycurcumin, and bisdemethoxycurcumin were shown to have a good affinity for COX-2. The affinity values are almost the same or slightly higher than the natural ligands, but not higher than the comparison drug (celecoxib). Toxicity studies showed that all five compounds were non-mutagenic, but predicted carcinogens in mice. **Conclusion:** Cyclocurcumin and dihydrocurcumin can be used as lead anti-inflammatory compounds in COX-1. Meanwhile, curcumin, demethoxycurcumin, and bisdemethoxycurcumin can be lead compounds in COX-2. These compounds need to be designed in such a way as to be used as anti-inflammatory drugs, especially to eliminate their carcinogenic potential.

Keywords: anti-inflammation, cyclooxygenase enzyme, turmeric

PPCP-4

Synthesis and in silico study of Bis-(1-(4-hexylbenzoyl)-3-methylthiourea) Cobalt (III) complex as anticancer candidate

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ABSTRACT

Over the years, the metal complexes have been reported as anticancer. Its properties are better than cisplatin, one of which is the cobalt complex. The research objectives were: (1) to synthesize the Bis-(1-(4-hexylbenzoyl)-3-methylthiourea) Cobalt (III) complex, (2) to do in-silico study on the complex in cancer receptors. The synthesis method was refluxed at 100 ^{o}C and it was characterized by HSM, UV-vis, FT-IR and MS as well as in silico studies through the docking method with AutoDock. The reaction between 1-(4-hexylbenzoyl)-3-methylthiourea with cobalt (III) produced a complex compound of 65.25 % and the docking simulation resulted in a binding affinity of -8.7 kcal/mol. From the results, it can be concluded that the Bis-(1-(4-hexylbenzoyl)-3-methylthiourea) Cobalt (III) complex can be used as an anticancer candidate.

Keywords: cancer, cobalt, in silico, thiourea, synthesis

PPCP-5

ADMET Prediction of Acyl Pinostrobin Derivatives Based on *In Silico* Study

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ABSTRACT

Background: Nine acyl pinostrobin derivatives design has been obtained from modifying pinostrobin, which is known to have cytotoxic activity against breast cancer. In silico study to predict the ADMET properties of these compounds was conducted, because its prediction in early-stage drug development is essential to ensure that compounds can reach the target site in sufficient concentrations to produce the physiological effect safely. **Objective:** The aim of this study was to predict the pharmacokinetic properties (absorption, distribution, metabolism, excretion) and toxicity of 9 pinostrobin acyl derivatives. **Method:** Prediction of ADMET properties was carried out using the online SMILES translator and pkCSM, with a total of 12 observed parameters (Water solubility, Caco-2 permeability, intestinal absorption (human), VDss, logBB, CYP2D6 inhibitor, CYP3A4 inhibitor, total clearance, renal OT2 substrate, AMES toxicity, rat LD_{50} and hepatotoxicity). **Results:** Absorption parameters indicate that the acyl pinostrobin derivatives have lower water solubility than pinostrobin, but almost all derivatives have higher intestinal absorption than pinostrobin. In the distribution parameters, some derivatives have higher VDss than pinostrobin, and all derivatives have lower BBB permeability than pinostrobin. Metabolism parameters showed no inhibitory activity in CYP2D6, but some derivatives inhibit CYP3A4. The excretion parameters showed a higher total clearance than pinostrobin, and none of these compounds is renal OCT2 substrate. The toxicity parameters showed that pinostrobin and some derivatives are carcinogenic, both pinostrobin and all derivatives are relatively harmless, and none of these compounds is hepatotoxic. **Conclusion:** Almost all derived compounds had better pharmacokinetic properties than pinostrobin, and all compounds were less toxic than pinostrobin. These results indicate that derived compounds can be further investigated as anti-breast cancer.

Keywords: *in silico*, ADMET, breast cancer,acyl pinostrobin derivatives, pkCSM

PPCP-9

Caesalpinia sappan L. and Brazilin Enhance Spatial Memory In Scopolamine-Induced Memory Impairment In Mice

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ABSTRACT

Background: Alzheimer's disease (AD) is −a complex central nervous system disease− characterized by the progressive memory deficiency that significantly disrupts human's quality of life. Indonesian herbal medicines have been considered as a potential source for pharmacological agents, including memory enhancers. *Caesalpinia sappan* L. (CS) is a well-known Indonesian medicinal plant, especially in the Yogyakarta region. However, its memory-enhancing effect has not yet been scientifically reported. **Objective:** This study was conducted to investigate the memory-enhancing effect of CS and its molecular mechanism in the scopolamine-induced memory impairment in mice. **Method:** Ethanolic extract (250; 500 mg/Kg BW) and brazilin (5; 10 mg/Kg BW) from CS were orally administered for 14 consecutive days in memory deficit mice. The spatial memory function was evaluated using the Morris Water Maze (MWM) test. The mice were sacrificed and the hippocampal tissue was collected for the investigation of cAMP/PKA/CREB/BDNF level using ELISA and Western Blot. **Results:** The CS extract and brazilin decreased the escape latency time and increased the time spent in the quadrant target in the MWM test. Interestingly, the administration of extract and brazilin also increased the cyclic adenosine mohophosphat (cAMP) level, protein kinase-A (PKA) activity and also the cAMP response element binding (CREB) and brain derived neurotrophic factor (BDNF) proteins expression levels in the hippocampus. **Conclusion:** Ethanolic extract and brazilin from CS enhance the spatial memory via cAMP/PKA/CREB/BDNF pathway in the hippocampus.

Keywords: Brazilin, Cognitive enhancer, Dementia, Memory, Sappan wood

PPCP-10

Effect of Lemongrass (*Cymbopogon citratus* (DC. EX Nees) S.), Avocado (*Persea americana* M.), and Eggplant (*Solanum melongena* L.) in the treatment of disease leading causes of death in Indonesia: A literature study

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ABSTRACT

Background: Cardiovascular disease, diabetes mellitus, chronic obstructive pulmonary disease, tuberculosis, hypertension and liver disease are leading causes of death in Indonesia. Indonesians use traditional plants in managing their illness because it is easily and affordably obtained, despite the lack of information for safety usage and their impact if co-administered with standard drugs. **Objective:** The study aimed to present a literature review providing information on the pharmacological effects of lemongrass (*Cymbopogon citratus)*, avocado (*Persea americana)*, and eggplant (*Solanum melongena)* as adjuvant therapy in the management of several diseases as top leading causes of death in Indonesia. **Method:** Literature search on PubMed and Google Scholar using particular keywords and inclusive criteria applied to published journals from 2011 to 2021, obtaining 84 journals for further analysis. **Results:** Studies suggested that *C.citratus*, *P.americana*, and *S.melongena* have been pre clinically tested and shown potential traditional remedies as adjuvant therapy. *C.citratus* can be used for hypertension, tuberculosis, liver disorders, and diabetes mellitus; *P.americana* for tuberculosis, diarrhoea, and liver disorders; while *S.melongena* for diabetes mellitus, liver disorders, and dyslipidemia. *Persea americana* and *Solanum melongena* also have been clinically tested to be effective in the treatment of hypertension and diabetes mellitus. **Conclusion:** *Cymbopogon citratus*, *Persea americana, and Solanum melongena* can be used as adjuvant therapy in various diseases that leading cause death in Indonesia. However, the usage of those plants are only allowed under the supervision of professional healthcare and further studies are required to evaluate the effect before it can be recommended to the general population.

Keywords: pharmacological effect; *traditional herbal medicine; adjuvant therapy; cardiovascular disease; liver disorder*

PPCP-11

Bitter Gourd (*Momordica charantia* L.) Affects the Pharmacokinetics Profile of Metformin in Rabbits' Plasma

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ABSTRACT

Background : The drug-herb combination between metformin and bitter melon frequently showed potential effects such as lowering glucose level. The use of both simultaneously needs to be studied further to find out the benefits and risks. **Objectives :** To see whether bitter gourd might affect metformin pharmacokinetics profile and analyze the possible interaction between both. **Methods :** An experimental study with post-test randomized controlled group design. Healthy albino rabbits were divided into three groups, which are bitter gourd juice 100% and metformin (B1+M), bitter gourd juice 50% and metformin (B2+M), and Metformin (M). B1+M and B2+M were given bitter gourd juice for 14 days, then a single dose of metformin was given to all groups on the fifteenth day before metformin pharmacokinetic parameters were measured. The plasma was analyzed using HPLC methods. **Results :** Pharmacokinetic parameter of B1+M and B2+M compared to M group showed the AUC_{0-t} and $AUC_{0-\infty}$ were increased twice for B2+M and thrice for B1+M, and Cl/F decreased significantly compared to M group ($p < 0.05$). T_{max} was reached at the same point for every groups, $t^1/_2$ and C_{max} increased insignificantly, while λ_z insignificantly decreased compared to M groups. **Conclusions :** To conclude, coadministration of bitter gourd juice and metformin resulted in beneficial pharmacokinetics interaction in normal condition.

Keywords: Drug-herb interaction, Pharmacokinetic profile, Metformin, Bitter Gourd.

PPCP-12

Physico-chemical Properties of Technetium-99m-Macroaggregated Albumin (^{99m}Tc-MAA) Radiopharmaceutical

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ABSTRACT

Background: Lung cancer is the most diagnosed cancer and the leading cause of cancer death. One of the effects of lung cancer is lung perfusion disorder. Radiopharmaceutical macroaggregated albumin (MAA) labeled with technetium-99m (^{99m}Tc) can be used to detect circulatory disorders in the pulmonary. As a radiopharmaceutical product, MAA kits must meet the requirements listed in the US Pharmacopeia. The requirements are pH, particle size, radiochemical purity, stability, and sterility. **Objective:** This research aim was to investigate the physico-chemical properties of ^{99m}Tc-MAA including pH, radiochemical purity, electric charge, temperature storage stability, particle sizes, and numbers. **Method:** Radiochemical purity of ^{99m}Tc-MAA was analyzed by radio-TLC with Whatman-1 paper and 85% methanol as eluent and stationary phase, respectively. The electric charge was determined using the electrophoresis method. The size and number of MAA particles were evaluated using a microscope. **Results:** The ^{99m}Tc-MAA has pH 4.7-5, radiochemical purity of 97.00% ± 1.69, and neutral electric charge. The radiopharmaceutical ^{99m}Tc-MAA was stable (radiochemical purity ≥95%) at 4 ℃ and room temperature for up to 6 hours. The size and number of particles of ^{99m}Tc-MAA remained constant of 10-90 µm (>90%) indicating no aggregated particles were formed. **Conclusion:** The results showed that ^{99m}Tc-MAA was stable at both refrigerator storage and room temperature for up to 6 hours. Based on these findings, the ^{99m}Tc-MAA conformed to the requirement as a radiopharmaceutical for lung perfusion imaging.

Keywords: perfusion, lung, radiopharmaceutical, MAA, physical chemistry, radiochemical

PPCP-13

The potential analgesic, anti-inflammatory, and anti-platelet activity of 2-((3-(chloromethyl)-benzoyl)oxy)benzoic acid

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ABSTRACT

Background: Acetylsalicylic acid (ASA) is used as a non-steroidal anti-inflammatory drug (NSAID) and antiplatelet agents by inhibiting cyclooxygenases (COX). However, long term intake of ASA could induce gastric bleeding. To overcome this problem, a new compound bearing salicylic acid residue namely 2-((3-(chloromethyl)benzoyl)oxy)benzoic acid (3-CH2Cl) was discovered. **Objective:** The aim of this study was to demonstrate the potential of 3-CH2Cl, particularly to evaluate its toxicity level and its effectiveness as an analgesic, anti-inflammatory, and antiplatelet agent compared with acetylsalicylic acid. **Method:** The acute oral toxicity assay was performed under OECD guidelines. The analgesic activity study was performed by plantar and writhing test on mice. For anti-platelet activity study, we performed mice tail-bleeding assay and flow cytometry-based platelet aggregation assay on human platelets. For anti-inflammatory assessments, rats were induced with LPS of 0.5 mg/kg bw intravenously, prior oral administration with 500 mg/60 kg body weight (rat dosage converted to human) of 3-CH2Cl or ASA. Temperature changes, cardiac blood plasma concentrations of IL-1β and TNF-α (ELISA), white blood cell concentrations, and lung histopathology were observed. **Results:** Lower gastric ulcer, and reduction of platelet aggregation was observed in 3-CH2Cl probes. Besides, a significant reduction of pro-inflammatory cytokines TNF-α and IL-1β and reduction of acute lung injury was observed. Additionally, this compound maintained the rat body temperature within normal limits during inflammation, preventing the rats from undergoing septic shock. **Conclusion:** 3-CH2Cl exhibits excellent analgesic, antiplatelet and anti-inflammatory activity, and most importantly: did not induce gastric ulcer.

Keywords: Anti-inflammatory; Anti-Platelet; Analgesic; 2-((3-(Chloromethyl)benzoyl)oxy)benzoic acid; COX; LPS

PPCP-14

Determination of Total Flavonoid Content, Total Phenol Content and Antioxidant Activity of Ethanol Extract of *Macrosolen cochinchinensis* (Lour.) V. Tiegh)

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ABSTRACT

Background: *Macrosolen cochinchinensis* (Lour.) V. Tiegh is one of the epiphyte plants used in traditional medicine, the part of the epiphyte plant is used as medicine is the leaves especially that found in Java but in Sumatera that is not much use by the people. *Macrosolen cochinchinensis* (Lour.) V. Tiegh leaves contain flavonoids that function as antioxidants and are efficacious in the treatment of cancer. **Objective:** This study was conducted to determine the total flavonoid content, total phenol and antioxidant activity of *Macrosolen cochinchinensis* (lour.) v. Tiegh leaves. **Method:** Extract was made by maceration method with ethanol 96%. Phytochemicals screening were analyzed for alkaloids, flavonoids, saponins, tannins and steroids/triterpenoids. The colorimetric method was used to determine total flavonoid and total phenolic content and antioxidant activity was determined by the 1,1-diphenyl-2-picrylhydrazyl (DPPH) and ABTS methods. **Result:** The results of phytochemicals screening showed that the extract contained flavonoids, tannins and steroids/triterpenoids group compounds. Extract was found to contain high levels of total phenolic 326.02 ± 0.72 mg GAE/g, total flavonoid 51.83 ± 0.11 mg QE/g. The antioxidant activity of the extract using the DPPH and ABTS tests showed IC_{50} values of 39.97 ± 0.02 µg/mL and 94.91 ± 0.10 µg/mL, respectively. **Conclusion:** *Macrosolen cochinchinensis* (Lour.) V. Tiegh leaves has high antioxidant properties

Keywords: *Macrosolen cochinchinensis* (Lour.) V. Tiegh leaves, antioxidant, total phenol, total flavonoid

CCP-1

A Bioinformatic Analysis Predicts Five Critical Gene Targets of Glycyrrhizic Acid Linked to Tamoxifen Resistance in Breast Cancer

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ABSTRACT

Background: Tamoxifen is a drug of choice for breast cancer treatment, particularly subtype Luminal A targeted to Estrogen Receptor Positive (ER+). However, Tamoxifen resistance has been reported, necessitating the discovery of an agent to enhance Tamoxifen's effectiveness. **Objective:** Although Glycyrrhizic Acid (GA) is recognized to exhibit cytotoxic effects on the Michigan Cancer Foundation-7 (MCF-7), the gene targets and pathways to overcome Tamoxifen resistance are incompletely understood. Therefore, the research goal is to discover GA's critical gene targets and pathways using a bioinformatics approach. **Method:** Differentially Expressed Genes (DEGs) were identified in the Gene Expression Omnibus (GEO) NCBI database using microarray data from GSE67916 and GSE85871. Further analyses were performed on DEGs using the DAVID v6.8, STRING-DB v11.0, and Cytoscape v3.8.0. The critical gene targets were chosen by the availability of data across the analysis results of each database. **Results:** GA is predicted to target five critical genes such as *CDK2* and *MDM2* in PI3K-Akt signaling pathway and FoxO signaling pathway, *NF1* in MAPK signaling pathway and Ras signaling pathway, *SMAD3* in FoxO signaling pathway, and *PTPN11* in Ras signaling pathway. **Conclusion:** The five critical gene targets of GA to overcome Tamoxifen resistance are *CDK2, SMAD3, NF1, MDM2,* and *PTPN11,* with specific pathways in cancer. Despite that, the findings of this study must be further validated.

Keywords: Breast Cancer, Tamoxifen Resistance, Glycyrrhizic Acid, and Bioinformatics.

CCP-2

Functional Network Analysis to Reveal the Potential of *Oleanolic acid* in Overcoming Tamoxifen Resistance in Breast cancer

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ABSTRACT

Background: Tamoxifen resistance is increasing in breast cancer therapy. Therefore, combination therapy with compounds that can overcome resistance is needed, such as *Oleanolic acid* (OA). OA is a bioactive compound particularly abundant in the roots of ginseng and olive trees (*Olea europaea*) shown in several studies to have anticancer activity and improve the sensitivity of tamoxifen-resistant breast cancer even though the mechanism is not fully understood. **Objective:** Through bioinformatics-functional network analysis, this study aimed to explore the potential of OA as a co-treatment for overcoming tamoxifen resistance in breast cancer. **Method:** This study was conducted using a bioinformatics approach by utilizing microarray data in the Gene Expression Omnibus (GEO) database and analysis using GEO2R to obtain data on differentially expressed genes (DEGs). The DEGs data were further analyzed using the DAVID, STRING, Cytoscape software and its plugin CytoHubba. **Results:** The results suggest that proteins encoded by *CD44*, *FGFR2*, *PIK3R1*, and *MDM2* gene may be a potential target for OA in overcoming tamoxifen resistance in breast cancer therapy **Conclusion:** Additional research is required to ascertain the roles and pathways of potential targets for OA in overcoming tamoxifen resistance in breast cancer therapy.

Keywords: Breast Cancer, Tamoxifen Resistance, Oleanolic acid, and Bioinformatics

CCP-3

Identification of Honokiol Target Proteins in the Inhibition of Breast Cancer Stem Cells by Bioinformatics Study

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ABSTRACT

Background: Breast cancer stem cells (BCSC) are responsible for drug resistance and tumor aggressiveness. Honokiol has been demonstrated to have an anti-cancer effect in breast cancer cells by altering several intracellular signaling pathways, including blocking signaling in p53-deficient tumors, suppressing Stat 3, and activating LKB1, which leads to loss of the stem-like phenotype in breast cancer. **Objective:** This study aims to predict the potential therapeutic target honokiol (PTTH) in BCSC using bioinformatics. **Method:** STITCH, Swisstargetprediction, and the SEA software were used to identify direct target protein (DTP). Indirect target proteins (ITP) were predicted using STRING. The regulatory genes for BCSCs were found in the PubMed gene database using the term "breast cancer stem cells." Analysis of the PTTH protein-protein interaction network (PPI) was conducted using STRING-DB v11.0 and the visualization was performed using Cytoscape software. The Database for Annotation, Visualization, and Integrated Discovery (DAVID) v6.7 was used to analyze gene ontology (GO) and KEGG pathways enrichment analyis. Genetics alteration analysis was done using cBioPortal. **Results:** HSP90AA1, PARP1, CCND1, VEGFA, HDAC1, CASP9, HDAC6, IL-4, HSP90AB1, SIRT2, and AURKB were the 12 proteins with the highest matthews correlation coefficient (MCC) scores in BCSC, according to bioinformatics analysis. Furthermore, GO analysis revealed that the protein regulates biological processes. **Conclusion:** This study highlights HSP90AA1, CCND1, VEGFA, CASP9, HDAC1, HSP90AB1, SIRT2, and AURKB as PTTH that regulate apoptosis, cell death, autophagy, and cell cycle arrest in biological processes.

Keywords: Breast cancer stem cells, bioinformatics, honokiol, protein target, potential therapy.

CCP-4

The bioinformatic study uncovered candidate target genes of a new PGV-1 derivative, CCA-1.1, encompassed in DMH-colorectal carcinogenesis

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ABSTRACT

Background: The newest pentagamavunone-1 derivative, CCA-1.1, performed a superior anticancer property than its lead compound against colorectal cancer. **Objective:** We are continuing to explore the candidate target genes and anti-tumorigenic properties of CCA-1.1 in colorectal adenocarcinoma (COAD). **Methods:** We utilized the SwissTargetPrediction and GeneCards website to obtain the target genes of CCA-1.1 and genes involved in COAD. The function of target genes was obtained from String.DB web resources. DMH 60 mg/kg (subcutaneous injection once a week for 16 weeks) was used to induce colorectal cancer. CCA-1.1 at 10 and 20 mg/kg (per-oral in Na-CMC 0.5% solution, twice a week for 16 weeks) were co-administered with DMH. The WBC and RBC were analyzed through a hematology analyzer. Haematoxylin-eosin staining was conducted to observe the microscopic characteristic of colon tissue. **Results:** Bioinformatics exploration revealed that CCA-1.1 targets the top five proteins, including CDK1, CDK2, MMP3, MMP14, and CYP3A4, which regulate the cell cycle arrest; cancer cell migration; and xenobiotic metabolism, respectively. Remarkably, CCA-1.1 targets CYP3A4 which obstructs the metabolism of DMH and possibly prevents the initiation of colorectal carcinogenesis. The WBC count elevated in a single DMH group and was countered by co-administration of CCA-1.1, but no significant differences in RBC. CCA-1.1 inhibited adenocarcinoma formation and suppressed most of the carcinogenic characteristics of the pre-malignancy stage caused by DMH. **Conclusion:** Overall, CCA-1.1 has the potential to challenge PGV-1 as a more effective anti-colorectal cancer candidate.

Keywords: CCA-1.1; DMH; bioinformatic; colorectal cancer.

CCP-5

Antiproliferative activity of Ethanolic Extract of Kembang Bulan (*Tithonia diversifolia*) Leaf on HeLa Cervical Cancer Cell Lines

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ABSTRACT

Background: Kembang bulan (*Tithonia diversifolia*) has been shown to be cytotoxic and antiproliferative on colon cancer, glioblastoma, hepatoma, kidney cancer, breast cancer, lung cancer, melanoma, leukemia, ovary cancer, prostate cancer, and stomach cancer cell lines, but not on cervical cancer yet. **Objective:** Our research aimed to determine the antiproliferative activity of kembang bulan leaf ethanolic extract on HeLa cervical cancer cell lines, using cytotoxic and antiproliferative assay. **Method:** The cytotoxic and the antiproliferative assay were done using MTT method. The cytotoxic activity was done for 24 hrs. with the IC_{50} value as parameter, while the antiproliferative assay was done for 24, 48, and 72 hrs., to determine the proliferation kinetics. All assays were done in triplicate. **Results:** Kembang bulan leaf ethanolic extract exhibited strong cytotoxic activity on HeLa cervical cancer cell lines with the IC_{50} of 97.839 $\pm$ 10.120 µg/ml. The cytotoxic activity was dose dependent. Based on the proliferation assay, the antiproliferative activity was stronger as the incubation time and the dose increased. **Conclusion:** Kembang bulan leaf ethanolic extract showed strong cytotoxic and antiproliferative activity on HeLa cervical cancer cell lines. Further research needs to be done to determine its potential to be developed as cervical anticancer.

Keywords: kembang bulan leaf ethanolic extract, HeLa cervical cancer cell lines, cytotoxic assay, antiproliferative assay, strong cytotoxic activity.

CCP-6

Bioinformatics Analysis Uncovers the Importance of RTK-RAS-PI3K/Akt Regulation by Borneol in Overcoming Breast Cancer Resistance to Tamoxifen

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ABSTRACT

Background: Currently, tamoxifen-based hormonal treatment remains the first line for luminal A (estrogen receptor [ER]-positive) subtype breast cancer, with a response of more than 30%. The long-term use of tamoxifen therapy will induce chemoresistance. Therefore, to prevent resistance and improve the effectiveness of tamoxifen, combined therapy is required. **Objective:** This study used bioinformatics to identify possible borneol target genes and their mechanism for overcoming tamoxifen resistance in breast cancer cells. **Methods:** We used data from the gene expression omnibus (GEO) collection to find differentially expressed genes (DEGs). The Database for Annotation, Visualization, and Integrated Discovery (DAVID) site, version 6.8, was also used to undertake gene ontology (GO) and the Kyoto Encyclopedia of Genes and Genomes (KEGG) pathways analysis of the DEGs. The STRING-DB site, version 11.0, was used to predict protein-protein interaction (PPI) study. The result of PPI analysis findings was analyzed using the Cytoscape software, version 3.8.2. Furthermore, the results of the gene hub were analyzed for calculations using the cytoHubba plugin. Genomic changes of the hub gene were processed using cBioPortal, version 1.18.1. **Results and Conclusion:** The potential target genes (PTGs) of borneol compounds are ESR1, FGFR2, STAT3, ERBB4, PRKCA, and RTK-RAS PI3K-Akt signaling as its prospective mechanism to overcome tamoxifen resistance in breast cancer cells. More studies are needed to confirm the potential of borneol to overcome tamoxifen resistance in breast cancer.

Keywords: Breast Cancer, Tamoxifen Resistance, Borneol, Bioinformatics

CCP-7

Integrative Bioinformatic Analysis Reveal CCA-1.1 Targets Mitosis Regulatory in Breast Cancer

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ABSTRACT

Background: Breast cancer remains the second most common cause of cancer-related death, particularly with the patients who presented with subtypes as a small subset of cancers (triple negative and HER2-positive) that associated with higher probability of recurrence and resistance to chemotherapy, hence effective therapies targeted to this subtype are highly desirable. Prior studies reported that a new curcumin analog named CCA-1.1 promotes anticancer activities against breast cancer cells. **Objective:** This time, we utilized a bioinformatics approach to identify potential biomarkers and molecular mechanisms of CCA-1.1 in interfering triple negative and HER2-positive breast cancer (BC) growth. **Method:** Genomics data expressions were collected from TCGA-BRCA data via UALCAN. We predicted CCA-1.1 potential targets using SMILES-based similarity algorithms across public webtools. The overlapping genes between the CCA-1.1 target and triple negative of HER2-positive (CPTGs) were selected and used in further assessment. Gene ontology enrichment and KEGG network analysis were generated in WebGestalt. The protein–protein interaction (PPI) network was established in STRING-DB, and then the hub-genes were defined through Cytoscape. The hub-gene's survival analysis was processed via CTGS web tools. **Results:** KEGG pathway analysis pointed to a cell cycle process which was enriched in CCA-1.1 potential targets. We also identified that the majority of CPTGs are responsible for mitosis by targeting the regulatory protein of mitosis. **Conclusion:** We suggest CCA-1.1 possibly regulates the cell cycle process during mitosis, which leads to cell death. These findings needed to be investigated through experimental studies to reinforce scientific data of CCA-1.1 therapy against triple negative and HER2-positive BC.

Keywords: TNBC, HER2-positive, CCA-1.1, Bioinformatics, Cell Cycle, Mitosis

CCP-8

Cytotoxic Analysis of Hesperidin and PGV-1 for HepG2 Hepatocellular Carcinoma Cells: Bioinformatics and *In-Vitro* Study

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ABSTRACT

Background: Pentagamavunon-1 (PGV-1), a monocarbonyl analogue of curcumin which has superior anticancer activity compared to curcumin, has minimal negative effects, and good selectivity in normal cells. Hesperidin, a flavonoid compound that is widely found in orange peels, has antiproliferative properties against cancer cells, but is safe for normal cells. **Objective:** This study aims to predict the protein targets of hesperidin and PGV-1 by using bioinformatic approaches and to determine the cytotoxic effect of both compounds on hepatocellular carcinoma cells. **Method:** Online databases PubChem, Swiss Target Prediction, UALCAN, interactive venn, GeneCards, and the software GraphPad Prism 9 were used for bioinformatic studies. The cytotoxicity was observed using the direct counting *method*. **Results:** Bioinformatic investigations showed that hesperidin and PGV-1 sharing target on EPHX2, ALB, and F2, overexpressed protein in hepatocellular carcinoma that plays an important role in cell cycle arrest. Hesperidin and PGV-1 showed a cytotoxic effect with an IC_{50} values of 105.39 µM and 0.86 µM, respectively. **Conclusion:** Hesperidin and PGV-1 modulate the cell cycle to suppress HepG2 cells growth possibly through the inhibition of proteins EPHX2, ALB, and F2. In addition, the IC_{50} values can be used for combination cytotoxic analysis and is expected to show a synergistic effect, so that the combination of hesperidin and PGV-1 compounds can be candidates for co-chemotherapy drugs against hepatocellular carcinoma.

Keywords: Bioinformatics, cytotoxicity, hesperidin, PGV-1, Hepatocellular carcinoma cells

CCP-9

Secondary Metabolite of Mango Peels Extracts Induces G1/S Phases Cell Cycle Arrest in Breast Cancer Cells Through The Regulation of Cyclin B1

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ABSTRACT

Background: Breast cancer is characterized by uncontrolled proliferation resulting from aberrant activity of various cell cycle proteins; therefore, cell cycle regulators are considered attractive targets in cancer therapy. It was recently reported that mango peels extract induced cell cycle arrest in several human cancer cell lines. However, the exact mechanism is unclear. **Objective:** The present study was to determine the cytotoxic effects and related mechanism of cell death induced by mango peels extracts on T47D breast cancer cells. **Method:** T47D cells were treated with 10-500µg/ml of mango peels extract. MTT assay used to determine cytotoxicity. Flow cytometry assay was used to examine the distribution of cell cycles. A bioinformatics approach was performed to identify molecular targets, key proteins, and molecular mechanism of mango peels secondary metabolite targeted at cell cycle arrest. **Results:** Ethanolic extract of mango peels possess cytotoxic effect with IC_{50} value of 89.24µg/mL through G2/M cell cycle arrest. Furthermore, the bioinformatics approach was also employed to confirm gene expression in cycle regulation. The several secondary metabolites of mango peels extract induced CASP3 expression and inhibited expression of CCNB1, CDC25C, MMP9 and CHEK1 expression, resulting in the induction of G2/M cell cycle arrest in T47D breast cancer cells. **Conclusion:** The results indicate that anticancer activity of mango peels extract promoted the gene expression of CASP3 and decreased that of CCNB1, CDC25C, MMP9 and CHEK1. Therefore, mango peel extract has the potential to be developed as an anticancer agent.

Keywords: Mango peel extract, breast cancer, cell cycle arrest, bioinformatics

CCP-10

Potential of Citrus Flavonoids as an inducer of colorectal cancer cell apoptotic targeting DNMT1 based on bioinformatics studies

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ABSTRACT

Background: DNMT1 is a protein that plays a role in DNA methylation. DNA hypermethylation and mutation causes the initiation and progression of colorectal cancer. Inhibition of DNMT1 activity leads to cell apoptosis. Citrus flavonoids have potential as chemotherapeutic agents targeting DNMT. **Objective**: The study was designed to determine the potential of citrus flavonoids compounds in inducing apoptotic of colorectal cancer cells with the target of DNMT1 using bioinformatic and chemometric studies. **Methods:** Online database was used to collect several data used in this study, including PDB, KnApsack, cBioPortal, and ChEMBL. Structure of DNMT1 and mutation profile was retrieved from PDB and cBioPortal. Compounds of citrus flavonoids were retrieved from KnApsack and literature review. DNMT1 inhibition models were computed using KNIME Analytic software., followed by computation of DNMT1 inhibitory activity by Citrus Flavonoids metabolites. Molecular docking was performed to analyze the interaction between two potential compounds of citrus flavonoids. **Results:** Based on the online database, Structure of DNMT1 and mutation profile was retrieved from PDB (ID: 4wxx) and cBioPortal can be used as molecular targets in cancer treatment. 10 Citrus flavonoids metabolites were retrieved from KnApsack and literature review. Based on a random forest algorithm (true positive rate: 0.788, accuracy: 0.95) on KNIME, 10 Citrus Flavonoids metabolites were discovered to be inhibitors of DNMT1. The 2 higher scores of them were molecular docked using MOE software and found to be a high-scored affinities (-14.0709 and -14.4595), compared to the native ligand (-12.5788).
Conclusion: Based on this study, citrus flavonoids have potency to induce cell apoptotic targeting DNMT1.

Keywords: DNMT1, Apoptotic, Citrus Flavonoids, Colorectal cancer, Bioinformatic

CCP-11

Structure-Activity Relationship (SAR) of Asymmetric Curcumin Derivatives as Promising Anti-Cancer Agent against Triple-Negative Breast Cancer (TNBC) Cells

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ABSTRACT

Background: Curcumin has been shown to exhibit chemopreventive activity, and in recent years it has been reported to possess activity and selectivity against TNBC. **Objective**: In this study, several strategies were adopted to design and synthesis a series of curcumin derivatives to further improve its potency and selectivity. The synthesized compounds were then tested on different TNBC (MDA-MB-231, HCC-1806) and non-TNBC (MCF-7) cell lines. Their selectivity was compared with the BEAS-2B non-cancerous cells. **Results**: SAR result revealed that the diketone moiety with the presence of the trifluoromethyl group at para position is crucial for the activity and selectivity against the cancer cells. Also, substituting heterocyclic linkers improved the activity of the compounds almost 6-fold higher than curcumin in all cancer cell lines. The presence of *p*-methyl at one of the phenyl rings significantly increased the selectivity of the compounds against the MDA-MB-231 (6-fold) and HCC-1806 (4-fold) TNBC cell lines over the non-cancerous BEAS-2B cells. Finally, the mono-substituted nitro group at *p*-position in the cyclohexanone series was the most active compound against non-TNBC MCF-7. It displayed 20-fold highly responsive to MCF-7 and 13-fold less toxic to the non-cancerous BEAS-2B cells compared to curcumin. On the other hand, curcumin only displayed modest growth inhibition (IC_{50} = 3.5-5.5 µM) and selectivity (SI = 0.90 – 1.10) to TNBC and non-TNBC cells over the non-cancerous BEAS-2B cells. **Conclusion**: The present study suggests that asymmetric structural modifications of curcumin could potentially improve its anti-cancer properties and selectivity.

Keywords: SAR, asymmetric curcumin, TNBC, anti-cancer, selectivity

PESC-1

The Satisfaction Level of Telemedicine Application: ITB Pharmacy Students Perspective

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ABSTRACT

Background: Telemedicine is a product of information and communication technology that allows the provision of remote health services by health professionals. The rapid increase utilization of telemedicine should be balanced with optimizing the quality of service to ensure its value in healthcare. **Objective:** The study aimed to determine the level of satisfaction with the drug purchase feature and to analyze the need for pharmacist services features in the telemedicine applications. **Method:** This study was a cross-sectional observational prospective study. This study used a modified SERVQUAL questionnaire. The questionnaire was tested for validity and reliability prior to its use. The satisfaction level was measured using Customer Satisfaction Index. Qualitative analysis and descriptive statistics were performed, including gap analysis using the Importance-Performance Analysis (IPA) method to determine the level of importance of variables that can affect satisfaction. **Results:** The average level of satisfaction was 83.48 ± 4.08%, with a coefficient of variance value of 4.88%. The service quality was ranked from the highest to the lowest as follows: assurance, facilities, responsiveness, reliability, and empathy. Based on IPA, the biggest gap was the empathy dimension. In addition, 79.37% of respondents stated that a pharmacist's role was needed in telemedicine applications. **Conclusion:** Overall, the users were very satisfied with the telemedicine application, however the role of pharmacist should be required in the telemedicine application.

Keywords: telemedicine application, online pharmacist, satisfaction level

PESC-2

E-Health Literacy and Adherence to Health Protocols in COVID-19 Patients Undergoing Self-Isolation in a Sub-district in West Java

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ABSTRACT

Background: During COVID-19 pandemic, valid information is crucial and electronic health literacy (EHL) plays a significant role in public adherence to health protocols. **Objective:** To evaluate the pattern of COVID-19 information-seeking, and to analyse the association between EHL versus COVID-19 knowledge, and EHL versus health protocol adherence. **Method:** Cross-sectional design with convenience sampling method was used. Data was collected through an online survey to self-isolating COVID-19 patients in a sub-district in West Java during March – December 2020. Descriptive analysis was conducted to determine patterns of online information-seeking for COVID-19, EHL score, COVID-19 knowledge, and health protocol adherence. Spearman test was used to evaluate the relationship between EHL and COVID-19 knowledge, and health protocol adherence. **Results:** There were 56 respondents with more than half being female (58.9%), university graduates (64.3%) and having good health status (57.1%). Before contracting COVID-19, respondents used the internet several times a month to search for COVID-19 information. Social media was the commonest online source and COVID-19 symptoms were the mostly sought information. During self-isolation, the frequency of internet use increased (i.e., every day) with information on vitamins and supplements as mostly searched. Respondents had high scores on EHL (mean= 20.0), knowledge (mean = 8.89/10, SD = 1,796), and adherence (mean = 26.98/30, SD = 3,066). This study found a significant relationship between EHL and knowledge (p-value = 0.001, r = 0.436), and the adherence (p-value = 0.011, r = 0.339). **Conclusion:** EHL had modest influence on COVID-19 knowledge and adherence to health protocol among self-isolating COVID-19 patients. Access to official social media providing reliable information on COVID-19 should be widely disseminated by Indonesian authorities.

Keywords: COVID-19, electronic health literacy, health protocol, self-isolation.

PESC-3

Drug Use Evaluation of Rivaroxaban on Out-Patient with Atrial Fibrillation at a Heart Centre in Indonesia

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ABSTRACT

Background: Atrial fibrillation is the most predominant cardiac arrhythmias that is associated with higher risk of ischemic stroke. To prevent stroke, direct acting oral anticoagulant is used as the standard treatment in patients with nonvalvular atrial fibrillation. Despite having been used for several decades for this purpose, the use of vitamin K antagonists (mostly warfarin) in clinical use is limited because of high risk of bleeding, low therapeutic index, susceptibility to drug interactions, and large interpatient variability. As an alternative, the novel oral rivaroxaban has been prescribed to out-patients with atrial fibrillation at a Heart Centre in Indonesia. **Objective:** This study aimed to evaluate the use of rivaroxaban in out-patients with atrial fibrillation at the hospital. **Method:** Drug use evaluation was done retrospectively by utilizing patients' medical records that fulfilled the inclusion criteria from January-March 2020. Qualitative evaluation was done by assessing the appropriateness of rivaroxaban prescribing while quantitative evaluation was determined using anatomical therapeutic chemical/defined daily dose (ATC/DDD). **Results:** A total of 47 patients were included in the study. Atrial fibrillation was more prevalent in men (72.3%) and elderly with the age of 60-79 (59.6%). Atrial fibrillation patients were also accompanied with various comorbidities that led to polypharmacy. Out of 59 prescriptions, drug interactions, duplication, and underdosing were identified in 87.2%, 23.7%, and 69.5% of the prescriptions. The DDD of rivaroxaban was 25.06 DDD/prescription/month. **Conclusion:** Rivaroxaban has not been appropriately used at the hospital hence the pharmacists should create a framework to ensure appropriate use of rivaroxaban.

Keywords: Rivaroxaban; Atrial fibrillation; Drug use evaluation; Indonesia; National Heart Centre

PESC-4

Development and evaluation of an elective course for third-year pharmacy students on pharmacy health coaching in Indonesia

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ABSTRACT

Background: Pharmacy health coaching has been proved to improve outcomes in chronic disease but there have been no papers documenting the development and evaluation of an elective course for pharmacy students on pharmacy health coaching. **Objective:** To describe our experiences in developing an elective course for third-year pharmacy students on pharmacy health coaching, as well as to evaluate its effects on students' attitude, knowledge, skills, and students' perceived satisfaction with the course. **Method:** Based on previously developed models, the 3 Co-TEAM models (collaboration, consultation skill, communication skill, training, education, attitude, motivation) consist of 18 hours of course modules. A multiple-choice and essay quiz was used to assess students' mastery of essential abilities pre and post elective course. After the last teaching session, students' self-perceived attitude, knowledge, skills, and level of satisfaction were evaluated by a voluntary survey. **Results:** Of the 60 students in the third year, only 7 students are willing to voluntarily take the elective course (response rate 11.67%). The development of the curriculum resulted in a course of 3 modules, the duration of each course was 2 hours. Before the course, students showed an overall low knowledge mean score [38.79, SD=7.11]. Results showed that there was a significant improvement in knowledge, overall mean score (81.21, SD=5.34, P-values <0.05). The overall mean composite score in the student's perceived attitudes section increased by 48.35% between the pre-and post-test (21.28 SD=1.496 vs. 31.57 SD=1.512, respectively, p<0.05). The overall mean composite score in the student's perceived knowledge section increased by 96.43% between the pre-and post-test (15.71 SD=1.254 vs. 30.86 SD=1.574, respectively; p<0.05). The overall mean composite score in the student's perceived skills section increased by 51.91% between the pre-and post-survey (11.00 SD=0.816 vs. 16.71 SD=0.756, respectively; p<0.05). Finally, when it came to assessing students' satisfaction with the course process, the majority of students stated they were satisfied with the overall course process and that it helped them understand the concept of pharmacy health coaching. **Conclusion:** This elective course has proven to be a successful way of educating pharmacy students. We advocate the incorporation of this style of education into the learning process to improve students' learning experiences while still supporting traditional healthcare learning.

Keywords: Pharmacy students, pharmacy education, educational measurement, pharmacy health coaching

PESC-5

The effectiveness of Education Session by Pharmacists for Asthma Management

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ABSTRACT

Background: Appropriate therapy and the education of asthma patients are key components of asthma management. **Objective:** The study aimed to evaluate the efficacy of pharmacist training sessions in asthma patients. **Method:** A three-month single-blinded (outcome assessor masked) randomized control trial was conducted to assess the impact of pharmacist education sessions on asthma patients. The intervention group received a 60-minute pharmacist session that consisted of educating patients about the management of asthma. In comparison, the control group remained with usual care. The study's primary outcome was to measure the change in the score of the asthma control questionnaire (ACQ). The other outcomes measured were changes in the score of asthma quality of life questionnaire (AQLQ) and the Adherence to Refills and Medications Scales (ARMS) questionnaire. The variables were measured at baseline, 1,2, and 3 months. **Results:** A total of 82 participants who completed the study were divided into two groups. A clinically significant decrease (≥0.5) was observed in the baseline ACQ score and the first two training sessions. There was also a significant difference in the ACQ score between the two groups (p=0.05) after 1 and 2 months of follow-up. Mean asthma AQLQ scores also increased significantly from baseline 4.88 to mean ± SD 5.026 ± 1.259, 5.356 ± 1.485 and 5.260 ± 1.410 after 1, 2 and 3 months, respectively. No significant increase was observed in the ARMS score in either group following follow-up. **Conclusion:** The study concluded that short time pharmacist education sessions could improve the patients' asthma status and quality of life.

Keywords: asthma, asthma-control, education, pharmacist, Quality of Life

PESC-6

Correlation of Medication Adherence and Quality of Life also its Related Factors in End-Stage Renal Disease Patients with Hypertension and Receiving Hemodialysis

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ABSTRACT

Background: End-stage renal disease (ESRD) mostly caused by hypertension. The medication adherence (MA) could be described from ESRD patients based on treatment received, which could also affect the quality of life (QOL). MA and QOL could be influenced by patient characteristics. **Objective:** This study aimed to analyze the correlation between MA and QOL and its related factors in ESRD patients. **Method:** This cross-sectional study was conducted in a Public Hospital, Buleleng, Bali in September 2020. The samples were ESRD patients with hypertension who aged ≥18 years, receiving hemodialysis, willing to fill out the questionnaires, and able to communicate well. Data were collected using ERSD-AQ and EQ-5D-5L questionnaires, also medication records. Data analysis was performed by Spearman's rho, Mann-Whitney U, Kruskal Wallis, Kendall's tau-b/c test (CI 95%). **Results:** Findings of 89 respondents demonstrated mostly were <60 years old (66.3%), male (71.9%), less than high school educational (68.5%), not working (69.7%), lower income (55.1%), having an ESRD duration of <3 years (67.4%), taking ≤6 item medicines (96.6%), moderate MA level (75.3%), and good QOL based on utility value >0,801 (59.6%), but low level OQL in VAS (95.5%). Hence, there was no significant correlation between MA and QOL, as well as patient characteristics to MA ($p>0.05$). However, age, educational level, income, and the number of medicines received were contributed to QOL ($p<0.05$). **Conclusion:** Patients who have a high MA level showed better QOL. Several patient characteristics have a relationship in influencing QOL, also positive support from family was estimated could help in increasing QOL.

Keywords: End stage renal disease, hemodialysis, hypertension, medication adherence, quality of life

PESC-7

Correlation of Knowledge with Medication Adherence and Quality of Life Among End-Stage Renal Disease Patients in Dialysis Unit of Private Hospital Denpasar Bali

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ABSTRACT

Background: End-stage renal disease (ESRD) is a major public health problem causing morbidity and mortality. Long-term medication and lifestyle modifications are difficult to adapt which significantly impairs medication adherence and quality of life (QOL). Some studies indicate that more patient knowledge is associated with increased medication adherence and QOL. **Objective:** This study aimed to analyze the correlation between knowledge with medication adherence and QOL of ESRD patients. **Method:** The cross-sectional study was conducted in the Dialysis Unit of Private Hospital Denpasar Bali. The total sample was 130 ESRD patients in May 2021 with a purposive sampling technique. Inclusion criteria included age ≥18 years, completed medical record data, willing to fill out the questionnaires. The patient who was pregnant/breastfeeding is excluded. Data was collected based on the patient's medical records and filling out the questionnaires (knowledge: *chronic kidney disease knowledge questionnaire*, adherence: *end-stage renal disease adherence questionnaire*, and QOL: *kidney disease quality of life*-36). Data were analyzed with Kendall's Tau-b and Spearman-rho test (CI 95%). **Results:** Most of patients were <60 years old (77.1%), male (66.7%), duration of disease <5 years (70.5%), high school education (32.2%), not working (50.5%), had complications (76.2%) and received ≤5 medication (66.67%). The average knowledge and medication adherence were moderate while QOL is above 50%. There was no significant correlation between knowledge with medication adherence (p=0.108), but a significant correlation was found between knowledge and domain of symptoms/problems (p=0.003;r=0.285) and physical health (p=0.007;r=0.261). **Conclusion:** Patients with a good level of knowledge showed better medication adherence and QOL.

Keywords: End-stage renal disease, hemodialysis, knowledge, medication adherence, quality of life

PESC-8

Relationship Between Blood Glucose Control Achievement And Covid-19 Severity

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ABSTRACT

Background: Coronavirus Disease 2019 (COVID-19) has become pandemic since early 2020 throughout the world, including Indonesia. Type 2 Diabetes Mellitus (T2DM) with uncontrolled blood glucose level was an important risk factor for progression of disease severity and death from COVID-19. **Objective:** The purpose of this study was to analyze the relationship between the achievement of blood glucose control and the severity of COVID-19 at a private hospital in Badung Regency, Bali. **Method:** This research was a cross-sectional study. This study was conducted in Covid-19 Ward in private hospital Badung Regency with 59 patients diagnosed with COVID-19 and T2-DM in July-December 2020. Inclusion criteria included age ≥18 years and complete medical record data. Patients were excluded if they had other comorbidities and were pregnant or breastfeeding. Data analysis of the relationship between the achievement of level blood glucose control and the severity of COVID-19 using the Mann Whitney test. **Results:** A total of 59 patients were included in this retrospective study which was dominated by female gender (64.4%), age <60 years (69.5%) and the patient's jobless status (74.6%). There were 47 subjects with controlled blood glucose levels (<200 mg/dL), and 12 subjects with uncontrolled glucose levels (>200 mg/dL). There were 44 subjects with mild COVID-19 severity, 14 patients with moderate/moderate severity, and 1 patient with critical severity. There is a relationship between the achievement of level blood glucose control level and the severity of COVID-19 (p = 0.000).
Conclusion: Uncontrolled blood glucose levels showed progression on COVID-19 severity.

Keywords: COVID-19, type 2 DM, blood glucose, severity

PESC-9

Antibiotics Therapy in Treatment COVID-19 at RSUP Dr. Sardjito Yogyakarta Indonesia

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ABSTRACT

Background: The first coronavirus disease (COVID-19) outbreak occurred at the end of 2019 in Wuhan China. Now, the virus has spread in 215 countries with millions of patients confirmed positive and causing hundreds of thousands of deaths worldwide. The virus can cause various diseases of the respiratory system ranging from mild to severe symptoms. In Indonesia itself, COVID-19 has been a pandemic since March 2020 and up to August 2021, there are 30.000 cases per day with tens of thousands of mortality. **Objective:** Describe commonly antibiotics prescribed which were used to treat COVID-19 in COVID-19 patients hospitalized at Rumah Sakit Umum Pusat Dr. Sardjito Yogyakarta Indonesia and the prognosis of the patient after had therapy. **Method:** This study was an observational study conducted retrospectively that used patient medical records in March – September 2020 period. We used the purposive sampling technique and obtained 85 patients who were appropriate to the inclusion and exclusion criteria. The data collected was demographics, a drug prescribed when patients were hospitalized in this hospital, and their prognosis. **Results:** The disease COVID-19 was mostly infected by men (69,40%) and the highest age for COVID-19 infected in productive age was in the range of 21 – 60 years old (75,2%). The majority antibiotic used in this hospital to treatment hospitalized COVID-19 patient was azithromycin (49,40%) then meropenem (27,10%), levofloxacin (25,90%), ceftazidime (14,10%), amoxicillin (7,10%), ceftriaxone (5,90%), clarithromycin (4,70%), ampicillin (3,50%), cefixime (3,50%), moxifloxacin (1,20%) and ciprofloxacin (1,20%). The rate of successful recovery was 76,50% and 23,50% patients died. The prognosis patient after having therapy was 76,50% patient recovery. **Conclusion:** The most common antibiotic prescribed for treatment of COVID-19 patients at Rumah Sakit Umum Pusat Dr. Sardjito Yogyakarta Indonesia was azithromycin. Where azithromycin is the main antibiotic recommended by the Indonesian Association of Pulmonary Doctors as a treatment for COVID-19 in Indonesia.

Keywords: antibiotic, therapy, COVID-19, Indonesia

PESC-10

Observational Study of Compounding Sterile Preparations in "X" Hospital Purwokerto City, Indonesia

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ABSTRACT

Background: Compounding sterile preparations in hospitals requires special attention because the process is more complex. Errors that occur when compounding sterile preparations can affect the quality of the prepared preparations. **Objective:** The purpose of this study was to observe the critical aspects that must be met in the compounding of sterile preparations at "X" hospital. **Method:** This research was conducted by observation of personnel, buildings and equipment, procedures, packaging and labeling, storage, distribution and quality assurance. Observations were carried out with the help of a checklist adapted to USP <797> 2019 and the 2009 Basic Guidelines for Dispensing Sterile Preparations, which were then analyzed descriptively. **Results:** The results showed that the activities of compounding sterile preparations carried out in a special room at hospital X were reconstitution (44.4%) and repacking (55.6%). Furthermore, from 36 compounding sterile preparations, it was found that there were discrepancies in the aspects of compounding personnel (100%), building (100%), equipment (100%), aseptic procedures (100%), packaging (0%), labels (100%), storage (2.78%), distribution (2.78%) and quality assurance (100%). **Conclusion:** Most of the critical aspects in compounding sterile preparations at hospital "X" have not met the requirements of the USP <797> 2019 and the 2009 Basic Guidelines for Dispensing Sterile Preparations, except for the packaging aspect. Improvements to some of these critical aspects need to be carried out to ensure the quality of the prepared preparations from microbial contamination.

Keywords: compounding, sterile, hospital, USP, observational

PESC-11

The Role of Agent of Change (AoC) Pharmacists in Supporting the Covid-19 Vaccine Program

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ABSTRACT

Background: The Covid-19 pandemic has attacked Indonesia since 2020. One of the efforts that can be done to end the pandemic is vaccination. Vaccination can be successful if all Indonesian people are willing to be vaccinated. Comprehensive education regarding Covid-19 and vaccines is needed to increase people's acceptance. The Agent of Change (AoC) Pharmacists that existed in the GEMA CERMAT programme can carry out this education. **Objective:** The aim was to assess the role of education by pharmacists in increasing public knowledge about the Covid-19 vaccine. **Method:** The study was conducted concurrently with a briefing to pharmacists. Then, education was carried out by the community in their work area online or offline. Educational media include brochures and pocketbooks. Education begins with a pre-test and ends with a post-test. The meaningfulness of knowledge was carried out based on pre and post-test scores and a description of attitudes seen from filling out the questionnaire. **Results:** A total of 20 pharmacists and 73 communities were involved in the study. Of the total educated people, 51 (69.86%) experienced an increase in knowledge, 15 (20.55%) remained, and 7 (9.59%) decreased. Based on the dependent t-test, the mean value of the pre-post test was significantly different, with $p<0.000$. After being given education, as many as 98.3% of people who have not been vaccinated are willing to be vaccinated. **Conclusion:** The educational pharmacists make a significant difference in increasing knowledge about vaccines so that education can continue to be carried out to make the Covid-19 vaccine program a success.

Keywords: Covid-19, vaccine, education, pharmacist

PDDS-1

Eutectic Mixture of Fenofibric Acid with Nicotinic Acid for Improving its Dissolution Profile

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ABSTRACT

Background: Eutectic mixtures can increase the dissolution rate of poorly soluble drug compounds due to a decrease in crystal lattice energy. **Objective:** The purpose of the present study was to improve the dissolution rate of poorly soluble drugs fenofibric acid (FA) by the formation of a simple eutectic mixture with nicotinic acid (NA). **Method:** The simple eutectic mixture of FA and NA was prepared using the solvent drop grinding method.. Solid state characterization was carried out using powder X-ray diffraction (PXRD) analysis, differential scanning calorimetry, fourier transform-infrared spectroscopy, scanning electron microscopy, and In vitro dissolution rate of the simple eutectic mixture in aqueous medium was performed by type I USP apparatus. **Results:** The PXRD pattern of eutectic mixture was representative of each intact component (FA and NA). SEM analysis showed that new crystal habits were formed. The FA dissolution rate of the eutectic mixture was increased compared to that of FA and its physical mixture. **Conclusion**: A simple eutectic mixture of FA and NA was successfully prepared using the solvent drop milling method. Simple eutectic mixtures show higher dissolution rates than intact fenofibric acid

Keywords: fenofibric acid; nicotinic acid; eutectic mixture

PDDS-3

Development and Optimization of Oleic Acid Nanoemulgel Loaded Dexamethasone Based On Its Physical Properties

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ABSTRACT

Background: Transdermal nanoemulgel which combines the advantages of nanoemulsion and gel is expected to overcome the dexamethasone oral delivery problem. Nanoemulgel has small droplet size and longer skin residence time in comparison to nanoemulsion which increases drug penetration through skin. Oleic acid serving as oil phase in nanoemulgel formulation is frequently used as penetration enhancer. However, concentration of oil phase will greatly affect the solubilization of drug, choice of surfactants, and the physical properties of nanoemulgel. **Objective:** This study aims to find the optimum concentration of oleic acid, surfactant mixture (s-mix), and water phase in dexamethasone nanoemulgel based on its physical properties. **Method:** The composition of oleic acid, s-mix, and water in nanoemulgel were optimized using simplex lattice design by Design Expert version 10 which generates 14 runs (formula). 1.5% HEC was used to convert nanoemulsion to nanoemulgel. Droplet size, PDI, zeta potential, adhesivity, dispersibility, viscosity, and pH were used as optimization parameters. The optimum formulation was further evaluated for content uniformity and accelerated stability by freeze thaw cycle. **Results:** The optimum formula was comprised of 3% oil, 27% s-mix, 65% water, and 0.5% dexamethasone which produced a clear emulsion (94.93± 2.02 %T), uniform droplet size of 228.10 ± 1.71 nm (PDI of 0.304 ± 0.05), high zeta potential (-96.67 ± 0.252 mV), with appropriate adhesivity, viscosity, good spreadability, pH of 5.11 ± 0.04, uniform drug content, and adequate stability after 6 freeze-thaw cycles.
Conclusion: This study suggested that dexamethasone can be successfully formulated into an acceptable nanoemulgel.

Keywords: dexamethasone, nanoemulgel, oleic acid, HEC, transdermal

PDDS-5

Development of the Oral Disintegrating Film Containing Diclofenac Potassium with Gelatin and Xanthan Gum as the Polymers

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ABSTRACT

One of the most common oral diseases which could reduce a person's quality of life is periodontitis. Diclofenac potassium is used to treat this disease, which is commonly available in capsule and sugar-coated tablet dosage form. Unfortunately, it will be a problem for dysphagia patients who cannot swallow the food and or liquid easily. Oral disintegrating film (ODF) of diclofenac potassium can become alternatif dosage form, facilitating patients with dysphagia. An ODF was made from water soluble polymers. This dosage form was optimized by variating a gelatin and a xanthan gum as the matrix. The preparation used a solvent casting method with distilled water solvent. The ODF diclofenac potassium was tested for their characterisation included: thickness, disintegration time, and moisture content.The responses of each ODF formulation were optimized by an expert design's program of simplex lattice design. The results showed that the combination of two polymers, a gelatin and a xanthan gum, did not influence the thickness of the ODF diclofenac potassium significantly. The disintegration time of ODF was decreased by increasing xanthan gum concentration until 5% w/w. However, a xanthan gum at concentrations above 5% w/w could slow down the disintegration time of ODF. In addition, moisture content of an ODF diclofenac potassium was decreased moderately by increasing xanthan gum concentration. Based on the expert design analysis, an optimum formula that produced a good ODF characterisation was a combination of gelatin and xanthan gum, 77,85% w/w and 4,15% w/w respectively.

Keywords : diclofenac potassium, oral disintegrating film (ODF), gelatin, xanthan gum

PDDS-6

Optimization of the Composition of Oleic Acid and Propylene Glycol as Enhancer of Essential Oil of Clove (*Syzygium aromaticum*) in Hydrocarbon Ointment with the Simplex Lattice Design Method

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ABSTRACT

Background: The addition of an enhancer mixture of oleic acid and propylene glycol in the ointment preparation clove essential oil hydrocarbons done to improve transport eugenol as an active ingredient, so that the anti-inflammatory effects may increase. **Objective:** The general objective of this research is to get ointment preparation hydrocarbon clove essential oil with a mixture of oleic acid enhancer and propylene glycol are optimal, effective and efficient for the treatment of inflammatory skin. **Method:** The addition of enhancer mixture of oleic acid and propylene glycol are prepared by the method simplex lattice design, the formula I (100% oleic acid), formula II (50% oleic acid: 50% propylene glycol), and formula III (100% propylene glycol). Ointment evaluated physical properties (dispersive power, adhesion, viscosity, pH), irritation index, transport eugenol (permeability, flux) and anti-inflammatory activity (thick epidermis, the number of inflammatory cells, the expression of COX-2). **Results:** Results of the study show that the increasing composition of PG caused the raising value of physical properties of the cream and parameters transport of eugenol. On the other hand it caused the decreasing number of inflammatory cells ($p < 0.05$), the expression of COX-2 ($p < 0.05$), and the thickening of the epidermis ($p > 0.05$). Irritation tests of FI, FII, and FIII showed that the preparation does not irritate ($p > 0.05$). **Conclusion:** The optimum composition enhancer present in the composition is oleic acid at 0% and propylene glycol at 100%.

Keywords: essential oil of clove, enhancer, oleic acid, propylene glycol, an ointment base hydrocarbons

PDDS-7

Pt(IV) Prodrugs and Metal-Organic Frameworks for Enhanced Cancer Therapy

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ABSTRACT

Background: Cancer is one of the most serious health problems in the world. The development of cisplatin-based Pt(IV) prodrug as a solution to overcome the resistance and also the side effect in the employment of cisplatin in cancer treatment is progressing rapidly. **Objective:** To briefly elaborate the development of cisplatin-based Pt(IV) prodrug and the delivery in metal—organic frameworks (MOFs). **Method:** Systematic literature study was used to analyse most recent studies in the related field. **Results:** Axial functionalization of cisplatin using bioactive ligands with broad spectrum ranged from DNA-alkylating agents, microtubule disruptors, NSAIDs, and enzymes (HER-2, HDAC, PDK, TDO, GST) inhibitors formed a 'double acting' Pt(IV) agent and showed enhanced the therapy efficacy. Moreover, the incorporation of the prodrug into metal-organic frameworks (MOFs) generates a drug delivery system that improves the treatment performance even more. The ultra-porous nature of MOFs allows high uptake of the drug, while the tunable properties both in the metal centres and the ligand of the materials makes it easier to design and develop the desired interaction between the drug and the cargo to minimize premature release of the drug. Recent study revealed the activity of some MOFs against several cancer lines so they could be combined with 'double acting' prodrug to obtain a 'triple acting' anticancer agent. **Conclusion:** Owing to the results, it could be concluded that the combination of Pt(IV) prodrug and MOFs gives an advanced prospective field in cancer therapy.

Keywords: cancer, cisplatin, metal-organic frameworks, Pt(IV) prodrug

PDDS-13

The Effect of Polysorbate 20 and Sucrose Concentration Variation as Stabilizer against Protein Aggregation

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ABSTRACT

Background: Recent advances in biotechnology drive researchers to focus on therapeutic protein as a drug candidate. Proteins need to be formulated and maintain stability for their functioning. Protein stability is influenced by storage conditions and the freeze-thaw process, which could trigger protein alteration into aggregates. Polysorbate 20 and sucrose are the potential excipients for reducing protein aggregation. **Objective:** This research aims to analyze the effect of polysorbate 20 and sucrose in protein stabilization and determine the combination concentration that could reduce protein aggregation using BSA as a protein model. **Method:** Four BSA protein formulations with polysorbate 20 and sucrose concentration variations were used to test the stabilizer effect in freeze-thaw stress and long-term storage. The determination of aggregate percentage is conducted using SDS-PAGE under non-reducing conditions. FTIR-ATR spectroscopy is used to determine the alteration of protein secondary structure related to aggregation. The data were statistically analyzed using SPSS. **Results:** The addition of 40 µM polysorbate 20 without sucrose (F1) in BSA (1 mg/mL) formulation resulted in the lowest aggregate formation in freeze-thaw stress. In 12 weeks of long-term storage, a combination of 40 µM polysorbate 20 and 0.5 M sucrose (F4) was the best combination in reducing BSA protein aggregate formation. **Conclusion:** A combination of polysorbate 20 and sucrose could reduce BSA protein aggregate formation during storage. Their stabilization effect depends on the concentration used in the formulation.

Keywords: protein, aggregation, stabilizer, polysorbate 20, sucrose

PPCP-6

Physicochemical Characteristics of ^{131}I-AMB10 And Its Internalization of The T-47D Human Cell Line As A Theranostics Radiopharmaceutical Candidate For Breast Cancer

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ABSTRACT

Background: Alpha mangostin is an isolate from natural products that have efficacy as a cancer drug, particularly for breast cancer therapy. AMB10, an alpha mangostin derivative, has been successfully synthesized by the radioisotope Iodine-131 through a radioiodination reaction using chloramine T. The synthesis of ^{131}I-AMB10 obtained a high radiochemical purity of 97.53 ± 1.08 % (n=9). **Objective:** This study aimed to determine the physicochemical characteristics of ^{131}I-AMB10 (plasma protein binding and lipophilicity) and internalization study of ^{131}I-AMB10 using T-47D human cell line. **Method:** A total of 5µL of ^{131}I-AMB10 (70-100µCi) was added in a test tube containing 1.5 mL plasma protein and incubated for 10 minutes. Plasma was precipitated with 10% TCA and centrifuged. The percentage of filtrate and precipitate was calculated to determine the percentage of plasma protein binding. Lipophilicity test was carried out by mixing ^{131}I-AMB10 into a test tube containing octanol and water, then separated the two layers to determine the percentage. Internalization test was carried out by inserting ^{131}I-AMB10 into T47D cell culture medium, incubated for 10, 30 and 60 minutes. Cells were lysed with the addition of 2M NaOH. **Results:** The percentage of plasma protein binding was 73.66±4.99% with a log P of 0.672. Internalization of ^{131}I-AMB10 using T-47D cells at 10, 30 and 60 minutes were 28.47±14.55%; 29.52±6.41% and 33.11±8.47% respectively. **Conclusion:** ^{131}I-AMB10 has physicochemical characteristics in accordance with the role of five. Internalization of ^{131}I-AMB10 showed penetration into the T-47D cell line and the highest internalization at 60 minutes.

Keywords: theranostics radiopharmaceutical, alpha mangostin derivative, breast cancer, T-47D human cell line, ^{131}I-AMB10

PPCP-7

Stability and In Vitro Study of ^{131}I-Alpha Mangostin as Radiopharmaceutical Candidate for Breast Cancer

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ABSTRACT

Background: Radiopharmaceutical ^{131}I-alpha mangostin (^{131}I-AM) was successfully synthesized for breast cancer with a radiochemical purity of 98.76±0.47%. To be applied as a radiopharmaceutical, ^{131}I-AM must pass the stability test and in vitro study. **Objective:** This study compared the effect of storage of 131I-AM and described physicochemical characteristics of^{131}I-AM, and the uptake of 131I-AM into MCF7 and T47D cell lines. **Method:** The stability test was carried out by storing radiopharmaceuticals at freezer, refrigerator, and room temperature. The purity of the radiopharmaceutical was determined at a certain time. Radiopharmaceuticals were stable when the radiochemical purity was above 90%. In vitro studies consist of physicochemical and cell uptake studies. The physicochemical studies were carried out by determining the lipophilicity and plasma protein binding of the radiopharmaceutical. Cell uptake study was carried out by observing the radiopharmaceutical uptake in the MCF7 and T47D cell lines. **Results:** The results showed that ^{131}I-AM was the most stable in freezer storage for four days, three days at refrigerator and one day at room temperature. ^{131}I-AM has a value of LogP 1.05±0.07 and plasma protein binding of 81.81±0.93%. At the incubation time of 30 minutes, the uptake of radiopharmaceuticals in MCF7was 18.79% and T47D was 40.12%. **Conclusion:** ^{131}I-AM was stable under freezer storage conditions, had good physicochemical character and cell uptake so that it has potential as a candidate radiopharmaceutical for breast cancer. Further in vivo study will be carried out to prove the radiopharmaceutical capability as a radiopharmaceutical for breast cancer.

Keywords: ^{131}I-alpha mangostin, breast cancer, stability test, in vitro study

PPCP-12

Physico-chemical Properties of Technetium-99m-Macroaggregated Albumin (^{99m}Tc-MAA) Radiopharmaceutical

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ABSTRACT

Background: Lung cancer is the most diagnosed cancer and the leading cause of cancer death. One of the effects of lung cancer is lung perfusion disorder. Radiopharmaceutical macroaggregated albumin (MAA) labeled with technetium-99m (99mTc) can be used to detect circulatory disorders in the pulmonary. As a radiopharmaceutical product, MAA kits must meet the requirements listed in the US Pharmacopeia. The requirements are pH, particle size, radiochemical purity, stability, and sterility. **Objective:** This research aim was to investigate the physico-chemical properties of 99mTc-MAA including pH, radiochemical purity, electric charge, temperature storage stability, particle sizes, and numbers. **Method:** Radiochemical purity of 99mTc-MAA was analyzed by radio-TLC with Whatman-1 paper and 85% methanol as eluent and stationary phase, respectively. The electric charge was determined using the electrophoresis method. The size and number of MAA particles were evaluated using a microscope. **Results:** The 99mTc-MAA has pH 4.7-5, radiochemical purity of 97.00% ± 1.69, and neutral electric charge. The radiopharmaceutical 99mTc-MAA was stable (radiochemical purity ≥95%) at 4 ℃ and room temperature for up to 6 hours. The size and number of particles of 99mTc-MAA remained constant of 10-90 µm (>90%) indicating no aggregated particles were formed. **Conclusion:** The results showed that 99mTc-MAA was stable at both refrigerator storage and room temperature for up to 6 hours. Based on these findings, the 99mTc-MAA conformed to the requirement as a radiopharmaceutical for lung perfusion imaging.

Keywords: perfusion, lung, radiopharmaceutical, MAA, physical chemistry, radiochemical

PPCP-16

Formulation and Antioxidant Activity of Cream Marine Sponge Extract (*Axinella carteri*) by Using the DPPH Method (*1.1-Diphenyl-2-Picrylhydrazyl*)

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ABSTRACT

Background: Sponges are one of the marine biota that have bioactive potential that is useful as an antioxidant to prevent free radicals. **Objective:** This study aims to under way to find out of preparations antioxidant activity cream containing marine sponge extracts (*Axinella carteri*) against DPPH and might know how much of the concentration of an cream extract marine sponge (*Axinella carteri*) that has the activity of the highest rate as antioxidant. **Method:** The marine sponge was extracted by maceration using methanol and made cream preparation using variation of concentration of extract in 5%, 7.5% and 10%. Furthermore, the cream formulation of marine sponge extract was tested for the preliminary cream testing parameters including organoleptic test, homogeneity, spreadability, pH, viscosity and cream type test. Antioxidant activity was determined with the DPPH method and expressed in IC_{50}. **Results:** The result of IC_{50} obtained in formula I is 661.38 ppm (very low), formula II is 512.82 ppm (very low) and formula III is 244.61 ppm (medium). Meanwhile, for the positive control vitamin C has an IC_{50} value of 5.02 ppm (very active). **Conclusion:** Formula III is the best formula which has a medium rate of antioxidant activity.

Keywords: Marine sponge, cream, antioxidant, DPPH

HMNP-2

Potential of Compounds in Moringa Leaves on Cellular Senescence Activity through Bioinformatics-based p21 Inhibition and In Silico Approach

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ABSTRACT

Background: High exposure to UV rays can result in cell aging or senescence caused by excessive production of Reactive Oxygen Species (ROS). The negative effects of senescence are skin hyperpigmentation, premature aging, and cancer. Senescence can be overcome by using antioxidants to reduce ROS levels. **Objective:** This study aims to examine the potential of Moringa Leaf Extract (MLE) (*Moringa oleifera* L.) as an antiaging through inhibition of cellular senescence against NIH/3T3 cells via p21. **Method:** Bioinformatics studies were carried out using STITCH, NCBI, Venny, STRING-DB, and Cytoscape. In silico molecular docking studies were carried out with PyRx and Biovia. Active compounds were identified by phytochemical screening. Cytotoxic test was carried out using the MTT assay method. ROS levels were tested with DCFDA staining flow cytometry assay, and senescence test with SA-β-galactosidase assay. **Results:** The active compound MLE has strong affinity energy with p21 through molecular docking in silico approach. Phytochemical screening showed that MLE contained flavonoids, phenolics, alkaloids, saponins, and steroids. MLE did not show cytotoxic effects as evidenced by the IC_{50} value of 420 µg/mL. MLE with concentrations of 105 and 210 µg/mL were able to reduce intracellular ROS levels. The percentage of senescent cells MLE 210 g/mL (30.20%) and MLE 210 g/mL + Dox (47.60%) was smaller than that of single Dox (78.90%). **Conclusion:** The results suggest that the compound induces antiaging activity through p21. MLE is not cytotoxic, and has antioxidant and anti-senescence activity.

Keywords: Moringa leaf, senescence, p21, anti aging

HMNP-3

The combination of *Coccinia grandis* and *Blumea balsamifera* extracts with enhanced antioxidant properties: *in vitro* synergistic effect

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ABSTRACT

Background: To achieve the best antioxidant effect, a single extract is usually given in high doses. A combination of extracts can be administered to reduce side effects due to high doses. **Objective:** The combination of *Coccinia grandis* and *Blumea balsamifera* extracts was investigated for its antioxidant and synergistic properties. **Method:** The extracts were obtained after a 24-hour maceration in 70% ethanol. The antioxidant activity of individual and combined extracts were determined by using Molybdenum(VI) reducing power activity and the ferric reducing antioxidant power (FRAP) methods. The ability of single and combined extracts to scavenge free radicals were tested using ABTS+ and DPPH radicals. The checkerboard method was used to assess the potential synergism effect, and the combination index values were calculated. **Results:** In the Molybdenum (VI) reducing power and FRAP assay, we discovered that the reducing power of the extract combination increases as the concentration of *B. balsamifera* extract increases ($p<0.05$). We discovered that *B. balsamifera* extract had higher antioxidant activity than *C. grandis* extract in the ABTS+ and DPPH radical scavenging assays ($p<0.05$) as well. Increasing the concentration of *B. balsamifera* resulted in an increase in radical scavenging activity ($p<0.05$). The combination of extracts with low concentration ratios resulted in synergism. **Conclusion:** We discovered that combining *C. grandis* and *B. balsamifera* leaf extracts had potent antioxidant properties. Some combinations had a synergistic effect at low concentration ratios, while the others had an antagonistic effect at higher concentration ratios.

Keywords: FRAP assay, DPPH, ABTS+, posfomolibdenum, antagonism, synergism.

HMNP-4

Antinephrolithiasis activity of ethanolic extract of *Uncaria gambir* Roxb leaves

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ABSTRACT

Background: Kidney stones (nephrolithiasis) are stones that form in the kidney tubules and one of the kidney disorders. Treatment in cases of kidney stones aims to overcome pain, remove existing stones, and prevent repeated stone formation. One of the plants that has specifications as a medicinal plant is gambir (*Uncaria gambir* Roxb.). **Objective:** This study aims to determine the effect and activity of ethanol extract of gambir leaves on the destruction of kidney stones in-vitro. **Method:** Gambir leaves were extracted by maceration method with ethanol as solvent. The compound content of the ethanol extract was analyzed qualitatively by TLC and quantitatively by LC-MS. The elemental content in kidney stones was analyzed by XRF. Testing the solubility of kidney stones with gambier extract was carried out using the incubation method at various concentrations of 1-6% gambier extract. Dissolved calcium levels of kidney stones were analyzed by a spectrophotometric method using AAS. **Results:** Gambir leaf ethanol extract contains alkaloids, flavonoids (catechins, quercetin and grosvenorine), tannins, anthraquinones, stigmastan-3,6-dione, and procyanidin A2. Kidney stones used as samples contain Ca of 16.2657 % or oxidized Ca 22.7601%. Dissolved calcium levels of kidney stones in variations of 1-6% gambier leaf extract were 0.89; 11.62; 18.49; 20.48; 22.27; 31.48; and 36.39 mg/L, where the higher the concentration of gambir leaf extract, the higher the dissolved calcium content of kidney stones. **Conclusion:** The results showed that the ethanol extract of gambier leaves had an effect on the destruction of kidney stones by forming a water-soluble Ca-catechin complex.

Keywords: gambir, kidney stones, dissolved calcium, catechins, and flavonoids

HMNP-5

Anti-inflammatory effects of *Curcuma xanthorrhiza* and *Physalis angulata* extract on lipopolysaccharide stimulated RAW 264.7 cells through inhibition of cytokine

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ABSTRACT

Background: Activation of macrophages triggers the release of various inflammatory mediators, so that inflammatory mediators become targets for the development of anti-inflammatory drugs. **Objective:** *C. xanthorrhiza* and *P. angulata* extracts were investigated for their anti-inflammatory properties by observing their effect on the pro-inflammatory cytokines tumor necrosis factor-α (TNF-α) and interleukin-6 (IL-6) and nitrite oxide (NO). **Method:** The extracts were obtained after a 24-hour maceration in 70% ethanol. Cell viability test was carried out using the MTT method. Both extracts were tested on LPS-induced RAW 264.7 cells to evaluate its effect on TNF-α, and IL-6 using the ELISA method. Nitric oxide production was determined by measuring the nitrite content using the Griess method. **Results:** The extract with a concentration of ≤20 µg/mL was used for anti-inflammatory tests because it gave cell viability above 80%. The highest inhibitory value was found at a concentration of 20 µg/mL when compared to dexamethasone (5 µg/mL). The inhibitory ability of TNF-α, IL-6 of both extracts was lower than that of dexamethasone ($p<0.05$), while the NO inhibition ability of both extracts was higher than that of dexamethasone ($p<0.05$). Extracts of *C. xanthorrhiza* and *P. angulata* were also able to inhibit inflammatory mediators such as TNF-α, IL-6, and NO. **Conclusion:** It is suggested that *C. xanthorrhiza* and *P. angulata* extracts possessed an anti-inflammatory activity on LPS-induced RAW 264.7 cells. However, both extracts certainly inhibited the production of inflammatory cytokines.

Keywords: Cytokine, Anti-inflammatory, RAW 264.7, LPS

HMNP-6

In Vitro Determination of Sun Protection Factor of *Elephantopus mollis* extracts

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ABSTRACT

Background: Exposure to UV radiation is one of the factors that can cause premature aging of the skin so that it triggers skin weakness in carrying out its function as a protective barrier. The use of sunscreen is one way to overcome aging on the skin due to UV radiation from the sun. **Objective:** This study was aimed to determine the SPF value from several types of *Elephantopus mollis* extract (based on the polarity of extracting solvent), so that the potential of this plant as a natural sunscreen can be predicted. **Method:** The dried powder of an aerial part of *Elephantopus mollis* was extracted using n-hexane (nonpolar) followed by ethyl acetate (semipolar) and methanol (polar) as solvents by using the maceration method. The absorption of each extract was measured at a wavelength of 290 – 320 determined by using spectrophotometric method and in vitro SPF value was calculated by Sayre equation. **Results:** The methanolic extract of *E. mollis* was found to have the highest SPF value of 13.85 followed by an ethyl acetate extract of 8.53 and hexane extract of 5.47. The SPF value was shown at a concentration of 250 ppm of each extract. The statistical analysis showed that data of the SPF value was significantly different $p<0.05$ for each extract. **Conclusion:** This study showed that the methanolic extract of *E. mollis* had potential activity as a sunscreen because of its high SPF value with maximum protection category.

Keywords: *Elephantopus mollis*, SPF, sunscreens, methanolic extract

HMNP-7

TLC-Densitometry Profile of Supernatant and Mycelium Extract from Fungi *Trichoderma reesei* TV221

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ABSTRACT

Background: Fermentation of fungi *Trichoderma reesei* TV211 is known to produce chemical compounds that are active as antibacterial and cytotoxic in some cancer cells. The fermentation time and the specimens extracted from the fermentation were estimated to affect the presence of chemical constituents. **Objective**: This study intends to investigate the TLC-Densitometry profile and estimate the type of chemical content of the supernatant and mycelium extracts from the fermentation of *Trichoderma reseei* TV221. **Method**: Fermentation of the fungi *Trichoderma reseei* TV221 was carried out on SDB medium with seawater concentration of 30 ppt. Fermentation was carried out by sampling from day 2 to day 14. The supernatant and mycelium extracts were determined by TLC-densitometric profile. The TLC plate was scanned with a densitometer at a wavelength of 254 nm and 366 nm. The TLC plate was sprayed with cerium sulfate. **Results**: The densitogram profile at a wavelength of 254 nm shows the mycelium extract has 3 spots and the supernatant extract has 5 spots, while the densitogram profile at a wavelength of 366 nm shows the mycelium extract has 3 spots and the supernatant extract has 6 spots. The TLC plate sprayed with cerium sulfate showed that the mycelium extract had 3 brown spots. In the supernatant extract, there were 3 brown spots. Brown spot formed indicates the presence of a terpenoid derivative chemical component. **Conclusion**: The chemical components of terpenoid derivatives in the mycelium extract were more than the supernatant extract.

Keywords : *Trichoderma reesei*, TLC-Densitometric, fermentation, supernatant, mycelium

HMNP-8

Determination of Specific and Non-specific Parameters of Ethanol Coriander (*Coriandrum sativum*) Leaves Extract and Its Antioxidant Activity

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ABSTRACT

Background: Earlier studies proposed the protective effect of coriander in preventing Alzheimer's like disease. Our previous research also showed that oral administration of ethanol coriander leaves extracts significantly ameliorated scopolamine-induced cognitive deficit in Y-maze and NOR tests. To develop the extract as a herbal product, the extract should be standardized according to BPOM standards. **Objective:** To standardize ethanol coriander leaves extract and evaluate its antioxidant activity. **Method:** Coriander leaves powder was macerated 3x for 24 hours using 80% ethanol, then the extract was concentrated Phytochemical screening, specific and non-specific parameters were evaluated as stated in the Indonesian Pharmacopeia and Materia Medica. Antioxidant activity and phenolic content were also determined using DPPH assay and folin-ciocalteu assay, respectively. **Results:** The extraction yielded was 36.204%. The extract's solubility in water and ethanol were 11.87 and 67.27% The loss on drying was 20.01% with a water content of 8.33%. Total ash content was 18.02%, and 7.65% of the ash was insoluble in acid. The density of 1%$(\frac{w}{v})$ concentrated extract was 1.0101. Lead and mercury were 700 and 112 ppb, respectively whereas cadmium was absent (≤300 ppb). The extract contained flavonoid, tannin, and triterpenoid with IC_{50} of 42.164 µg/ml. Phenolic component was 38.272 mg GAE/g extract. **Conclusion:** The water and heavy metal content in the extract follow the BPOM regulation. It had antioxidant activity that may be contributed by the presence of phenolic compounds (flavonoid and tannin).

Keywords: Coriander leaves, *Coriandrum Sativum*, extract standardization, antioxidant, Alzheimer-like diseases

HMNP-9

Validation of the Analytical Method of Assay of Eugenol in the Formulation O/W Creams of Essential Oil of Clove by High-Performance Liquid Chromatography

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ABSTRACT

Background: The amount of eugenol in clove essential oil cream is one of the parameters of the chemical stability of the preparation. The levels must be determined by valid analytical methods so that the results can be justified. **Objective:** This research aimed to prove that the methods have linearity, selectivity, precision, accuracy, the limit of detection (LOD), and the limit of quantification (LOQ) that fulfil the requirement of validity of methods analysis by high performances liquid chromatography. **Method:** validation methods of eugenol in O/W creams by high performances liquid chromatography determined the linearity from regression linear between concentration and wide-area peak, which could calculate the number of LOD and LOQ. The selectivity by estimated the resolution value between two peaks, precision was known from CV value in concentration 10 µg /mL, 20 µg/mL and 30 µg/mL, and accuracy was known from recovery value in concentration 80%,100% and 120% with three replication. **Results:** The results show that methods of analysis have the linearity with r= 0.998; LOD's value was 0.28 µg/mL and LOQ was 0.93 µg/mL. The precision at concentration 10 µg/mL, 20 µg/mL and 30 µg/mL with CV values 0.64%, 0.84%, and 0.12%, respectively. The accuration has a recovery value of 95,50%. The research showed the selectivity (Rs) of 2.551. **Conclusion:** The method analysis is valid, so it can be used to determine the amount of eugenol in O/W cream by high performance liquid chromatography.

Keywords: eugenol, O/W creams, validation of methods analysis, HPLC

HMNP-10

LC-MS/MS Analysis, Docking and Molecular Dynamics Approaches to Identify Potential SARS-CoV-2 3-Chymotrypsin-like Protease Inhibitors from *n*-hexane extract of *Zingiber officinale* Roscoe

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ABSTRACT

Background: *Zingiberaceae officinale* is a broadly distributed plant in several city in Indonesia as it is commonly utilized for daily food, spicing, and medication. **Objective:** This study aims to isolate and identify the main compounds of *n*-hexane extract of *Z. officinale* and to predict and evaluate the inhibitory potency on SARS-CoV-2 3 chymotrypsin-like protease. **Method:** Isolation and identification were performed by using preparative TLC and LC-MS/MS methods, and the inhibitory activity was performed by using docking, molecular dynamics simulations, and *in vitro* assay. **Results:** LC-MS/MS analysis identified 5-hydro-7,8,2'-trimethoxyflavanone, (*E*)-hexadecyl-ferulate, isocyperol, *N*-isobutyl-(2*E*,4*E*)-octadecadienamide and nootkatone from the rhizome extract, as well as from the leaves extract with the absence of 5-hydro-7,8,2'-trimethoxyflavanone. Three known steroid compounds i.e. spinasterone, spinasterol and 24-methylcholesta-7-en-3*ϐ*-on were further identified from the pseudostem extract. Molecular docking showed that the three steroid compounds have lower predictive binding energies (MMGBSA) than remdesivir and indinavir as the positive controls. Compound spinasterone showed the lowest binding energy of -87.91 kcal/mole, followed by spinasterol and 24-methylcholesta-7-en-3*ϐ*-on with their predictive binding energy of -78.11 and -68.80 kcal/mol, respectively. MD simulations showed the stability of 3CLpro in a complex with compound 24-methylcholesta-7-en-3*ϐ*-on during 100 ns simulation time with the RMSD value was less than 3 Å. Further characterization on the single isolated compound by NMR showed that 24-methylcholesta-7-en-3*ϐ*-on was identified, and possessed 75% inhibitory activity on SARS-CoV-2 3CL protease enzyme that was comparable with the positive control GC376 (77%). **Conclusion:** *Z. officinale* pseudostem was potential to be developed as herbal medicine to treat SARS-CoV-2.

Keywords: *Zingiber officinale*; LC-MS/MS; Steroids; 24-Methylcholesta-7-en-3β-on; 3CL Protease; SARS-CoV-2.

HMNP-11

The In Vitro Antibacterial Activity of Combination of *Muntingia calabura* FRUIT Extract With Yoghurt against Escherichia coli Bacteria

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ABSTRACT

Background: Yoghurt, completed with lactic acid bacteria has the ability to inhibit the growth of *Escherichia coli*. The flavonoids, tannin, and saponin of *Muntingia calabura* L. plant showed antibacterial activity. **Objective:** To identify the effect of addition of *Muntingia calabura* L. fruit extract to yoghurt to the activity of *Escherichia coli*. **Method:** The staining reagents were used for the phytochemical screening. The study was an experimental study with various treatments in adding muntingia fruit extract infusion (12.5 %, 25%, 50%, 75%, and 100% with three times replications) to the cow-milk based yoghurt. The antibacterial activity was tested using the Kirby Bauer method by observing the diameter of the inhibition zone. The mixed muntingia-yoghurt (MMY) was then centrifuged to obtain supernatant. Plain yoghurt was used for the negative control and Cefotaxime for the positive control. **Results:** Flavonoid, tannin, steroid, phenol and saponin have been observed in infusion of muntingia fruit extract. The MMY showed antibacterial activity toward *E. coli* as indicated by the various diameter of inhibition zones of 5.03± 2.66 mm, 4.95± 0.39 mm, 5.68± 0.84 mm, 8.02± 1.45 mm, and 15.73± 1.60 mm in the muntingia extract concentration of 12.5 %, 25%, 50%, 75%, and 100%, respectively. The diameter of the inhibition zone of negative control was 3.95 mm, while positive control was 45.60 mm. The MMY at concentrations of 75% and 100% *Muntingia calabura* L. extract significantly inhibited the growth of *E. coli* bacteria ($P<0.05$). **Conclusion:** Addition of *Muntingia calabura* L. fruits extract at concentration 75% and 100% could inhibit the growth of *E. coli* bacteria.

Keywords: antibacterial activity, yoghurt, *Muntingia calabura* L., *Escherichia coli*

HMNP-12

Turmeric Yields Neuroprotective Effect In Animal Model Of Repetitive Traumatic Brain Injury Via ERK/NRF2 Pathway

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ABSTRACT

Background: Exposure to repetitive traumatic brain injury (RTBI), even in its mildest form, is linked with long term disability. One the most prominent hallmark is aggregation of phosphorylated tau protein into neurofibrillary tangles. Activation of nuclear factor erythroid 2-related factor 2 (Nrf2), a crucial transcription factor in the defence against oxidative stress, will reduce the level of phosphorylated tau. Activation of extracellular protein kinase (ERK) is required for Nrf2 nuclear localization. Curcumin, a strong antioxidant found in turmeric, is capable of inducting the Nrf-2 pathway. **Objective:** The aim of this study is to explore the effect of turmeric extract on expression of phosphorylated tau, ERK, Nrf-2 in repetitive traumatic brain injury models. **Methods:** Mice were randomly assigned into three groups, including sham, vehicle-treated, and turmeric-treated injured mice. We used a weight drop model; twelve total traumas were divided into four days, with one day rest between trauma days. Turmeric was given per oral daily for six days. Phosphorylated tau, ERK, and Nrf2 were assessed using immunohistochemistry assay. **Results:** Injured mice treated with turmeric extract had significant increase in expression of ERK and Nrf-2 compared to vehicle-treated injured mice. We also found a notable decrease in expression of phosphorylated tau. **Conclusion:** Turmeric was effective in reducing phosphorylated tau expression following repetitive traumatic brain injury via ERK/Nrf2 pathway. Turmeric is a potential candidate for treatment of repetitive traumatic brain injury.

HMNP-13

Endophytic Fungi, A potential Source of Bioactive Compounds

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ABSTRACT

Background: Endophytic fungi are microorganisms living inside plant tissues without causing damage to the plant hosts. Their existence has attracted attention to some scientists to explore their potential as the source of bioactive compounds having industrial or pharmaceutical values. **Objective:** These studies report some findings regarding the potential of endophytic fungi collected from some Indonesian medicinal plants in producing bioactive compounds with pharmaceutical values. **Methods:** Isolation of endophytic fungi was conducted by aseptically placing sterilized cutted parts of plants to the PDA plates containing antibiotic, incubated and isolated to obtain pure cultures. The pure cultures were fermented, and the supernatants were extracted using ethyl acetate. The ethyl acetate extracts were tested for antimicrobial, cytotoxic and antioxidant potential. Some bioactive compounds were isolated and further elucidated for their chemical structure, optimized fermentation, or mechanism of actions. **Results:** Some of the endophytic fungi isolated from the medicinal plants have been identified namely *Aspergillus fumigatus*, *Athelia rolfsii, Arthrinium rasikravindrae, Syncephalastrum racemosum,* and *Eutypa linearis* which were isolated from *Piper crocatum* or *Coleus amboinicus.* Some other endophytic fungi were also isolated from *Catharanthus roseus*, *Phaleria macrocarpa* and *Typhonium flagelliforme*. Four pure compounds have been obtained which include pyrophen, isoprene compounds, an aromatic compound having methoxy, hydroxyl and methyl groups as well as an N-containing substance having conjugated double bonds. The extracts or these compounds were shown to possess either antimicrobial, cytotoxic or antioxidant properties. Biotic or abiotic factors also affected the secondary metabolites production. **Conclusion:** Secondary metabolites produced by the endophytic fungi isolated from some Indonesian medicinal plants were shown to possess antimicrobial, cytotoxic or antioxidant activities. Further investigations are needed to examine their potential of pharmaceutical values.

Keywords: endophytic fungi, antioxidant, antimicrobial, cytotoxic, medicinal plant

HMNP-14

Immunomodulator Activity of Tin Fruit Ethanol Extract (*Ficus carica* Liin) Against Phagocytosis Macrophages and Lymphocyte Proliferation in Vitro

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ABSTRACT

Background: Tin (*Ficus carica* L.) is a natural product that has the potential to improve the immune system because it has flavonoids that have the potential as immunostimulants. **Objective:** The research aims to determine the potential of tin fruit ethanol extract as an immunomodulator by knowing the activity of macrophage phagocytosis and lymphocyte proliferation in vitro as well as knowing the levels of flavonoids contained in the extract. **Method:** The research began with extraction and then the sample was tested with KLT and colorimetry methods. Furthermore, the sample in the immunomodulatory activity test in vitro, measured through the activity of macrophage phagocytosis and lymphocyte proliferation. In the phagocytosis activity test, macrophage cells were given samples in various concentrations and latex. It is then calculated the number of active macrophages and the number of latex eaten. For tests of lymphocyte proliferation activity, lymphocyte cells were sampled with different concentrations and induced hepatitis B vaccine. Then the cell absorbance was read with an ELISA reader 550nm. **Results:** The results of the study found that the samples contained flavonoid compounds and total flavonoid levels obtained were 0.74±0.01 mgEK/g samples. Immunomodulatory activity showed that the sample increased phagocytosis activity of macrophages compared to cell control. The lymphocyte proliferation test produced IS<2 values, showing no effect on the proliferation of lymphocytes. **Conclusion:** This study indicated that tin fruit ethanol extract had the ability to increase the phagocytosis activity of macrophage cells, but did not affect the proliferation of lymphocyte cells in vitro.

Keyword: Tin fruit, total flavonoids, phagocytosis macrophages, lymphocyte proliferation, in vitro

HMNP-16

Biological Activities Found in Black Rice Lead Promising Functional Food and Natural Cosmetics : A Review

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ABSTRACT

Background: Black rice is one of the pigmented rice that is famous in many parts of the world. There are many varieties of it, such as japonica black rice, Chinese black rice, Thai black rice and Indonesian black rice. The study of this cereal is now topical because of the nourishing elements which is evidently beneficial for human's health. Many studies have investigated single compounds, biological activities, geographical origin, and also the employment of black rice for other purposes. Nevertheless, there are still few reviews that present a profound overview of black rice's potency of future development. **Objective:** Therefore, the aim of this study is to find the future development of black rice based on its biological activities. **Method:** A total of 41 journals which discussed about black rice's beneficial effect were reviewed (HMNP). **Results:** Based on the review process, there are several major valuable biological activities from black rice, such as antioxidant, anti photoaging, antimicrobe, prebiotic activity, and high nutritional value. Those beneficial effects are mainly caused by the appearance of its phytochemical contents including anthocyanin, flavonoid, and phenolic contents. **Conclusion:** Black rice has a high potency to be developed as promising functional food and cosmetic products in the future. However, further studies were still needed to overcome the instability problem of black rice active contents.

Keywords: Black rice, functional food, cosmetics product, and development of black rice.

HMNP-17

Phytochemical Screening and Antioxidant Activity of Black Ginger (*Kaempferia parviflora*) And Black Turmeric (*Curcuma caesia*)

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ABSTRACT

Background: Black ginger (*Kaempferia parviflora*) and Black turmeric (*Curcuma caesia*) are medicinal plants belonging to the *Zingiberaceae* family. Both plants contain high phytonutrients and have high antioxidant activity that are very useful for improving health, preventing diseases and also treating some diseases. These two plants also show some potential activities such as anti-hyperglycemia, anti-inflammatory, aphrodisiac, anti-hyperuricemia, anti-cancer and others. **Objective:** The aims of this study were to determine secondary metabolites, total phenolic content (TPC), total flavonoid content (TFC) and antioxidant activity from ethanolic and water extracts of *K.parviflora* and *C.caesia.* **Method:** The ethanol extract was obtained from the maceration of the sample using 97% ethanol. Meanwhile, the aqueous extract was obtained from the boiling process using distilled water. The crude extract of the samples was then screened for secondary metabolites. The determination of TPC and TFC was carried out using a spectrophotometer method. GC-MS analysis was also carried out for the ethanolic extract of *C. caesia* in order to determine its secondary metabolite profile. The antioxidant activity of the samples was tested using the DPPH spectrophotometric method with ascorbic acid as the positive control. **Results:** The results showed that all extract contained polyphenols, alkaloids and flavonoid compounds. TPC and TFC value for ethanolic extract of *K.parviflora* were 52.33 mgGAE/100g; 14.42 mgQUE/g, and for water extract were 191.44 mgGAE/100g; 4.91 mgQUE/g, respectively. Meanwhile, TPC and TFC values for ethanolic extract of *C.caesia* were 73.29 mgGAE/100g; 1.36 mgQUE/g and for water extract were 106.08 mgGAE/100g; 4.32 mgQUE/g, respectively. The results of GC-MS profiling on the ethanolic extract of C. caesia have been estimated to contain at least 147 types of phytochemicals, including isoborenol, curcumenol, and santalol. Based on the DPPH method, the antioxidant activity of the ethanolic extracts of *K.parviflora* and *C.caesia* were 737.52 g/mL and 72.10 g/mL, and for aqueous extracts were 191.618 g/mL and 192.342 g/mL, respectively. **Conclusion:** Based on the initial results obtained, the high antioxidant activity from ethanolic and water extract of *C. caesia* is correlated to the polyphenol and flavonoid content detected during phytochemical screening. Meanwhile, the content of polyphenols and flavonoids in *K. parviflora* did not support its antioxidant activity. Further research is needed to investigate the efficacy of both plants to treat or prevent diseases.

Keywords: Black ginger, *Kaempferia parviflora*, Black turmeric, *Curcuma caesia*, Antioxidant

HMNP-18

The Effect of Extraction Methods towards Antioxidant Activity, Total Phenolic Content and Total Flavonoid Content of *Clitoria ternatea* L. Flower

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ABSTRACT

Background: Controlling the pro-oxidative factors or factors that have the ability to generate reactive oxygen species in the oral cavity is an important issue nowadays. *Clitoria ternatea* L. flower (Butterfly Pea flower) has been recognized in some tropical countries as having antioxidant potential. This will require a proper extraction method to obtain its secondary metabolite that has various biological activities. **Objective:** This research was conducted to analyze the effect of extraction methods on antioxidant activity, total phenolic and total flavonoid content in *Clitoria ternatea* L. flower (CTF). **Method:** Extraction of CTF powder was extracted by percolation, reflux and soxhletation with absolute ethanol. Antioxidant activity was determined with 1,1-diphenyl-2-picrylhydrazyl (DPPH) method. Colorimetric methods were used to determine total flavonoid and total phenolic content. **Results:** The IC_{50} values for antioxidant activity in percolation, reflux and soxhletation extracts using the DPPH assay were 145.51 ± 0.73; 130.52 ± 0.58 and 131.14 ± 0.71 µg/mL respectively. Extracts were found to contain high levels of phenolic (116.19 ± 0.69; 149.73 ± 0.88 and 90.50 ± 0.83 mg GAE/g), and total flavonoid (9.17 ± 0.29; 10.76 ± 0.48 and 9.42 ± 0.47 mg QE/g). **Conclusion:** The reflux method shows the best extraction method to obtain the highest antioxidant activity and highest level of phenol and flavonoid for CTF.

Keywords: *Clitoria ternatea* L. flower, extraction methods, antioxidant, total phenol, total flavonoid

HMNP-19

Antioxidant Activity Evaluation of Sambiloto (*Andrographis paniculata* (Burm.f.) Nees): In Vitro Approach

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ABSTRACT

Background: Excessive, unbalanced free radicals could lead to the accumulation of oxidative stress, which is the potential cause of various diseases. Consuming exogenous antioxidant sources can be a solution, including the potential medicinal plants that spread around the world. In Indonesia, Sambiloto (*Andrographis paniculata* (Burm.f.) Nees) is gaining recognition due to its various powerful constituents and might be a strong candidate to be a complementary health supplement. **Objective:** To evaluate the antioxidant activity of ethanolic extract of Sambiloto using three different methods and mechanisms of antioxidant assay. **Method:** Ultrasonic Assisted Extraction (UAE) method using ethanol as the solvent was used. Three different evaluations of antioxidant activity were used: scavenging free radical using DPPH (2,2-diphenyl-1-picrylhydrazyl) method; total antioxidant using phosphomolybdate method (ascorbic acid was used as the standard); and metal chelating using ferrous ion chelating method (EDTA was used as the positive control). The data were statistically analyzed using IBM SPSS Statistics software with 95% of confidence level. **Results:** The result shows the antioxidant activity profile of Sambiloto is comparable to the standard. **Conclusion:** Ethanolic extract of Sambiloto is quite promising to be developed as a complementary health supplement due to its antioxidant activity.

Keywords: Antioxidant, Sambiloto (*Andrographis paniculata* (Burm.f.) Nees), Ultrasonic Assisted Extraction, In Vitro

HMNP-20

In Vitro Antioxidant Activity of Temu Mangga (*Curcuma mangga* Val.)

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ABSTRACT

Background : Antioxidants can help to prevent free radical reactions and cellular damage by raising cellular defense and reducing oxidative stress. Temu Mangga (*Curcuma mangga* Val. & Zijp) is a potential medicinal plant with high availability in Indonesia, and it can be an alternative source of exogenous antioxidants because it contains curcuminoids, tannins, flavonoids, and phenolic compounds. **Objective :** In vitro antioxidant activity assay should be carried out with different test mechanisms because one test does not provide realistic results compared to a series of tests involving different mechanisms. In this experiment, we tested the antioxidant activity of Temu Mangga using a different chemical reaction mechanism from previous studies (phosphomolybdate and Ferric Ion Chelating methods). **Method :** Extraction was done by ethanol solvent using the Ultrasonic Assisted Extraction (UAE) method. The in vitro antioxidant assay uses three different mechanisms of chemical reaction of antioxidants, namely DPPH (2,2'-diphenyl-1-picrylhydrazyl) for radical scavenging activity, phosphomolybdate method for complex formation, and Ferric Ion Chelating (FIC) method for chelating formation. For standard we used ascorbic acid in phosphomolybdate method, and EDTA in Ferric Ion Chelating method. IBM SPSS software was used for statistical data analysis with a 95% confidence level. **Results :** The result shows that Temu Mangga's antioxidant activity profile is comparable to the standard (ascorbic acid and EDTA).

Keywords : Temu Mangga*, Curcuma mangga*, Antioxidant, Ultrasonic Assisted Extraction, in vitro

HMNP-21

Anticovid Drug Candidate In Bay Leaf (*Syzygium polyanthum* (Wight) Walp).) Targeted Main Protease And Ace-2 Receptors As Well Reduced Comorbid Diseases

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ABSTRACT

Background: Covid-19 is a disease caused by SARS-CoV-2 (Severe Acute Respiratory Syndrome-Coronavirus-2). The virus is driven by the main protease (Mpro) enzyme and SARS-CoV-2 infects humans by interacting with a receptor called ACE-2. **Objective:** One of the efforts to overcome the Covid-19 pandemic using several treatment approaches that have been carried out by utilizing one of the natural ingredients, for example, bay leaves (*Syzygium polyanthum* (Wight) Walp.) which is known as a herbs with the main compound of eugenol, methyl kavikol, and catechins. **Method:** This research uses the molecular docking method with the ligands eugenol, catechins, methyl chavicol and comparison ligands of lopinavir and chloroquine using software PLANTS. Tests carried out on the main protease (Mpro) (PDB:6LU7) and ACE-2 receptor (PDB:1O86). Validation using YASARA, preparation of test and comparison ligands using software ChemAxon, running molecular docking using software PLANTS and the result of docking are visualization by software LigPlot+ and PyMOL. **Results:** The results showed that the compound combination of eugenol, catechins and methyl chavicol had a docking score which was close to the comparison drug, namely chloroquine. **Conclusion:** Also Bay Leaf (*Syzygium polyanthum* (Wight) Walp.) indicated to potential herbal plants like chloroquine.

Keywords: Bay leaf, molecular docking, comorbid disease.

HMNP-22

Cellular Senescence Prevention via CD36 Inhibition by *Cinnamomum verum* Active Compounds: An In Silico Study with Molecular Docking and KNIME

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ABSTRACT

Background: Cellular senescence is defined as irreversible growth arrest which contributes to aging and age-related disease such as diabetes and skin tissue aging. Increased ROS (Reactive Oxygen Species), SASP (Senescence Associated Secretory Phenotype), and lipid accumulation lead to cellular senescence. CD36 (Cluster Difference 36), which is found overexpressed in senescent cells, accepts various activators that can generate ROS and SASP. *Cinnamomum verum* (Ceylon cinnamon) has been known to exert several pharmacological effects. However, its anti-senescence effect on CD36 as a senescence hallmark has not been reported yet. **Aim:** This *in silico* study aims to show that cinnamon's compounds are effective to inhibit CD36 to stop senescence. **Methods:** Literature study and in silico approaches like database searching, molecular docking, and KNIME open analytics platform were used in this study. **Results:** Cinnamaldehyde, a major compound of cinnamon, is proven as a better competitive CD36 inhibitor (random forest true positive rate: 1.0, accuracy: 0.93) with much better affinity (-7,43) than native ligand (-5,76), previously studied inhibitors (-5,79), and Rapamycin as an anti-senescence drug (-5,67). Based on the STRING database, CD36 interacts with PPAR γ (0,951; CD36's regulator), and TLR4 (0,944; co-express with CD36). Furthermore, bioinformatics investigations showed that major compounds of cinnamon also target the CD36 regulator, TLRs, oxidoreductases, and SASP-producing receptors that co-expressed with CD36. **Conclusion:** Active components of *Cinnamomum verum* exhibit a synergistic impact and potential to be an anti-senescence agent by inhibiting CD36 and eradicating other senescent factors such as CD36 overexpression, ROS and SASP production, and lipid accumulation.

Keywords: Cellular senescence, CD36, *Cinnamomum verum*, bioinformatics, molecular docking, KNIME

PPCP-8

NLMIXR, a powerful open-source tool for population-based pharmacokinetic modeling

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ABSTRACT

Background: Although available since the late 70s, the population-based approach in pharmacokinetics and pharmacodynamic has not been widely applied in Indonesia. The familiarity and availability of tools/software are among the reasons for the limited application of such methods. **Objective:** This research aimed to evaluate the potency (based on the benefits and limitations) of NLMIXR as one of the relatively new open-source software available for population-based analyses. **Method:** NLMIXR was used to analyze the previously published plasma concentration data of warfarin and theophylline delivered via per-oral routes. The population-based performances in all cases were evaluated based on the goodness of fit analyses. The capacity of NLMIXR was compared with two other available software packages in this approach, i.e., NONMEM and Monolix. NONMEM is the first developed tool in the population-based approach, considered the gold standard in the modeling approach. Monolix is free for academic use software in a population-based approach. **Results:** NLMIXR adequately models the observed warfarin and theophylline data in this population-based approach. The goodness of fit analyses confirmed the similarity of NLMIXR modeling performance to NONMEM and Monolix. **Conclusion:** NLMIXR is a powerful and free tool for a population-based approach that can be widely used in Indonesia

Keywords: NLMIXR, population-based approach, NONMEM. and Monolix

PPCP-15

Discovery of Curcumin-Based Compounds as Amyloid β Inhibitors and Application to MRI Contrast Agents for Alzheimer's Disease

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ABSTRACT

Background: Alzheimer's disease is characterized by the presence of a plaque consisting of Amyloid β (Aβ) peptide. A natural compound Curcumin is known as an inhibitor of Aβ-aggregation, although it is still limited due to non-negligible side effects such as gastrointestinal symptoms during phase II clinical trial. Conjugation of curcumin with gadolinium (Gd) complexes is also reported as potential MRI contrast agents but there is no MRI contrast agent used for theranostics of Alzheimer's disease. **Objective:** Here, we introduce the design and synthesis of curcumin derivatives as Aβ inhibitors using structure activity matrix (SARM) approach and further application to the development of theranostic Gd-based MRI contrast agents that work both as Aβ inhibitors and imaging probes of Aβ fibril. **Method:** Known Aβ inhibitors in the ChEMBL database were plotted on the SARM to obtain the novel curcumin derivatives. All the curcumin derivatives were synthesized from a three steps reaction including condensation reaction as a key step using microwave irradiation. Biological evaluation included Aβ inhibitory assay, biodistribution study, transmission electron microscopy (TEM), and MRI study. **Results:** Some of the derivatives had more potent Aβ inhibitory activity than curcumin and alleviated Aβ-induced cytotoxicity through shortening the amyloid fibrils. Curcumin derivative also was more selectively accumulated in the brain than curcumin. The curcumin derivatives conjugated with a Gd complex showed high MRI sensitivity toward Aβ fibril and Aβ inhibitory activity. **Conclusion:** In conclusion, we successfully developed the potent Aβ inhibitors derived from curcumin and applied them as an MRI contrast agent for theranostics of Alzheimer's disease.

Keywords: SAR matrix, curcumin, amyloid β, Alzheimer's disease, MRI contrast agent

PPCP-17

Anti Inflammatory Activity of The Black Turmeric (*Curcuma caesia* Roxb.) Ethanol Extract in Carrageenan Induced Male Wistar Stream Rats

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ABSTRACT

Background: The high risk of side effects caused by the use of modern medicines has resulted in people turning to the use of traditional medicines. Currently, the treatment of inflammation still relies on conventional drugs, especially non-steroidal anti-inflammatory drugs (NSAIDs), the continuous use of these drugs will certainly cause various adverse side effects. **Objective:** This research aims to determine the anti-inflammatory activity of ethanol extract of Curcuma caesia Robx. in carrageenan-induced male rats. **Method:** In this research, Curcuma caesia Robx. was extracted using 80% ethanol solvent then the viscous extract obtained was made into suspension preparations with concentrations of 32.5mg/mL, 65mg/mL, 97mg/mL, 130mg/mL and 195mg/mL. The extract was tested for anti-inflammatory testing using the Paw edema method induced by carrageenan 1% w/v to the soles of the rats' feet. Changes in the volume of the rat's feet were observed at 0, 1, 2, 3, 4 and 5. The data were then analyzed using the Kruskal-Wallis test followed by post hoc Mann-Whitney with 95% confidence level. **Results:** The results of the anti-inflammatory activity test of the ethanolic extract of Curcuma caesia Robx. showed a significant inhibition of inflammation ($p < 0.05$) both at doses of 250 mg/kgBW, 500 mg/kgBb, 750 mg/kgBW, 1000 mg/kgBW and 1500 mg/kgBW at the 5th hour. **Conclusion:** This anti-inflammatory activity can be influenced by the content of phytochemical compounds contained in it, including alkaloids, flavonoids, and tannins.

Keywords: *Curcuma caesia, anti-inflammatory, carrageenan induction method*

PPCP-19

Interaction between Active Compounds from *Crocus sativus* L. As Anti Rheumatoid Arthritis Targeted Sirtuin 1, MAPK14, and IκB

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ABSTRACT

Background: This research is an in silico research with few of active compounds in *Crocus sativus* L. (Saffron) which is *crocin, picrocrocin, and crocetin* believed to have activity ability in suppressing inflammation in Rheumatoid Arthritis (RA) patients. **Objective:** This research aims to search for pathways that conduct expression on Sirtuin 1 and closely related with mechanisme on formation of pro-inflammatory cytokines. **Method:** This experimental research using software such as PLANTS 1.2 to determine that saffron is a good candidate therapy for rheumatoid arthritis by targeting Sirtuin 1, MAPK14, and IκB. Using Yasara 19.7.20 with the purpose of preparing protein and visualization. Other than that the usage of MarvinSketch 5.2.5.1 for ligand preparation. **Results:** There are 6 test compounds that are going to be used such as *crocin, crocetin, picrocrocin, cineole, geraniol, and limonene*. The result obtained using *crocin* and Sirtuin 1(4KXQ) with docking score -126.382 with difference 16.37% from reference ligand. Using ligand IκB (4KIK) *picrocrocin* was obtained with docking score -81.050 and difference 35.53% from reference ligand. The third ligand MAPK14 (2BAJ) obtained crocetin with docking score -88.978 and difference 21.13% from reference ligand. After having the docking result, we do the visualization profile using Ligplot 2.2.4 for 2D visualization, and Pymol 2.5.1 for 3D visualization. **Conclusion:** Based on the results of the docking score and visualization with the application of ligplot and pymol and their interaction profile with the three target proteins, *crocin, crocetin, and picrocrocin* compounds are compounds that inhibit the cytokine expression pathway by inhibiting the upstream cytokine production pathway.

Keywords: Crocus sativus, Sirtuin1, MAPK14, IκB, molecular docking

PPCP-20

Molecular Docking Compounds of Extract Saffron (*Crocus Sativus* L.) As Anti-Cytokine Storm Potential with Target Proteins IKK- β and MAPK

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ABSTRACT

Background: SARS-CoV-2 belongs to the genus β coronavirus is the virus that causes the COVID-19 pandemic. SARS-CoV-2 can stimulate an immune response in the host, leading to a decrease in lymphocytes and cytokine storms. Cytokine storms are an increased release of proinflammatory cytokines, such as IL-6 and IL-1β that can trigger an infectious response and become acute respiratory distress syndrome (ARDS). **Objective:** Saffron (*Crocus Sativus* L.) has major compounds such as crocin, crocetin, picrocrocin, and safranal. In previous studies, crocin was known to suppress the production of proinflammatory cytokines *in vivo* and *in vitro* through suppression of NF-kB activation by interacting with IKK-β. **Method:** Molecular Operating Environment 2015.10 (MOE) software is used as a docking software with IKK- β (pdb: 4KIK) and MAPK (pdb: 2BAJ) proteins as test ligand targets given the role of both proteins in cytokine production. The ligands tested included crocin, crocetin, picrocrocin, cineole, and geraniol. The docking procedure used triangle matcher placement method and refinement induced fit, with London dG and GBVI / WSA dG as scoring function (Code: PPCP). **Results:** The results showed that the docking scores of crocin (-10.276 kkal/mol) and picrocrocin (-7.653 kkal/mol) compounds were close to native ligand score values in both proteins IKK-β (-9.810 kkal/mol) and MAPK (-9.810 kkal/mol). **Conclusion:** Crocin and picrocrocin compounds in saffron (*Crocus Sativus* L.) could bind to the proteins IKK-β and MAPK.

Keywords: *Crocus Sativus* L., Cytokine storm, molecular docking, docking score

PPCP-21

Design and Synthesis of 1,3 bis(p-hydroxyphenyl)urea as an Alzheimer's Drug

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ABSTRACT

Background: Alzheimer's disease is a brain disease that causes a gradual decline in memory, thinking and speaking abilities, and changes in behavior. This condition is mostly found in people over 65 years. Rivastigmine works by inhibiting the breakdown of a special chemical compound in the brain, namely acetylcholine, which plays a role in the process of remembering or thinking. **Method: Method of Design**: Validation of 1ACJ.PDB, by redocking the ref_ligand THA (tacrine) in the receptor (acetylcholinesterase enzyme). RMSD is valid if the value is <2 Angstrom. The molecular design 1,3 bis(p-hydroxyphenyl)urea interacts with acetylcholine esterase and the docking score is compared with the Tacrine docking score. **Method of Synthesis**: 2.18 g of para-amino phenol was added with 3.0 mL of 25% HCL + H2O until 48 mL and stirred until dissolved. Add as much as 5.7 g of urea, stirred until dissolved, heated for 30 minutes in a fume hood, then refluxed for 1 hour on a scale of 4 max with a heating mantle. Pour the reflux result into the Erlenmeyer which is surrounded by ice water until crystals appear. Perform recrystallization. Crystals that have one spot were elucidated their structure using NMR, IR and mass spectrometry. **Results:** Validation of 1ACJ.PDB with RMSD = 0.4224 A<2A so that it is declared valid. The molecular docking results showed that the docking score (DS) 1.3 bis(p-hydroxyphenyl)urea was -94.3915, rivastigmine -94.8415 was more stable than tacrine -91.5670. Statistical tests showed that 1,3 bis(p-hydroxyphenyl)urea was as potent as an Alzheimer drug as potent as rivastigmine and more potent than tacrine. Based on the results of the structural elucidation, the molecule is in accordance with the prediction as 1,3 bis(p-hydroxyphenyl)urea. **Conclusion:** The molecular design of 1,3 bis(p-hydroxyphenyl)urea has a better potential as an Alzheimer's drug than the reference tacrine.

Keywords: Alzheimer, rivastigmin, tacrine, 1,3 bis(p-hydroxyphenyl)urea

PPCP-22

Agaricus bisporus Supplementation Decreased Parasitaemia in *Plasmodium berghei*-Infected Mice

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ABSTRACT

Background: There are bioactive compounds from natural ingredients that have been tested to inhibit Plasmodium in red blood cells, including flavonoids and terpenoids. *Agaricus bisporus* (*A. bisporus*) is one of the organisms that contain these compounds. However, there has been no scientific evidence related to the effectiveness of *A. bisporus* in reducing the parasitemia degree. **Objective:** This study aims to examine the effect of *A. bisporus* mushroom supplementation on the degree of parasitemia of mice (*Mus musculus*). **Method:** The methods used in this study include supplementation of *A. bisporus* mushroom powder in mice orally; malaria induction by inoculation of erythrocytes containing *Plasmodium berghei* in mice intraperitoneally; measurement of the degree of parasitemia by microscopic observation of a thin blood smear using a sample of mice blood stained with Giemsa. **Results:** The profile of parasitemia degree of the positive control group that was not given *A. bisporus* supplementation had the highest parasitemia degree, it is 15.9%, in contrast to the test group that had been given *A. bisporus* supplementation, the parasitemia degree was only 10%. Furthermore, on the 3rd and 5th day of measurement, it can be seen the effect of *A. bisporus* supplementation in the test group there was a decrease of parasitemia degree up to >50% whereas the positive control group only experienced a decrease of parasitemia degree by around 9%. **Conclusion:** According to this study, we found that supplementation of *A. bisporus* can decrease the degree of parasitemia in mice.

Keywords: supplementation, *Agaricus bisporus*, parasitemia

PPCP-23

PDB2PLIF-assisted Identification of Sandwich Interaction between MMP9 and CC27

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ABSTRACT

Background: The availability of PyPLIF HIPPOS (https://github.com/enade-istyastono/PyPLIF-HIPPOS), a software to convert docking poses from PLANTS or AutoDock Vina to Protein-Ligand Interaction Fingerprints (PLIF) bitstrings, has triggered inquiries whether it can be developed for other docking software. We are now working on it. Meanwhile we developed PDB2PLIF (https://github.com/enade-istyastono/pdb2plif), a PyPLIF HIPPOS powered shell script to convert a protein-ligand complex in pdb format from to PLIF bitstrings. The pdb format was chosen since it is a widely used format in structural biology. The availability of PDB2PLIF offers possibilities to study protein-ligand interactions during molecular dynamics (MD) simulations. The complex of MMP9 and CC27 downloaded from https://www.rcsb.org/structure/4H3X was selected as the pilot project. **Objective:** The research was aimed to study protein-ligand interactions during MD simulations of the MMP9-CC27 complex. **Method:** Molecular dynamics simulations of the MMP9-CC27 complex for 15 ns were performed in YASARA-Structure 20.10.4. The snapshots were taken in every 100 ps during the MD simulations and converted to pdb files. PDB2PLIF was then employed to perform PLIF identification on the pdb files. **Results:** By neglecting the hydrophobic interactions, PDB2PLIF could only identify aromatic face-to-face interaction of CC27 to HIS226 of MMP9 from the original 4H3X.pdb. Another aromatic edge-to-face interaction of CC27 to TYR248 of MMP9 was identified in 81.3% of all snapshots from the MD simulations. **Conclusion:** Together, these aromatic interactions formed sandwich interactions between MMP9 and CC27.

Keywords: PDB2PLIF, PyPLIF HIPPOS, YASARA-Structure, molecular dynamics simulations

PPCP-24

Activity of Active Protein of Soursop Seed (*Annona muricata* L.) on 4T1 and T47D Cells

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ABSTRACT

Background: Soursop seeds (*Annona muricata*) have been shown to have anticancer activity. Plants in the same genus namely srikaya (*Annona squamosa*) have RIPs protein activity that have anticancer activity. **Objective:** This study aimed to determine the anticancer activity of the active protein of soursop seeds on 4T1 and T47D cells. **Method:** Protein isolation used column chromatography with DEAE and BUTYL matrix. Identification of protein used the SDS-PAGE method. The cytotoxic activity test was carried out using the MTT assay method and read with an ELISA reader at wavelengths of 595 nm. **Result:** The highest protein isolate yield with DEAE matrix was 4359 µg/mL. SDS-PAGE identification showed that the protein molecular weights were 18 kDa, 20 kDa, 29 kDa, 32 kDa, 34 kDa and 62 kDa which were suspected to contain type II RIPs. The results of the cytotoxic test proved that the active DEAE protein isolate did not have cytotoxic activity against T47D and has moderate potential as an anticancer with an average IC_{50} of 324.49±5.46 g/mL against 4T1. The protein isolates using the BUTYL matrix have 26 kDa, 28 kDa, 32 kDa, and 35 kDa which contain RIPs. The results of the cytotoxic test showed that the protein fraction was able to induce high cell death in 4T1 and T47D with an average percentage of cell death was 86.78%-94.40% in 4T1 cells and 65.63%-96.12% in T47D cells. **Conclusion:** The active protein of *Annona muricata* has molecular weight which was indicated as type II RIPs but has less potential activity to 4T1 and T47D cells.

Keywords: soursop seed, DEAE, Butyl, MTT Assay, T47D, 4T1, SDS-PAGE, cytotoxic

PPCP-25

Examination of Wnt/β-catenin Signaling Activity on Human Cerebral Microvessels Endothelial Cells (hCMEC/D3) Following Treatment of Lithium-atypical Antipsychotic Combination

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ABSTRACT

Background: Lithium and atypical antipsychotic are CNS drugs which have GSK3β inhibitory properties on its downstream signaling. Stabilization of β-catenin upon GSK3β inhibition is one of the strategies to activate Wnt/β-catenin signaling. In brain endothelial cells, activation of Wnt/β-catenin signaling improves blood-brain barrier function. Our previous studies showed that chronic treatment of lithium or risperidone at therapeutic relevance concentration activated Wnt/β-catenin signaling in human cerebral microvessels endothelial cells (hCMEC/D3). Although Axin-2, a marker of Wnt activation, is elevated following lithium or risperidone treatment, the blood-brain barrier phenotype was unchanged. **Objective:** The current study is aimed to examine if combination of lithium with antipsychotic at therapeutic relevance concentration would synergistically increase Wnt/β-catenin activation and improve barrier properties of hCMEC/D3. **Method:** hCMEC/D3, an in vitro blood-brain barrier model, was treated with a combination of lithium+risperidone or lithium+clozapine for 7 days. Medium was changed every 24 hours. GSK3β inhibition, Wnt/beta catenin activity, and blood-brain barrier phenotype were examined using immunoblotting or real time PCR. **Results:** Combination of lithium+risperidone or lithium+clozapine did not synergistically increase GSK3β inhibition and Wnt/β-catenin activity. The net result of drug combination was not significantly different from lithium alone in terms of GSK3β inhibition and Wnt/β-catenin activity. Our follow up studies suggested that inhibition of GSK3β by lithium is more sustained compared to inhibition of GSK3β by atypical antipsychotic drugs. **Conclusion:** Inhibition GSK3β by atypical antipsychotic did not synergistically add lithium activity in activating Wnt/β-catenin signaling in hCMEC/D3 cells.

Keywords: lithium, atypical antipsychotic, combination, Wnt/β-catenin signaling, hCMEC/D3

PPCP-26

Molecular Docking of Betasianin Compound on Red Beetroot (*Beta vulgaris* L.) Targeted Protein DHFR, CA9, CA12, and SRC as Breast Cancer Support Therapy

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ABSTRACT

Background: Breast cancer is a malignant disease that occurs in women. The number of breast cancer sufferers has increased from 2018 to 2020. Betacyanin compounds in red beet tubers may be a chemopreventive agent for breast cancer. **Objective:** The purpose of this study was to determine the molecular interaction between betacyanin compounds and DHFR, SRC, CA9, and CA12 receptors. **Method:** The method used is molecular docking using the PLANTS program. Protein preparation was carried out using the YASARA program to eliminate the docking protocol. Ligand preparation was carried out using the MarvinSketch program for optimization. **Result:** Protein stability is indicated by a decrease in the docking score. The obtained protein complexes are SRC, DHFR, CA9, and CA12 with the test ligand (or stronger than the more complex protein with the original ligand). **Conclusion:** Therefore, betacyanin may be developed as a potential MCF-7 breast cancer therapeutic agent.

Keywords: molecular docking, betacyanin, breast cancer

PPCP-27

Physicochemical Properties of Sodium Alginate from Brown Alga *Sargassum aqualifolium* and *Sargassum cinereum*

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ABSTRACT

Background: Synthesis and characterization of sodium alginate from brown alga *Sargassum aquifolium* and *Sargassum cinereum*, the Dompu Islands, West Nusa Tenggara. Knowledge of the physicochemical properties of sodium alginate becomes an excellent opportunity to support further processing in its application. **Objective:** The aims are to synthesize and characterize sodium alginate from brown alga *S. aquifolium* dan *S. cinereum*. **Method:** The extraction by acid pathway, due to cell disruption and addition of Na_2CO_3 for extraction. HCl was added to convert acid alginate into alginate, then transform acid alginate into sodium alginate using NaOH. NaOCl and IPA were used for purification. Physicochemical properties were characterized using SEM-EDS, FTIR, and TA/DTA. **Results:** The morphological structure of synthetic sodium alginate shows that layer structure and other impurities have been successfully removed through the purification process. FTIR spectrum as indicated by the presence of functional groups at the following wavelengths OH at 3200-3400 cm^{-1}, and CH_2 at 2915 cm^{-1}, CO double bonds at 1614 cm^{-1}, the presence of mannuronic acid and uronic acid, which function the CH group stretches at 828-935 cm^{-1}. TGA/DTA results showed a reduction in thermal stability at 250-300°C. **Conclusion:** Synthesis of sodium alginate from *S.aquifolium* dan *S. cinereum* has been successfully performed. The morphological structure showed layer structure and no impurities. FTIR spectrum, which is indicated by the presence of functional groups at the following wavelengths OH at 3200-3400 cm^{-1}, and CH_2 at 2915 cm^{-1}, CO double bonds at 1614 cm^{-1}, the presence of mannuronic acid and uronic acid which function the CH group stretches at 828-935 cm^{-1}. Thermal stability between 250-300°C. So, it is suitable for its applications.

Keywords: sodium alginate, *S. aquifolium*, *S. cinereum*, synthesize, characterization

CCP-12

ROCK1 in Metastasis as The Target of *Caesalpinia sappan* L. Heartwood Compounds: a Virtual Metabolomic Study

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ABSTRACT

Background: ROCK1 is a metastasis-related kinase that is involved in metastasis. ROCK1 high expression level was known to be related with poor prognosis of cancer. *Caesalpinia sappan* (CS) was known to inhibit cancer cell migration, but the molecular mechanism remains unknown. **Objective:** This study aimed to discover the molecular mechanisms involved in cancer metastasis that can be targeted by CS heartwood metabolite, especially ROCK1 regulation on cancer metastasis. **Methods:** Online databases had been used to retrieve several data, including CMAUP, Oncolnc, Gepia, Genecards, UALCAN, and ChEMBL. ROCK1 inhibition models were computed using KNIME Analytics software, followed by molecular docking to analyze the interaction between ROCK1 and CS metabolites. Lastly, STRING was used to determine the protein network on cancer metastasis regulation targeted by CS metabolites. **Results:** Based on the online database, ROCK1 was highly expressed on pancreatic ductal adenocarcinoma (PDAC) and was not favorable ($p<0.01$). Based on the random forest algorithm, we discovered that 5 CS metabolites were predicted to have ROCK1 inhibitor properties. All of them were molecular docked using MOE software and we found that brazilin has a high-scored affinity compared to known ROCK1 inhibitors, fasudil and y27632. Our analysis on the STRING protein network enrichment observed that CS metabolites have a high interaction score with PDAC metastasis regulator proteins. **Conclusion:** Based on this study, ROCK1 has the potency to be the target protein on PDAC therapy. Five CS metabolites were potential to target ROCK1 and inhibit the progression of PDAC invasion.

Keywords: Sappan wood, pancreatic cancer, bioinformatic, *Caesalpinia sappan*, ROCK1, metastasis, molecular docking

CCP-13

Galangal's (*Alpinia galanga*) Potential as Immune Checkpoint Inhibitor Targeting CTLA-4 Protein: Bioinformatic and Chemometric Studies

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ABSTRACT

Background: Cytotoxic T-Lymphocyte Associated Protein 4 (CTLA-4) is an immune checkpoint that acts as a negative modulator of T cells. Therefore, in the therapy of cancer, a CTLA-4 blocker is needed to T cells fight the cancer cells. Galangal (*Alpinia galanga*) is a typical Indonesian herb that has an immunopotentiation effect through PD-1 and PD-L1. However, the activity of galangal to inhibit the CTLA-4 protein in immune cells is not yet known. **Objective:** This study aims to explore the phytochemical profile of galangal n-hexane extract (GE) which has the potential to block CTLA-4 protein. It also aims to discover the correlation of galangal physicochemical properties of each compound with its interaction strength with CTLA-4. **Method:** The data were obtained from GC/MS analysis and several online databases from PDB, PubMed, and PubChem. The interaction strength of the compound with CTLA-4 was obtained by molecular docking. Meanwhile, correlation analysis was obtained by chemometric analysis. **Results:** From 28 compounds that contain in galangal extract, the strength of interaction with CTLA-4 was the highest for Carvyl Acetate with the docking score -9.3133 kcal/mol. Meanwhile, according to the loading plot obtained from the chemometric analysis, the interaction strength and XLogP3 showed a negative correlation. **Conclusion:** Based on this study, GE has the potency to block CTLA-4 protein. In addition, it was found that the XLogP3 variable is inversely proportional to the strength of the compound's interaction with CTLA-4.

Keywords: CD152, immunotherapy, molecular docking, PCA, CTLA-4 blocker

CCP-14

The Potency of Gelsolin Inhibition in Epithelial-Mesenchymal Transition Using Active Compounds of *Caesalpinia sappan* through Virtual Proteomics Approach

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ABSTRACT

Background: *Caesalpinia sappan* L. was reported to have anti-migrative and anti-invasive activity towards colon cancer and highly metastasis breast cancer cell lines. Hepatocellular Carcinoma (HCC) is a migrative malignancy with a high mortality rate annually. Gelsolin has an important role in the EMT transition of HCC that leads to its migration activity. **Objective:** This study unfolded the potency of active compounds in *C. sappan* as a chemopreventive agent targeting gelsolin in HCC through molecular docking. **Method:** The data in this article were retrieved from bioinformatics and online databases, including CMAUP, GEPIA, UALCAN, and OncoLnc. Furthermore, we performed molecular docking using Molecular Operating Environment (MOE) between the crystal structure of gelsolin domain 1-3 (PDB ID: 3FFK) and six active compounds of *C. sappan* and analysed the affinity score. **Results:** Based on the metabolomic profiles of *C. sappan* retrieved from CMAUP, we found six active compounds having anti-migrative activity. The expression profile and survival plot obtained from UALCAN and OncoLnc showed that gelsolin is overexpressed in HCC and HCC patients with high expression gelsolin have poor survival prognosis. Active compounds with the three highest affinity scores against gelsolin domain 1-3 were 3,7-O-dimethylquercetin (-17.509), sappanone A (-15.332), and brazilin (-14.489). The scores were compared to ATP as a native ligand (-22.417) and gelsolin inhibitory drug latrunculin A (-14.987). The affinity scores of *C. sappan* compounds were comparable with latrunculin A as an anti-migratory drug targeted on gelsolin. **Conclusion:** Based on our current study, *C. sappan* has the potency as a chemopreventive agent targeting gelsolin in HCC with anti-migrative activity.

Keywords: hepatocellular carcinoma, *Caesalpinia sappan*, gelsolin, epithelial-mesenchymal transition, molecular docking, bioinformatic

CCP-15

Metabolomic Analysis of *Piper nigrum* Essential Oil and Its Potential as co-chemotherapy Agent for Prostatic Cancer through JAB1 Inhibition: A Virtual Proteomics Study

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ABSTRACT

Background: Prostate adenocarcinoma (PRAD) is usually detected at a late stage with overexpression of JAB1 protein as a marker of poor prognosis. Compounds in *Piper nigrum* essential oil (PNEO) are known to have anticancer activity and are expected to inhibit JAB1 as an alternative PRAD treatment. **Objective:** This study aimed to discover the molecular mechanisms involved in cancer metastasis that can be targeted by PNEO, especially JAB1 regulation on prostatic cancer metastasis. **Methods:** Analysis of PNEO compounds was carried out by GC-MS. Results of GC-MS analysis were docked using MOE application to obtain affinity value of compound for JAB1 protein. Molecular network analysis was carried out through GeneCards, SwissTargetPrediction, Interactivenn, and STRING databases. **Results:** GCMS analysis detected 150 compounds in PNEO. MOE analysis obtained 7 compounds: Methyl linolelaidate; (-)-Caryophyllene oxide; Delta-elemene; Trans-caryophyllene; (R)-(-)-14-Methyl-8-hexadecyn-1-ol; Tetrahydropiperine; and Palmitic acid, with lower docking score than native ligand of JAB1. This lower docking score indicates that these 7 compounds have stronger bond with JAB1 than their native ligand, so they have potential as JAB1 inhibitory agents. Data analysis using GeneCard, SwissTargetPrediction, and Interactivenn showed the presence of 27 intersecting proteins, which play a role in prostate cancer proliferation with a positive result of STRING analysis on KEGG Pathways enrichment with a confidence value of 1.57. **Conclusion:** Based on this study, JAB1 has the potency to be the target protein on PRAD therapy. Seven PNEO metabolites were potential to target JAB1 and inhibit the progression of PRAD invasion.

Keywords: *Piper nigrum*, prostate cancer, bioinformatic, JAB1, molecular docking

CCP-16

The Potency of Citrus Flavonoid as A Chemopreventive Targeting GGPS1 in Liver Cancer: A Bioinformatic Study

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ABSTRACT

Background: GGPS1 is an unfavorable prognosis in liver cancer development. The side effects of therapeutic standards and chemoresistance in cancer therapy encourage the development of therapeutic enhancing agents from natural resources. *Citrus reticulata* peels are rich in compounds with cytotoxic activities, especially flavonoid compounds i.e. tangeretin, naringenin, nobiletin, and hesperidin. **Objective:** This study aims to determine the potential of citrus flavonoids as chemopreventive agents target GGPS1 through bioinformatics studies. **Methods:** The expression level of GGPS1 was obtained from the UALCAN database, while its correlation with survival rate was obtained from the GEPIA database. Prediction models regarding the potential inhibitors of citrus peel compounds against GGPS1 were obtained through KNIME software and the ChEMBl database, followed by a literature search on the chemopreventive activity of citrus flavonoid compounds in orange peels. The molecular docking approach was used to predict the molecular interactions as indicated by the docking score. **Results:** The results showed that overexpression of GGPS1 reduced the survival rate of liver cancer patients. Three citrus flavonoid compounds, namely tangeretin, nobiletin and naringenin, showed GGPS1 inhibition potential with predictive values of 0.71; 0.60; and 0.51, respectively. The molecular docking results showed that tangeretin and nobiletin had the lowest docking scores compared to native ligands and zoledronate, a commercially available drug as comparison. **Conclusion:** Further development on the chemopreventive potency of orange peel compounds on the target protein needs to be carried out through in vitro and in vivo studies.

Keywords: GGPS1, liver cancer, citrus flavonoids, bioinformatics

CCP-17

Culture Optimization of *Streptomyces sp.* GMY01 Bacteria as Anticancer Agent by Chemometric Analysis

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ABSTRACT

Background: Breast cancer is still a major health problem in the world because of its high morbidity and mortality. The main problem in cancer treatment is the resistance to anticancer and the emergence of serious side effects due to chemotherapy. The need for sensitive anticancer with a specific mechanism of action is urgently needed. One of the potential producers of new anticancer molecules to be developed is secondary metabolites produced by Actinomycetes. Previous research related to Actinomycetes proved that the cultured methanol extract of *Streptomyces sp.* GMY01 from the coast of Krakal, Gunung Kidul has very strong cytotoxic activity on breast cancer cells MCF-7 and T47D with IC_{50} values of 0.6 and 1.3 µg/mL. **Objective:** This research studied the culture method optimization of *Streptomyces sp.* GMY01 to determine the best method for the culture of these bacteria using chemometric analysis. **Method:** The variation of the culture methods covers culture medium (SNB and TSB medium), culture container (erlenmeyer and baffled erlenmeyer), part of the extract (pellet and supernatant) and duration of culture harvest (3 and 5 days). **Results:** The result of culture container optimization using baffled and standard Erlenmeyer got the mean of pellet weight of 8.93 and 5.27 g, respectively. The results of the optimization of the culture method based on chemometric analysis showed that the culture method using Starch Nitrate Broth (SNB) media, an Erlenmeyer container and a culture time of 5 days showed the best results and cytotoxic activity with IC_{50} value of 23 µg/mL compared with other culture methods. **Conclusion:** The results of this study concluded that chemometric analysis can be used to study the correlation of several variations of culture treatment with the potency of the anticancer form *Streptomyces sp.*GMY01 bacteria.

Keywords: *Streptomyces sp.* GMY01, culture optimization, cytotoxic activity, anticancer agent, chemometric analysis

CCP-18

2-Benzoxazolinone from *Acanthus ilicifolius* Leaves Potential for MCF-7 Breast Cancer Cell Inhibition via Estrogen Receptor

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ABSTRACT

Background: Estrogen receptors subtype alpha (ERα) or beta (ERβ) is highly expressed in different cancer cells. Inhibition of ERs by small molecules is a promising approach to develop a novel cancer treatment. *Acanthus ilicifolius* (Jeruju) leaves contain a heterocyclic molecule 2-benzoxazolinone. Its derivative possesses anticancer on cancer cell types such as HeLa, MCF-7, A-549, and SW-480. However, the mechanism of cancer cell inhibition is an enigma. **Objective:** This study aimed to unmask the activity of 2-benzoxazolinone from *Acanthus ilicifolius* to inhibit the growth of the MCF-7 breast cancer cell line via estrogen receptor modulation. **Method:** We preliminary identified the presence of 2-benzoxazolinone obtained from ethyl acetate fraction of ethanolic extract *Acanthus ilicifolius* leaves using high-performance liquid chromatography (HPLC). The modulation mechanism was predicted by molecular docking of 2-benzoxazolinone toward estrogen receptor alpha (PDB ID: 2JF9) and its beta isoform (PDB ID: 5TOA). Subsequently, MCF-7 cell viability assay was performed to validate the *in-silico* prediction. **Results:** 2- Benzoxazolinone was identified in subfraction number 3 (SF-3) of ethyl acetate fraction obtained by column chromatography separation with gradient solvent. The binding energy of 2-benzoxazolinone toward ERα and ERβ exhibited a similar score (-6.3 kcal/mol). 2-Benzoxazolinone and SF-3 showed inhibition toward MCF-7 breast cancer cell lines with IC_{50} value 35.4 µM and 588.7 ppm, respectively. **Conclusion:** 2-Benzoxazolinone from *Acanthus ilicifolius* leaves may be a potent small molecule that inhibits the growth of MCF-7 breast cancer cell line via estrogen receptor modulation.

Keywords: 2-Benzoxazolinone, *Acanthus ilicifolius*, breast cancer, estrogen receptor

CCP-19

Chemopreventive Activity of *Gnetum gnemon* L. Ethyl Acetate Fraction on Colon Cancer Cells Line

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ABSTRACT

Background: Cancer is a disease with a relatively high mortality rate. Cancer treatment using natural products has less side effects than chemotherapy. Melinjo (*Gnetum gnemon* L.) is known to have antioxidant and cytotoxic activity. **Objective:** This study aims to determine the cytotoxic activity of the Melinjo Seed Ethyl Acetate Fraction (MSEAF) against colon cancer cells WiDr by *in vitro* and *in silico* study. **Method:** Melinjo seeds were extracted by maceration method using 70% ethanol then fractionated using ethyl acetate to obtain Melinjo Seed Ethyl Acetate Fraction (MSEAF). The STITCH-STRING bioinformatics test to determine the target protein of the compounds, *molecular docking* using *Autodock Vina* to determine the binding affinity between the compounds with target protein, and MTT *Assay* to determine the cytotoxic activity of MSEAF. **Results:** The results of the bioinformatics test showed that the target proteins of resveratrol and isorhapontigenin compounds were AKT1-EP300 and SIRT1-TP53. In the *in silico* test using *molecular docking*, isorhapontigenin and SIRT1 protein had the best binding affinity with a *docking* score of -8,9 kcal/mol. MTT *Assay* cytotoxic test showed that MSEAF was toxic on colon cancer cells WiDr with an IC_{50} value of 51,64 g/mL and chemotherapy drug 5-FU had an IC_{50} value of 261,64 g/mL on colon cancer cells WiDr which was categorized as moderately toxic. **Conclusion:** This study shows that MSEAF has the potential to be used as an anticancer agent in colon cancer by *in vitro* and *in silico* study.

Keywords: Gnetum gnemon L., bioinformatics, molecular docking, cytotoxic, WiDr

CCP-20

Antioxidant and Anticancer Activity of *Dillenia serrata* Thunb Ethanol Extract against Breast Cancer Cell Line MCF-7

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ABSTRACT

Background: The breast cancer incidence rate of women in Indonesia ranks number one with 12/100.000 cases. The development of comprehensive chemo-therapy to treat it is still of interest to researchers. *Dillenia serrata* Thunb belongs to *Dilleniaceae, an endemic* plant from Sulawesi. Traditionally, the bark and roots are used for treating liver, blood vomiting, and anti-inflammatory. **Objective:** This research investigated the antioxidant ability and cytotoxic and antiproliferative effects of the ethanolic extract of *D. serrata* Thunb against the MCF-7 cell line. **Method:** The leaves of *D. serrata* were macerated, while the bark and root samples were refluxed with 96% ethanol as solvent. All extracts were evaporated with a rotary evaporator. Qualitative evaluation of the phytochemical content of leaf extract (EED), bark extract (EEKB), and root extract (EEA) were done using the standard tube test method. The antioxidant assay was carried out using the DPPH. The cytotoxic and antiproliferative activity was determined in vitro using MTT assay against the MCF-7 cell line with a series of concentrations from 12.5– 400 mg/mL. Doxorubicin was the positive control applied at a concentration of 3.125–100 mg/mL. **Results:** The antioxidant activity showed that EED had the highest antioxidant activity, followed by EEA and EEKB, respectively, with IC_{50} values of 95.66, 335.96, and 270.5 mg/mL. EED and EEA's cytotoxic ability is considered moderate cytotoxic with an IC_{50} ranging from 100 to 500 mg/mL. Antiproliferation assays showed that EED and EEKB could inhibit the cell cycle by doubling the time value at 102.75 h for EED and 692 h for EEKB. **Conclusion:** The results showed that the ethanolic leaf extract of *D. serrata* had the highest potency for both antioxidant, cytotoxic, and antiproliferative effects compared to the other two extracts.

Keywords: dillenia serrata, antioxidant, cytotoxic, antiproliferative, MCF-7

CCP-21

The Potency of Sappan Wood (*Caesalpinia sappan* L.) as Co-chemoterapy Agent in Ovarian Cancer Targeting SUMO1 Protein

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ABSTRACT

Background: Ovarian cancer (OV) is gynecological cancer with the highest mortality rate. Cancer cells have an imbalance between proliferation and cell death (apoptosis). SUMO1 is known as an inhibitor of cancer cell apoptosis. Previous studies have reported that sappan wood extract (SWE) and its isolates have the activity to inhibit the proliferation of various cancer types, including OV. **Objective:** This research aims to reveal potential of compounds in sappan wood (SW) as an anticancer agent by targeting SUMO1. **Method:** We used the UALCAN, Protein Atlas, STRING, and Genecards databases to obtain the profile and expression of SUMO1 and also survival rate of OV patients. Pubchem and CMAUP database used to obtain metabolomic profiles of SW. ChEMBL used to make KNIME prediction models which are used to predict compound activity in SW. Furthermore, the affinity of active compounds in SW with SUMO1 protein were analyzed using MOE. **Results:** Based on Random Forest algorithm with true positive rate 0.799 and accuracy 0.95 on KNIME analysis with parameter IC_{50} value, there are 5 compounds with highest activity inhibit sumo activating enzyme (SAE) namely protosappanin-d, hematoxylin, brazilin, brazilein, and brazilide-a with docking scores -14.2131, -12.8420, -10.7626, -10.3230, and -10.0180. This shows that protosappanin-d, hematoxylin, and brazilin more easily bind to SAE complex than their native ligands (-10.7103). **Conclusion:** The overall results of study indicate that the compounds contained in SW have potential to be developed as co-chemoterapy agent against OV by targeting regulation of SUMO1.

Keywords: *Caesalpinia sappan* L., apoptosis, ovarian cancer, SUMO1, co-chemotherapy

CCP-22

Cytotoxic Activity of Melinjo Seed Ethanol Fraction (*Gnetum gnemon* L.) Against HeLa Cells and Bioinformatics Assay Targeted Cervical Cancer Regulatory Proteins

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ABSTRACT

Background: GLOBOCAN data for 2020 shows that cases of cervical cancer in Indonesia reached 36,633 cases. The usual treatment uses chemotherapy but serious side effects often occur. Melinjo (*Gnetum gnemon* L.) is known to have some potential as anticancer. Melinjo seeds are reported to contain resveratrol and oleic acid which can induce cancer cells apoptosis. **Objective:** The purpose of this study was to determine the cytotoxic activity of melinjo seed ethanol fraction (MSEF) forHeLa cells and its inhibitory power against cancer proteins. **Method:** Extraction of melinjo seed powder using70% ethanol. The cytotoxic activity of MSE for HeLa cells using the MTT Assay method. In bioinformatics assay using STITCH-STRING to obtain target proteins. A molecular docking test was used to determine the binding affinity between the test compounds (resveratrol and oleic acid) andthe target protein. The comparison used ispaclitaxel. **Results:** The results of MSEF are 6.02 g and have moderate cytotoxic activity with an IC_{50} value of 784 µg/mL. In bioinformatics, the test showed that the target proteins were MYC-TP53 (Resveratrol) and SERPINE1-VEGFA (Oleic acid). Then for the molecular docking test, the stronger binding affinity is obtained for the interaction of resveratrol and TP53 with a docking score of -7.2 kcal/mol. These results showed similar potency to paclitaxel where the docking score was-7.3 kcal/mol. **Conclusion:** This study shows that MSE has the potential to be developed as a chemopreventive agent in cervical cancer.

Keywords: *Gnetum gnemon* L., HeLa cells, cytotoxic, bioinformatics, molecular docking

PESC-12

The Association of Knowledge and Adherence to Clinical Outcome in Type 2 Diabetes Mellitus Patients in Several Health Centers in Bandar Lampung

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ABSTRACT

Background: One of the barriers to good blood sugar control is the lack of knowledge or education about the goals of therapy in optimal blood sugar control and medication adherence. **Objective:** This study aimed to determine the Association of knowledge and adherence to the therapeutic achievement of type 2 diabetes mellitus patients in several health centers in Bandar Lampung. **Method:** This study used a cross sectional design which was conducted in several health centers in Bandar Lampung in August-October 2020. This study applied the DKQ-24 instrument to measure the level of knowledge and MARS-5 to measure the level of medication adherence. Outcome assessment of the clinic is based on the value of FPG, RPG. The data obtained were analyzed using Chi-Square analysis and logistic regression analysis. **Results:** The total respondents involved were 176 patients with the majority having unachieved clinical outcomes (69.3%), poor knowledge (70%), and relatively low levels of adherence (57.4%), based on the results of the chi square analysis. shows that there is no significant effect between the level of knowledge on the clinical outcome (p=0.651, OR=0.862). Significant results occurred in the relationship between adherence to clinical outcomes (p=0.048, OR=1.917, CI=1.002-3.665). Based on the logistic regression analysis, there were variables that influenced the influence of adherence to clinical outcomes, namely BMI (p=0.014), and Gender (p=0.016). **Conclusion:** These results indicate that adherence has an influence on clinical outcomes in Type 2 DM patients in several health centers in Lampung which are influenced by the variables of BMI and gender.

Keywords: knowledge, compliance, clinical outcome, DM Type 2

PESC-13

3 Co-TEAM: A Logic Model for Pharmacy Health Coaching among Substance Use Disorders Patients

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ABSTRACT

Background: Pharmacy health coaching on various chronic diseases has been widely used with promising results. Drug addiction is a chronic disease, however, the intervention model for pharmacy health coaching in these patients has not been previously reported. **Objective:** Developing a logic model for pharmacy health coaching among substance use disorders patients that can be used by community pharmacists as a tool to support development, innovation, monitoring, and evaluating the performance of pharmacy health coaching. **Methods:** A logic model to develop pharmacy health coaching model following a process consisting of four steps: (1) a literature review to identify key values, scope, delivery & tools, the content of the session, and competencies for pharmacy health coaching; (2) focus groups discussion (FGD) to obtain information from specific sources and discuss the results of the literature review; (3) developing a logic model based on the finding from steps 1 and 2; and (4) Interviews with stakeholders to discuss and fine-tune the model. **Results***: Step 1. Literature review*. From Scopus and Pubmed we identified 381 articles according to keywords. After the exclusion process, 10 eligible articles were obtained. The most frequently mentioned scope in eligible articles is about providing pharmaceutical care for chronic diseases, a collaboration between coaches and patients to improve their clinical outcomes, maintain a healthy condition, or at least prevent worsening the sick condition that will ultimately increase the cost of treatment/medication, patients' attitudes to experience positive changes, and disease management. *Step 2. FGD.* The FGD lasted for 150 minutes and was attended by 11 participants. Competence according to the health professional perspective includes attitude, knowledge, and skills. Attitude includes empathy, enthusiasm, confidence, and reliability. The knowledge that must be possessed includes mastery of the trans-theoretical model, understanding substance abuse & impact, pharmacotherapy for substance abuse, holistic and comprehensive approach, medication adherence, deal with patients' irrational beliefs, and psychoeducation. While the skills that must be possessed are communication, collaboration, consultation, and motivational interviewing. *Step 3. Developing a logic model.* The 3 Co-TEAM model outcomes were developed which consist of communication, collaboration, consultation, training, education, attitude, and motivational interviewing. *Step 4. Interview with stakeholders.* The logic model was then discussed with stakeholders. The pharmacy health coaching model fits with the health system, except for the "psychosocial interventions" component from health coaching activities by pharmacists. It was recommended by experts to be removed so pharmacists do not overlap with other health professionals (*e.g.*, psychologists), and intervention will also be more efficient and focused. **Conclusion:** We were successful in developing the 3 Co-TEAM models for pharmacy health coaching which provides steps to implement this service in an objective, organized and comprehensive manner. The proposed model can function as a tool that provides guidance and reference for pharmacists in the process of implementing pharmacy health coaching among substance use disorders patients and collaborating with other health professionals.

Keywords: logic model, pharmacy health coaching, substance use disorders, pharmaceutical services, patient-centered care

PESC-14

Provision of Antibiotic Injections to the Patient Caring in Internal Disease Inpatient at Palembang Hospital

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ABSTRACT

Background: The use of antibiotics (AB) must be in accordance with clinical needs. Improper use has various negative impacts, including the emergence of side effects, accelerated resistance, the risk of therapy failure, increases the burden of the patient's disease, the length of time the patient suffers, and increases the cost of treatment. **Objective:** The purpose of this study was to analyze the accuracy of injecting antibiotics in the inpatient room. **Method:** This type of research is observational with a descriptive approach. The population of this study were all hospitalized patients who were given antibiotics in January-April 2019 totaling 176 seen on the medical record card. **Result:** The exact timing of the injection of antibiotics was seen from the suitability of the medical record records with the initials of the nurses (±30 minutes) from each first administration. The frequency of age 46-65 is the most given antibiotics. The frequency of body weight <70 kg the most using injection antibiotics according to the dose. The dose of AB with body weight >70 kg has not shown any dose adjustment. In the history of allergies, only 1 patient was found to be allergic to antibiotics from the total sample. **Conclusion:** The conclusion is that the timing of the injection of antibiotics is stated to be 80% on time for the injection of antibiotics while 20% is not correct. As many as 20% have not complied in writing medical records.

Keywords: Inpatient; antibiotic drugs, injection, bodyweight

PESC-15

The Management of Minor Ailments Scope and Curricula across Indonesian Pharmacy Schools

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ABSTRACT

Background: The provision of advice by community pharmacy staff for the management of minor ailments (MMA) is beneficial to the community. The demarcation of professional roles creates challenges for academics, including the delivery of MMA courses. Limited evidence exists regarding the nexus of MMA education in Indonesian pharmacy and technician courses. **Objective:** This study examined how pharmacy academics interpret the scope of minor ailments and teach minor ailments across Central Java, Indonesia, pharmacy institutions. **Method:** Online surveys were conducted between 5 November 2020–18 January 2021 of academics teaching the MMA to pharmacy and technician students from 30 institutions. Percentage of common responses (PCR) described similarity of perceived scopes of practice of pharmacists and technicians by academics. **Results:** A total of 12 academics teaching pharmacy (P) and 10 teaching technician (T) students responded to the survey. The majority of academics (P=8/12, 66.7%; T=6/10, 60.0%) were teaching in MMA courses which varied in total time from 1 and 100 hours. Formulating a diagnosis for MMAs was considered a relevant topic for both pharmacy students (P=8/12, 66.7%) and technician students (T=6/10, 60%). Academics teaching pharmacy and technician students perceived that the following ailments were limited to pharmacist's scope of practice: indigestion/heartburn, migraine, dermatitis, gastro-oesophageal reflux disease, diarrhoea, and allergy/rash (PCR above 80%). **Conclusion:** There is a need to define scopes of practice for pharmacists and pharmacy technicians in the MMA. Consensus amongst academics teaching pharmacy and technician students and the support of professional bodies are important for future practice and patient safety.

Keywords: pharmaceutical education, community pharmacy services, pharmacists, pharmacy technicians, scope of practice, Indonesia

PESC-16

The Role of Antibiotics and Antivirals on Clinical Improvement of COVID-19 Patients in Yogyakarta

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ABSTRACT

Background: COVID-19 pharmacological therapy on antibiotics and antivirals as interim treatment might generate new problems such as antibiotic-resistance and adverse effects in the future. Experts were working on their capability to discover the efficacy and safety of these medicines. **Objective:** This study aimed to determine the correlation of antibiotics and antivirals on clinical improvement COVID-19 patients. **Method:** Study design was analytical observational, cross-sectional, with retrospective approach. Research was taken in Sleman General Hospital Yogyakarta using medical record data of COVID-19 inpatients from March 2020 to May 2021. Patient's demographic and correlation between the medicines against clinical improvement were assessed. Clinical improvement marked by length of stay and clinical outcome. **Results:** A total of 220 met the inclusion criteria with a high prevalence on male (52.3%), 45-64 years old (48.2%), moderate level (70.5%), and with comorbid (85.5%). The most frequently used antibiotic was the combination of azithromycin plus levofloxacin (53.2%) while antiviral was remdesivir (35.9%). There was no correlation on the administration of single or combination therapy against clinical improvement. A correlation was found between regimen type of antiviral and duration of hospital stay (p value 0.037) with the 3.54 times higher of longer duration might occur in a single antiviral group. **Conclusion:** COVID-19 was likely occurred in male, 45-64 years old, with comorbid, and in moderate levels. Regimen type of antiviral has an effect on duration of hospital stay. Study implication was the efficacy of antiviral clinical use in Indonesian COVID-19 patients.

Keywords: COVID-19, antibiotics, antivirals, length of stay, clinical outcome

PESC-17

Identifying Beers Criteria Medications among Older Outpatients in Harapan Kita National Heart Center

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ABSTRACT

Background: Elderly with cardiovascular diseases are more likely to have complications and require multiple drug therapy. These result in increased risks of adverse drug reaction (ADR). According to the Beers Criteria developed by the American Geriatric Society (AGS), there are some potentially inappropriate medications (PIM) for patients aged ≥65 years. Furthermore, in outpatient cases, exposure to PIM may lead to unmonitored ADR. **Objective:** to investigate the prevalence of potentially inappropriate medication (PIM) in older outpatient prescriptions using The AGS 2015 Beers Criteria. **Method:** 333 electronic health records were retrieved from the hospital system with systematic random sampling. The outpatient polyclinic visits from 2017-2019 were recorded, including drug prescribed, primary diagnoses, and laboratory data. **Results:** A total of 235 out of 333 elderly patients were identified as receiving at least one potentially inappropriate medication (PIM) in the prescription. In the category of drugs that need to be avoided, proton pump inhibitors (PPIs) were the drugs most commonly prescribed for geriatric patients (n= 93; 27.9%). In the category of drugs used with caution, there were diuretics (n=191, 57.4%) and aspirin for the elderly >80 years (n=4; 1.2%). At last, in the category of drug interaction, terazosin and furosemide were concomitantly used in 2 patients (0.6%). **Conclusion:** the prevalence of PIM should lead to closer monitoring of drug use in older patients. It is recommended to use the Beers list as a tool for hospital pharmacists to improve outpatient care.

Keywords: geriatric, beers criteria, proton pump-inhibitor

PESC-18

Evaluation of the Use of Pain Relievers through Self-Medication and Potential Drug Interaction in the Pharmacy at Magetan Regency

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ABSTRACT

Background: Pain is one of the symptoms that can be relieved by the community through self-medication. The rational use of drugs in self-medication ensures that people get medicines according to their needs. Severe symptoms and dangerous drug interactions is the risk of inappropriate self-medication. **Objective:** The aim of this study was to evaluate the use of pain relievers through self-medication based on the appropriate indications, drug selection and dose also the potential of drug interactions in Pharmacy at Magetan Regency. **Method:** Observational research was conducted to obtain information from respondents using a questionnaire in 2019. A total of 150 respondents, selected by purposive sampling method, were involved in this study. Respondents were pharmacy visitors who have bought pain relievers, aged 17-55 years, communicative and were willing to be respondents. **Results:** The use of pain relievers in 15 respondents (10%) was inappropriate. This was caused by the condition of the patient who should be referred to the doctor, namely: severe pain, more than 3 days, due to an accident, pain when chewing and opening the mouth. Inappropriate drug selection was found in 15 out of 135 respondents with appropriate indications (11.1%). This was caused by the use of prescription drugs, such as: diclofenac sodium 50 mg, diclofenac potassium 50 mg and meloxicam 7.5 mg. No potential drug interactions were found in 28 respondents who used other drugs. **Conclusion:** 20% of respondents have not used pain relievers through self-medication appropriately.

Keywords: analgesics, appropriate drug, pain relievers, self-medication

PESC-19

The Impact of the COVID-19 Pandemic on the Drug Management and Drug Availability in Three Public Health Centers in Kendari City

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ABSTRACT

Background: The pandemic of Coronavirus Disease-19 or COVID-19 impacts almost all aspects of life, including the management and level of drug availability in health facilities. Puskesmas, known as the public health center, is a primary health service facility that usually became the first choice for seeking treatment. **Objective:** This study aimed to determine the impact of the Covid-19 pandemic on drug management and drug availability in three Puskesmas (Kandai, Lepo Lepo, Poasia) in Kendari City. **Method:** This study was descriptive and used retrospective data in 2019 (before the pandemic) and 2020 (during the pandemic). Data were obtained in quantitative and qualitative forms from document observations and interviews with relevant pharmacy installation officers. **Results:** The percentage value of drugs given on-demand increased at Puskesmas Lepo-Lepo and Poasia, but the opposite happened at Puskesmas Kandai. The percentage value of the empty stock (<1 month) increased, and the percentage value of the safe stock (12-18 months) decreased at each Puskesmas. The percentage value of less stock (1 to <12 months) decreased at Puskesmas Lepo Lepo and Kadia. The percentage value of the excess stock (>18 months) increased at Puskesmas Kadia, but the opposite happened at two other puskesmas. The percentage value of expired and or damaged drugs increased each Puskesmas. **Conclusion:** The COVID-19 pandemic had different impacts on some indicators and did not significantly impact other indicators at three public health centers in Kendari City.

Keywords: COVID-19 pandemic, drug availability, public health center

PESCP-20

Compliance to Health Protocols among Pharmacy Technician in Community Pharmacies

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ABSTRACT

Background: COVID-19 has been declared as a global pandemic by WHO on 11 March 2020. The virus is mainly spread through droplets. Nevertheless, the transmission of COVID-19 can be avoided by implementing health protocols in every activity. Pharmacy technicians as health workers in pharmacies have high risk of transmitting the COVID-19 virus. They often have direct contact with public or COVID-19 patients who come to pharmacies. **Objective:** This study aimed to determine the compliance level of pharmacy technicians to the COVID-19 health protocols and its correlations to the level of knowledge, organizational-environment and self-efficacy. **Method:** This study was designed descriptive correlational research with cross sectional study. A self-administered questionnaire was used to collect data. The participants were selected with simple random sampling among pharmacy technicians who worked in community pharmacies in Sleman. A total of 97 pharmacy technicians participated in this study. **Results:** The compliance levels were divided into low, medium and high. Most participants were in the medium level of compliance (53.6%), followed by high level (43.3%) and only 3.1% participants in low level. Statistical tests on organizational-environmental factors and self-efficacy showed a significance value (p<0.05) with a Pearson Correlation value of 0.391 and 0.346. While the level of knowledge showed no significance value (p>0.05) with a Pearson Correlation value of 0.152. **Conclusion:** There was a correlation between organizational-environmental factors and self-efficacy with the compliance level of Pharmacist Assistants to the COVID-19 health protocols with a weak level of relationship. While the level of knowledge showed results that there is no correlation.

Keywords: pharmacist assistants, COVID-19, health protocol, self-efficacy

PESC-21

Antibiotic Use to Meningoencephalitis Bacterial at Regional Hospital of Central Java

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ABSTRACT

Background: Bacterial meningitis and encephalitis is an infection of the central nervous system (CNS) to the brain parenchyma. The disease is estimated to reach 1,2 million cases per year with mortality rate of patients ranging 2%-30% worldwide. Cases of bacterial meningitis in Indonesia reached 158.100.000 cases per year, with the etiology of Haemophilus influenzae type B [Hib], Streptococcus pneumoniae [Sp]. High mortality and morbidity causing meningoencephalitis bacteria need to be re-studied related to the observation of bacterial sensitivity used in therapy. **Objective:** This study aims to determine the susceptibility of antibiotic use to clinical outcome in patients with bacterial meningitis and encephalitis inpatient ward. **Method:** This research was done with descriptive observational design with retrospective data collection to patient medical records which comply with inclusion and exclusion criteria. **Results:** The results of this study showed that the antibiotic is 64.70% suitable with the results of the culture and antibiotic sensitivity. 100% (34 patients) clinical outcome of suitable antibiotic which given definitively becomes better. Descriptions of the sensitivity bacterial meningitis and encephalitis of Dr. Sardjito Hospital are 65.21% Gram positive and 34.79% Gram negative. **Conclusion:** Antibiotic use for meningitis and encephalitis bacteria are Cefotaxime, Ceftazidime, Ceftriaxone, Gentamicin, Vancomycin, Imipenem, Clarithromycin, Ciprofloxacyn, and antibiotic combination

Keywords: bacterial meningitis-encephalitis, antibiotic, clinical outcome

PESC-22

Severe neutropenia and transaminitis in acute lymphoblastic leukemia children treated with FRALLE-2000 protocol

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ABSTRACT

Background: comprehensive study of severe neutropenia and transaminitis–treatment-related toxicities in childhood acute lymphoblastic leukemia (ALL) treatment–is lacking. **Objective:** To evaluate the incidence and associated risk factors of severe neutropenia and transaminitis during treatment period in ALL children treated with FRALLE-2000 protocol. **Method:** A retrospective study was conducted in 56 ALL patients treated with FRALLE-2000 regimen between January 2016 and March 2020 at Ho Chi Minh City Oncology Hospital. Data were collected from patients' medical records. Adverse events were assessed according to Common Terminology Criteria for Adverse Events (CTCAE) version 4.0. Severe neutropenia was defined as absolute neutrophil count [ANC]<1000/mm^3 and fever/infection or ANC<500/mm^3 with or without fever/infection; severe transaminitis was defined as grade ≥3 (*i.e.*, AST or ALT>5× upper limit of normal). **Results:** A total of 192 severe neutropenia episodes were observed during all phases (mean 3.43±2.12 per patient). These episodes occurred more frequently and earliest in the induction phase. Age more than 10 years-old, female and high-risk stratification were associated with higher incidence of severe neutropenia ($p<0.01$). 18 patients (32.1%) had laboratory evidence of severe transaminitis; recurrence of this event occurred in 7 patients. Patients experienced the most severe transaminitis events during the maintenance phase (13/28 events). **Conclusion:** Severe neutropenia and transaminitis events in ALL children treatment should be evaluated carefully, especially in children older than 10 years old, female, patients stratified at high-risk group and patients during maintenance phase.

Keywords: acute lymphoblastic leukemia, children, neutropenia, transaminitis, FRALLE-2000

PESC-23

The Development of "DOSING GAMA": an Application for Dose Adjustment in Patients with Renal and Hepatic Impairment

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ABSTRACT

Background: Pharmacokinetic variability between individuals in medication processes often produces different therapeutic results, so that individualization of drug dosage is important, especially in patients with renal and hepatic impairment. Preliminary research indicated that many drug dosages in patients with renal impairment were still not appropriate. One of the obstacles was the dose adjustment process took a considerable time for health workers in health facilities. **Objective:** This study aims to develop "Dosing GAMA", an Application of Dose Adjustment in Patients with Renal and Hepatic Impairment. **Methods:** This application was developed in two stages. The first stage was a preliminary study by mapping problems of drug use related to dose adjustment (including types of drugs that were widely used in hospitals) and therapy monitoring. The second stage was application development. **Result:** The Application of Dose Adjustments in Patients with Renal and Hepatic Impairment "Dosing GAMA" is a web-based application that is able to provide the dosage information needed for patients with renal and hepatic impairment. It provides information on 120 types of drugs that are often used in hospitals and it is also equipped with the calculation of Creatinine Clearance, Body Mass Index (BMI) and Body Surface Area (BSA). **Conclusion:** It is expected that this software is able to assist pharmacists and other health professionals in determining dose individualization and drug therapeutic monitoring in order to increase rational medication.

Keywords: dose adjustment application, dosing GAMA application, renal disease, hepatic impairment

PDDS-8

Formulation of Wound Healing Hydrogel From 70% Ethanol Extract Kelakai Roots (*Stenochlaena palustris* (Burm. F.) Bedd) with Polymer Combination of PVA and HPMC

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ABSTRACT

Background: Kelakai root (Stenochlaena palustris (Burm. F.) Bedd) contains an alkaloid, saponin, tannin, and flavonoid. This compound is known to have properties as wound healing. The effectiveness of wound healing increased by using hydrogel to deliver the active substance. The use of polymers played a role in delivering the active substance. **Objective:** This study aimed to formulate hydrogel as a wound healing with various concentrations of Polyvinyl alcohol (PVA) and Hydroxypropyl methyl cellulose (HPMC) K4M. **Method:** Extraction of Kelakai root is using the maceration with 70% of ethanol. Preparation of hydrogel by the solvent casting method with 0.2% Kelakai root extract. The physical characteristics of hydrogel investigated before and after the stability test included organoleptic, weight uniformity, thickness, pH, moisture content, and hedonic test of hydrogel Kelakai roots extract. The optimum formula tested for wound healing activity. Wound healing activities were carried out by cutting the rabbit's back and then observing the wound healing time for 14 days. The data obtained were then analyzed using Wilcoxon. **Results:** Physically, Kelakai root extract hydrogel met the test requirement. The results of the wound-healing activity showed that the hydrogel extract of the Kelakai root was able to heal the cut wound within seven days. There was a difference in wound healing time with a value of (p) = 0.014 < 0.05. **Conclusion:** The optimum formula obtained based on the stability test was F4 with a ratio of PVA and HPMC 1:4.

Keywords: Kelakai Root, Antioxidant, Hydrogel, PVA-HPMC, Wound Healing

PDDS-9

Surface Modification of MIL-100(Fe) with Mesoporous Silica Nanoparticles for Slow Release of Curcumin

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ABSTRACT

Background: As a class of biocompatible porous material, bio-metal-organic-frameworks (bio-MOF) is very promising to be used as a carrier for hydrophobic drugs including curcumin. However, the stability of bio-MOF against water and humidity in carrying out its application still needs to be improved. **Objective:** This presentation will discuss about the study on surface modification of MIL-100(Fe), [Fe3O(H2O)2(OH){C6H3(CO2)3}2.nH2O], with mesoporous silica nanoparticles and its application as a matrix in the slow release of curcumin. **Method:** Composite of MIL-100(Fe)@SiO2 (denoted as composite 1) was synthesized ex situ by sonochemical and reflux method, composite SiO2@MIL-100(Fe) (denoted as composite 2) was prepared in situ by mechanochemical method. XRD, FTIR, and EDX analysis proved the targeted materials were successfully synthesized. Based on SEM and TEM imaging, MIL-100(Fe) and composite 1 have irregular morphologies, SiO2 and composite 2 have spherical morphologies, with both composite formed core shell structures. **Result:** The presence of SiO2 in the composites can reduce the surface area of the MIL-100(Fe) and give impact in the loading and release properties and show the behavior of delayed release in composite 1 and sustained release in composite 2 at pH 5.8 compared to pH 7.4. **Conclusion:** This research demonstrated surface modification on MIL-100(Fe) have resulted in two profile materials potentially used as drug delivery systems triggered by pH.

Keywords: curcumin, composite, core shell, MIL-100(Fe), SiO2, slow release

PDDS-12

Optimization Polysorbate 80 and Sorbitan Monooleate 80 as Emulsifier in Cosmetic Foundation Containing Ethyl Cinnamate

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ABSTRACT

Background: Cosmetic foundation is a type of decorative makeup and commonly includes a sunscreen agent. Ethyl cinnamate is one of the potential organic essential oil sunscreens. Nevertheless, there is little study on ethyl cinnamate usage in cosmetics, particularly oil-in-water foundation cream. Using an emulsifier in oil-in-water foundation cream, a higher concentration does not guarantee higher oil phase recovery. However, using two combinations of emulsifiers such as polysorbate 80 and sorbitan monooleate 80 with the optimum combination can be the right solution. **Objective:** This study aims to optimize polysorbate 80 and sorbitan monooleate 80 in a cream foundation using ethyl cinnamate as an active ingredient designed to have an effective ability to protect facial skin from ultraviolet radiation and are safe to use. **Method:** The optimization formulas design of the emulsifier combination in foundation cream was made using the Simplex Lattice Design method with help Design Expert version 10.0.1. Parameter optimization were the value of pH, viscosity, spreadability, adhesion, and Sun Protection Factor (SPF) value. The stability test and skin irritation test of optimum formula were also conducted. As a positive control, Revlon Colorstay Foundation, one of the brand cosmetic foundations, was used (with National Food and Drug Agency of Indonesia number: NA18140300519). **Results:** The optimum ratio of polysorbate 80 and sorbitan monooleate 80 were 9.565 and 1.435 with the physical characteristics of pH 6.478+0.008; viscosity 5844.2+31.82 cPs; spreadability 6.16+0.11 cm; adhesion 3.346+0.14 seconds; SPF Value 22.385+0.48, and no irritation symptoms. **Conclusion:** The ethyl cinnamate foundation created was physically stable, had a pleasing look, and did not irritate the skin, making it safe to wear. It also provides efficient UV radiation protection.

Keywords: foundation, SPF, cinnamate

PDDS-14

Nanoencapsulated Formulation of Antibacterial Metabolites by *N. niigatensis* TP5 Strain with Ionic Gelation Technique Using Na Alginate

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ABSTRACT

Background: Formulation of nanoencapsulation of antibacterial metabolites from the fermentation of *Nocardia niigatensis* TP5 Strain has been carried out. To maintain the antibacterial metabolite activity, nanoencapsulated formulations with sodium alginate polysaccharides obtained from brown seaweed were carried out. **Objective:** This study aims to formulate antibacterial metabolite nanoencapsulation by using the ionic gelation technique using sodium alginate and CaCl2. **Method:** The nanocapsules were prepared by combining the extracellular secondary metabolite *N. niigatensis* TP5 Strain with the encapsulation sourced from Na alginate and CaCl2 by ionic gelation. The manufacturing methods include fermentation of *N. niigatensis* TP5 Strain with substrates derived from soy whey and molasses, nanoencapsulated formulation by varying the concentration and ratio of Na alginate, CaCl2, and antibacterial metabolites, and analysis of nanocapsules. The analysis and characterization of nanocapsules included: surface morphology and particle size, chemical constituents, and zeta potential using SEM-EDS, PSA, and antibacterial testing against *Escherichia coli* and *Staphylococcus aureus*. **Results:** The results showed that the best-nanoencapsulated formula contains the composition of Na alginate 0.3%, CaCl2 0.06% with a ratio of Na alginate: CaCl2: antibacterial metabolite is 2:4:1. The results of morphological observations showed that the capsule-shaped particles were evenly distributed with a particle size of 425 nm, zeta potential. -27 mV and antibacterial activity inhibited the growth of *E. coli* and S. aureus by 20 and 21 mm, respectively. **Conclusion:** The variation of the appropriate concentration ratio of Na alginate and CaCl2 greatly affects the size of the nanocapsules with an even distribution as well as maintaining and increasing antibacterial activity.

Keywords: antibacterial nanoencapsulation, N. *niigatensis* TP5 Strain, Na alginate, ionic gelation, CaCl2.

PDDS-15

Nanoencapsulated Formulation of Antibacterial Metabolites by Soil Actinomycete, *Nocardia sp.* TP5 from Tangkuban Perahu Mountain, West Java, Indonesia with The Ionic Gelation Technique Using Na Alginate

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ABSTRACT

Background: Formulation of nanoencapsulation of antibacterial metabolites from the fermentation of actinomycete strain designed as TP5 has been carried out. To maintain the antibacterial metabolite activity, nanoencapsulated formulations with Na alginate polysaccharides obtained from brown seaweed were carried out. **Objective:** This study aims to enhance antibacterial activity of *Nocardia sp.* TP5 in the form of nanoencapsulated formulations of antibacterial metabolites with ionic gelation technique using Na alginate and CaCl2. **Method:** The nanocapsules were prepared by combining the extracellular secondary metabolite *Nocardia sp*. TP5 with the encapsulation sourced from Na alginate and CaCl2 by ionic gelation technique. The manufacturing methods include fermentation of *Nocardia sp*. TP5, nanoencapsulated formulation by varying the concentration and ratio of Na alginate, CaCl2, antibacterial metabolites, as well as analysis of nanocapsules. The analysis and characterization of nanoencapsulation using SEM-EDS and PSA included: surface morphology, particle size, chemical constituents, and zeta potential as well as antibacterial testing against *Escherichia coli* and *Staphylococcus aureus*. **Results:** The results showed that the best-nanoencapsulated formula contains the composition of Na alginate 0.3%, CaCl2 0.06% with a ratio of Na alginate: CaCl2: antibacterial metabolite is 2:4:1. The capsule particles formed are evenly distributed over the entire surface with a particle size of 425 nm, zeta potential of -27 mV and antibacterial activity inhibited the growth of *E. coli* and *S. aureus* by 20 and 21 mm, respectively. **Conclusion:** The variation of the appropriate concentration ratio of Na alginate and CaCl2 greatly affects the size of the nanocapsules with an even distribution as well as maintaining and increasing antibacterial activity.

Keywords: antibacterial nanoencapsulation, soil actinomycete *Nocardia sp*. TP5, Na alginate, ionic gelation, $CaCl_2$

PDDS-16

Quercetin Nano-emulsion Preparation: A Preliminary Optimization

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ABSTRACT

Quercetin is considered to be one of the most powerful antioxidants among polyphenols, protecting the body against reactive oxygen produced both during normal oxygen metabolism and induced by exogenous damage. However, its poor oral bioavailability with only 2% in humans limits its potential activity per oral. Nano-emulsion helps oral bioavailability both on the solubility and permeability aspects, therefore we propose to use the formulation to improve quercetin oral biopharmaceutics performance *in vitro*. We found oleic acid superior to Miglyol 812, virgin coconut oil, and olive oil to dissolve quercetin, with Cremophor RH40 and PEG 400 worked best as surfactant and co-surfactant in combination with the oil, giving 74.79 nm of average particle size. Transmittance of above 80% were reached at 92.5 with surfactant combination level at least four times the proportion of oleic acid, with 3 to 1 Cremophor RH40-PEG 400 ratios. The best formula in our preliminary optimization so far is at the oleic acid to surfactant combination ratio of 1:8, with the surfactant consists of 3 to 1 Cremophor RH40-PEG 400 ratios, giving particles average size of 16.19 nm with poly-dispersity index of 0.216. Indeed the physical properties are excellent, yet the use of a high level of surfactant is not preferable therefore we still need to find a way for further optimization.

Keywords: quercetin, oleic acid, cremophor RH40, PEG400, nanoemulsion

HMNP-23

A Bibliometric Analysis of Preclinical Trials of *Tinospora crispa* (L.) Hook.f. & Thomson on Diabetes Mellitus

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ABSTRACT

Background: Trends in the utilization of herbal medicine and natural product have increased, including *Tinospora crispa* (L.) Hook.f.& Thomson to prevent and/ or cure diabetes mellitus. Recently, many literature data have been published related to *T. crispa* on diabetes mellitus, meanwhile, no existing paper on bibliometric analysis of this topic. **Objective:** This study aimed to investigate the existing published papers about preclinical trials of *T. crispa* to treat diabetes mellitus using a bibliometric approach with a focus on authors, countries, and keyword trends. **Method:** Scopus database was used to search the bibliographic information related to our topic which developing bibliometric. Information datasets were analyzed applying the bibliometric approach using Vosviewer 1.6.16. **Results:** A total of 24 original studies appeared from 1989 to 2019 with up and down in the numbers which covering 90 authors and 9 countries. The main topic of preclinical trials of *T. crispa* as antidiabetic from selected literature was dominated by the discipline of phytochemistry and pharmacology which was gained from analysis of the most influential papers, co-citation network of the most influential papers, bibliographical coupling network based on authors, and keyword co-occurrence network and overlay. **Conclusion:** The finding of our study has impacts for both theoretical aspects about research gaps of this topic (molecular mechanisms, diabetic complications, drug formulations, etc.) and managerial aspects such as encouraging research collaboration to develop this research topic.

Keywords: *Tinospora crispa* (L.) Hook.f. & Thomson, diabetes mellitus, bibliometric analysis, scopus, vosviewer

HMNP-24

Optimization extraction of curcumin from *Curcuma domestica* Vahl. rhizome with microwave-assisted extraction technique

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ABSTRACT

Background: Curcumin is a yellow dye derived from the turmeric plant (*C. domestica* Vahl.). In turmeric rhizomes, there are active compounds that are often used as traditional medicine in the form of curcuminoids. The microwave-Assisted Extraction (MAE) technique is an extraction technique that utilizes microwave radiation to heat the solvent quickly and efficiently and is also very suitable for extracting compounds that are not resistant to heat. **Objective:** This research was conducted to determine the level of curcumin from *C. Domestica* Vahl. Extract with MAE using Virgin Coconut Oil (VCO) as solvent. **Method:** Extraction of curcumin was carried out using *C. Domestica* Vahl powder with various weights (1 g, 1,5 g, 2 g, and 2,5 g) and VCO as solvent (mL), with an extraction time of 10 min and power 270 W. Curcumin from the extract was measure using High-Performance Liquid Chromatography. **Results:** The results were showed that the method has a limit of detection (LOD), which is 3.57±0.01 ppm, limit of quantification (LOQ) 11.91±0,04 ppm, and good linearity with a correlation coefficient (r) 0.9993. The curcumin level was determined with HPLC from each various weight (1.27±0.03 mg/g); 1.5 g (1.20±0.02 mg/g); 2 g (3.45±0.02 mg/g) and 2.5 g (3.44±0.01 mg/g) respectively. **Conclusion:** The results showed that the optimum weight for curcumin extraction with MAE is 2 g with 20 mL of VCO with 10 min extraction time and power (279 W).

Keywords: *C. Domestica* Vahl., curcumin, microwave-assisted extraction, high-performance liquid chromatography

HMNP-25

Identification of Chemical Compounds and Heme Polymerization Inhibition Assay of n-Hexane Fraction of Manuran (*Coptosapelta tomentosa* Valeton ex K. Heyne) Stem from Kotabaru South Kalimantan

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ABSTRACT

Objectives: This study was to determine the chemical compound and hem polymerization inhibition activity of the n-hexane fraction on the stem of C. *tomentosa* Valeton ex K. Heyne. **Method:** Identification of the chemical compound was carried out by tube test method while in vitro heme polymerization inhibition activity was carried out using modified *Basillico* method. **Results:** Phytochemical screening test and Thin Layer Chromatography test on n-hexane fraction of C. *tomentosa* Valeton stem ex K. Heyne was proven containing flavonoids, terpenoids and anthraquinone compounds. The percentage of heme polymerization inhibition from n-hexane fraction was 98.05; 96.94; 95.12; 91.71; 86.29; 76.53; 48.95%. The IC_{50} value of n-hexane fraction was 0.267±0.017 mg/mL, the positive control used in this study was chloroquine with an IC_{50} value of 0.214±0.012 mg/mL. Independent sample t-test analysis showed that the n-hexane fraction and ethyl acetate fraction had heme polymerization inhibition activity. **Conclusion:** n-hexane and ethyl acetate fraction from C. *tomentosa* Valeton stem ex K. Heyne has hem polymerization inhibition activity.

Keywords: *Coptosapelta tomentosa* Valeton ex K. Heyne, inhibition of hem polymerization, n-hexane fraction, phytochemical screening, TLC.

HMNP-26

Anti-aging Properties of Citronella Essential Oil by Targeting PTGS2, CYP19A1, and HMGCR in Cellular Senescence Pathway

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ABSTRACT

Background: Skin aging and its prevention are of concern to people. A natural ingredient widely used in topical treatment, citronella (*Cymbopogon nardus*) essential oil, has been known to reduce reactive oxygen species (ROS) levels that contribute to cellular senescence, one common cause of skin aging. Nevertheless, its anti-aging potential through senescence prevention has not been fully explored. **Objective:** This study aims to reveal the anti-aging properties of citronella essential oil through antioxidant activities via the cellular senescence pathway. **Method:** Protein targets of citronella constituents were predicted using SwissTargetPrediction. GeneCards database was utilized to understand the involvement of protein targets in the skin fibroblast cellular senescence. Possible activities and molecular interactions between involved protein targets with citronella constituents were further analyzed respectively using random forest modeling and molecular docking. **Results:** Six major constituents in citronella essential oil targeted antioxidant-related proteins. Protein targets PTGS2, CYP19A1, and HMGCR were involved in the skin fibroblast cellular senescence. Geraniol, citronellol, and nerol inhibited the inflammatory protein PTGS2 with a close affinity to one of the PTGS2-selective inhibitors, Rofecoxib. Meanwhile, citronellal and citronellol inhibited CYP19A1, a protein that contributed to endogenous ROS production. On top of that, antioxidant-related HMGCR protein was also inhibited by geraniol and citronellol. **Conclusion:** Citronella essential oil possibly prevents cellular senescence through its antioxidant properties by targeting PTGS2, CYP19A1, and HMGCR. Hence, citronella essential oil can potentially be developed as an anti-aging agent.

Keywords: citronella essential oil, cellular senescence, anti-aging

HMNP-27

Secang Wood Extract (*Caesalpinia sappan*) Prevents Aging through Inhibition of Cellular Senescence

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ABSTRACT

Background: Age-related diseases such as cancer and coronary heart disease increase with ageing-related mechanisms such as cellular senescence are involved in disease pathology. Age-related disease due to senescence is associated with inhibition of cyclin-dependent kinase (CDK) expression, especially $p16^{INK4a}$. Therefore, an understanding of cellular senescence may provide new therapeutic strategies to prevent and treat age-related diseases. **Objective:** This study aimed to explore the sappan wood extract effect on senescence and analyze the mechanism associated with $p16^{INK4a}$. **Method:** This research used mixed methods. Extraction and TLC was analyzed to identify compounds, and a cytotoxic MTT assay was performed to determine the growth inhibitory activity. SA-β-gal assay to analyze the number of senescence cells and a structural approach utilizing multiple virtual platforms to monitor their activity. **Results:** The yield of sappan wood extract and brazilin ethanol fraction obtained was 8.02% and 1.24%. Based on the TLC, sappan wood extract and brazilin ethanol fraction were confirmed to contain brazilin based on the similarity of RF values compared to the standard. Both have weak cytotoxic activity with IC_{50} values of 240 g/mL and 380 g/mL. Compounds in the sappan wood extract and brazilin ethanol fraction inhibited senescence by regulating OPA1, CDKN2A, P16INK4A, and TP53 genes. **Conclusion:** Based on the results of molecular docking, brazilin compounds can inhibit the P16INK4a gene more strongly than P16INK4a ligand. Based on this research, sappan wood has potential as anti-ageing agent that targets P16INK4a and CDKN2A genes in fibroblast cells ageing process. These results indicate that derived compounds can be further investigated as anti-breast cancer.

Keywords: sappan wood, brazilin, cellular senescence, $p16^{INK4a}$, CDKN2A

HMNP-28

Analgesic Activity of Herbal Extract Combinations for Common Cold

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ABSTRACT

Background: Common cold is often manifested by nasal congestion, cough, throat pain, and headache. In dealing with the pain, people can use synthetic or traditional (herbal) medicines. We developed an herbal product for the common cold that consists of several herbals, *i.e.* temulawak rhizome extract, legundi leaf extract, ginger rhizome extract, citrus fruit extract, and Echinacea purpurea Herb extract. This herbal combination has been evaluated for several pharmacological activities related to common cold symptoms. Here we report the analgesic activity of the herbal product that can relieve the pain symptoms. **Objective:** The objective of this study was to determine the analgesic activity of the herbal extract combination in mice. **Methods:** The analgesic test was carried out using the stretching method conducted by Millind and Monu (2012) with slight modifications. Mice were used and divided randomly into 5 groups, *i.e.* treatment groups (3 doses) and control group. The pain was induced by 10 mL/kg BW intraperitoneal injection of 0.7% acetic acid. The tested compounds were administered orally 30 minutes before pain induction. The total response time of writhing in mice was observed every 5 minutes for 30 minutes. The analgesic activity was then calculated from the data of stretching number compared to negative control and expressed as % analgesic. **Results**: Results showed that the herbal products have analgesic activity, *i.e.* 62.88% in the dose of 9.7 mg/20g BW, and 69.63% in the dose of 19.4 mg/20g BW, respectively. **Conclusion**: The herbal products have analgesic activity that can help to alleviate pain symptoms in the common cold.

Keywords: analgesic, herbal extracts combination, stretching method

HMNP-29

Antidepressant Activity of *Coffea canephora* Pierre ex A. Froehner Seed Extract

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ABSTRACT

Background: Depression which is not treated properly can lead to suicide and death. The seed of *Coffea canephora* is known to have an effect on the central nervous system, but its activity as an antidepressant has never been carried out. **Objective:** The objective of this study was to evaluate antidepressant activity of *C. canephora* seed ethanol extract. **Method:** The *Coffea canephora* seed was extracted with maceration using ethanol as the solvent. The animals induced depression with chronic mild stress (CMS) for 14 days. Then the extract was given to the mice at the doses of 50, 100, 200 mg/kg with administration for 10 days. Antidepressant test using tail suspension test (TST) and forced swimming test (FST) to measure the duration of immobility time (IT), while the open field test (OFT) to measure duration of locomotor activity. Observations include increasing locomotor activity, decreasing immobility time, measurement of blood glucose levels, and gastric irritation (macroscopic and microscopic). Data analyzed statistically using ANOVA. **Results:** The extract doses of 50, 100, and 200 mg/kg significantly reduced the duration of IT in the TST and FST methods (p<0.05). Based on OFT observation, extract doses of 50, 100, and 200 mg/kg significantly increased the locomotor activity by increasing the central square and number of crosses (p<0.05), and also reduced the duration of grooming (p<0.05). Extract also prevented the increase of blood glucose and irritation in the gastric. **Conclusion:** The ethanol extract of *C. canephora* seeds at doses of 50, 100, and 200 mg/kg has a potential antidepressant activity.

Keywords: *Coffea canephora*, antidepressant activity, locomotor activity, immobility time, blood glucose, gastric injury

HMNP-30

Galangal Essential Oil as an Alternative for Cancer Immunotherapy through Sting Activation

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ABSTRACT

Background: The ability of cancer cells to evade the immune system causes further damage to the body. Galangal *(Alpinia galanga)* reported having cancer immunopotentiation activity with an unknown mechanism. STING (Stimulator of Interferon Genes) is a transmembrane protein and its activation triggers the secretion of type 1 interferon to activate the innate immune system. **Objective:** This study aimed to determine the potential of galangal essential oil as a cancer immunopotentiation agent through STING activation. **Method:** Data were retrieved from online methods such as exploration of the human protein atlas and STRING database as well as offline methods including extraction and GC-MS to obtain the chemical compounds of galangal, predicting the active compound using machine learning KNIME and comparing its affinity with native ligand STING through molecular docking. **Result :** STING with TRIM56, IRF3, and TBK1 have an activity to produce type 1 interferon which plays a role in stimulating the immune system. The high expression of STING in several types of cancer indicates a significant increase in the patient's survival probability. Based on the extraction and GC-MS, the % yield was 2.264% with a total of 210 active compounds. From a total of 210 compounds, 9 compounds were predicted to be able to activate STING. Meanwhile, based on the docking score comparison, thunbergol (-10.1743) and xanthorrhizol (-10.0888) have lower bond energy than the native ligand STING, 3,3 c-di GMP (-10.0277). **Conclusion:** All of the data showed that galangal contains various active compounds that potentially can be used as alternative cancer immunotherapy through STING activation.

Keywords: galangal *(Alpinia galanga)*, immunopotentiation, immunotherapy, interferon, STING

HMNP-31

The Minimum Potency of Sappanwood (*Caesalpinia Sappan* L.) as Anti-metastatic Agent in Cervical Cancer Targeting MMP-9 Protein

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ABSTRACT

Background: Cervical cancer (CC) is deadly and most common cancer in women. MMP-9 has been known to have a role in metastasis and invasion of cancer. Previous studies have reported that sappan wood (KS) has anti-migration and anti-invasive activity against cancer cells. **Objective:** This study aims to explore the potential of compounds in KS as anti-metastatic agents by targeting MMP-9. **Method:** We used GEPIA to obtain the profile and expression of MMP-9 and also survival rate of CC patients. CMAUP and PubChem are used to obtain metabolomic profiles of KS. ChEMBL and KNIME used to make prediction models to predict compound activity toward MMP-9. The affinity of active compounds in KS with MMP-9 protein were analyzed using MOE and PDB. **Results:** Based on the GEPIA database, MMP-9 expression is significantly higher in cancer cells compared to normal cells. Based on the prediction model using KNIME, some compounds in KS have inhibition activity toward MMP-9. We analyzed further with molecular docking analysis with docking scores of caesalpiniaphenol (-13.6828), 3-deoxysappanone (-13.4690), sappanchalcone (-13.0813), 3-deoxysappanchalcone (-12.3484), brazilane (-12.3484), 3'-deoxy-4-O-methylepisappanol (-11.7254), braziline (-11.6196), brazilein (-11.3290), sappanone (-10.9593), protosappanin (-10, 6561), and 7MR native ligand (- 10.4626) which shows that the active compound of KS binds stronger to MMP-9 inhibitory-site receptor compared to native ligand. **Conclusion:** The results indicate that active compounds of KS have potential to be developed as anticancer agents by inhibiting the activation of MMP-9.

Keywords: *Caesalpinia sappan* L., metastasis, cervical cancer, MMP-9, bioinformatics

HMNP-32

Analysis of Synthetic Drugs Adulterant in Herbal Medicine Product Using FTIR Spectroscopy and Multivariate Analysis

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ABSTRACT

Background: The increasing number of herbal product consumption in society was followed by the raising of adulterated herbal products in the market. This phenomenon led to a seeking of rapid, inexpensive, and non-destructive analytical techniques as herbal product quality control. FTIR-ATR has fulfilled the method criteria for analysis of the falsified herbal product by synthetic drugs. **Objective:** This research objective was to perform the strength of FTIR Spectroscopy and multivariate calibrations to analyse binary mixtures of adulterated reducing pain herbal products by Metamizole and Diclofenac Sodium. **Method:** The collecting spectra were obtained by scanning the samples using FTIR-ATR at 4000-650 cm^{-1} region. The multivariate calibrations used were Principal Component Analysis (PCA), Principal Component Regression (PCR), Partial Least Square Regression (PLSR), and Linear Discriminant Analysis (LDA). The selected region performed as defined by the value of the statistical parameters. The herbal medicine product, especially Jamu samples, were intentionally mixed with metamizole and diclofenac sodium each in binary mixtures at 0-100% concentrations. **Results:** The PCA score plot of both binary mixtures between herbal medicine products with Metamizole or Diclofenac Sodium exhibited a good classification between unadulterated and adulterated samples. The statistical parameter's value of multivariate calibrations demonstrated an optimum value of coefficient determination in both calibration and prediction (R^2) root mean square of calibration (RMSEC), and root mean square of prediction. The values of R^2 in all samples were >0,99, and the values of RMSEC and RMSEP of all analysed samples were low. **Conclusion:** Therefore, the combination of FTIR spectroscopy and multivariate analysis showed an excellent potential analytical technique to counter the growth of adulterated herbal medicine products, especially synthetic drugs adulterants.

Keywords: PCA, PCR, PLSR, jamu, diclofenac sodium, metamizole

HMNP-33

Antioxidant Activity of Single-Dose and Combined-Dose of Nanoparticles from Soursop Leaves (*Annona muricata* L.) and Sappan wood (*Caesalpinia sappan* L.)

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ABSTRACT

Background: Soursop leaf chloroform extract and secang wood methanol extract have been known to have low solubility, so a drug delivery system such as nanoparticles is needed. **Objective:** This study aims to determine the optimum composition of the nanoparticle preparation of chloroform extract of soursop leaves and secang wood methanol extract also to measure the antioxidant activity of the two nano-extracts using the DPPH method. **Method**: The research on the optimization of the nanoparticle formula used the D-Optimal method and the measurement of the antioxidant activity of the two nano-extract preparations was tested using the DPPH method. **Result:** Based on the D-Optimal method, the optimal component of soursop leaf extract nanoparticles was selected on composition of kitosan: Na TPP are 85.71: 14.29 showed a particle size of 221.5 nm with a polydispersity index of 0.190 and a zeta potential value of 34.9 mV. The component secang wood nanoparticle was selected on composition of kitosan: Na TPP are 93.75: 6.25 showing a particle size of 237.3 nm with a polydispersity index of 0.272 and a zeta potential value of 19.7 mV. Antioxidant activity examination showed that secang wood extract nanoparticles had the antioxidant activity with an IC_{50} value of 34.18 µg/mL. IC_{50} of soursop leaf nanoparticles is 56.99 µg/mL. The combination of the two nanoparticles with a ratio of had the antioxidant activity compared to other combinations with an IC_{50} value of 37.38 µg/mL. **Conclusion:** The optimal component of sappan wood nanoparticles has the best antioxidant activity compared to nanoparticles soursop leaves and their combination, while the combination of the two nanoparticles with a ratio of 1:2 has the best antioxidant activity compared to the combination with a ratio of 1:1 and 2:1.

Keywords: antioxidants, nanoparticles, D-Optimal, DPPH

HMNP-34

Pharmacognostic Standards, Antioxidant Activity, and Hepatic Safety Profile of An Indonesian Antidiabetic Polyherbal Formulation

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ABSTRACT

Background: The excessive oxidative processes and the lack of cellular antioxidative mechanisms are significantly observed in diabetes, while long-term medication required for the treatment might harm the hepatic tissues. **Objective:** This study evaluated the selected pharmacognostic characters, antioxidant activities, total phenolic content, and the hepatic safety of a polyherbal formulation containing seven plant constituents used by *Klinik Wisata Kesehatan Jamu Kalibakung, Tegal,* Indonesia, to treat patients with diabetes. **Method:** The pharmacognostic properties of the formulation were characterized according to the WHO quality control methods for herbal materials. The 2,2-diphenyl-1-picrylhydrazyl scavenging activity (DPPH RSA), ferric reducing antioxidant power (FRAP), and total phenolic content (TPC) were evaluated as per the standard method. The effect of formulation on the hepatic HepG2 cells was determined by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) reduction assay. **Results:** The pharmacognostic properties of the formulation specified as follow: foreign matters (1.32±0.05%), loss on drying (11.50±0.07%), total ash (5.68±0.07%), acid-insoluble ash (0.94±0.04%), water-soluble extractable (18.22±0.60%), and ethanol-soluble extractable (16.90±0.77%). The ethanol extract showed a superior DPPH RSA (960.70±2.58 mM Trolox equivalent (TE)/g dry weight (DW)), FRAP (1112.69±8.39 mM TE/g DW), and TPC (1768.40±32.40 mg Gallic acid equivalent (GAE)/g DW) over its water counterpart. The water extract was safer for HepG2 cells than the ethanol one, with the IC_{50} values of 218.25±14.03 and 40.24±3.53 µg/mL, respectively. **Conclusion:** This study specified the pharmacognostic standards of an antidiabetic polyherbal formulation with excellent antioxidant activities, in which its traditional use as a decoction was safe for the hepatic cells.

Keywords: science-based *jamu* development, polyherbal formulation, pharmacognostic specification, antioxidant, hepatotoxic effect

HMNP-35

The potential of *Vernonia amygdalina* Delile Leaves as Antibiofilm and Stimulation of Membrane Leakage on *Salmonella typhi*

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ABSTRACT

Background: Typhoid fever is a life-threatening infection caused by the bacterium *Salmonella typhi*. Typhoid fever can be treated with antibiotics. *Vernonia amygdalina* Delile. leaves have the potential to treat Typhoid fever because of changes in antibiotic use. **Objective**: This research was to determine the potential of antibiofilm activity and the antibacterial stimulation of leakage cells of *Vernonia amygdalina* Delile. leaves of *Salmonella typhi*. **Method**: Extraction of *Vernonia amygdalina* Delile. leaves powder was extracted by the maceration method using ethanol and fractionation using ethyl acetate solvent. The antibiofilm activity was determined using a well plate and measuring the absorbance with a spectrophotometer UV-Vis. Leakage cell stimulation was measured using a spectrophotometer at 260nm (for DNA) and 280nm (for protein).The Minimum Inhibitory Concentration (MIC) were determined using the Kirby-Bauer disc diffusion method and Minimum Bactericidal Concentration (MBC) were determined with streaking on MIC zones for MBC. **Result**: MIC determination was measured at a 1.56 mg/mL concentration with an inhibitor zone of 8.2±0.09 mm (ethyl acetate) and 7.2±0.11 mm (ethanol). MBC for ethyl acetate at a concentration of 6,25 mg/mL, for ethanol at a concentration of 50 mg/mL. Antibiofilm showed a percentage reduction of biofilm of 58.51 0.41% on ethyl acetate and 39.95 0.31% on ethanol. The leakage cell of DNA and protein showed an increased absorption at 50 mg/mL concentration with 260nm/280nm was 0.722 (ethyl acetate) and 0.710 (ethanol). **Conclusion:** The ethyl acetate extract shows the optimum activity for antibiofilm and stimulation of leakage cells (DNA and protein) of *Vernonia amygdalina* Delile. Leaves.

Keywords: *Vernonia amygdalina* Delile. Leaves, antibiofilm, leakage cell, minimum inhibitory concentration, minimum bactericidal concentration

HMNP-36

Purple Sweet Potato Leaf Extract (*Ipomoea batatas* var Ayamurasaki) Reduce Blood Glucose Levels on Wistar Rats (*Rattus norvegicus*)

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ABSTRACT

Background: Purple Sweet Potato (*Ipomoea batatas* var Ayamurasaki) is one of the plants that can reduce blood glucose levels in diabetics. The leaves contain flavonoids that function as antioxidants. This compound can secrete the hormone insulin for sugar metabolism. **Objective:** This study aimed to determine the antihyperglycemic effect of purple sweet potato leaf extract on Wistar rats. **Method:** This research was experimental research in the laboratory with a Posttest With Control Group design. Wistar rats were divided into 5 treatment groups, each given 1% Na CMC solution (negative control); metformin suspension (positive control); Purple Sweet Potato Leaf Extract Suspension Dosage 150 mg/kg BW; 300 mg/kg BW and 600 mg/kg BW. Wistar rats blood sugar level were measured before and after being induced with glucose. After the test solution was administered, the blood glucose level of the Wistar rats were measured at 30, 60, 90, and 120 minutes. The data were tabulated and analyzed descriptively and statistically at a 95% confidence level. **Results:** The results showed that the purple sweet potato leaf extract descriptively reduced the blood glucose levels of Wistar rats, but there was no significant difference between the treatment groups. **Conclusion:** The purple sweet potato leaf extract can reduce the blood glucose levels of Wistar rats.

Keywords: antihyperglycemic, blood glucose, purple sweet potato leaf

HMNP-37

Anti-Inflammatory Effects of The n-Hexane Fraction of Papaya Flowers (*Carica papaya* L.) in Rats (*Rattus novergicus*)

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ABSTRACT

Background: Papaya flowers (*Carica papaya* L.) are used as food ingredients by the people of Indonesia. The secondary metabolites of papaya flower are alkaloids, flavonoids, terpenoids, and steroids which are thought to have anti-inflammatory effects. **Objective:** This study aimed to determine the anti-inflammatory effect of the n-hexane fraction of papaya flowers (*Carica papaya* L.) in rats (*Rattus novergicus*). **Method:** The extract was prepared by the maceration method using 96% ethanol solvent and then fractionated with n-hexane. Tests were carried out on 4 treatment groups, namely the negative control group (CMC 1%), positive control (Diclofenac Sodium), the n-Hexane fraction at a dose of 200 mg/kg BW and 400 mg/kg BW. Rats were induced with 0.1 ml of egg white subplantarly. The diameter of rat foot edema was measured with a plethysmometer every hour for 6 hours. The data were then analyzed descriptively and statistically with one-way ANOVA and continued with LSD. **Results:** The results of the statistical test showed that there were significant differences (p<0.05) in the three treatment groups with negative control from the 2nd to the 6th hour. Increasing the dose of the n-hexane fraction did not give a significant difference in reducing edema volume. **Conclusion:** It was concluded that the n-hexane fraction of papaya flowers (*Carica papaya* L.) at doses of 200 mg/kg BW and 400 mg/kg BW have an anti-inflammatory effect in rats (*Rattus norvegicus*).

Keywords: anti-inflammatory, n-Hexane fraction, papaya flowers

HMNP-38

Analgesic Activity and Toxicity of Methanol Fraction from Breadfruit Leaf *(Samanea saman* (Jacq.) Merr.)

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ABSTRACT

Background: Breadfruit *(Samanea saman* (Jacq.) Merr.) is an herbal plant from Fabaceae. It has potency as an analgesic, contains flavonoid, tannins, terpenoids, alkaloids and saponins. **Objective:** Purpose of this study was to determine the analgesic activity and acute toxicity of methanol fraction of breadfruit leaves. **Method:** Breadfruit leaves were extracted with 70% of ethanol and gradually partitioned by solid-liquid method using n-hexane, ethyl acetate and methanol as solvents. The methanol fraction obtained was used for testing. The analgesics activity was tested by Writhing Test Method with the treatment groups, they are negative control (CMC-Na 0.5%), positive control (Acetosal 360 mg/kgBW) and three doses fraction (200, 350 and 500 mg/kgBW). The mice *(Mus musculus* L.) were given a test compound and then pain was induced by 0.5% acetic acid as intraperitoneal. The mice were observed for an hour. Observations of gastric irritation were carried out macroscopically. Acute toxicity testing was carried out for 24 hours with the LD50 parameter. Furthermore, toxicity was observed for 7 days to observe delayed effect. **Results:** Result showed that methanol fraction had analgesic activity with percentage of analgesic power respectively 200mg/kgBW was 35.32%, 350mg/kgBW was 52.48% and 500 mg/kgBW was 70.14%. The LD50 value was 5000 mg/kgBW and the ulcus index of all treatment groups was 2. **Conclusion:** Based on observations, the most effective dose as an analgesic was methanol fraction at dose 500 mg/kgBW which is equivalent to the acetosal ($p>0.05$). Toxicity was categorized as mild toxic and there was no irritation to the stomach. Breadfruit is a promising source of analgesic candidates.

Keywords: analgesic, fraction, breadfruit, toxicity

HMNP-39

Phytochemistry and Cytotoxicity Test of Kemang (*Mangifera kemanga*) Peel Extract against T47D Breast Cancer Cell Proliferation

Yusuf Mushlih[1], Rafika Indah Paramita[2,3], Khaerunissa Anbar Istiadi[3], Linda Erlina[2,3], Yatri Hapsari[4], Fadilah Fadilah[2,3*]

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ABSTRACT

Background: Kemang (*Mangifera kemanga*) is a close relative of *Mangifera caesia* and *Mangifera indica*, but there are no studies that discuss the anticancer effect of kemang, especially on breast cancer cells. **Objective:** To identify the compounds contained in the ethanol, n-hexane, and ethyl acetate extracts of kemang fruit peels and their cytotoxicity effect on T47D breast cancer cell proliferation. **Method:** The kemang peel extracted using ethanol, n-hexane, and ethyl acetate as solvents. The extract content was analyzed using phytochemical tests and thin layer chromatography. The MTT test carried out to determine the inhibitory ability and IC50 of the three extracts against T47D cells and doxorubicin was used as positive control. **Results:** The compounds contained in the ethanol extract are tannins, triptenoids, and alkaloids; in n-hexane extract are triptenoid; and in ethyl acetate extract are flavonoids, tannins, and triptenoid. The ethanol extract was found to have one spot at Rf 0.9; n-hexane extract has five spot at Rf 0.94, 0.8, 0.72, 0.59, and 0.28; and ethyl acetate extract had six spot at Rf 0.97, 0.88, 0.83, 0.59, 0.32, and 0.2. The IC50 values obtained in the MTT test of ethanol, n-hexane, and ethyl acetate extracts against T47D cells were 28.72 ppm, 62.19 ppm, and 415.09 ppm respectively. **Conclusion:** Kemang fruit peel extract has the potential to be an alternative treatment for breast cancer because it has anticancer properties against T47D breast cancer cells.

Keywords: kemang (*Mangifera kemanga*) peel extract, breast cancer, T47D Cells, thin layer chromatography, MTT Test

HMNP-40

Phytochemical Analysis, Total Phenol, Total Flavonoids, and In-vitro Test of Kunto Dewo (*Kigelia pinnata*) Flesh and Skin Fruit Ethyl Acetate Extract on HeLa Cells

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ABSTRACT

Background: One of the potential plants is kunto dewo (*Kigelia pinnata*) which is often used as a traditional medicine and has several effects such as anti-inflammatory, antibacterial, antidiabetic, antioxidant, and anti-cancer. **Objective:** The aims of this study are to determine the components of phytochemical compounds, total phenols, total flavonoids, and in-vitro cytotoxic activity of *Kigelia pinnata* ethyl acetate extract against HeLa cells. **Method:** The Flesh and skin of *Kigelia pinnata* extracts were analyzed for phytochemicals compounds through phytochemical tests, thin layer chromatography (TLC), total phenol test, and total flavonoid test. In addition, the extract's in vitro cytotoxic activity to HeLa cells was tested by the MTT assay method. **Results:** Ethyl acetate extract of *Kigelia pinnata* fruit flesh contains flavonoids, tannins, and triterpenoids, as well as total phenol content of 18.81 mg of Gallic Acid Equivalent (mgGAE)/mL and total flavonoids level of 2,37 mg of Quercetin Equivalent (mgQE)/mL. Ethyl acetate extract of *Kigelia pinnata* fruit skin contains flavonoids, tannins, glycosides, and steroids, with total phenol content of 14.42 mgGAE/mL and total flavonoids level of 19.06 mgQE/mL. The cytotoxic activity of the ethyl acetate extract of the flesh and skin of *Kigelia pinnata* fruit to HeLa cells showed mean IC_{50} values of 118.76 µg/mL and 157.46 µg/mL, respectively. **Conclusion:** Ethyl acetate extract of the flesh and skin of *Kigelia pinnata* fruit have the potential to be developed as cervical anticancer.

Keywords: *Kigelia pinnata*, phytochemistry, total phenols, total flavonoids, HeLa cells, anticancer

HMNP-41

Molecular Docking Study of Ciplukan Herb (*Physalis angulata* L.) As Antivirus Covid-19

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ABSTRACT

Background: The Covid-19 virus pandemic, which is still quite new and dangerous for the community, needs to be prevented and treated as an effort to improve a person's quality of life. Meanwhile, until now there is no specific drug that can treat this virus, therefore it is necessary to develop and explore an antiviral agent from natural ingredients, one of which is ciplukan (*Physalis angulata* L.). Ciplukan is one of the local herbal plants found in Indonesia which has several secondary metabolites derived from the tannin group such as corilagin and the flavonoid group, namely myricetin. This compound has the potential to be developed as an antiviral agent. **Objective:** The purpose of this study was to compare the highest potential as an antiviral between the two compounds. **Methods:** The research method used is the in silico test method using molecular docking. The test was carried out with the application of computer equipment autodock vina, DS visualizer, and autodock tools. **Results:** The results obtained after docking with 2 Covid-19 proteins, namely PD-ACE-2 (PDB: 6VW1) and TMPRSS2 (PDB: 7MEQ), obtained RMSD values <2Å in 2 secondary metabolite compounds of ciplukan. The docking of myricetin obtained an RMSD value of 1.250 and a docking score of -5.5 on the PD-ACE-2 protein, while the TMPRSS2 protein obtained an RMSD value of 1.532 and a docking score of -6.9. The results of docking of the corilagin obtained an RMSD value of 1.055 and a docking score of -8.0 for the PD-ACE-2 protein, while the TMPRSS2 protein obtained an RMSD value of 1.344 and a docking score of -9.2. Based on this value, the activity of the corilagin with PD-ACE-2 and TMPRSS2 protein has the strongest affinity energy compared to myricetin compound. **Conclusion:** From the docking results, it can be concluded that the corilagin compound from the tannin group in ciplukan (*Physalis angulata* L.) has a higher potential to be developed and formulated as an antiviral agent.

Keywords: antivirus, Covid-19, Ciplukan, molecular docking

HMNP-42

Virtual Screening and Molecular Docking Studies of Fungal Secondary Metabolites to Identify Potential Human Cytomegalovirus pUL145 Inhibitors

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ABSTRACT

Background: Human cytomegalovirus (HCMV) infects the majority of the world population. This infection is mostly asymptomatic. However, it can be life-threatening for an immunocompromised host. Currently, only a handful of drugs are available to treat the infection. Current findings show HCMV pUL145 as a possible target to strongly inhibit viral replication. Fungi has been known for its medicinal property. The first antibiotic, penicillin, is also naturally isolated from fungi. Recent studies also indicate that secondary metabolite from fungi is a promising source of antiviral compounds. **Objective:** In this study, the inhibitory potential of fungal secondary metabolites against HCMV pUL145 is assessed. **Method:** 3D structure of pUL145 is modeled using I-TASSER and AlphaFold. Binding pockets are predicted using DeepSite. Then, DDB1 is docked against pUL145 to identify and measure chemical interaction. In addition, a series of possible ligands are generated using LIGANN. 3D structures of fungal secondary metabolites are downloaded from the MeFSAT database. Then, virtual screening, with LIGANN-generated ligands as input queries, is performed using RDKit implemented in Python. Finally, top predicted compounds are docked against pUL145 using Autodock Vina.

Keywords: virtual screening, molecular docking, fungi, secondary metabolite, human cytomegalovirus, pUL145

HMNP-43

Phytochemical, Antioxidant and Antibacterial Activities of *Spatholobus hirsutus* from East Kalimantan

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ABSTRACT

Background: *Spatholobus hirsutus* Wiriad. & Ridd (Fabaceae) is one of the endemic plant species from East Kalimantan which was recognized as material for traditional medicine for orangutan and human beings. Research reports on its bioactivities were still very limited. **Objective:** The aims of this research were to explore potential of secondary metabolites, antioxidant and antibacterial activity of *Spatholobus hirsutus*. **Methods:** The stem bark, stem core and leaves of this plant were extracted with methanol to obtain methanol extract. The phytochemical assay was used to identify secondary metabolites from that plant. DPPH assay was used to determine antioxidant activity, then agar well diffusion against three species of bacteria (*Staphylococcus aureus, Streptococcus mutans, Propionibacterium acne*) were used to determine antibacterial activity and one fungi species (*Candida albicans*). **Results:** The phytochemical results showed that alkaloid, flavonoid, terpenoid, carbohydrate and tannins were found in stem bark and stem core, but terpenoid was not found in the leaves. The stem bark had strong antioxidant activity in 100 ppm concentration, compared to the leaves. Stem bark and stem core extract had been categorized as strong antibacterial activities against *S. aureus, S. mutans, P. acne* and *C. albicans*. **Conclusion:** The secondary metabolite of stem bark and stem core were more complex than leaves, it also correlated to their antioxidant and antibacterial activity. This finding was expected to be a reference in exploring active compounds from the Spatholobus *hirsutus* plant.

Keywords: *Spatholobus hirsutus*, antioxidant, antibacterial, phytochemical, East Kalimantan

Timmerman Award Schedule Thursday, November 4, 2021 – Day III

Time	Agenda
08.00 – 08.15	Registration
08.15 – 08.30	Opening
08.30 – 08.50	Presentation of Finalist 1
	Prof. apt. Enade Perdana Istyastono, PhD
08.50 – 09.10	QA Finalist 1
09.10 – 09.30	Presentation of Finalist 2
	Sri Fatmawati, S.Si., M.Si., PhD
09.30 – 09.50	QA Finalist 2
09.50 – 10.00	Inspirational address from Timmerman Awardees
10.00 – 10.20	Presentation of Finalist 3
	Dr. rer.nat. Ronny Martien, M.Si.
10.20 – 10.40	QA Finalist 3
10.40 – 11.00	Presentation of Finalist 4
	apt. Elin Julianti, Ph.D.
11.00 – 11.20	QA Finalist 4
11.20 – 11.40	Presentation of Finalist 5
	apt. Adam Hermawan, M.Sc., PhD
11.40 – 12.00	QA Finalist 5
12.00 – 13.00	Break
13.00 – 14.00	Discussion of Judging Panel
15.50	Winner announcement

TIMMERMAN AWARD 2021

"Pharmaceutical Sciences: bringing molecules from bench to the market for a better quality of life."

This award dedicated to recognize young pharmaceutical scientist who have made significant contributions to the advancement of pharmaceutical science in Indonesia

TIMMERMAN – Professor Henk Timmerman (1937) obtained a M.Sc. in Chemistry at the Vrije Universiteit in Amsterdam in 1964, and then started his Ph.D. studies under the supervision of Prof. Dr. W. Th. Nauta in the department of Pharmacochemistry. It is clear from the title of his Ph.D. thesis "2-alkyl-1-orthoalkylphenyl cyclohexanols: synthesis and pharmacological investigations", the department of Pharmacochemistry was already focused on organic synthesis, but also on the molecular mechanisms behind the potential biological activities of the prepared compounds. After his Ph.D. in 1967, Henk Timmerman joined Gist-Brocades (now part of Yamanouchi) and became head of Pharmacology and then from 1972-1979 their scientific director. In 1979, Henk Timmerman returned to academia and took over the department of Pharmacochemistry from his previous supervisor Prof. dr. Nauta. He held his position of professor in Pharmacochemistry until 2002 and is now, as emeritus professor, appointed as consultant for the department. During his academic career of almost 25 years, most of his research was in the area of histamine receptors and their ligands. It should be noted that in 2006, his 375 research papers (most of them in the area of histamine) still obtained 450 citations, indicating the impact of his work in this field. Henk Timmerman is regarded as one the leading medicinal chemists of his time in the histamine research area. His work resulted in many new pharmacological tools (amthamine, imetit, clobenpropit, immepip, immethridine, methimmepip), which were easily shared with the pharmacological community and allowed him to develop an extensive network of valuable scientific friends. At the same time, Henk Timmerman was also very interested in the molecular mechanisms of actions of the developed molecules. This is also well reflected in his publication record. One of his most cited papers details the inverse agonistic properties of histamine H2 receptor antagonists, which has been an important contribution to our present understanding of receptor antagonist action. Among many official representations, Henk Timmerman was member of the IUPHAR committee on histamine receptors, took the initiative to organize the first IUPHAR satellite meeting 'New Perspective in Histamine Research' in Noorwijkerhout in 1990 and hosted the 32nd annual meeting of the European Histamine Research Society in Amsterdam in 2003. Besides a scientist with impact, he is also a great mentor for numerous Ph.D. and master students. At this moment three of his former students have been appointed as professor and many of his Ph.D. students are currently employed in international pharmaceutical industry.

PURPOSE – Timmerman Award is designed to recognize and highlight young scientist working on pharmaceutical sciences that have made significant contribution to the advancement of pharmaceutical sciences in Indonesia.

COLLABORATING ORGANIZATION – International Conference of Pharmacy and Pharmaceutical Sciences VII, Faculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta

AWARDS – Every two years, the recipient of Timmerman Award will be selected.

ELIGIBILITY –

1. Candidates for Timmerman Award 2021 must be scientists who have been working and living in Indonesia permanently for at least five years prior to the nomination and not exceed than 45 years old of age at 1 January 2021. The candidate minimum qualification is PhD/Doctor.
2. Each candidate must submit one of the most significant published paper whose research was done in Indonesia and funded by Indonesian Government. The nominee can either become the first author or the corresponding author in the paper submitted. The paper submitted should not be part of the PhD dissertation.

NOMINATIONS – All academia affiliated with school of pharmacy or research center are encouraged to apply.

SELECTION PROCESS – The selection process will be administered by Faculty of Pharmacy Universitas Gadjah Mada. The assessment will be based on achievement in the field, with particular attention paid on the nominees' research achievement and impact. The winner will be informed in November 2021.

Finalist of FP UGM-TIMMERMAN AWARD 2021

Congratulation to the five finalists of Faculty of Pharmacy-Timmerman Awards 2021, the nation's prestigious awards for young pharmaceutical scientist. The FP UGM – Timmerman Award 2021 finalists were selected among the best Indonesian young pharmaceutical scientist based on their contribution on pharmaceutical sciences advancement in Indonesia. The nomination based on their research work that were done in Indonesia after their doctoral program completion.

Dr. rer. nat. apt. Adam Hermawan, M.Sc.

Affiliation : Dept. of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Gadjah Mada

Biosketch

Adam Hermawan finished his doctoral studies in 2015 and returned to UGM to develop his research field, pharmaceutical biotechnology and oncology. He got a research grant to develop basic research in 2016 to characterize breast cancer stem cells. In 2017-2018, he received a PDUPT (basic research) to develop the citrus flavonoids hesperetin, hesperidin, and naringenin as breast cancer stem cell targeting agents and produced five publications from that research. He had the opportunity to visit Universität Leipzig for training and research collaboration development in March 2018. He is also a visiting researcher at the BNCT research center of Osaka prefecture University in the World Class professor program. In 2019 he received a final assignment recognition grant with the theme of tracing agents targeted for breast cancer metastasis from cinnamon and cumin. In 2020-2021 he received one research grant (PDUPT) for exploring citrus flavonoids tangeretin, nobiletin, and sinensetin targeted to BCSCs and published three papers. 1 PDUPT grant was also obtained for 2020-2022 to develop a boron carrier from curcumin analogs in BNCT-based breast cancer therapy and has produced two scientific publications. In 2021, Dr. Adam Hermawan received one research grant, namely world-class research (WCR) for developing a curcumin analog as an anti glioblastoma. He is also active as a part of Organizatio committee of the Indonesian Society for Cancer Chemoprevention (ISCC) as a Communication and Information staff. In 2021, he received two final project recognition grants for bioinformatics analysis of natural products for overcoming breast cancer chemoresistance.

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Prof. apt. Enade Perdana Istyastono, Ph.D

Affiliation : Faculty of Pharmacy, Sanata Dharma University, Yogyakarta

Biosketch:

Enade Perdana Istyastono graduated as a pharmacist from Faculty of Pharmacy Universitas Gadjah Mada in 2003, Dr. Enade then joined Faculty of Pharmacy Universitas Sanata Dharma (FAUSD) as a young lecturer. He then pursued the degree of M.Sc. (2006-2008) and Ph.D. (2008-2012) from the Vrije Universiteit Amsterdam. After his Ph.D. defense in May 2012, he returned to FAUSD, where he was then appointed as an Associate Professor in 2013. In 2020, Dr Enade was appointed as a Full Professor in Pharmaceutical Analysis and Medicinal Chemistry. His research focuses on the implementation of molecular interaction fingerprints in computer-aided drug design and discovery. Since 2012, his research has focused on the implementation of molecular interaction fingerprints in computer-aided drug design and discovery. In 2013, Dr Enade research group developed and published PyPLIF, a software to identify and convert three dimensional (3D) protein-ligand interactions fingerprint (PLIF) into binary bitstrings. Together with the increasing trend of the using of machine learning methods in drug design and discovery, the software has served as an excellent tool to increase the prediction quality of some structure-based virtual screening (SBVS) protocols. Dr Enade research group has chosen estrogen receptor α (ERα), cyclooxygenase-2 (COX-2), and acetylcholinesterase (AChE) as the molecular targets of interest in the drug discovery employing PyPLIF. In 2020, the group have upgraded PyPLIF into much better version called PyPLIF HIPPOS. Currently, his group perform research employing PyPLIF HIPPOS with AChE, G-protein coupled receptors (GPCRs), matrix metalloproteinase 9 (MMP9) and Dipeptidylpeptidase IV (DPP4) as the target of interests.

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Sri Fatmawati, S.SI, M.Sc, Ph.D

Affiliation : Dept. of Chemistry, Faculty of Science and Analytical Data, Institut Teknologi Surabaya (ITS)

Biosketch

Sri Fatmawati, PhD is President of the Indonesian Young Academy of Sciences (ALMI). Her contribution as a women researcher brings her to be appointed as Chair of Organization for Women in Science for The Developing World (OWSD) Indonesia since 2018. In 2020, she was elected as a member of the Global Young Academy. In academics, she was appointed as Head Deputy of Agrifood and Biotechnology Research Center, Institut Teknologi Sepuluh Nopember, Indonesia.

A natural product chemist, she holds a PhD from Kyushu University, Japan. Her major contribution to the field of natural product chemistry, especially Jamu—Indonesian heritage traditional drink, was recognized by a number of awards and honours such as International L'Oreal – UNESCO For Women in Science in 2013, The Elsevier Foundation Award for Early-Career Women Scientist in 2016, and The Best Speaker of Virtual Summer School in 2020. As a researcher and academician, she writes academic articles published in reputable international and Indonesian national journals, books, and joins several international research collaborations in Asia and Global.

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Dr. rer. nat. Ronny Martien, M.Si
Affiliation : Dept. of Pharmaceutics, Faculty of Pharmacy, Universitas Gadjah Mada

Biosketch

Ronny Martien is currently Lecture and Researcher at Faculty of Pharmacy, Universitas Gadjah Mada. He earned his Bachelor of Science at Faculty of Science and Mathematic, Universitas Diponegoro, majoring Microbiology in 2000, and his Master in Biotechnology from Univ. Gadjah Mada in 2003. His PhD in Pharmaceutical Technology at Universitat Innsbruck, Austria in 2007 working with Prof. Andreas Bernkop-Schnürch. In his thesis work he formulated nanoparticulated drug / gene delivery system in order to increase stability and bioavailability of the drug. After completing his PhD, Ronny accepted a position as Lecture and Researcher at Department of Pharmaceutic, Faculty of Pharmacy, Universitas Gadjah Mada in Yogyakarta, where he is working until now. During that time, he developed and formulated nanoparticulated drug, gene and plant extract system. He granted 63 project proposals from the government. As researcher he has 78 publication at Scopus and 9 Intellectual Property Right. In 2008 and 2010, he was a finalist of Young Scientist and Best Research Award, RISTEK-KALBE AWARDS. In 2012-2014, he joint organizing committee for The Indonesian – American Kavli Frontier of Sciences Symposium help by Nasional Academy of Science, US and Indonesia Academy of Science. At 2014, He run those Symposium as A Chair. He created some product innovation which already on the market such as OST-D vitamin D3 drop, DERMAVITA OHC The first vitamin D3 lotion in the market and PIPERANTIS Nanoparticulated Herbal Hand Sanitiser.

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apt. Elin Julianti, Ph.D.
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Biosketch

Elin Julianti is an associate professor at the Department of Pharmacochemistry, School of Pharmacy, Bandung Institute of Technology. She completed her undergraduate degree in Pharmacy with a cum laude predicate (1998), Pharmacist Profession (2000) as well as her Master degree (2003) from Bandung Institute of Technology. She graduated as Doctor of Philosophy (2012) from College of Pharmacy, Seoul National University, South Korea. As one of academic faculties in Bandung Institute of Technology, her research interest and courses focus on pharmaceutical science, pharmaceutical microbiology as well as exploration of bioactive secondary metabolites from marine-derived microorganism. Elin Julianti received a grant for research topic about active metabolites of marine derived fungus as a potential candidate for anticancer (2020-2021). She published around 20 research articles, with more than 300 citations.

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Three Minute Presentation Schedules		
Thursday, November 4, 2021 – Day III		
Code	**Name**	**Title**
CCP	Irna Julita	Potential of Melinjo (*Gnetum gnemon* L.) as Chemopreventive Lung Cancer through In Vitro and In Silico
HMNP	Puput Herawati Said Hasan	Validation of Analysis Method Testing of Eugenol by High Performance Liquid Chromatography in Water Soluble Base Ointment of Essential Oil of Clove (*Syzygium aromaticum*)
HMNP	Tomi Hendrayana	Pharmacological Effects of Garlic (*Allium sativum* L.), Roselle (*Hibiscus sabdariffa* L.) and Celery (*Apium graveolens* L.) on Disease Causing Death in Indonesia: a Literature Study
HMNP	Tomi Hendrayana	Pharmacological Effects of Gotu Kola (*Centella asiatica* L. (Urb.)), Neem (*Azadirachta indica* A. Juss) and Goji Berry (*Lycium barbarum* L.) on Diseases Causing Death in Indonesia: a literature study
HMNP	Hanifah Rahma Maulyda	Cytotoxic Activity Test of Melinjo Seed Ethanol Fraction *(Gnetum gnemon* L.) Against HTB-179 Lung Cancer Cells with Stitch-String Bioinformatics Method
HMNP	Tomi Hendrayana	The Use of Magnolia Berry (*Schisandra chinensis*), Black Cumin (*Nigella sativa* L.), and Cinnamon (*Cinnamomum burmannii*) in the Treatment of Disease-Leading Causes Death in Indonesia: A Literature Study
PESC	Febriyanti Siahaan	Evaluation of Drug Interaction in Stroke Patient at Medical Ward of RSBP Hospital Batam
PESC	Aulia Rozita Rahma	Factors Associated with Intention to Provide Smoking Cessation Program among Community Pharmacists in Surabaya
PESC	Ade Ayu Sukma Puspita Putri	Public' Perception about Design and Information Content of Prescribed Drug' Labels on Prescription Services in Community Pharmacy
PESC	Yaniar Nur Hidayah	Pharmacists' Perception about Design and Information Content of Prescribed Medicines' Labels on Prescription Services in Community Pharmacy
PESC	Farisa Luthfiana	Case Series, Medication Pattern in Severe or Critically Ill COVID-19 Patient in One of Public Hospital, Yogyakarta
PESC	Auzan Al-Kautsar	Knowledge and Attitude Overview of Elderly Outpatient at Tertiary Hospital in Aceh toward COVID-19
PESC	Geubrina Dara Alisa	Drug Interactions in Patients Treated for COVID-19: An Exploratory Study in Aceh
PESC	Nabila Risti Rachmadi	Community Pharmacy Services in Banda Aceh during COVID-19 Pandemic
PESC	Nada Firdaus	Development of Alternative Design and Content of Label in Prescription Services
PDDS	Wanda B. Putri	Effect of Cup Depth of Concave-Faced Punch on the Physical Properties and Dissolution Profile of Mups Metformin HCl Tablets
PDDS	Erwin Fauzana	The pH Value and The Viscosity of The Ointment with Variations in The Total Concentration of Kelulut Honey and Olive Oil (1:1)

3 Minute Presentation

PPCP	Amal Rezka Putra	Preparation of Radiopharmaceutical Iodine-131 Rituximab-conjugated $MnFe_2O_4$ nanoparticles as multimodalities contrast agent on MRI and SPECT
PPCP	Aisyah Fitriannisa Prawiningrum	Next Generation Sequencing for Genomic Surveillance of SARS-CoV-2

3MP-CCP

Potential of Melinjo (*Gnetum gnemon* L.*)* as Chemopreventive Lung Cancer through *In Vitro* and *In Silico*

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ABSTRACT

Background: The incidence of lung cancer in Indonesia in 2020 reached 34,783 and was ranked third after breast cancer and cervical cancer**.** Lung cancer treatment with chemotherapy has not been selective in treating cancer because the drug targets are not specific so that it can cause damage to normal cells and side effects in cancer patients. **Objective:** This study aims to determine the potential of *Melinjo* Seed Ethyl Acetate Fraction (MSEAF) as chemopreventive in lung cancer through *in vitro* and *in silico*. **Method:** Target proteins of ursolic acid and polydatin compounds from MSEAF were identified using bioinformatics methods. Docking with Autodock Vina was used to determine binding affinity of compounds with target proteins. Cytotoxic test to determine cytotoxic activity of MSEAF against HTB-179 cells using MTT Assay. **Results:** The results of *in silico* test showed that the target proteins for ursolic acid were TP53 and AKT1 with docking scores of -6,3 kcal/mol and -7,4 kcal/mol. while the polydatin protein targets were GAPDH and VEGFA with docking scores of -8.8 kcal/mol and -5.5 kcal/mol. As a comparison, carboplatin was used for TP53, AKT1, GAPDH and VEGFA proteins with docking scores of -4.5 kcal/mol, -4.7 kcal/mol, -4.6 kcal/mol, and -3.6 kcal/mol, respectively. Based the results of the cytotoxic test on HTB-179 showed a better IC_{50} value of 35.54 µg/mL compared to the IC_{50} value of carboplatin 216.99 µg/mL. **Conclusion:** Thus, MSEAF has the potential to be developed as a chemopreventive agent for lung cancer.

Keywords: *Melinjo*, bioinformatic, molecular docking, MTT Assay

3MP-HNMP

Validation of Analysis Method Testing of Eugenol by High Performance Liquid Chromatography in Water Soluble Base Ointment of Essential Oil of Clove (*Syzygium aromaticum*)

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ABSTRACT

Background: The level of the active substance in the preparation is one of the factors that determine the activity of the drug preparation. Therefore, the analytical method used to determine the level of the active substance must be proven valid. **Objective:** To prove the High Performance Liquid Chromatography method has linearity, selectivity, precision, accuracy, detection limit (LOD), and quantification limit (LOQ) that meet the requirements of the validity of the analytical method. **Method:** The parameters used in the validation of this analytical method are the linearity (based on regression linear between concentration and wide area peak), the number of LOD and LOQ, the selectivity (based on the resolution value between two peaks), the precision (based on CV value in concentration 10 µg/mL, 20 µg/mL, and 30 µg/mL) and the accuration (based on recovery value in concentration 20000 µg/mL). The amount replications are three. **Results:** The result show that method of analysis have the linearity with r=0.998; LOD's value was 0.28 µg/mL and LOQ was 0.93 µg/mL. The precicion at concentration 10 µg/mL, 20 µg/mL, and 30 µg/mL with CV values 0.64%, 0.84%, and 0.12%, respectively. The accuration at concentration 20.000 µg/mL has recovery value 90.79%. The research show the selectivity has Rs =6,772. **Conclusion:** The method analysis is valid so it can be used to determined the amount of eugenol in water soluble base ointment by high performances liquid chromatography.

Keywords: eugenol, water soluble base ointment, validation of methode analysis, HPLC

3MP-HNMP

Pharmacological Effects of Garlic (*Allium sativum* L.), Roselle (*Hibiscus sabdariffa* L.) and Celery (*Apium graveolens* L.) on Disease Causing Death in Indonesia: a Literature Study

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ABSTRACT

Background: Diseases cause most deaths in Indonesia is non-contagious diseases such as hypertension, diabetes mellitus, dyslipidemia, liver disease, cardiac disease and contagious disease such as tuberculosis. Garlic, roselle, and celery are available plants in various regions of Indonesia with easy cultivation, therefor the people of Indonesia may easily use them as traditional herb remedies**. Objective:** This literature study aims to present the pharmacology effect of garlic, roselle, and celery towards several diseases with the highest death number in Indonesia as well as to review the active compound within in hope that this literature review may provide information for future research or for people experiencing related disease so that it may be applied for daily usage. **Method:** The study has been carried out by extensive searching on Pubmed from 2011 to 2021. The search result with the corresponding keywords of each plant as well as the inclusion criteria resulted in 72 journal to be further analyzed. **Result:** Garlic, roselle, and celery possess pharmacological effects toward several diseases with the highest death number in Indonesia. Garlic possesses pharmacological effects on hypertension, it has been researched at the pre-clinic and clinic stage, and also liver disease, dyslipidemia, and diabetes mellitus, it has been researched at the pre-clinic stage. Roselle possesses pharmacological effects on hypertension, it has been researched at the pre-clinic and clinic stage, and also liver disease, kidney disease or nephrotoxicity, myocardial infarction, diabetes mellitus it has been researched at the pre-clinic stage. Whereas celery possesses pharmacological effects on diabetes mellitus, it has been researched at the clinic stage, and also liver disease and hypertension, it has been researched at the pre-clinic stage. **Conclusion:** Garlic, roselle, and celery can be used as adjuvant therapy in various diseases that leading cause death in Indonesia. However using of those plants as adjuvant therapy are only allowed under supervision of professional healthcare and further studies are required to evaluate the effect before it can be recommended to general population.

Keywords: traditional herbal medicine, adjuvant therapy, cardiovascular disease, liver disease

3 Minute Presentation

3MP-HNMP

Pharmacological Effects of Gotu Kola (*Centella asiatica* L. (Urb.)), Neem (*Azadirachta indica* A. Juss) and Goji Berry (*Lycium barbarum* L.) on Diseases Causing Death in Indonesia: a literature study

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ABSTRACT

Background: Indonesia is well known as country with high diversity of plants, some of them are being used as traditional medical plants for handling several diseases. Unfortunately, the evidence related to the efficacy and safety of using herb remedies has not yet been widely available. Previous research has shown the potential activity of gotu kola, neem, and goji berry against hypertension, one of the highest causes of death in Indonesia. **Objective:** The aim of the study is to present a literature review providing information on the pharmacological activity of gotu kola, neem, and goji berry against disease leading causes of death in Indonesia. **Methods:** An extensive literature search on PubMed has been carried out using particular keywords and inclusive criteria to screen published articles from 2016-2021 yielded 69 journals for further analysis. **Results:** The results suggested that gotu kola in preclinic stage showed potential benefit to be used in therapy for cardiac ischemia and diabetes mellitus. Neem was clinically tested and showed effect as an antidiabetic agent. Whereas goji berry has been tested in preclinical phase and showed potential benefits for stroke, cardiac ischemia and diabetes mellitus, and also in clinical stage goji berry showed beneficial effects in COPD patients. **Conclusion:** Gotu kola, neem, and goji berry have potential pharmacological effects to be used as adjuvant therapy in various diseases that leading cause of death in Indonesia, however further studies are required to evaluate its effect when used by humans before it can be recommended to general population.

Keywords: traditional herbal medicine, adjuvant therapy, preclinical test, cardiovascular disease

3MP-HNMP

Cytotoxic Activity Test of Melinjo Seed Ethanol Fraction *(Gnetum gnemon* L.) Against HTB-179 Lung Cancer Cells with Stitch-String Bioinformatics Method

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ABSTRACT

Background: Lung cancer is the number one cause of death in the world reaching 18% of the total cases of death. The treatment of cancer itself can cause adverse effects so developed herbal products in hopes of minimizing side effects, namely with melinjo seeds *(Gnetum gnemon* L.). Previous research by Wintantri (2015) said that in melinjo seeds there are compounds Gnetin-C and Isorhapontigenin has anti-cytotoxic effects. **Objective:** to find out if the Melinjo Seed Ethanol Fraction (MSEF) can be a chemo-preventive agent in HTB-179 cancer cells in *In-vitro* and *In-silico*. **Method:** Uses the STITCH-STRING bioinformatics program to see proteins bound to MSEF. Molecular docking on the active compound MSEF against the proteins RAF1, EP300, PPARG. MTT Assay cytotoxic test to look at cytotoxic activity against HTB-179 cancer and its combination with the carboplatin. **Results:** From the bioinformatics program obtained four proteins from Gnetin-C and Isoharpontigenin compounds (ESRP1, RAF1, EP300 and PPARG) which are further docked obtained strong affinity bonds in RAF1, EP300 and PPARG proteins consecutively -6.6 kcal/mol, -7.5kcal/mol, and -9.3kcal/mol and potentially inhibits HTB-179 lung cancer cells. MTT Assay test used MSEF with the drug combination Carboplatin, MSEF has weak cytotoxic activity with an IC_{50} value of 1356.39 µg/mL and in drugs have moderate cytotoxic activity with a cytotoxic value 428.93 µg/mL. **Conclusion:** In this study it can be concluded that MSEF is not too potent used as an inhibitor of HTB-179 lung cancer cells.

Keywords: *Gnetum gnemon* L., HTB-179, bioinformatics STITCH-STRING, molecular docking, MTT assay

3 Minute Presentation

3MP-HNMP

The Use of Magnolia Berry (*Schisandra chinensis*), Black Cumin (*Nigella sativa* L.), and Cinnamon (*Cinnamomum burmannii*) in the Treatment of Disease-Leading Causes Death in Indonesia: A Literature Study

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ABSTRACT

Background: Hypertension, dyslipidemia, diabetes mellitus, and cardiovascular disease have been public concerns. These diseases are the main cause alter the mortality rate in Indonesia. Many Indonesians use plants that are believed to be an alternative or adjuvant treatment for these diseases. The use of plants as an alternative treatment is easily obtained, despite its safety use in treatment has not been widely available. **Objective:** The study aimed to present information related to the safety use and efficacy of magnolia berry, Black cumin, and cinnamon against several diseases that often cause death in Indonesia. **Method:** PubMed is used for extensive search published from 2011 to 2021 using determined keywords and inclusion criteria, obtained 76 journals for further analysis. **Results:** Studies of magnolia berry have been researched until the preclinical phase in type 2 diabetes mellitus, hypertension, and dyslipidemia. Whereas the cinnamon effect have been found until preclinical phase in type 2 diabetes mellitus, hypertension, and dyslipidemia also type 2 diabetes mellitus and hypertension at clinical phase. Black cumin have been researched at preclinical and clinical phase for type 2 diabetes mellitus and dyslipidemia, also hypertension only at clinical phase. These plants suggested as an alternative treatment for type 2 diabetes mellitus, hypertension, and dyslipidemia. **Conclusion:** magnolia berry, black cumin, and cinnamon can be alternative therapy under professional healthcare supervision. Further studies for these plants are required to evaluate the efficacy and safety before being used for the general population.

Keywords: traditional therapy, cardiovascular disease, preclinical test, adjuvant therapy

3MP-PESC

Evaluation of Drug Interaction in Stroke Patient at Medical Ward of RSBP Hospital Batam

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ABSTRACT

Background: The most deadly case of Indonesia's health problem is stroke with many risk factors, and complications can arise which increase polypharmacy that potentially causes drug interactions (DDIs). Drug Interactions can lead to treatment failure, toxicity, and also extend a patient's length of stay (LOS). **Objective:** Although RSBP Hospital Batam has been known as a good referral hospital for stroke in Riau Islands, the information about drug prescription, interaction events, the correlation between patient characteristics and DDIs, and the correlation between DDIs and LOS are incompletely understood. **Method:** This cross-sectional study uses retrospective data collection through medical records. The population of this study is stroke patients (age ≥18 years) who received drug therapy ≥2 types in August 2019–August 2020 (N=87). Potential DDIs were analyzed using drug interaction checker drugs.com and then evaluated using the Drug Interaction Facts literature. The data obtained were analyzed using the chi-square method to describe the significance. **Results:** 51 out of 87 patients who met the inclusion and exclusion criteria were most prescribed the antihypertensive agents with 104 prescriptions (26.87%). Forty-six patients experienced 147 potential DDIs, with the most potential DDIs is Amlodipine and Bisoprolol for 18 events (11.25%). The highest degree of severity is moderate (66.25%). The mechanisms that occur are pharmacokinetics (25.00%), pharmacodynamics (14.38%), and unknown (60.62%). **Conclusion:** Based on the study, there is a correlation between patient characteristic (comorbid) and potential DDIs but there is no correlation between potential DDIs and LOS.

Keywords: drug interactions, stroke, length of stay

3MP-PESC

Factors Associated with Intention to Provide Smoking Cessation Program among Community Pharmacists in Surabaya

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ABSTRACT

Background: Tobacco use is a preventable cause of premature death and a common risk factor of non-communicable diseases in Indonesia. The high prevalence of smoking can be reduced by smoking cessation. Smoking cessation provided by healthcare professionals is expected to prevent tobacco-related diseases. Community pharmacists are well-positioned to encourage smoking cessation for patients. **Objective:** This study aimed to assess factors associated with intention to provide smoking cessation among community pharmacists in Surabaya using the Theory of Planned Behavior (TPB) constructs. **Method:** A cross-sectional study was conducted in June 2021 using an electronic self-administered questionnaire that had been tested for validity and reliability. The questionnaire was circulated to respondents through WhatsApp and email. About 112 out of 383 contacted candidates agreed to participate in the survey (response rate= 29.2%). The Spearman's Rho correlation test was conducted to assess the correlation between knowledge, attitude, subjective norms, and perceived behavioral control (PBC) toward the intention. **Results:** The research showed that most of respondents had sufficient knowledge (n=85;79,4%), positive attitude (n=96;89,7%), moderate subjective norms (n=53;49,5%), moderate PBC (n=78;72,9%) and strong intentions to provide smoking cessation services (n=63;58,9%). A significant correlation was shown in attitude, subjective norms, and perceived behavioral control intending to provide smoking cessation program (p<0.05). However, there was no significant correlation between knowledge and intention. **Conclusion:** The positive correlation shows that stronger attitude, subjective norms, and PBC align with stronger intention. Collaboration between pharmacists and stakeholders is needed to prepare smoking cessation services in the future.

Keywords: community pharmacist, intention, smoking cessation, *theory of planned behavior*

3MP-PESC

Public' Perception about Design and Information Content of Prescribed Drug' Labels on Prescription Services in Community Pharmacy

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ABSTRACT

Background: In Indonesia there is no regulation about the design and content of prescribed drug' labels at community pharmacies. Therefore, the labels received by patients have various designs and content. Incomplete information and insufficient design can decrease patient adherence to therapy. **Objective:** This study aimed to determine the public' perception of the design and content of prescribed drug' label information. **Method:** This study was conducted by survey using an online questionnaire developed based on the "FIP Guidelines for The Labels of Prescribed Medicines" and Permenkes No. 73 Tahun 2016. Questionnaires were distributed through various types of social media. **Results:** A total of 240 respondents from 23 regions of Indonesia participated in this study. The majority of respondents considered the ideal design of prescribed medicines' label is printed (55.00%) on 8cm x 5cm paper (52.90%) with Arial font (69.20%) and affixed to the primary packaging (54.60%). The label of drugs for external use needs to be distinguished from internal use (90.80%) using the light blue color as the background (63.80%). The majority of respondents also considered the most important contents in prescribed drug' label are medication instructions (90.4%), drug name (90%), patient name (82.1%), drug shelf-life limit (80.4%), and pharmacy's identity (76.7%). **Conclusion:** Public' perception of prescribed drug' label is influenced by the labels they ever get. The results of this study are expected to provide a reference for Indonesian government to formulate the policies related to prescribed drug' labels in community pharmacies.

Keywords: community pharmacist, labeling, prescription, patient adherence

3MP-PESC

Pharmacists' Perception about Design and Information Content of Prescribed Medicines' Labels on Prescription Services in Community Pharmacy

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ABSTRACT

Background: The existence of different perceptions of each pharmacist coupled with the absence of standards or regulations related to labels of prescribed medicines in Indonesia makes the labels received by patients have different designs and content. Incomplete information and insufficient medicine labels design can lead to medication errors. **Objective:** This study aimed to determine the pharmacists' perception of the design and content of prescribed medicines' label information. **Method:** This study was conducted by survey using an online questionnaire developed based on the "FIP Guidelines for The Labels of Prescribed Medicines" and Peraturan Menteri Kesehatan No. 73 Tahun 2016 tentang Standar Pelayanan Kefarmasian di Apotek. Questionnaires were distributed through personal chat and groups consisting of community pharmacists. **Results:** A total of 925 pharmacists from 32 regions of Indonesia participated in this study. Respondents considered the content of information that were very important included instructions for drug use (84.6%), patient name (81.6%), pharmacy name (76.1%), special instructions (71.5%), and pharmacist's name (63.9%), while the content of information that were very unimportant included initials of pharmacist (5.0%), drug dosage form (4.4%), name of pharmacy (4.0%), instructions for use of drugs/rules of use (3.9%), name of the pharmacist, patient name and drug name with the same percentage (3.8%). For the labels design, mayority of respondents prefered combination of printed and handwritten labels (61,2%). **Conclusion:** Different pharmacists' perceptions affect the labeling of medicines given to patients. There is a need for regulations or standards for labeling prescribed medicines.

Keywords: community pharmacist, perception, prescription medicine labeling, medication error

3MP-PESC

Case Series, Medication Pattern in Severe or Critically Ill COVID-19 Patient in One of Public Hospital, Yogyakarta

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ABSTRACT

Background: Most of mild or moderate COVID-19 patients show improvement after taking medications, however in many severe or critically ill patient will worsen even after taking medications. **Objective:** The aim of study to determine medication patterns of severe or critically ill COVID-19 patients and to explore deeply of therapy used in one of ICU pubic hospital, Yogyakarta. **Method:** This was a descriptive case series study in 10 survival and 10 non-survival severe or critically ill COVID-19 patients, the data were taken retrospectively through the medical records of hospitalized COVID-19 patients in January - July 2021. The data was obtained to get an overview of medication patterns. This research is expected to become a source for health care practitioners' learning and a reference for further research regarding therapy studies in severe/critically ill COVID-19 patients. **Results:** Non-survival group patient used 100% antiviral, 100% antibiotics, 90% anti-inflammatory, 80% anticoagulants and additional therapy (60% NAC, 10% colchicine). The survival group used 100% antiviral, 100% antibiotics, 80% anti-inflammatory, 90% anticoagulants and additional therapy (90% NAC, 30% colchicine). **Conclusion:** Antibiotics are the most common prescription in both groups and non-survival receive less additional therapy compared to survival patient. Therefore, it require further research to assess the benefit of additional therapy in severe or critically ill COVID-19 patients.

Keywords: COVID-19, case series, therapy

Knowledge and Attitude Overview of Elderly Outpatient at Tertiary Hospital in Aceh toward COVID-19

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ABSTRACT

Background: Coronavirus Disease-19 (COVID-19) is a infectious disease caused by SARS-CoV-2 that spread across the world creating a pandemic. COVID-19 is transmitted via sneezing and coughing causing widespread infection unavoidable without proper precaution. Until August 10th, 2021 about three million Indonesian resident were infected with mortality reaching 3%. Elderly are one of the most vulnerable group if infected by COVID-19 as they have many comorbidities and lower immunity compared to those who were younger. As in 2019, the number of elderly in Indonesia has reached 9.6% of the total population. Therefore, it is crucial for them to have a good knowledge and attitude toward COVID-19 which in turn prevent them from getting infected by COVID-19. **Objective:** To evaluate the knowledge and attitude of elderly outpatient toward COVID-19 **Method:** An observational descriptive with cross-sectional design study of 96 outpatient at tertiary hospital in Aceh was conducted using questionnaire-guided interview about elderly knowledge and attitude toward COVID-19. Data was analyzed using descriptive statistic to determine participant knowledge and attitude percentage. **Results:** More than half of the participant (64.58%) has a good knowledge and about three quarter of them (75%) have an adequate attitude toward COVID-19. **Conclusion:** The study suggest that elderly outpatient at tertiary hospital in Aceh has a good knowledge and adequate attitude toward COVID-19.

Keywords: COVID-19, elderly patient, knowledge, attitude

3MP-PESC

Drug Interactions in Patients Treated for COVID-19: An Exploratory Study in Aceh

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ABSTRACT

Background: Coronavirus Disease-2019 (COVID-19) is an infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Management of patients with COVID-19 may differ between health care facilities, depend on several factors. COVID-19 patients who have high risk and require hospital treatment are generally elderly patients and patients with serious comorbidities. This affects the acceptance of many drugs (polypharmacy) in patients and will increase the risk of potential drug interactions. Currently, there are many allegations in the community that drug interactions be a problem for COVID-19 patients who are hospitalized. **Objective:** The aim of this study is to analyze the drug interactions in patients treated for COVID-19. **Method:** This study is an observational descriptive used cross-sectional method through retrospective data on electronic medical records of COVID-19 inpatients during 2020 period at a tertiary hospital in Aceh. Data is analyzed using descriptive statistic and will be presented in the form of prevalence, explanations related to interacting drugs and their effects. **Results:** Potential drug interactions was found to occur in 378 patients (40.51%) with a total incidence of 707 interactions, with minor as many as 110 events (15.56%), moderate as 368 events (52.05%) and major as 229 events (32.39%). **Conclusion:** The study suggest that the most potential drug interactions occur in patients treated for COVID 19 are moderate.

Keywords: COVID-19, inpatient, drug interaction

3MP-PESC

Community Pharmacy Services in Banda Aceh during COVID-19 Pandemic

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ABSTRACT

Background: Research has shown that the current practice of community pharmacy services experiences new challenges caused by SARS-CoV-2. Community pharmacy services condition during a pandemic can be described through two variables, namely the management of pharmaceutical supplies, medical devices and consumable medical materials and self-medication profiles. **Objective:** This study aims to determine the pharmaceutical supplies, medical devices and consumable medical materials management condition and to evaluate the self-medication profile in community pharmacy in Banda Aceh during COVID-19 pandemic. **Method:** This was a descriptive observational study using a cross-sectional design. The study sample was 55 pharmacies located in Aceh. The pharmacies were identified by stratified random sampling method. In order to evaluate the pharmacy services during covid 19 pandemic, the questionnaire was distributed to the pharmacists who work at the selected pharmacies. Research instruments used in this study were questionnaire for management of pharmaceutical supplies, medical devices and consumable medical materials and a self-medication profile questionnaire. **Results:** The result shows that there are changes in community pharmacy services by the condition of pharmaceutical supplies, medical devices and consumable medical materials management based on item prices, stock availability and people's purchasing power aspects by 94.54% and self-medication activities in Banda Aceh increased by 89.1%. **Conclusion:** It can be concluded that community pharmacy services in Banda Aceh during COVID-19 pandemic experienced changes.

Keywords: community pharmacy services, COVID-19, management of pharmaceutical supplies, medical devices, consumable medical materials, self-medication profile

3MP-PESC

Development of Alternative Design and Content of Label in Prescription Services

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ABSTRACT

Background: Often the only information about drug use that patients receive at prescription services is in the form of a label affixed to the drug package. Meanwhile, the provisions regarding the design and information on labels regulated in the applicable laws only concern the color difference for oral and non-oral use. Clear guidelines are needed on the design and content of information so that there are no variations in writing information that could potentially cause medication errors. **Objective:** to find out the development of alternative designs and contents of etiquette in Indonesia. **Method:** Collecting data by conducting in-depth interviews with various backgrounds of pharmacists who were academics, practiced in independent pharmacies, practiced in network pharmacies, and administrators of professional organizations. **Results:** The difference in the color of the blue and white labels was still needed, it was possible to add one more color for preparations that were difficult to categorize. The label could be affixed to the primary or secondary packaging by considering the size and did not cover important information on the drug packaging. The identity of the pharmacist did not need to be included in the label because it was already attached to the identity of the pharmacy. One respondent considered writing the serial number of the drug on the label according to the order in the prescription is better than writing down the prescription number. **Conclusion:** further research is needed to confirm the label design based on the results of this study.

Keywords: alternative development, drug label, pharmacist

3MP-PDDS

Effect of Cup Depth of Concave-Faced Punch on the Physical Properties and Dissolution Profile of Mups Metformin HCl Tablets

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ABSTRACT

Background: Compaction of multi-unit pellet system (MUPS) into a tablet is a potential alternative for sustained release drugs. However, compaction pressure potentially damages the pellet coating resulting in immediate release. Excipients and tablet tooling design impact the MUPS tableting process and the resultant MUPS tablets. Punch shape modification and addition of excipient cushioning agent to withstand the compression pressure intend to preserve the desired drug release properties of pellets. **Objective:** This study aims to investigate the effect of cup depth of concave-faced punch on MUPS tablet physical properties and in minimizing pellet coating damage. **Method:** Blends containing ethyl cellulose coated-metformin HCl pellets, superfine lactose, disintegrant and lubricant were compacted using a concave-faced punch with cup depth 2.00 mm (deep–concave) and 2.82 mm (extra deep–concave) at two different compaction pressures. Tablet physical properties were assessed based on tensile strength and disintegration time. Metformin HCl release from pellets and tablets were used to assess pellet coating integrity. Pellets distribution in a tablet was examined on axial, radial, and tablet core. Excavated pellets from tablet core were assessed for the coat damage using SEM imaging. **Results:** Release profile showed that concave tablets of both deep-concave and extra-deep concave could not minimize pellet damage, thus sustained release drugs was not achieved. Tablet mechanical strength obtained was considered low. The MUPS tablets disintegration time is approximately one minute. **Conclusion:** To ensure the pellet coat integrity, the choice of punch shape is critical and applied compaction pressure should result tablet with a strong mechanical strength.

Keywords: MUPS tablet, coated pellets, cushioning effect, concave faced tablet, compaction pressure

3MP-PDDS

The pH Value and The Viscosity of The Ointment with Variations in The Total Concentration of Kelulut Honey and Olive Oil (1:1)

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ABSTRACT

Background: Diabetic ulcer wound care is an important factor to prevent amputation. There are 2 natural ingredients that have long been used in wound care, namely kelulut honey (Trigona sp) and olive oil. **Objective:** The purpose of this study was to obtain the optimum total concentration mix of kelulut honey and olive oil (1:1) in the ointment for the treatment of diabetic wounds. **Method:** Determination of the optimal concentration of the mixture of kelulut honey and olive oil (1:1) was carried out in two stages. In the first stage used concentrations of 15%, 20%, 25% and 30%. Based on the data in the first stage, the second stage used concentrations of 20%, 25% and 30% with the addition of 0.4% triethanolamine. The ointment is determined by the pH value and viscosity. **Results:** Test results show that at concentrations of 15%, 20%, 25% and 30% have a pH value = 3.2±0.12; 3.6±0.10; 2.6±0.47 and 3.1±0.35 respectively and viscosity value = 86.133±3.066; 64.133±6.025; 54.867±3.009; 34.000±953.94 mPa.S respectively. The test results at concentrations of 20%, 25%, and 30% with the addition of 0.4% triethanolamine have a pH value = 5.0±0.1; 4.3±0.1; 3.6±0.2 respectively and viscosity value = 67.838±9.088; 47.219±3.743; 39.814±955 mPa.S respectively. **Conclusion:** The optimum total concentration mix of madu kelulut and olive oil (1:1) is 20% with the addition of 0.4% triethanolamine.

Keywords: diabetic ulcer, ointment, kelulut honey, olive oil

3MP-PPCP

Preparation of Radiopharmaceutical Iodine-131 Rituximab-conjugated $MnFe_2O_4$ nanoparticles as multimodalities contrast agent on MRI and SPECT

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ABSTRACT

Background: Superparamagnetic $MnFe_2O_4$ nanoparticles (NPs) have gained considerable interest in magnetic resonance imaging (MRI) application for detecting diseases such as lymphocyte cancer. The specific imaging of CD20 antigen-positive lymphocyte cancer may be accomplished by conjugating these NPs with anti-CD20 antibody rituximab. **Objective:** The purpose of this research is to synthesize superparamagnetic $MnFe_2O_4$ NPs conjugated with antibody rituximab iodine-131 and evaluate their physicochemical characterization. **Method:** $MnFe_2O_4$ NPs were prepared by the sol-gel method. The antibody rituximab was then conjugated to the surface of PEGylated $MnFe_2O_4$ NPs. The $MnFe_2O_4$-rituximab was labeled to iodine-131 by using iodogen method. Synthesized conjugates were characterized using UV-DRS, fourier transform infrared (FTIR), x-ray diffraction (XRD), vibrating sample magnetometer (VSM), and scanning electron microscope (SEM-EDX). **Results:** The results of the XRD characterization of $MnFe_2O_4$ NPs showed the presence of a crystal structure that correlates well with ICDD card No. 00-010-0319. The results of the hysterical loop of $MnFe_2O_4$ NPs exhibited the values of coercivity (Hc), remanence (Mr), and saturation magnetization (Ms) of 129 oe, 5.36 emu/g, and 18.80 emu/g, respectively. The morphology of the formed $MnFe_2O_4$ NPs was cubic crystal. The shape of the FTIR curve of naked $MnFe_2O_4$ NPs showed the presence of Mn-O and Fe-O vibrations at wavelengths 516 and 422 cm^{-1}, respectively. FTIR analysis demonstrated the changes in wavelength of NPs after conjugation with rituximab, indicating that the conjugation was successful. The results of the radiochemical purity test for $MnFe_2O_4$-rituximab-iodine131 using TLC radio were 99.3±0.7%. **Conclusion:** $MnFe_2O_4$-PEG-Rituximab-iodine131 were successfully prepared and characterized. The sufficient magnetization saturation value of these rituximab-based $MnFe_2O_4$ NPs suggested their potential as MRI and SPECT contrast agents.

Keywords: $MnFe_2O_4$ nanoparticles, rituximab, iodine-131, contrast agent, MRI, SPECT

3MP-PPCP

Next Generation Sequencing for Genomic Surveillance of SARS-CoV-2

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ABSTRACT

Background: The spread of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has been causing pandemic with more than 200 million cases confirmed per August 17th, 2021. The inclining cases are subject to the ease of transmission even in asymptomatic viral incubation period. Moreover, as infection cases increase, the more likely it is for SARS-CoV-2 to mutate due to genome replication error. Impacts of the emerging variants varies from transmission change to altering drug and vaccine response. Hence, identification and genomic surveillance of SARS-CoV-2 becomes essential in this pandemic era. **Objective:** To conduct genomic surveillance of SARS-CoV-2 and its implication based on the information we gained. **Method:** We analysed the whole genome sequencing data obtained from next generation sequencing to assign the variants to their respective clades and lineages, thus providing us overview of current circulating variants. **Results:** Whole genome data obtained from this study revealed several mutation sites. Phylogenetic analysis using SARS-CoV-2 isolates from other countries suggested that SARS-CoV-2 isolates from Indonesia were closely related to those from other countries. The speedy local transmission may indicate how travel ban in Indonesia was poorly executed, besides the fast-spreading nature of SARS-CoV-2. **Conclusion:** Genomic surveillance of SARS-CoV-2 provides overview of virus evolution, as well as possible transmission pathways. By continuously observing its evolution, researchers may find leads to future drugs or vaccines for SARS-CoV-2.

Keywords: SARS-CoV-2, whole genome sequencing, genomic surveillance

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