Abstract Book

icpsp

The 1st International Conference on Pharmaceutical Sciences and Pharmacy

Challenges on Development towards Pharma 4.0

7-8 October 2020

Organized by:

School of Pharmacy

Co-organized by:

Pusat Penelitian Nanosains dan Nanoteknologi

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Editor

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POSTER PRESENTATION

WELCOME ADDRESS FROM RECTOR OF ITB

Distinguished speakers, guests and participants. Welcome to ITB.

We are very grateful to welcoming all of you to the first ever virtual conference of 1st ITB International Conference of Pharmaceutical Science and Pharmacy (ICPSP) 2020. While we regret that the COVID pandemic prevented us from holding the conference in Bandung, we are excited about the opportunities of holding a virtual conference. In recent situation, we send our wishes and hopes for good health to all of you. This ICPSP organized by School of Pharmacy ITB under the theme Challenges on development towards Pharma 4.0. “Pharma 4.0” is a specific expansion of “Industry 4.0” with vision to obtain efficient, strong and flexible manufacturing operations. In Pharma 4.0, the manufacturing control strategy must be integrated with all parts of the manufacturing process as well as with the quality and function of the business. Horizontal integration of laboratory systems in university with manufacturing processes, equipment and facility systems enables feed-forward and reverse control.

As a well-known University in Indonesia, ITB always make strong commitment in teaching, learning, community services and research which are responsive to regional, national and international needs. This virtual conference is one of our commitments in spreading-out the development of science and technology in Indonesia, especially in updated information with an emphasis on the basic researches towards innovation on Pharmaceutical Sciences and Pharmacy to support the Pharma 4.0 era. I believe that this virtual conference will help all of us to explore more about state of the art of pharmaceutical science and pharmacy and its applications, through the advanced information delivered by the keynote speaker, invited speakers, as well as many research results which will be presented during these two day-virtual conference. Presentation of research is also to see a map of research positions in Indonesia among other countries in the world.

School of Pharmacy ITB, which established in 1947, has been exploring and exploiting a lot of research in sciences and technology of pharmaceutical sciences and pharmacy, together with industries and other research institutions in Indonesia. They offer us a wide range of aspects to be explored in development of technology that will suits with your interest. ITB fully supports this activity and we do hope that ITB would be a center of scientific research activities, especially in innovation on Pharmaceutical Sciences and Pharmacy to support the Pharma 4.0 era, not only for scientific development in university but also for commercial purposes in the publics.

We certainly encourage all participants and attendees to participate and engage with sessions as-though you were here in person. We hope this virtual experience will offer important opportunities to develop and maintain professional networks, even during this trying time. I would like to thank the organizing committee, sponsors and all parties for their contribution to the success of the virtual conference. May all efforts contributed in this virtual conference could bring good impressions to all national and international participants.

Enjoy the conference, thank you.

Prof. Reini Wirahadikusuma, Ph.D

Welcome Remar ks by the Chairman of 1st ITB International Conference of Pharmaceutical Science and Pharmacy (ICPSP) 2020

Dear Excellencies, Colleagues, Ladies and gentlemen.

It is a great pleasure for me to welcome you to this virtual conference of the of 1st ITB International Conference of Pharmaceutical Science and Pharmacy (ICPSP) 2020. I am very glad to acknowledge Ministers and other participants joining us. I would like to start by wishing you and your families my personal best—for your health and safety in these difficult times. Yes, we all experience an unprecedented situation with the global COVID 19 pandemic.

This conference will address the critical issues in the scope of Challenges on development towards Pharma 4.0. This conference will provide updated information with an emphasis on the basic researches towards innovation on Pharmaceutical Sciences and Pharmacy to support the Pharma 4.0 era by inviting multi-disciplinary researchers from academia, pharmaceutical industry, research institutions, and regulatory organizations.

With 1 keynote lectures, 6 plenary lectures, 4 invited speaker, 46 oral presentation and 58 poster contributions from over 300 participants from 5 countries, the topics of the conference cover various issues such as Pharmaceutical Technology and Drug Delivery System, Pharmacology-Toxicology, Biopharmaceutics and Pharmacokinetics, Pharmacochemistry and Analytical Method Development, Natural Product and Phytochemistry, Computational Science in Pharmacy, Clinical Pharmacy and Pharmaceutical Biotechnology.

Ladies and gentlemen,

Without the generous support provided by PT. Croda, PT. Dwi Tunggal Putra, PT. Telkomsel and Research Centre for Nanoscience and Nanotechnology ITB, this conference would not have been possible at this scale. Many members of the organizing team worked very hard to turn our initial visions for this conference into reality. Additionally, I would like to warmly thank all the authors who, with their presentations and posters, generously contributed to the lively exchange of scientific information that is so vital to the endurance of scientific conferences of this kind.

I extremely hope you all find this conference highly engaging and beneficial for your future venture. Your support will also make this a memorable and successful event. Ladies and gentlemen let me finally wish you a successful virtual meeting. Thank you.

Chairman

Dr. apt. Rachmat Mauludin

Schedule of The 1st ITB International Conference on Pharmaceutical Sciences and Pharmacy 2020

Wednesday, October 7th 2020

Time (GMT+7)	Activity
08.00-09.00 AM	Registration
09.00-09.15 AM	Opening Ceremony: Report of Chairman ICPSP 2020
09.15-09.30 AM	Rector of Institut Teknologi Bandung/Dean School of Pharmacy
09.30-10.00 AM	Official Opening and Keynote Speech by Minister of Research and Technology/National Research and Innovation Agency, Republic of Indonesia
10.00-10.50 AM	**Plenary Session** Moderator : Dr. apt. Diky Mudhakir **Plenary Speaker 1 : Prof. Hideyoshi Harashima** Multifunctional Envelope-type Nano Device for Gene Delivery: Concept and Clinical Application for Nanomedicine
10.50-11.20 AM	Sponsorship Presentation from PT. Croda Trading Indonesia **Presenter : Akira Ichii** Full Spectrum Solution Provider to Deliver Your API: Polysorbate 80 in Biopharma Formulations
11.20-12.10 AM	**Plenary Session** Moderator : Dr. apt. Yuda Prasetya Nugraha **Plenary Speaker 2 : Dr. Sci. Hidehiro Uekusa** Pharmaceutical Co-crystals: Crystal Structure and Property Relationship
12.10 AM -1.00 PM	BREAK
1.00-2.00 PM	**Invited Session** Moderator : Dr. apt. Hegar Pramastya **Invited Speaker 1 : Dr. apt. Ilma Nugrahani** Salt Co-crystallization as A Strategy to Improve the Drug's Physicochemical Properties: can a co-crystal be generated from salt compound? **Invited Speaker 2 : Dr. apt. Elfahmi** Development of Medicinal Plants Using Biotechnological Approaches **Panel Discussion**
2.00-2.10 PM	Sponsorship Advertisement/Presentation from PT. Dwi Tunggal
2.10-3.00 PM	**Plenary Session** Moderator : Dr. Fransiska Kurniawan **Plenary Speaker 3** : **Prof. Federico Gago** Molecular Modeling and Computer Simulations in Pharmacy and Pharmacology
3.00-3.10 PM	*Preparation for Oral Presentation Session 1*
3.10-4.30 PM	Oral Presentation Session 1
4.30-4.40 PM	Closing

Thursday, October 8th 2020

Time (GMT+7)	Activity
08.00-09.00 AM	*Re-entry Participant to Main Room (Webinar)*
09.00-10.00 AM	**Invited Session** Moderator : apt. Irianti Bahana, M.Si. **Invited Speaker 3 : Dr. apt. Kusnandar Anggadiredja** Neuroinflammation and Addictive Drug Dependence **Invited Speaker 4 : Dr. apt. Tri Suciati** Surface Modification of Lipid Nanoparticle to Improve Antibiotic Cellular Uptake **Panel Discussion**
10.00-10.10 AM	Sponsorship Advertisement/Presentation: PT. Telkomsel
10.10-10.20 AM	*Preparation for Oral Presentation Session 2*
10.20-12.10 AM	Oral Presentation Session 2
12.10-12.50 AM	BREAK
12.50 AM-1.00 PM	*Re-entry Participant to Main Room (Webinar)*
1.00-1.50 PM	**Plenary Session** Moderator : Dr. apt. Neng Fisheri Kurniati and Dr. apt. Muhamad Insanu **Plenary Speaker 4 : Dr. M. (Matijs) van Meurs** Novel Drugtargets for Acute Kidney Injury
1.50-2.40 PM	**Plenary Speaker 5 : Prof. Dr. Wim. J. Quax** Engineering TNF-ligand Family Members for Future Therapies
2.40-3.30 PM	**Plenary Speaker 6 : Prof Maria Jose Alonso** Design and Development of Novel Nanostructures as Drug Delivery Carriers
3.30-3.40 PM	*Preparation for Poster Presentation Session*
3.40-5.00 PM	Poster Presentation
5.00-5.10 PM	Award Ceremony and Closing

ORAL PRESENTATION SCHEDULE

Wednesday, October 7th 2020

Session I : 3.10-4.30 PM (GMT+7)

Room I : Main Room Webinar, link sent via email
Moderator : Dr. apt. Rika Hartanti

Code	Abstract Title	Presenter
OP-1	ANTIOXIDANT ACTIVITIES AND TOTAL PHENOL FROM MARINE MICROALGAE Chlorella vulgaris	Dewi Kurnia
OP-2	Optimization of Ultrasound-assisted Deep Eutectic Solvent Extraction of Phenolic Compounds from Ixora javanica Flowers	Nina Dewi Oktaviyanti
OP-3	In Vitro Micropropagation of Two Varieties of Orthosiphon aristatus Blume Miq	Fahrauk Faramayuda
OP-6	*IN VITRO BIOLOGICAL ACTIVITIES OF METHANOL EXTRACT OF DIPLAZIUM ESCULENTUM LEAVES (ANTIOXIDANT, ANTIDIABETIC AND TOXICITY)*	Megawati
OP-7	Alpha Glucosidase Inhibition of Crude Ethanol Extract and Fraction of Kedabu Fruit (Sonneratia xivate Backer)	Rahma Dona
OP-21	Effectivity of Gel Form of Ricinus communis L Leaves Extract Against Burns Healing of Rat Model	IFMAILY

Room II : http://bit.ly/ICPSP_OP2Oct7
Meeting ID : 826 5953 4778
Passcode : ICPSP2020
Moderator : Dr. apt. Pratiwi Wikaningtyas

Code	Abstract Title	Presenter
OP-4	EVALUATION of CD4 COUNT IN HIV OUTPATIENTS WITH OPPORTUNISTIC INFECTION (A Retrospective Study)	Budi Prasetyo Utomo
OP-5	THE CORRELATION OF HBA1C WITH SPUTUM CONVERSION IN TUBERCULOSIS PATIENTS CATEGORY I WITH DIABETES MELLITUS (A Cohort Prospective Study)	Oki Nugraha Putra
OP-8	Improved insulin sensitivity with extract and Active fractions of Hibiscus surattensis L. leaves in diabetic mice	Yuliet
OP-14	Budesonide treatment does not prevent airway neuroplasticity in a murine chronic asthma model	Siti Farah Rahmawati
OP-22	ANTIBACTERIAL ACTIVITY OF ESSENTIAL OILS OF POMELO PEEL (Citrus maxima) AGAINST BACTERIAL CAUSING BODY ODOR (Staphylococcus epidermidis)	Wisdawati

Room III : http://bit.ly/ICPSP_OP3Oct7
Meeting ID : 849 5956 0384
Passcode : ICPSP2020
Moderator : Dr. apt. Catur Riani

Code	Abstract Title	Presenter
OP-24	GPCR Receptor (D2 Receptor) Related by Nicotine-Induced Conditioned Preference Through Calcium Calmodulin Protein Dependent Kinase (CaMKII) and Extracellular-Signal Regulated Kinase (ERK) the Promising Target for Nicotine Dependence Therapy.	Gofarana Wilar
OP-31	Detection of Pork DNA in Bufallo Meatballs from Tana Toraja Using the PCR (Polymerase Chain Reaction) Method	St. Maryam
OP-32	The Effect of TMEPAI protein knockdown in colon cancer cell lines on AXIN2 mRNA level and in vitro tumorigenesis activity	Riezki Amalia
OP-33	Lactococcus lactis: high-level expression of Lectin-like Oxidized-LDL Receptor-1 (LOX-1)	Valentina Yurina
OP-34	Understanding the Challenges Upon Shifting from In Vitro to In Vivo siRNA Delivery; Hepatocellular Carcinoma as a Disesase Model	Mahmoud A. Younis

Room IV : http://bit.ly/ICPSP_OP4Oct7
Meeting ID : 844 0181 3205
Passcode : ICPSP2020
Moderator : Dr. apt. Satrialdi

Code	Abstract Title	Presenter
OP-35	Responsive Microparticles Loaded with Silver Nanoparticles for Specific Delivery in The Presence of Biofilms Former Bacterial	Andi Dian Permana
OP-37	DEVELOPMENT OF NANOCALSI TOOTH PASTE FROM CRAB SHELL WASTE AS AN ANTIBACTERY OF STREPTOCOCCUS MUTANS	Ambar Maisa
OP-39	Nanosuspension Formulation of Ethanol Extract of Safflower's (Carthamus tinctorius L.)	Gabby Vanessa
OP-43	GREEN SYNTHESIS OF SILVER NANOPARTICLES USING AQUEOUS EXTRACT OF FRESH AND DRIED Coffea canephora LEAVES AS BIOREDUCTOR	Mauizatul Hasanah
OP-45	Development of Mitochondrial-targeted Nanocarrier for Photodynamic Therapy Using the Microfluidic Device	Fumika Kubota

Thursday, October 8th 2020
Session II (10.20-12.10 WIB)

Room I : Main Room Webinar, Link sent via email
Moderator : Dr. apt. Ilma Nugrahani

Code	Abstract Title	Presenter
OP-25	Analysis of Physical-Chemical, Toxicology and Target Potential of Pure Compounds from Andalas Sitawa Fitolab: A Computational Study	Purnawan Pontana Putra
OP-26	*In Silico Studies of Several Compounds of Peperomia pellucida (L.) Kunth. Targeting Cathepsin K and MMP-9 for Osteoporosis Treatment*	I Gusti Agung Ayu Kartika
OP-27	QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIP OF 4-(3-NITROPHENYL)-THIAZOL-2-YLHYDRAZONE AS INHIBITOR OF MONOAMINE OXIDASE B ENZYMES FOR THE TREATMENT OF PARKINSON'S DISEASE	Purwaniati
OP-28	Molecular Docking, 3D Structure-Based Pharmacophore Modelling, and ADMET Prediction of Amentoflavone against the Main Protease of SARS-CoV-2	Faisal Maulana Ibrahim
OP-29	Esterification of Cinchonine Alkaloid and Anticancer Activity Test Against MCF-7 Breast Cancer Cells	Andini Sundowo
OP-30	New HPLC Method for Concomitant Quantification of Doxycycline, Ivermectine and Albendazole Metabolites in Rat Plasma Following Simulatenous Oral Administration	Ismail

Room II : http://bit.ly/ICPSP_OP2Oct8
Meeting ID : 895 2086 1850
Passcode : ICPSP2020
Moderator : Dr. apt. Amirah Adlia

Code	Abstract Title	Presenter
OP-36	Application of Simplex Lattice Design for Optimization of PVA, HPMC, and Gliceryn as Peel-Off Gel Mask Antioxidant Containing Ethanol Extract of Papaya Leaves (Carica papaya L.)	Andi Nafisah Tendri Adjeng
OP-38	Optimization and Evaluation of Alginate-HPMC Microspheres Composition for Encapsulation of Bromelain as Antiplatelet	Asih Gayatri
OP-40	Mouthwash Formulation and Evaluation of Bundung Plants (Actinoscirpus grossus) Ethanol Extract as a Mouth Antiseptic	Noval
OP-41	Effect of Surfactants Type on Particle Size and Stability of Docetaxel Polymeric Micelles Pre-pared by Freeze Drying Method	Dwianto Harry Nugraha
OP-42	The microsponge delivery of glibenclamide: Preparation and characterization	Rifka Nurul Utami
OP-44	Polymer design displaying acid-inducing isothermal hydrophilic-to-hydrophobic phase transition for effective cancer traetment photodynamic therapy (PDT)	Sjaikhurrizal El Muttaqien
OP-46	The Pharmacokinetics and Bioequivalence of Two Omeprazole Capsules in Indonesian Healthy Volunteers: A Partial Replicate Design	Yeyet Cahyati Sumirtapura

Room III : http://bit.ly/ICPSP_OP3Oct8
Meeting ID : 879 4998 9124
Passcode : ICPSP2020
Moderator: apt. Cindra Tri Yuniar, M.Si.

Code	Abstract Title	Presenter
OP-10	Effects of 2- (4-(chloromethyl)benzoyloxy)benzoic acid on TNF-α and IL-1β Cytokines Levels in Lipopolysaccharide-Induced Rat	Efendi Anggara
OP-11	EFFECT OF 2-((3-(CHLOROMETHYL)BENZOYL)OXY)BENZOIC ACID COMPOUND ON THE DEGREE OF INFLAMMATION OF LUNG AND LIVER OF LIPOPOLYSACCHARIDES-INDUCED MALE WISTAR RATS	Helen Kristiana Budi Agung
OP-19	Antihypertensive activity of cucumber fruit (Cucumis sativus L.) in hypertensive rats induced by angiotensin II	Klaudia Yoana
OP-13	MANURAN'S ROOT (Captosapelta tomentosa Valeton ex K. Heyne) AS APHRODISIAC ON WHITE MALE MICE (Mus musculus L)	Dyan Fitri Nugraha
OP-9	Effects of 2- (3-(chloromethyl)benzoyloxy)benzoic acid on TNF-α and IL-1β Cytokines Levels in Lipopolysaccharide-Induced Rat	Yongky Novandi Gunawan
OP-15	Acute Toxicity Assessment of "Bitter Honey" (Alstonia scholaris) and Histopathology Images in Mice (Mus musculus)	An Nisaa Nurzak

Room IV : http://bit.ly/ICPSP_OP4Oct8
Meeting ID : 816 5403 1964
Passcode : ICPSP2020
Moderator : Dr. apt. Kusnandar Anggadiredja

Code	Abstract Title	Presenter
OP-17	Traditional Medicinal Plants used for Lowering Blood Pressure: Mode of action and their interaction with standard antihypertensive agents	Tomi Hendrayana
OP-18	Antihypertensive activity of cucumber fruit (Cucumis sativus L.) in hypertensive rats induced by adrenaline	Muthia Kemala Dewi
OP-20	EFFECT OF BLACK GARLIC (Allium sativum (L)) TO REDUCTION OF TOTAL CHOLESTEROL LEVELS IN WHITE MALE MICE	Mukti Priastomo
OP-16	Antihypertensive activity of cucumber fruit (Cucumis sativus L.) in hypertensive rats induced by dexamethasone	Syifa Fauziah
OP-12	Effect Of 2-(4-(Chloromethyl)Benzoyloxy)Benzoic Acid Compound On The Degree Of Inflammation Of Lung And Liver Organs In Lipopolysaccharides-Induced Wistar Rats	Wiska Stephani Tjiali
OP-23	Red Ginger Nutraceutical Nanoparticles as Pain Relief in Menstruation (Dysmenorrhea)	Putri Arifa Ayu Damayanti

POSTER PRESENTATION SCHEDULE

Thursday, October 8th 2020

3.40-5.00 PM (GMT+7)

Room I : Main Room Webinar, link sent via email

Moderator : Dr. apt. Afrillia Nuryanti Garmana

Code	Abstract Title	Presenter
PP01	Identification of Flavonoids Compounds of Purple Leaf Extract (Graptophyllum pictum [L.] Griff.) Using Spectrophotometry Uv-Vis and Infrared	Hendy Suhendy
PP02	Total Phenol-Flavonoid Levels and Antioxidant Activity by Using DPPH and CUPRAC Methods of Binjai Leaves (Mangifera caesia Jack. Ex. Wall) Methanol Extract from South Kalimantan	Hafiz Ramadhan
PP03	Total Carotenoid Content and Antioxidant Activity of Pouteria campechiana (Kunth) Baehni. Extract	Sani Nurlaela Fitriansyah
PP04	UV-Visible Spectrophotometric Quantification of Total Flavonoid Content of Tiger Milk Mushroom (Lignosus rhinocerus) Fraction	Dina Yuspita Sari
PP05	ANTIOXIDANT ACTIVITY AND SUN PROTECTION FACTOR OF SEQUENTIALLY EXTRACTED ORGANIC SOLVENT EXTRACTS OF KATUK LEAVES (Sauropus androgynus (L.) Merr.)	Sofia Fatmawati
PP06	Determination of Total Flavonoid and Total Phenol Content of Pagoda (Clerodendrum paniculatum) Leaves Ethanol Extract and It's Antioxidant Activity	Dewi Pertiwi
PP07	Determination of Scpecific Standardization Parameters of Kasturi (Mangifera casturi Kosterm.) Leaves Extract From South Kalimantan	Aristha Novyra Putri
PP08	ANTIOXIDANT ACTIVITY TEST AND POLYPHENOL LEVELS OF INSTANT POWDER TAMARILLO JUICE (Solanum betaceum CAV.) BASED ON DIFFERENT FOAMING AGENTS	Novi Fajar Utami
PP25	Effect of Pepper Elder on Hypertensive Rats	Afrillia Nuryanti Garmana
PP09	ACUTE TOXICITY ASSAY OF Carthamus tintorius Linn. FLOWER USING BRINE SHRIMP LETHALITY TEST (BSLT) METHOD	Rini Hamsidi
PP10	*IN-VITRO STUDY OF INHIBITORY ACTIVITY α-AMYLASE AND PANCREATIC LIPASE ON FERMENTED ROBUSTA GREEN COFFEE BEANS*	TEDJO NARKO

Room II : **http://bit.ly/ICPSP_PP2Oct8**
Meeting ID : **893 6475 0211**
Passcode : **ICPSP2020**
Moderator : **apt. Bhekti Pratiwi, M.Si.**

Code	Abstract Title	Presenter
PP11	*INTERACTION OF BITTER MELON (Momordica charantia) FRUIT EXTRACT WITH SGLT-2 INHIBITOR DRUG IN DIABETIC MOUSE MODEL*	Zulkaida
PP12	The Effect of Ethanol Extract of Lime Peel (Citrus aurantifolia (Christm) Swingle) on Decreasing Total Cholesterol Level in Swiss Webster Strain Male White Mice (Mus musculus)	Ratna Widyasari
PP13	The Effect of 1,3-Bis (p-Hydroxyphenyl)Urea towards Viability of RAW 264.7 Cells-Induced by Lipopolysaccharide	Denny Satria
PP14	Biomarkers Non Invasive for Cardiovascular Risk Factors in Hypertensive-Animal Model: PWV And QRS-T Angle	Patonah Hasimun
PP15	The Cytotoxic Activities of Marine Sponges Extract from Staring Bay Against Cervical Cancer Cell Line (HeLa)	Nur Diana Hadad
PP16	*Citrus maxima peel extract inhibits cell growth and promotes apoptosis on highly metastatic breast cancer cells*	Sri Mursiti
PP17	Study of LSMT activity towards Spheroid	Fauzia Azzahra
PP18	Anti-Inflammatory Activities of Aqueous Extract of Beringin (Ficus Benjamina L.) and Kersen (Muntingia Calabura L.) Leaves in albino Rats	Dominus MBunga
PP19	Anti-fatigue effect of faloak bark infusion (Sterculia quadrifida R.Br.) using the Weight-loaded Forced Swimming Test (WFST) method	Stefany fernandez
PP20	Potential of African Leaf Water Extract (Gymnanthemum amygdalinum) as Antiinflammatory	Lusi Agus Setiani
PP21	Preventive Effect of Ethanol Extract of Parkia speciosa Hassk Seeds on Blood Lipid Profile in High-Fat Diet-Induced Rats	Cynthia Astiti Putri

Room III : **http://bit.ly/ICPSP_PP3Oct8**
Meeting ID : **824 8649 1123**
Passcode : **ICPSP2020**
Moderator : **apt. Irianti Bahana, M.Si.**

Code	Abstract Title	Presenter
PP22	Antiinflammatory test of Duwet Leaf Ethanol Extract (Syzygium cumini L. Skeels) and Histopathology test on Stomach Wistar Rat (Rattus norvegicus L) in vivo	Dhiya Hanifan
PP23	Evaluation of the diuretic and saluretic activity of cucumber fruit (Cucumis sativus L.) in wistar rats	Linarti Magdalena
PP24	Immunomodulatory Activity of Zanthoxylum acanthopodium DC. Fruits On Rats-Induced by Staphylococcus aureus	Rosidah
PP26	ANTI-INFLAMMATORY ACTIVITY OF Urena lobata LEAF EXTRACT: Study in silico and in vivo	Yudi Purnomo
PP27	ANTIFUNGAL ACTIVITY TEST FROM A STEM BARK OF TAMARIND (TAMARINDUS INDICA L.) TO THE PATHOGENIC FUNGUS BOTH IN VITRO AND IN SITU	Rohayati
PP28	Acute Toxicity Effect of Zingiber zerumbet (L.) J. E. Smith Rhizome Ethanolic Extract and Fraction Using Zebrafish (Danio rerio) Embryo Model	Kharina Septi Lestari
PP29	Lab Scale Capsule Formulation of Centella asiatica and Ipomoea aquatica	Neng Fisheri Kurniati
PP30	Anti-osteoporosis Potency of Vigna radiata Seed Coat Extract Compared to The Seed and Sprout: Phytochemical and In Silico Analysis	I Gusti Agung Ayu Kartika
PP31	Study In Silico of Xanthone, a-Mangostin, and g-Mangostin on PPAR-g Receptor and Aldosa Reductase Enzymes as Anti-Diabetic Drug Candidate	Rifa'atul Mahmudah
PP32	EVALUATION OF ITB STUDENTS' KNOWLEDGE TO NARCOTICS, PSYCHOTROPICS, AND ADDITIVE SUBSTANCES	Lia Amalia
PP33	THE IMPACT OF QUARTET CARD AS THE MEDIA OF EDUCATION ON JUNIOR HIGH SCHOOL STUDENT'S KNOWLEDGE ABOUT DRUG ABUSE	Irianti Bahana Maulida Reyaan
PP34	VALIDITY TEST AND RELIABILITY OF RESEARCH INSTRUMENTS IN HOSPITALS OF MEDICINE INFORMATION SERVICES	HENY PUSPASARI

Room IV : **http://bit.ly/ICPSP_PP4Oct8**
Meeting ID : **876 5165 2848**
Passcode : **ICPSP2020**
Moderator : **apt. Tasia Amelia, M.Si.**

Code	Abstract Title	Presenter
PP35	Pharmacophore Modeling, Virtual Screening, and Molecular Docking Studies for identification of inhibitor Urokinase Plasminogen Activator as anticancer	Bina Lohita Sari
PP36	SARS-CoV-2 Inactivation Under the Photodynamic Effect of Metal Phthalocyanine Complexes for the Future Treatment of COVID-19: In Silico Study	NURFADILLAH HAZAR
PP37	Molecular Docking Approaches of New Scorpion Venom Peptide Activity against CCR5 Receptors for the Improvement of HIV Infection Therapy	Eky Syahroni
PP38	Docking Study of Beta-Sitosterol Against HMG Co-A Reductase, HMG Synthase, LDL Receptor, PPAR-alfa and HCAR 2	Inarah Fajriaty
PP39	Molecular Docking Analysis of The Chemical Constituents of Luffa acutangula Related to Antidiabetic Molecular Targets	Rahmawaty Hasan
PP40	MOLECULAR DOCKING STUDY OF BROMELAIN AS VEGFR2 INHIBITORS	Hilda Aprilia Wisnuwardhani
PP41	Molecular Docking and ADMET Prediction of JPH203 as a Potential Radiopharmaceutical Kit for Molecular Imaging of Cancer	Elisha Wianatalie
PP42	In Silico Studies of 5-Benzyloxytryptophan against LAT-1 as a Potential Radiopharmaceutical Kit of Cancer	Ghifari Farhan Hasibuan
PP43	*Myristica fragrants oil: Potent inhibitor of Candida albicans biofilm development in vitro*	Ratika Rahmasari
PP44	Cytotoxic Activity of Marine-derived Fungi Emericella sp. against HT 29 Cell Line	Elin Julianti
PP51	*Agaricus bisporus Mannose Binding Protein is Not An Agglutinating Protein*	Najwa Nabila
PP55	In Silico Prediction Study of Mechanism β-cyclodextrin in Enhancement of Flavonoids Bioavailability by Complexation Phenomenon	Taufik Muhammad Fakih

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Moderator : Dr. apt. Yuda Prasetya Nugraha

Code	Abstract Title	Presenter
PP45	Effect of Hepatitis B Virus X Protein Mutant T118N and K130M/V131I on HepG2 Cells Transcriptome Profile	Andhika Rizky Gilang Mahaputra
PP46	Overproduction, Purification, and Characterization of Hepatitis B Virus X Protein Fused with Thioredoxin in Escherichia coli Rosetta-gami™	Tia Hadianti
PP47	Promoting a New Interaction in The Dimer Interface of rMnSOD Staphylococcus equorum Through Site-Directed Mutagenesis of The Coding Region	Ismiana Pajatiwi
PP48	Screening for Crystallization Conditions of Recombinant Manganese Superoxide Dismutase Staphylococcus equorum Mutants	Rahmat Muliadi
PP49	*OPTIMIZATION OF FORMULA TABLET EXTRACT RANGGAP BANANA (Musa troglodytarum L.) WITH A COMBINATION OF PVP-HPMC AS BINDERS USING SIMPLEX LATTICE DESIGN AND TESTING AS ANTIDIABETIC*	Dolih Gozali
PP50	Biodistribution of Coumarin-6-Labeled Ursolic Acid Niosomes with Chitosan Layer in Mice Induced with N-Nitrosodiethylamine	Andang Miatmoko
PP52	Characterization and Utilization Of Micro Crystalline Cellulose (MCC) From Galam (Melaleuca Leucadendron Linn) As Binding Agents	Dyera Forestryana
PP53	Formulation and Evaluation of Graptophyllum Leaves Extract Suppositories using Oleum Cacao and Suppocire Bases	Erni Rustiani
PP54	Controlled Release Solid Dosage Form of Shell Melinjo Seed Extract (Gnetum gnemon L)	Eni Masruriati
PP56	IDENTIFICATION OF THE PHYSICAL INTERACTION GLIMEPIRIDE WITH METFORMIN HCl	Fitrianti Darusman
PP57	Phase Transformation of Metoclopramide Polymorphs	Yuda Prasetya Nugraha
PP58	Development of Non-alcohol Liquid Dosage Form Containing of Acetaminophen by Using Combination of Cyclodextrin with Hydrophilic Polymer	Jessie Sofia Pamudji

SPEAKER

Multifunctional Envelope-type Nano Device for gene delivery: Concept and Clinical Application for Nanomedicine

Hideyoshi Harashima
Laboratory for Molecular Design of Pharmaceutics and Laboratory of Innovative Nanomedicine, Faculty of Pharmaceutical Sciences, Hokkaido University Sapporo City, Hokkaido 060-0812, Japan

Corresponding author: harasima@pharm.hokudai.ac.jp

We are developing a multifunctional envelope-type nano device (MEND) as a novel nonviral gene delivery system based on a new packaging concept termed “Programmed Packaging”. **Cytosolic delivery**: MEND was modified octaarginine (R8) to enhance cellular uptake and GALA peptide was also introduced to enhance endosomal escape. The R8/GALAMEND can deliver siRNA successfully to dendritic cells (DC) to increase immune response, however, the antitumor activity was not sufficient. Then we introduced newly designed pH-sensitive cationic lipid YSKC12 and YSKC12-MEND can induce remarkable silencing effect in human NK cells as well as DC and T-cells. **Mitochondrial delivery**: We proposed a MITO-Porter, a liposome-based carrier system that introduces macromolecular cargos into mitochondria via membrane fusions. An antisense RNA oligonucleotide (ASO) against cytochrome c oxidase subunit II was encapsulated into MITO-Porter to knockdown mitochondrial RNA. MITO-Porter can successfully knockdown the targeted mitochondria-encoded mRNA, protein and membrane potential in HeLa cells. D-arm, a mitochondrial import signal of tRNA to the matrix was chosen as ASO. Mitochondrial gene therapy will also be discussed based on our recent data in mutated tRNA G625A cells. **In vivo delivery**: In order to apply MEND via a systemic administration, we designed a pH-responsive cationic lipid to control biodistribution as well as intracellular trafficking. A newly designed YSK05 can respond to endosomal pH to induce efficient escape from endosome while maintaining neutral surface charge in blood circulation. The YSK-MEND can induce gene silencing in hepatocytes at a dose of 0.06 mg/kg. YSK-lipids were optimized based on chemical library which contains diversed chemical structures of YSKlipids. We will discuss structure-activity relationship of newly synthesized YSK-library. We have made our own microfluidic system for MEND preparation in collaboration with Prof. M. Tokeshi in our University. The flow system has been designed so that efficient and homogenous mixing can make smaller nanoparticles.

Keywords: nanomedicine, mitochondria, cancer immunotherapy, MEND, MITO-Porter.

Pharmaceutical Co-crystals - Crystal Structure and Property Relationship

Hidehiro Uekusa
Department of Chemistry, School of Science, Tokyo Institute of Technology, Tokyo, Japan

Corresponding author: uekusa@chem.titech.ac.jp

The importance of the crystalline phase of pharmaceutical solid-state cannot be overemphasized because the active pharmaceutical ingredients (APIs) in drugs are manufactured, stored, and delivered as a stable crystalline phase. The physicochemical properties of pharmaceutical crystals, i.e., solubility, stability, bioavailability, and mechanical properties, etc., have a strong link to the crystal structure. Thus, the rational approach to delivering an effective drug with more favorable properties should be based on the structural understanding of pharmaceutical crystals, which is available through X-ray crystal structure analysis of single or powder crystals. Recently, co-crystal formation or salt crystal formation is focused as one of promising "Crystal Engineering" methods by which a more favorable crystalline form is realized. In the co-crystal or salt crystal, API and co-former molecules together make a new crystal structure with new physicochemical properties, yet still, it includes the same API. This "Crystal Engineering" consists of the design and synthesis of the co-crystals and salt crystals and is attracting much interest in the pharmaceutical and crystallographic field. The relationship between crystal structure and physicochemical properties has not yet fully established; however, it would be revealed when some characteristic structures are elucidated and connected to the features. In this lecture, structure-property relationship of multi-component crystals (MCC) is explained including Benexate[1], Epalrestat[2], Gliclazide–Metformin[3], and Metoclopramide HCl[4] MCCs. In these examples, multiple unfavorable properties of mother crystals were improved by “Crystal engineering” that is a new crystal structure formation.

1. Pharmaceutics, 2018, 10, 64
2. Cryst. Growth Des., 2018, 18, 373-379
3. Cryst. Growth Des., 2016, 16, 3577-3581
4. CrystEngComm, 2018, 20, 2653-2662

Keywords: Crystal structure, Crystal Engineering, Cocrystal, Salt crystal, X-ray analysis.

Molecular modeling and computer simulations in pharmacy and pharmacology

Federico Gago
Department of Biomedical Sciences, University of Alcalá, E-28871 Madrid, Spain
Corresponding author: federico.gago@uah.es

Our everyday world of experience is separated from the normally invisible universe of molecules by an astounding million-fold difference in size. Nonetheless, continuous advances in extremely powerful structural biology tools such as X-ray crystallography, NMR spectroscopy, and electron cryomicroscopy have allowed us to gain unprecedented atomic detail about the beautiful and sophisticated architecture of a significant percentage of the molecular machines that work in concert within cells to perform synchronously the numerous tasks needed for life and to respond to a variety of external stimuli including light and chemical substances. This insight has provided irrefutable proof to Paul Ehrlich's original proposals, more than a century ago, that *corpora non agunt nisi fixata* ("bodies do not act unless they are bound") and that cells have chemically distinct receptors, or "side-chains", which they use with lock-and-key specificity to adsorb a dye or a bacterial toxin. These pioneering concepts, which set up the foundations of modern chemotherapy, converged with similar ideas emanating from experimental pharmacology and were seminal to account for the action of numerous drugs and poisons on living systems. On the other hand, a better understanding of the nature and magnitude of the forces that govern drug–receptor association and the possibility to simulate them using theoretical chemistry methods can help to understand, among other things, how chemical modifications in a series of ligands bring about changes in binding affinity and to perform virtual screening campaigns and structure-based ligand design in attempts to discover new drugs.

Novel drugtargets for Acute Kidney Injury

Matijs van Meurs, MD PhD
University Medical Center Groningen Department of Critical Care & Dept. Pathology and Medical Biology Hanzeplein 1, Internal Postal Code BA49 9713 GZ Groningen

Corresponding author: m.van.meurs@umcg.nl

Organ failure in critically ill patients on Intensive Care Units has a grave patient outcome and huge socioeconomic burden. A major failing organ is the kidney, Acute Kidney Injury. Until now critical care physicians can offer support for patients with failing kidneys by "doing the simple things good" and buy time for recovery by using organ replacement techniques. Despite these clinical efforts AKI is often fatal, and if the patients survive, accelerated aging and premature kidney function loss are observed. Drug treatment options for AKI are lacking because its molecular causes of are incompletely understood. In recent years, the role of the microvasculature in the kidney has been identified as central in the pathophysiology leading to AKI. Not only is loss of blood vessel barrier function a hall mark, also the recruitment of leukocytes from the systemic circulation into the renal tissue and subsequent tissue damage infliction is under the control of the microvasculature. One of the controllers of the microvasculature is the angiopoietin/Tie2 system. This lecture will discuss several translational studies in cells, mice and man of the angiopoietin/Tie2 system in AKI. The role of the angiopoietin/Tie2 system as AKI biomarkers, AKI mediators and as an AKI novel therapeutic strategy will be discussed. Novel drug therapies for AKI patients will hopefully be available in the future.

"Design and development of novel nanostructures as drug delivery carriers"

María José Alonso
Department of, Pharmacy and Pharmaceutical Technology
CIMUS Research Center, Santago de Compostela, Spain

Corresponding author: Mariaj.alonso@usc.es

The advances in pharmaceutical nanotechnology with regard to its connection with precision medicine have been largely associated to the formulation of biological drugs. Biological molecules, including antigen and therapeutic proteins and monoclonal antibodies, are taking an increasing space in the industry pipelines. Despite their potency, the difficulties of these macromolecules for overcoming biological barriers and reach their specific targets have significantly limited their exploitation. Fortunately, the continuously improved understanding of the biological barriers and the molecular biology associated to pathological conditions is paving the way for precision nanomedicine. Our laboratory has significantly contributed to this field by designing nanotechnologies intended to facilitate the targeted delivery of an array of molecules. In my presentation, I will focus on the design of targeted delivery carriers that could be used in different therapeutic areas: (i) oral delivery of peptides intended to treat either local or systemic diseases, (ii) nanovaccines designed to prevent diseases, i.e. HIV as well as to treat diseases, i.e. diabetes and multiple sclerosis, (iii) nose-to brain delivery of RNA molecules intended to treat Alzheimer disease and, (iv) delivery of mAb targeted to intracellular onco-proteins, as new oncological treatments. Overall, our experience in this field has benefited from integrative approaches adopted by specifically designed consortia. Hopefully, the results of these cooperative efforts will help to accelerate the progress of a rational design of protein-based nanomedicines.

Keywords: Nanomedicine, vaccines, oral peptides, nose-to-brain delivery, monoclonal antibodies, cancer

More information about these projects can be found at: http://www.usc.es/grupos/mjalonsolab/

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Engineering TNF-ligand Family Members for Future Therapies

Wim Quax
Department Chemical & Pharmaceutical Biology,
Groningen Research Institute of Pharmacy
Corresponding author: w.j.quax@rug.nl

Prof. dr. Wim. J. Quax received his PhD in the field of molecular biology at the Department of Biochemistry from the University of Nijmegen. After a career in the Biotech Industry he was appointed to full professor in Pharmaceutical Biology at the University of Groningen in 1998. Prof. Quax heads an active research line on using directed evolution and protein design technology for researching pharmaceutically relevant proteins. One of his focus areas are enzymes that interfere bacterial virulence. Especially quorum quenching enzymes have been explored by his group. Prof Quax has published > 250 peer reviewed papers and book chapters and he is named inventor on > 45 patents. At present he is the director of the Groningen Research Institute for Pharmacy (GRIP). He is the chairman of the University Committee for Academic Practice.

Salt-cocrystallization as a strategy to improve the drug's physicochemical properties: can a cocrystal be generated from salt compound?

Ilma Nugrahani
Department of Pharmacochemistry, School of Pharmacy,
Bandung Institute, Bandung, Indonesia
Corresponding author: ilma_nugrahani@fa.itb.ac.id

In drug development, the solubility and dissolution profile of solid drug material is very crucial to be considered. Crystal engineering by salt and cocrystal formation is still taking much attention for decades, especially in the pharmaceutical field, due to its capacity to improve those physicochemical properties. As known, both forms involve non-covalent interaction. However, the salt components interact with ionic bonding; meanwhile, cocrystal is defined as a multi-component system with two or more compounds interacted by the non-ionic bonding. Salt and cocrystal have been reported to enhance the pharmaceutical performance of low solubility drugs. Hence, the salt forms have been used widely for solid dosage formulations. Both modified solid forms have their respective advantages. In many cases, the salt form has a higher solubility than a similar parent drug's cocrystal. Still, several data revealed the inverse phenomenon, the higher solubility of cocrystal than its counterpart. Accordingly, we attempted to create salt cocrystals to combine salt and cocrystal advantages. Firstly, we studied the possibility of mixing the ionic bonding with the non-ionic bonding in a new multi-component lattice. Next, the active compound properties improvement in the salt cocrystal obtained was investigated. As a result, some salt cocrystals have been successfully developed, such as theophylline-Na-saccharine, diclofenac-Na-proline, diclofenac-K-proline. Besides, recently, we also succeeded in isolating and creating some other salt cocrystals. All salt cocrystals, except theophylline-Na-saccharine, have been evaluated to improve the parent drug solubility and dissolution by around 2-4 folds compared to the singular parent compound. It is proven that salt cocrystallization is one of the potential approaches in the pharmaceutical field. In this presentation, the salt cocrystal of diclofenac sodium and potassium cocrystal with L-proline production, structure determination, characterization, and pharmaceutical performance studies will be explained in more detail.

Keywords: salt cocrystal, solubility, dissolution, diclofenac sodium, diclofenac potassium, L-proline.

Development of Medicinal Plants Using Biotechnological Approaches

Elfahmi[1,2,*]
[1]Department of Pharmaceutical Biology, School of Phamacy, Bandung Institute of Technology, Indonesia
[2]Univercity Centre of Excellence, Nutraceutical, Bioscience and Biotechnology Research Centre, Bandung Institute of Technology, Indonesia
Corresponding author: elfahmi@fa.itb.ac.id

Many plants have been used for health purposes such us maintaining of health, prevention and treatment of diseases since long. Most of their traditional use has been proven by scientific researches. Based on the scientific evidences, the medicinal plants have been further developed as evidence base herbal medicines as well as plant derived drugs. Active secondary metabolites isolated from medicinal plants are responsible for the pharmacological activities, however, in general the secondary metabolites content is usually low. It is one of a bottle neck in the development of medicinal plants. Biotechnological approaches, such as plant tissue cultures technique and genetic engineering have been applied to enhance the production of acitive secondary metabolites and to discover new compounds. These techniques have been applied for several plants in our laboratories, some of them are reviewed and presented. Suspension cultures of *Phyllanthus niruri* produced cubebin dimethyl ether and urinatetralin, new lignan from *P. niruri*, but reported earlier from P. urinaria. This is the first report of cell suspension cultures of P. niruri that successfully produce lignans. Feeding 0.5 mM ferulic acid or 0.5 mM caffeic acid, being early precursors of lignan biosynthesis, resulted in an increase up to 0.7 mg g-1 DW of cubebin dimethyl ether (control value 0.1 mg g-1 DW) and up to 0.3 mg g-1 DW of urinatetralin (control value 0.2 mg g-1 DW). Another cytotoxic lignan, justicidin B was produced by genetically hairy root culture of Linum leonii up to 5-fold compared to callus cultures. Hairy root cultures of *Artemisia annua* was able to produce artemisinin which is not found in the native roots. Callus cultures of Boesenbergia pandurata produced panduratin A, a main active compound. In addition phytosterol and cardamonin with the content 285.85 ± 8.36 % and 316.35 ± 0.82 % were produced respectively which were higher than the original plant. Comparison of the lignan profiles of cell suspensions, callus cultures, aerial plant parts, roots, and seeds showed significant differences.. Genetically engineering of enzymes which are responsible on the biosynthes of artemisinin has been also performed in our study. Transformation of amorphadiene synthase (ads), one of key enzymes among 5 others, together with an antisilencing gene p19 in *A. annua* could enhance the production of artemisinin in transient transgenic leaves. We have also succesfully transformed these genes encoded key enzymes in other microorganism such as *Eschericia coli* and *Sacharomyces cereviceae*

Keywords: Medicinal plant, secondary metabolite, biotechnology, cell cultures, genetic engineering

Neuroinflammation and Addictive Drug Dependence

Kusnandar Anggadiredja
Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia

Corresponding author: kusnandar@fa.itb.ac.id

Drug dependence remains a public concern worldwide with detrimental impact on health as well as the society. Substrates involved in the inflammatory mechanism in the brain have been indicated to play some roles in the etiology of dependence to addictive substances. Thus, in the past years we have demonstrated that the cyclooxygenase and lipoxygenase pathways of the arachidonic acid cascade significantly contributed to the development of dependence and expression of drug seeking in several animal models. Based on this data, possible neural machinery related to inflammation can be proposed to be responsible to the development of dependence. From the viewpoint of drug development for the management of drug dependence, these findings warranted the inquiry into the possibility of developing neuroinflammation-based therapy. Here, we also present some preliminary results on the potential of substances with anti-inflammatory activity to be used, and further developed into pharmaceutical formulation, in the management of drug dependence.

Keywords: neuroinflammation, drug, dependence.

Surface Modification of Lipid Nanoparticle to Improve Antibiotic Cellular Uptake

Tri Suciati
Department of Pharmaceutics, School of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia

Corresponding author: tri.suciati@fa.itb.ac.id

Transporting antibiotics to intracellular infection sites and regaining host immune response are among the major challenges in developing drug delivery carriers for combating life-threatening persistent pathogens. Various methods of surface modification have been attempted to improve the performance of lipid nanoparticles as a promising intracellular vehicle. Here, we proposed the use of botanical immune actives to modify lipid nanoparticles to mimic the bacterial entry pathway. Lipid soluble rifampicin was encapsulated within lipid nanoparticles prepared by the emulsification process and surface modified by a facile method of electrostatic binding during the preparation process. Two lipid types of stearyl alcohol and lecithin were surface modified with chitosan conjugated acemannan - a polymannose aloe origin and artinM – a TLR2 agonist *Artocarpus integrivolia* isolated lectin, respectively. The morphology of both modified lipid nanoparticles was shown by a layered shell surrounding core nanoparticles revealed by transmission electron microscope. Rifampicin release profiles at pH 7.4 and 5.5 were similar for both unmodified and modified particles with various release rates. The success of modified particles in traversing mammalian cells were shown by confocal microscope of Nile-red labeled lipid nanoparticles. The activity of rifampicin loaded modified lipid particles against intracellular *Staphylococcus aureus* were shown in in vitro culture of fibroblast and epithelial cells. To conclude, the lipid modification that resembles glycolipid and lipoprotein structures of bacteria becomes potential drug carrier for the treatment of intracellular infection diseases.

Keywords: intracellular infection, electrostatic binding, rifampicin, acemannan, botanical lectin.

ORAL PRESENTER

OP-1

ANTIOXIDANT ACTIVITIES AND TOTAL PHENOL FROM MARINE MICROALGAE *Chlorella vulgaris*

Dewi Kurnia[1*], Erna Rosliana[1], Dadang Juanda[1], Zeily Nurochman[2]
[1]Department of Pharmacy, Faculty of Pharmacy, Bhakti Kencana University, Bandung, Indonesia
[2]Department of Chemistry, Faculty Science and Mathematics, Bandung Institute of Technology, Bandung, Indonesia
*Corresponding author: dewi.kurnia@bku.ac.id

Antioxidants are compounds that can counteract free radicals, several researches have shown that microalgae have antioxidant activities that can neutralize free radicals. This research aims to examine the antioxidant activity and determination of total phenolic compound from *Chlorella vulgaris* microalgae. Extraction was carried out using multilevel maceration method using solvents n-hexane, ethyl acetate, and ethanol 96 %. Activity test by reducing DPPH (*2,2-diphenyl-1-picrylhldrazyl*) method and total phenol levels using *Folin-ciolcateau* reagent. Antioxidant activity test results showed that *Chlorella vulgaris* microalgae antioxidant activity with IC_{50} values for n-hexane, ethyl acetate, ethanol, and vitamin C successive comparisons ratio of 18.896; 11.979; 20.437 and 7.895 µg/ml. The total phenol levels of n-hexane, ethyl acetate and ethanol extracts were respectively 1.388; 1,184; 1,184 mg/GAE (*gallic acid equivalence*) per 100 mg extract. Ethyl acetate had very strong antioxidant activity with an IC_{50} value of 11.979 µg/ml and the highest total phenol levels from n-hexane amounted of 1.388 mg/GAE (*gallic acid equivalence*) per 100 mg extract. The results showed that n-hexane extract; ethyl acetate and ethanol very strong antioxidant activity but ethyl acetate extract from microalgae *Chlorella vulgaris* was more potential to be used as an alternative source of antioxidant compounds.

Keywords : *antioxidant, Chlorella vulgaris, DPPH, total phenolic compound.*

OP-2

OPTIMIZATION OF ULTRASOUND-ASSISTED DEEP EUTECTIC SOLVENT EXTRACTION OF PHENOLIC COMPOUNDS FROM *Ixora javanica* FLOWERS

Nina Dewi Oktaviyanti[1,2], Kartini Kartini[2], Hayun Hayun[3], Abdul Mun'im[1,3]
[1]Department of Pharmacognosy-Phytochemistry, Faculty of Pharmacy, Universitas Indonesia, Cluster of Health Sciences Building, Depok 16424 West Java, Indonesia
[2]Department of Pharmaceutical Biology, Faculty of Pharmacy, University of Surabaya, Surabaya 60293, East Java, Indonesia
[3]Graduate Program of Herbal Medicine, Faculty of Pharmacy, Universitas Indonesia, Kampus UI Depok 16424 West Java, Indonesia
Corresponding author: munim@farmasi.ui.ac.id

In this study, the development of environmentally friendly extraction methods for *Ixora javanica*, a flowering plant belonging to the family Rubiaceae, was carried out. The objectives of the present work were to provide recommendations for the optimal extraction conditions on phenolics yields from the *I. javanica* flower. The extraction process was performed using deep eutectic solvent (DES) (choline chloride and propylene glycol at a molar ratio of 1:1) and ultrasound-assisted (UAE) extraction methods. The response surface analyses using three-level and three-factor Box Behnken designs were conducted to obtain the optimum phenolic concentrations. The optimum extraction conditions for total phenolic featured an extraction time of 40 min, 25% water content in DES, and a solid-to-liquid ratio of 1:27 g/mL. The extract obtained under optimum extraction conditions showed higher total flavonoid yields than the ethanolic extract. The scanning electron microscope (SEM) images demonstrated that both of the solvents also showed different effects on the outer surface of the *I. javanica* flower during the extraction process. In sum, our work succeeded in determining the optimum conditions for total phenolics in the *I. javanica* flower using a green extraction method.

Keywords: Deep eutectic solvent, *Ixora javanica*, phenolic, Response surface methodology, ultrasound-assisted extraction

OP-3

IN VITRO MICROPROPAGATION OF TWO VARIETIES OF *Orthosiphon aristatus* BLUME MIQ

Fahrauk Faramayuda [1,2*], **Totik Sri Mariani**[3], **Elfahmi**[1,4], , **Sukrasno** [1]
[1]School of Pharmacy, Institut Teknologi Bandung (ITB), Bandung, Indonesia.
[2] Faculty of Pharmacy Universitas Jenderal Achmad Yani (UNJANI), Cimahi, Indonesia.
[3] School of Life Sciences and Technology, Institut Teknologi Bandung (ITB), Bandung, Indonesia.
[4]Biosceinces and Biotechnology Research Center, Institut Teknologi Bandung (ITB), Bandung, Indonesia.
*Corresponding author: fahrauk.faramayuda@lecture.unjani.ac.id

The *O. aristatus* plant is one of the potential plants to be developed in traditional medicine because it has several pharmacological activities, including antihypertensive, antidiabetic, and antiviral. *O. aristatus* can also be used as a material for making supplements and cosmetics. There are three varieties of *O. aristatus* that grow in Indonesia, namely white, white-purple and purple. The variety that grows the most is the white variety, while the other two varieties are limited in number, especially for the purple variety. The purple variety of *O. aristatus* has a higher sinensetin content than the other two varieties. This study aims to *in vitro* produce seeds of white-purple and purple *O. aristatus* and is expected to have better quality. *In vitro* propagation was carried out by plant tissue culture with the composition of MS + Zeatin + BAP and MS + BAP + NAA media. In shoot induction, the explants used with nodes with essential media MS + ZPT Zeatin 3 ppm + BAP 2 ppm can induce faster growth of shoots, while the media MS + ZPT BAP 2 ppm + NAA 3 ppm can grow shoots with the number of leaves a lot more. Shoots that have been formed in the previous stage are grown on IBA media to initiate root growth. IBA media with a concentration of 0.75 ppm is the fastest in growing roots and increasing shoot height. Shoots with edible roots are then planted on soil media to optimize the acclimatization process. Shoots of two varieties of *O. aristatus* originating from MS + Zeatin 3 ppm + BAP 2 ppm media succeeded in growing on acclimatization media.

Keywords: *O. aristatus*, White-purple variety, Purple variety, Micropropagation, Plant tissue culture

OP-4

EVALUATION of CD4 COUNT IN HIV OUTPATIENTS WITH OPPORTUNISTIC INFECTION (A Retrospective Study)

Budi Prasetyo Utomo[1], Oki Nugraha Putra[1], Ruddy Hartono[2]
[1] Study Program of Pharmacy, Faculty of Medicine, Hang Tuah University, Surabaya, Indonesia
[2] Departement of Clinical Pharmacy, H.S.Samsoeri Moertojoso Hospital, Surabaya, Indonesia
Corresponding author: budi.prasetyo@hangtuah.ac.id

HIV (Human Immunodeficiency Virus) is a virus that lower CD4 count. A reduction in CD4 cell counts of less than 500 cells / mm^3 leads to opportunistic infections. The main modality in HIV patients is the administration of antiretroviral drugs (ARV). The aim of this study was to evaluate CD4 counts in HIV patients with opportunistic infections after the administration of a first-line ARV regimen. This study was an observational analytic with a cross-sectional design conducted on outpatient HIV patients at H.S. Samsoeri Mertojoso Hospital Surabaya, by observing a CD4 count at least once during the first-line ARV therapy in a period of 12 months using medical record data for HIV patients in 2008-2018. There were 32 outpatient HIV patients who met the inclusion criteria and 18 of them were accompanied by opportunistic infections. The most opportunistic infections were oral candidiasis, diarrhea, and lung tuberculosis. The ARV regimens used are mostly in fixed-dose combination (FDC) consisting of Tenofovir (TDF), Lamivudine (3TC), and Efavirenz (EFV). CD4 counts in HIV patients with opportunistic infections after the administration of first-line ARV therapy in 12 months were 394.22 ± 106.37 cells / mm^3 and only 14% HIV patients with opportunistic infections had CD4 counts greater than 500 cells/mm^3. CD4 count in opportunistic infection with mycosis was 410.1 ± 131.97 cells/mm^3 while in non-mycosis opportunistic infection was 374.3 ± 65.39 cells/mm^3, although there was no significant difference ($p = 0.496$) with independent t-test. The conclusion of this study was that only 14% of HIV patients with opportunistic infections who reach CD4 counts are more than 500 cells mm^3 after the administration of the first-line ARV within 12 months.

Keywords: HIV, opportunistic infections, ARVs, CD4 counts.

OP-5

THE CORRELATION OF HBA1C WITH SPUTUM CONVERSION IN TUBERCULOSIS PATIENTS CATEGORY I WITH DIABETES MELLITUS (A COHORT PROSPECTIVE STUDY)

Oki Nugraha Putra, Hardiyono, Fitriyatul Rizkiah
Study Program of Pharmacy, Faculty of Medicine, Hang Tuah University, Surabaya, Indonesia
Correspondence author: oki.nugraha@hangtuah.ac.id

Background: The incidence of tuberculosis is higher in patients with diabetes mellitus (DM) than without DM. TB patients with DM are proposed to have delayed conversion of sputum from positive smear to negative smear. HbA1C is thought to have an association with sputum conversion in TB patients with DM. Method: This study was an observational analytic study with a prospective cohort design. The purpose of this study was to analyze the correlation between HbA1C and sputum conversion in TB patients with DM at the end of the intensive phase and compare it with TB patients without DM. This research was conducted from November 2019 to March 2020 in several primary health centers in Surabaya. Results: There were 16 TB patients with DM and 21 TB patients without DM who met the inclusion criteria. In TB patients with DM, the initial smear value was found to be the most positive 2 (+2). The HbA1C in TB patients with DM was significantly greater (9.79 ± 1.95%) compared to TB without DM (5.51 ± 0.55%), p = 0.000 with the independent t-test. By Pearson correlation, there was no correlation between the HbA1C with sputum conversion (p> 0.05). Sputum conversion in TB patients with DM was 85.71% while in TB patients without DM sputum conversion was 100% at the end of the intensive phase. Conclusion: The conclusion in this study that there was no correlation between the HbA1C with sputum conversion in TB patients with DM, and the percentage of sputum conversion was more than 80% in accordance with the sputum conversion requirements by the Ministry of Health of Indonesia Republic

Keywords: Tuberculosis; Diabetes Mellitus; Sputum Conversion; HbA1C

OP-6

IN VITRO BIOLOGICAL ACTIVITIES OF METHANOL EXTRACT OF *DIPLAZIUM ESCULENTUM* LEAVES (ANTIOXIDANT, ANTIDIABETIC AND TOXICITY)

Megawati
Reserach Center for Chemistry - Indonesian Institute of Sciences
Kawasan Puspiptek Serpong 15314
*e-mail: megarafandi@gmail.com

Background: *Diplazium esculatum*, also known locally as daun paku sayur is tropical plant widely distributed and easy found in Indonesia. Shikimic acid content caused this plant cannot consumed directly. *D. esculatum* also content some bioactive compounds. Method: Antidiabetic and antioxidant activity test, also toxicity test of the methanol extract of *D. esculatum* leaves has been done and conducted in vitro using α-glucosidase, DPPH free radical scavenger, and BSLT (Brine Shrimp Lethality Test) methods, respectively. Results: Methanol extract of *D. esculentum* leaves showed activity for antidiabetic with IC_{50} 14.5 ppm, moderate activity for antioxidant with IC_{50} 240.9 ppm and Artemia salina Leach. larvae with LD_{50} 1253.1 ppm. Conclusion: that *D. esculentum* has strong antidiabetic activity with IC_{50} value 14.51 ppm compared with quercetin as positive control (IC_{50} 13.73 ppm) and also safe to be consumed because its has LC50 value 1253.1 ppm (LC_{50} > 1000 ppm).

Keywords: *Diplazium esculentum,* Antidiabetic, antioxidant, toxicity, α-glukosidase, DPPH, Brine Shrimp Lethality Test

OP-7

ALPHA GLUCOSIDASE INHIBITION OF CRUDE ETHANOL EXTRACT AND FRACTION OF KEDABU FRUIT (*Sonneratia ovata* Backer)

Rahma Dona[1], Tyasakti Viryana[1]
[1]Department of Pharmacy, Sekolah Tinggi Ilmu Farmasi (STIFAR) Riau Pekanbaru-Riau, Indonesia
Corresponding author: rdona1985@gmail.com

This study aims to determine the effect of ethanol extract and fraction of kedabu fruit (*Sonneratia ovata* Backer) on antidiabetic activity through inhibition of the α-glucosidase enzyme. The test was carried out in vitro by inhibiting the enzyme α-glucosidase which was measured using a microplate reader with a wavelength of 410 nm. Testing was carried out on ethanol extract, n-hexane fraction, ethyl acetate fraction and water fraction. IC_{50} value calculation results obtained by ethanol extract of 1.86 µg / mL, the n-hexane fraction of 193.32 µg / mL, in ethyl acetate fraction of 2.32 µg / mL and in the water fraction of 2.29 µg / mL. Acarbose used as a positive control had an IC_{50} value of 0.75 µg / mL. Based on the research results, the ethanol extract of kedabu fruit (*Sonneratia ovata* Backer) was very active as an antidiabetic, followed by a water fraction and an ethyl acetate fraction, in contrast the n-hexane fraction it can be said to be inactive as antidiabetic.

Keywords: Kedabu Fruit, *Sonneratia ovata* Backer Antidiabetic effect, α-glucosidase enzyme

OP-8

IMPROVED INSULIN SENSITIVITY WITH EXTRACT AND ACTIVE FRACTIONS OF *Hibiscus surattensis* L. LEAVES IN DIABETIC MICE

Yuliet[1,2], Elin Yulinah Sukandar[1], I Ketut Adnyana
[1] Department of Pharmacology and Toxicology, School of Pharmacy, Bandung Institute of Technology, Indonesia
[2]Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Tadulako University, Palu City, Central Sulawesi, Indonesia
Corresponding author: yuliet_susanto@yahoo.com

Insulin resistance is a characteristic of type 2 diabetes mellitus. *Hibiscus surattensis* L. is a native herb that is used to treat diabetes mellitus. However, the information available on the effect of *H.surattensis* L. leaves on insulin resistance is not yet known. The level of HOMA-IR is one of the parameters of insulin sensitivity. The aim of this study is to prove that the use of extract and active fractions of *H. surattensis* L. leaves can improve insulin resistance in the diabetic mice model. This study used 36 mice divided into 6 groups of normal control (Na CMC 0.5%), diabetic control (STZ + Na CMC 0.5%), positive control (STZ + glibenclamide), K1 (STZ + ethanol extract 50), K2 (STZ + ethyl acetate fraction 50), and K3 (STZ + water fraction 50). Mice administered STZ dose of 100 mg/kg BW intraperitoneal to obtain hyperglycemia. The treatment has been given for 28 days. Increasing insulin sensitivity in the rats was measured based on HOMA-IR values. Analysis of data was done by using one-way ANOVA followed by Duncan post hoc test. The results showed the mean value of HOMA-IR after treatment for normal control, diabetes control, positive control, K1, K2 and K3 was 1.25; 3.24; 1.36; 1.28; 1.21 and 1.19 respectively. The HOMA-IR value of the treatment group was significantly lower compared to the diabetes group. Our study concludes that the use of *H. surattensis* L. leaves can improve insulin sensitivity in diabetic mice.

Keywords: Diabetes, *Hibiscus surattensis* L., HOMA-IR, streptozotocin

OP-9

EFFECTS OF 2- (3-(CHLOROMETHYL)BENZOYLOXY)BENZOIC ACID ON TNF-A AND IL-1B CYTOKINES LEVELS IN LIPOPOLYSACCHARIDE-INDUCED RAT

Yongky Novandi Gunawan[1], Yudy Tjahjono[1], Steven[2], Kuncoro Foe[1], Senny Yesery Esar[1], Caroline[1]

[1]Faculty of Pharmacy Widya Mandala Catholic University Surabaya

[2]Faculty of Medicines Widya Mandala Catholic University Surabaya

Corresponding author email: catcarol_2000@yahoo.com

Salicylic acid derivative non streoidal anti-inflammatory drug (NSAID) named acetylsalicylic acid (ASA) is the most widely prescribed drug. Beside its anti-inflammatory activity, this drug could induce anti-thrombotic feature due to its inhibition on both cyclooxygenase isoforms (COX-1 and COX-2). But a long administration of this compound could induce severe peptic ulcers. To eliminate the side effect, our research group succesfully created a novel salicylic acid derivative compound 2-(3-(chloromethyl)benzoyloxy)benzoic acid (3CBB) with better activity and lower side effects than ASA. This research aims to determine the effect of 3CBB on the concentration of rat Tumor Necrosis Factor-α (TNF-α) and Interleukin-1β (IL-1β) proinflammatory cytokines after induction of endotoxin Lipopolysaccharide (LPS). To induce inflammation, wistar rats (*Rattus norvegicus*) was induced by LPS 0.5 µg / gram intravenously. Several dosage of 3CBB which represents 100; 500; 900; 1300; 1700 mg/60KgBW in human dosage were given orally after 30 minutes of LPS administration. At 30 minutes after drug administration, blood was prepared by cardiac puncture, and centrifuged to obtain plasma. The plasma was tested immediately on Rat TNF-α ELISA kit and Rat IL-1β ELISA kit. 3CBB with a several dose can reduce TNF-α cytokines concentration at doses 100 mg/60KgBW (2.94+-0.44 x 10^3 pg/mL, p=< 0.05); 500 mg/60KgBW (2.01+-0.34 x 10^3 pg/mL, p=< 0.05); 900 mg/60KgBW (2.01+-0.42 x 10^3 pg/mL, p=< 0.05); 1300 mg/60KgBW (2.92+-0.44 x 10^3 pg/mL, p=< 0.05) and IL-1β cytokines concentration at doses 100 mg/60KgBW (2.31+-0.56 x 10^3 pg/mL, p=< 0.05); 500 mg/60KgBW (2.54+-0.28 x 10^3 pg/mL, p=< 0.05); 900 mg/60KgBW (2.57+-0.41 x 10^3 pg/mL, p=< 0.05); 1300 mg/60KgBW (3.68+-0.48 x 10^3 pg/mL, p=< 0.05); 1700 mg/60KgBW (2.23+-0.34 x 10^3 pg/mL, p=< 0.05) compared with positive LPS control group. 3CBB could inhibit inflammation by inhibiting proinflammatory cytokines secretion in LPS-treated rat models.

Keywords : 2-(3-(Chloromethyl)Benzoyloxy)benzoic acid, cytokines TNF-α, cytokines IL-1β, ELISA

OP-10

EFFECTS OF 2-(4-(CHLOROMETHYL)BENZOYLOXY) BENZOIC ACID ON TNF-A AND IL-1B CYTOKINES LEVELS IN LIPOPOLYSACCHARIDE-INDUCED RAT

Efendi Anggara[1], Steven[2], Kuncoro Foe[1], Senny Yesery Esar[1], Caroline[1], Yudy Tjahjono[1]

[1]Faculty of Pharmacy Widya Mandala Catholic University Surabaya

[2]Faculty of Medicines Widya Mandala Catholic University Surabaya

Corresponding author email: yudy.tjahjono@ukwms.ac.id

A famous Salicylic acid derivate named acetylsalicylic acid (ASA) is the most prescribed Nonsteroidal Anti-inflammatory Drug (NSAID) of around 30 million people/day worldwide. This drug has another therapeutic advantage. It can inhibit thrombocyte aggregation, particularly in stroke patient. However, regular consumption of acetylsalicylic acid bears detectable side effect such as irritation of the gastric mucosa. Our research groups could successfully synthetize a novel salicylic acid derivate by through Schotten-Baumann reaction named 2-(4-(chloromethyl) benzoyloxy) Benzoic Acid (4CBB). Our recent findings demonstrated the effectiveness and lower toxicity grade of 4CBB, better than ASA. Whether 4CBB could induce anti-inflammatory activity should be investigated thoroughly. The purpose of this study was to observe the effect of 4CBB on rat pro inflammatory Tumor Necrosis Factor-α (TNF-α) and Interleukin-1β (IL-1β) concentration which has been induced by bacterial endotoxin (LPS). Through this study, we will have a better insight on specific activity 4CBB drugs on suppressing inflammation and would further open a new pathway towards the novel NSAID development. Male wistar rats (*Rattus norvegicus*) were induced by LPS 0.5 µg/gram intravenously prior 4CBB administration. Different 4CBB dosages represents 100; 500; 900; 1300; and 1700 mg/60KgBW in human dosage were given orally on separate animals 30 minutes after LPS induction. 30 min after drug administration rat blood was prepared by cardiac puncture, then centrifuged to isolate the plasma. The plasma was immediately measured by Rat TNF-α and Rat IL-1β ELISA kit. 4CBB could reduce the concentration of TNF-α at doses 500 mg/60KgBW (6.28+/-1.17 x 10^3 pg/mL, p=<0.05); 900 mg/60KgBW (7.69+/-0.95 x 10^3 pg/mL, p=<0.05) and IL-1β at doses 100 mg/60KgBW (3.29+/-0,5 x 10^3 pg/mL, p=<0.05); 500 mg/60KgBW (2.97+/-0.37 x 10^3 pg/mL, p=<0.05); 900 mg/60KgBW (2.57+/-0.44 x 10^3 pg/mL, p=<0.05); 1700 mg/60KgBW (3.30+/-0.30 x 10^3 pg/mL, p=<0.05) compared to the LPS control group. 4CBB could inhibit inflammation by inhibiting proinflammatory cytokines secretion in LPS-treated rat models.

Keywords : Anti-inflammatory, 4CBB, TNF-α, IL-1β, LPS

OP-11

EFFECT OF 2-((3-(CHLOROMETHYL)BENZOYL)OXY)BENZOIC ACID COMPOUND ON THE DEGREE OF INFLAMMATION OF LUNG AND LIVER OF LIPOPOLYSACCHARIDES-INDUCED MALE WISTAR RATS

Helen Kristiana Budi Agung[1], Handi Suyono[2], Caroline[1],Yudy Tjahjono[1]
[1]Faculty of Pharmacy of Widya Mandala Catholic University Surabaya
[2]Faculty of Medicine of Widya Mandala Catholic University Surabaya
Corresponding author email: catcarol_2000@yahoo.com

Salicylic acid derivative- non-steroidal anti-inflammatory drugs (NSAIDs) such as Acetylsalicylic acid are the most commonly prescribed for treating inflammation. However, therapies involving most salicylic acid derivatives have the undesired side effects of gastric ulcer. Therefore, our research groups developed a novel salicylic acid derivate, namely 2-((3-(chloromethyl)benzoyl)oxy)benzoic acid (3CBB). It has an execellent analgesics effect with no sign of gastric mucosal damage compared to acetylsalicylic acid. To strengthen further towards the drug development, this research aims to investigate 3CBB-anti-inflammatory activity by observing the histology of the lung and liver of endotoxin LPS (lipopolysaccharide)-treated rat. To induce inflammation, male *Wistar* rat was intravenously injected 0.5 mg/kg lipopolysaccharides (LPS). The compound 3CBB was administered orally at the first hour and at the sixth hour after LPS injection. After 24 hours of LPS injection, the lungs and the liver were histologically prepared, and stained with hematoxylin and eosin. The sections were examined by evaluating the degree inflammation parameter with scoring method. Microscopical evaluation of 3CBB treated LPS-rats histology section indicates reduction of lung alveolar edema and decrease of necrotic hepatocytes compared with LPS-induced rats. No significant decrease ($P>0.05$) was observed in the lung sample compared with the exclusively LPS-induced population. However the liver showed a decrease ($P<0.05$) in the degree of inflammation in comparison with LPS-induced population. 2-((3-(chloromethyl)benzoyl)oxy)benzoic acid could reduce lung edema and hepatocyte necrosis, and therefore lowering the inflammatory response in endotoxins treated animal models.

Keywords: 2-((3-(chloromethyl)benzoyl)oxy)benzoic acid, Acetylsalicylic acid, Lipopolysaccharide, Anti-inflammatory, Histopathology

OP-12

EFFECT OF 2-(4-(CHLOROMETHYL)BENZOYLOXY)BENZOIC ACID COMPOUND ON THE DEGREE OF INFLAMMATION OF LUNG AND LIVER ORGANS IN LIPOPOLYSACCHARIDES-INDUCED WISTAR RATS

Wiska Stephani Tjiali[1], Handi Suyono[2], Caroline[1], Yudy Tjahjono[1]
[1]Faculty of Pharmacy of Widya Mandala Catholic University Surabaya
[2]Faculty of Medicine of Widya Mandala Catholic University Surabaya
Corresponding author email: catcarol_2000@yahoo.com

Acetylsalicylic acid (ASA) is the most commonly administered as non-steroidal anti-inflammatory drugs (NSAID) in the world. However, this salicylate derivative drug has infamous side effects. Long term administration of ASA could induce severe gastric mucosa damage. Therefore, our research groups successfully create a new, pure and cost-effective salicylic acid derivative through schotten-baumann reaction, namely 2-(4-(chloromethyl)benzoyloxy)benzoic acid (4CBB). Through toxicity and effectiveness study, 4CBB has lower side effect and excellent analgesic activity, better than ASA. This study emphasized on histological investigation of 4CBB through animal endotoxin induced inflammation models, whether this compound has the anti-inflammatory activity. To trigger inflammation, male Wistar rats were induced by endotoxin lipopolysaccharide (LPS) (0.5 mg/kg) intravenously. 4CBB with 10.33 mg/200gBW animal dosage (comparable with 500 mg/60KgBW human dosage) was administered orally each 1 and 6 hours after LPS induction. After 24 hours, the animals were euthanized for histological lung and liver preparation. The histological sections were stained with hematoxylin and eosin prior to microscopical evaluation. Microscopic evaluation is performed by determining the degree of inflammation through a scoring system. 4CCB gave a decreased in inflammation parameters by reducing lung alveolar edema and decrease necrotic hepatocytes compared to the LPS control group that have severely damage. Statistically shown LPS-rats treated with 4CCB have a lower inflammation score in lung ($P>0.05$) and liver ($P<0.05$) compared with LPS control group. 4CBB could decrease the inflammation parameters in the lung and liver organs in LPS-treated rat models, supporting the general hypothese of 4CBB as a novel candidate of salicylate derivative NSAID.

Keywords : Inflammation, 2-(4-(chloromethyl)benzoyloxy)benzoic acid, Anti-inflammatory, Lipopolysaccharide, Histology.

OP-13

MANURAN'S ROOT (*Captosapelta tomentosa* Valeton ex K. Heyne) AS APHRODISIAC ON WHITE MALE MICE (*Mus musculus* L)

Dyan Nugraha
Pharmacy Department of Health Faculty of Sari Mulia University of Banjarmasin, Indonesia
Corresponding author: dyanfitrinugraha@unism.ac.id

Residents in Kotabaru, South Borneo often consumed Manuran's root to increase their aphrodisiac activity. The purpose of this research was to prove the aphrodisiac activity in manuran's root, and to know how many dose must be given to male mice to show the aphrodisiac activity. Observation time duration was one hour, and the n-butanol fraction manuran's doses were 0.5 g/kgBW and 1 g/kgBW. There were three parameter used in this research with calculated frequencies. Which were introduction, climbing, and coitus. It showed that 1 g/kgBW n-butanol fraction manuran's root had aphrodisiac activity, with more frequent introduction than positive control and for another dose, 0.5 g/kgBW did not show any aphrodisiac's effect. Manuran's root dose recommendation for aphrodisiac activity is 1 g/kgBW.

Keywords: Aphrodisiac, Manuran, Captosapelta tomentosa Valeton ex K. Heyne.

OP-14

BUDESONIDE TREATMENT DOES NOT PREVENT AIRWAY NEUROPLASTICITY IN A MURINE CHRONIC ASTHMA MODEL

Siti Farah Rahmawati[1,2,5], Sophie Bos[1], Huib Kerstjens[3,5], Loes Kistemaker[1,4,5], Reinoud Gosens[1,5]

[1] Department of Molecular Pharmacology, University of Groningen, Groningen, The Netherlands;

[2]Department of Pharmacology and Clinical Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia;

[3]Department of Pulmonary Medicine, University Medical Center Groningen (UMCG), Groningen, The Netherlands;

[4]Aquilo Contract Research, Groningen, The Netherlands;

[5]Groningen Research Institute for Asthma and COPD, University Medical Center Groningen (UMCG), Groningen, The Netherlands

Corresponding author: s.f.rahmawati@rug.nl

Background: Neuronal remodelling occurs in asthma and contributes to airway hyper responsiveness (changes in lung function). Corticosteroids, an established asthma therapy, have been shown to improve lung function by means of reducing airway inflammation[1]. However, its effects on airway neuroplasticity have not been described yet. Aim :To investigate the effects of the corticosteroid budesonide on airway neuroplasticity in a murine chronic asthma model. BALB/cByJ (Jax-strain) mice (N = 8 per group, 8 weeks old) were sensitized to ovalbumin (OVA) on day 0, day 14 and day 21 via ip injection. Thereafter, animals were challenged with ovalbumin for 4 weeks (2x per week) via nebulization. Animals also were treated with budesonide via nebulization 24 hours prior and on the first day of each allergen challenge. 24 hours after the last challenge, lungs were collected for eosinophil immunohistological staining and gene expression analyses. Results: OVA challenge significantly increased eosinophil infiltration into the airway basal membrane and preventive budesonide treatment significantly hindered this effect ($p<0.05$). OVA challege significantly upregulated neuronal marker gene expressions, AChE and PGP9.5, and treatment with budesonide did not alleviate it ($p<0.05$). Strikingly, budesonide treatment even amplified the gene expression of other neuronal markers, ChAT and Tubb3/Tuj1 ($p<0.05$). OVA challege upregulated expression of the neurotrophins NGF, NT3 and BDNF, as well as their receptor expressions TrkA and p75 ($p<0.05$), but budesonide failed to downregulate their expression. NT3 expression was even significantly increased compare to OVA challenge alone ($p<0.05$). Conclusion: Budesonide fails to inhibit airway neuroplasticity in a murine chronic asthma model and even upregulates specific neuronal and neurotrophin markers.

Keywords: Asthma, budesonide, corticosteroid, neuroplasticity.

OP-15

ACUTE TOXICITY ASSESSMENT OF "BITTER HONEY" (*Alstonia scholaris*) AND HISTOPATHOLOGY IMAGES IN MICE (*Mus musculus*)

An Nisaa Nurzak[1,2], Suarni[2], Elly Wahyuddin[2],Veni Hadju[3], Marianti A. Manggau[2*]
[1]Pharmacy Department, Institute of Health Science Salewangeng, Maros, Indonesia
[2]Department Biopharmacy, Faculty of Pharmacy, Hasanuddin University, Makassar, Indonesia
[3]Department Nutrition, Faculty of Health Science, Hasanuddin University, Makassar, Indonesia
Corresponding author: mariantimanggau@unhas.ac.id

Bitter Honey is the kind of honey which harvested when Alstonia scholaris flowers produce a distinctive bitter taste, originating from the highlands of Buakkang Village, Gowa Regency, South Sulawesi. The Buakkang community uses it as a medicine for internal diseases, especially liver and kidney diseases. This study aimed to determine the acute toxicity of bitter honey through measurement of Lethal Dose (LD_{50}) in mice (*Mus musculus*). The method used in this research was experimental post-test only control group design. In this study the parameters observed were body weight, clinical symptoms, LD_{50} and histopathology of liver organ and mortality of animals. Twenty four female mice were randomly assigned into four groups of six animals each. Three groups of animals was administered orally bitter honey at different doses (500, 1500 and 4500 mg/kg) and one group as negative control. The observation for 24 hours showed, that there were no mortality is recorded, so the LD_{50} of the bitter honey was greater than 4500 mg/kg. The Observations were conducted for 14 days to observed delayed occurrence of toxic effects. At the end of 14 days, there were no mortality ~~is~~ was recorded. Meanwhile, histopathology observations of mice liver cell showed necrosis, hydrophilic degeneration, sinusoid dilatation of liver cells at the dose of 4500 mg/kg and the administered of the bitter honey influenced the mice body weight but not significantly. The present study revealed that oral acute toxicity assessment of Bitter Honey at dosage up to 4500 mg/kg induced mild toxicity symptoms.

Keywords: Acute Toxicity, Bitter Honey, *Alstonia scholaris*, Mild Toxicity, LD_{50}

OP-16

ANTIHYPERTENSIVE ACTIVITY OF CUCUMBER FRUIT (*Cucumis sativus* L.) IN HYPERTENSIVE RATS INDUCED BY DEXAMETHASONE

Tomi Hendrayana[1], Syifa Fauziah[1], Afrilia Nuryanti Garmana[1], Elin Yulinah Sukandar[1], I Ketut Adnyana[1]

[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia

Corresponding author: tomi@fa.itb.ac.id

Hypertension is the most common cardiovascular-related medical problems suffered by community. Nowadays, herbal remedies are being incorporated into clinical practice of treating cardiovascular diseases on the basis of evidence-based medicine. Cucumber (*Cucumis sativus* L.) may be one of the candidates to manage hypertension; however, its mechanism of action has not yet been determined. This study aimed to evaluate antihypertensive activity of cucumber fruit in hypertensive rats induced by dexamethasone and its interaction with standard antihypertensive agent (amlodipine). To evaluate antihypertensive activity, rats were divided into groups, which were given: cucumber 9, 18, 27, or 36 mg/kg bw, amlodipine 0.45 mg/kg bw as standard or combination (1:1) of cucumber 36 mg/kg and amlodipine 0.45 mg/kg bw orally. All animal subjects except those in negative control group were induced for hypertension, by administration of dexamethasone 0.5 mg/kg bw/day as subcutaneous injection for 7 to 10 days until blood pressure equal to or exceed 140/90 mmHg. Blood pressure was measured using CODA® tail-cuff blood pressure system, and data was analyzed statistically using SPSS software. By the seventh day of therapy, groups receiving cucumber in the doses 9, 18, 27, and 36 mg/kg bw, showed significant ($p<0.05$) SBP reductions and DBP reductions with the average SBP/DBP reductions of 20.73/12.93, 20.06/18.16, 19.07/17.47, and 26.51/19.56 mm Hg, respectively. However, combination group demonstrated a significantly ($p<0.05$) less SBP reduction compared with group receiving amlodipine alone, with the SBP/DBP reductions of combination group 26.22/18.92 mm Hg while that of amlodipine group 33.81/20.85 mm Hg. In conclusion, study demonstrated cucumber fruit has antihypertensive activity that increases with dosage, but inferior to that of amlodipine. Combination of cucumber and amlodipine failed to demonstrate more significant BP reductions, suggesting an indifference interaction.

Keywords: antihypertensive activity, blood pressure, cucumber, *Cucumis sativus* L., herb-antihypertensive agent interaction

OP-17

TRADITIONAL MEDICINAL PLANTS USED FOR LOWERING BLOOD PRESSURE: MODE OF ACTION AND THEIR INTERACTION WITH STANDARD ANTIHYPERTENSIVE AGENTS

Tomi Hendrayana[1], Klaudia Yoana[1], Syifa Fauziah[1], Muthia Kumala Dewi[1], Linarti Magdalena[1], Afrilia Nuryanti Garmana[1], Nova Suliska[1], Elin Yulinah Sukandar[1], I Ketut Adnyana[1]

[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia

Corresponding author: tomi@fa.itb.ac.id

Hypertension is a disease characterized by having a systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg. It is estimated that approximately 1.13 billion worldwide population has increased BP with tendency to rise every year. Hypertension is the highest risk factor for cardiovascular disease and be the most causes of death. Patient adherence to therapy plays a pivotal role to achieve the optimal outcome, unfortunately the data showed a high incidence of non-compliance with ranges from 25% of total patients. Recently, FDA announced of recalling angiotensin-receptor blocker due to the presence of nitrosamine impurities that don't meet the FDA safety standards. These circumstances tend to antihypertensive agent shortage and increasing the number of uncompliant patients to their regimen, hence increasing mortality. Nowadays, herbal remedies are being incorporated into clinical practice of treating cardiovascular diseases on the basis of evidence-based medicine; however, information on the uses of herbal medicine proven effectively lowering blood pressure and their interaction with antihypertensive agents is not yet widely available. This study aimed to present literature review providing information on the traditional medicinal plants used for lowering blood pressure and their interaction with standard antihypertensive drug. Literature search on PubMed and Google Scholar using particular keywords and inclusive criteria yielded 262 journals for further analysis. Studies suggested that *Onopordum acanthium* L., *Apium graveolens* L., *Ginkgo biloba* L., *Tripterygium wilfordii* Hook. f., *Curcuma longa* L., *Artocarpus altilis* Fosberg., *Alpinia speciosa, Ipomoea digitata, Eucommia ulmoides. Allium sativum* L. *Hibiscus sabdariffa* L. and *Punica granatum* L. have shown promising BP reductions and co-administrating those plants with standard drugs could enhance the antihypertensive effect. Numerous plants that had been preclinically tested still required further study to complete their evaluation and needed cautions when consumed by hypertensive patients.

Keywords: antihypertensive activity, blood pressure, traditional medicinal plant, herb-antihypertensive agent interaction.

ANTIHYPERTENSIVE ACTIVITY OF CUCUMBER FRUIT (*Cucumis sativus* L.) IN HYPERTENSIVE RATS INDUCED BY ADRENALINE

OP-18

Tomi Hendrayana[1], Muthia Kemala Dewi[1], Afrilia Nuryanti Garmana[1], Elin Yulinah Sukandar[1], I Ketut Adnyana[1]

[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia

Corresponding author: tomi@fa.itb.ac.id

Hypertension is a persistent condition of increasing blood pressure (BP) and one of the biggest factors causing cardiovascular disease. The number of adults with hypertension continues to increase from 594 million in 1975 to 1.13 billion in 2015. The World Health Organization (WHO) estimates the global prevalence of hypertension is 22%, in which 25% of the population in Southeast Asia are affected. The community in Indonesia has been using traditional medicinal plants as alternative/adjuvant therapy to manage hypertension, such as cucumber. However, cucumber's mechanism of action through inhibition of β-adrenergic receptors has not been studied. This research aimed to evaluate antihypertensive activity of cucumber fruit in hypertensive rats induced by adrenaline and its interaction with standard antihypertensive agent (propranolol). All animal subjects except those in negative control group were induced intraperitoneal for hypertension by adrenaline 2,7 µg/kg bw at 1 hour after drug/cucumber administration. Comparison group received propranolol 7,2 mg/kg bw, whereas the experimental groups received cucumber juice of 9, 18, 27, 36 mg/kg bw or a combination of propranolol and cucumber (7,2 mg/kg bw + 36 mg/kg bw). Blood pressure was measured on T0 until T120 after induction using CODA® tail-cuff blood pressure system and data was analysed statistically using SPSS software. Results showed that BP reductions at groups receiving cucumber by doses 9, 18, 27, and 36 mg/kg bw with the average SBP/DBP reductions of 23.35/16.54, 20.30/22.77, 32.90/16.59, and 34.97/27.92 mmHg, respectively. The highest reduction observed at dose 36 mg/kg bw. However, group receiving combination of cucumber and propranolol showed less BP reduction with the average SBP/DBP reduction of 29.83/20.92 mmHg compared with cucumber alone with reduction of 34.97/27.92 mmHg. In conclusion, cucumber has antihypertensive activity that improves proportionally with increasing dosage. The combination of cucumber-propranolol did not show more significant BP reduction indicating an indifferent interaction.

Keywords: Traditional medicinal plants, antihypertensive activity, cucumber, *Cucumis sativus L.*, herb-antihypertensive agent interaction.

OP-19

ANTIHYPERTENSIVE ACTIVITY OF CUCUMBER FRUIT (*Cucumis sativus* L.) IN HYPERTENSIVE RATS INDUCED BY ADRENALINE

Tomi Hendrayana[1], Klaudia Yoana[1], Nova Suliska[1], I Ketut Adnyana[1], Elin Yulinah Sukandar[1]

[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia

Corresponding author: tomi@fa.itb.ac.id

Hypertension, a condition characterized by systolic blood pressure (BP) ≥140 mmHg and/or diastolic BP ≥90 mmHg, is a very common cardiovascular disease affecting community. People commonly use traditional plants for treating hypertension due to easily and affordably obtained, despite lack of guideline for using those on hypertension therapy and their impact if co-administrated with standard antihypertensive drug. One of the traditional plants used for lowering BP is cucumber, but antihypertensive activity of cucumber in lowering BP through angiotensin II receptor blocking has not been studied. Therefore, the aims of this research were to evaluate the mechanism of action of cucumber in lowering BP regarding angiotensin II receptor blocking and its' effect when combined with angiotensin receptor blocker drug. BP was measured using CODA® tail-cuff blood pressure system and data was analyzed statistically using SPSS software. To find out the antihypertensive activity, rats were grouped and received cucumber juice 9, 18, 27, 36 mg/kg-bw; combination of cucumber 4.5 mg/kg-bw and Losartan 2.25 mg/kg-bw; cucumber 9 mg/kg-bw and Losartan 2.25 mg/kg-bw; 13.5 mg/kg-bw cucumber and Losartan 2.25 mg/kg-bw; 18 mg/kg-bw cucumber and 2.25 mg/kg-bw Losartan; or Losartan 4.5 mg/kg-bw. Angiotensin-II 100 µg/kg-bw was used to induce hypertension. Results showed that 30 minutes after induction, cucumber dosage 9, 18, 27, and 36 mg/kg-bw gave SBP/DBP values at 143.0/92.8, 134.7/91.7, 134,3/90.7, and 127.0/87.3 mmHg, resepectively. Moreover, as time goes on SBP and DBP values were decreased. Dosage of cucumber 36 mg/kg-bw showed the highest antihypertensive effect by its capability to prevent BP elevation. Other than that, co-administration of cucumber dosage 18 and Losartan 2.25 mg/kg-bw showed SBP/DBP value at 129.3/86.5 mmHg, which was similar to antihypertensive effect from single cucumber dosage 36 and Losartan 4.5 mg/kg-bw. This resulted a suspected-synergistic interaction and magnified antihypertensive effect between cucumber and Losartan, therefore caution should be applied.

Keywords: antihypertensive activity, cucumber (*Cucumis sativus* L.), angiotensin II-induced hypertensive rats, traditional plant-antihypertension drug interaction.

OP-20

EFFECT OF BLACK GARLIC (ALLIUM SATIVUM (L)) TO REDUCTION OF TOTAL CHOLESTEROL LEVELS IN WHITE MALE MICE

Naftalia Khetrine Hutapea, Mukti Priastomo[1], Niken Indriyanti
Laboratorium Penelitian dan Pengembangan FARMAKA TROPIS Fakultas Farmasi Universitas Mulawarman, Samarinda, Kalimantan Timur email:
Corresponding author: mukti@farmasi.unmul.ac.id

Garlic (*Allium sativum)* has been used as a medicinal for hyperlipidemia. Various processing developments are used to reduce the smell of garlic. Black garlic is made with a high temperature and humidity heating process. The black garlic has therapeutic benefits of lowering cholesterol levels. The chemical content in black garlic are allicin, S-allyl cysteine (SAC), flavonoid compounds, and polyphenol compounds. The purpose of this study is to use spice plants as a medicine that is effective in reducing total cholesterol levels. This research is an in vivo study which is experimental with a pre and post test controlled group design. The samples were devide into three groups with varying doses, namely group I with a dose of 0.126 g/kg, group II with 0.252 g/kg, and group III with 0.504 g/kg. The control positive group use simvastatin with 0.252 g/kg single dose. The test results that have been carried out the seventh day indicate in total cholesterol levels in the three test groups. The average reduction in total cholesterol levels in all groups was 10.3 mg/dL. The best results were in group II with a decrease in the mean total cholesterol levels of 13 mg/dL.

Keywords: hyperlipidemia, black garlic, total cholesterol, rats

EFFECTIVITY OF GEL FORM OF *RICINUS COMMUNIS L* LEAVES EXTRACT AGAINST BURNS HEALING OF RAT MODEL

OP-21

Ifmaily, Ifmaily
Department of Pharmacology, Faculty of Pharmacy, University of Perintis Indonesia, Padang, Indonesia
Corresponding author: ifmaily.72@gmail.

Burns not only cause damage against skin tissue of human, but also cause psychological,social, and economic effect in the sufferer. Prevalence of burns was 0,7% in Indonesia, 2013. The reseacher continued to find the burns healing from traditional plant. *Ricinus communis L* is a traditional plant that has many benefits in the health sector and is a medicinal plant that has potential as an anti-inflammatory, antimicrobial, anti oxydant, and others effect. This study aims to determine the effect of gel form of castor leaves extract on the burns healing on the skin of rats model. The 25 rattus novergicus white rats were divided into 5 groups, each group of 5 rats. The group division consisted of NC (negative control with gel base), F1 (2,5% concentration of castor leaves extract), F2 (5% concentration of castor leaves extract), F3 (10% concentration of castor leaves extract) and as comparison was Bioplacenton. Testing the effectiveness of gel - based castor leaves extract on burn healing using parameters of burns healing percentage, epithelialization time, and histopathology (fibrocollagen tissue). Based on the results of the one-way ANOVA statistical analysis showed that there were significant differences in burns healing between the treatment, negative control and comparison groups. The parameter of the effectiveness of gel form of castor leaves extract in healing burns was indicated by the largest percentage of wound healing in the F2 group (5% concentration) with a value of 83.65% and the fastest epithelialization time was found in F2 where the value was 12,8 days and the results histopathological test of fibrocolagen tissue was dense and widely available in the F2 and comparison groups. The conclusion was the castor leaves extract had a good effect in burns healing in rats model at 5% concentration.

Keywords: *Ricinus communis*, extract, burn healing, gel form

OP-22

ANTIBACTERIAL ACTIVITY OF ESSENTIAL OILS OF POMELO PEEL (CITRUS MAXIMA) AGAINST BACTERIAL CAUSING BODY ODOR (*Staphylococcus epidermidis*)

Wisdawati W., Handayani S.
Department of Pharmacognosy-Phytocemistry, University of Muslim Indonesia, Makassar, Indonesia.
Corresponding author: wisdawati.wisdawati@umi.ac.id

Pomelo is a common fruit in Indonesia, especially in Maros, South Sulawesi. Although pomelo peel is just a waste, it is reported that the essential oils of pomelo peel has some chemical compounds that can be used as an antibacterial. This research aim to determine the antibacterial activity of essential oils of pomelo peel against bacterial causing body odor *(Staphylococcus epidermidis).* Extraction method that using to obtain the essential oils of Pomelo peel was water distillation. Furthermore, we made some concentration series ranging from 0.3125% to 10 % (v/v). Moreover, antibacterial activity assay of the essential oils of Pomelo peel conducted by using agar well diffusion method to determine the MIC (Minimum Inhibition Concentration) and MKC (Minimum Killing Concentration) against bacterial causing body odor *(S. Epidermidis)* by evaluating the inhibition zone diameter. The MIC and MKC of the essential oils of Pomelo peel against S. Epidermidis were 0.3125 % v/v and 1.25 % v/v, respectively. It is concluded that the essential oils of Pomelo peel has an antibacterial activity against bacterial causing body odor (S. Epidermidis) at 0.3125% (v/v) as a minimum concentration.

Keywords: Pomelo peel (Citrus maxima), body odor, Staphylococcus epidermidis

OP-23

REVIEW PAPER : RED GINGER NUTRACEUTICAL NANOPARTICLES AS PAIN RELIEF IN MENSTRUATION (DYSMENORRHEA)

Putri Arifa Ayu Damayanti[1], Ega Astiana Nuzul Wahyuni[1], Nabilla Winriantika Putri[1], Lutfi Chabib[2]

[1]Department of Pharmacy, Faculty of Mathemaics and Natural Science , Islamic University of Indonesia, Yogyakarta, Indonesia

[2]Professional Pharmacy Education Program, Islamic University of Indonesia, Yogyakarta, Indonesia

Corresponding author: putri.damayanti@students.uii.ac.id

Menstrual pain or dysmenorrhea is a problem that is often pleasing to adolescents or women that has an impact on daily life, namely reducing the ability to concentrate and disrupting studies, affecting mental health and a person's quality of life. Red Ginger *(Zingiber officinale var. Rubrum*) is a potential plant with a high production rate in Indonesia that has an anti-inflammatory effect of the composition of gingerol or 6-gingerol can be used to facilitate handling of dysmenorrhea. This study aimed to examine and gather information regarding the nutraceutical potential of red ginger nanoparticles as a dysmenorrhea pain reliever. This review examines the online literature via PubMed, ScienceDirect, Cochrane, and Google Scholar. Based on the literature review conducted, it was found that red ginger has anti-inflammatory activity by inhibiting the secretion of cyclooxygenase (COX) -2 which causes pain during menstruation, several studies have also shown that giving red ginger orally is more effective in relieving dysmenorrhea pain in women compared to placebo and there is no difference in effectiveness between NSAIDs such as mefenamic acid and ibuprofen in relieving dysmenorrhea . Red Ginger has the potential to be used as nutraceutical preparations in the form of nanoparticles so that they can work better, the particles are more easily accepted by body cells and are healthier and safer for consumption.

Keywords : Dysmenorrhea, Red Ginger, Nutraceutical, Nanoparticle

OP-24

GPCR RECEPTOR (D2 RECEPTOR) RELATED BY NICOTINE-INDUCED CONDITIONED PREFERENCE THROUGH CALCIUM CALMODULIN PROTEIN DEPENDENT KINASE (CAMKII) AND EXTRACELLULAR-SIGNAL REGULATED KINASE (ERK) THE PROMISING TARGET FOR NICOTINE DEPENDENCE THERAPY

Gofarana Wilar[1], Sri Adi Sumiwi[1], Kohji Fukunaga[2]
[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor, Indonesia
[2]Department of Pharmacology, Graduate School of Pharmaceutical Sciences, School of Pharmacy, Tohoku University, Sendai, Japan
Corresponding author: g.wilar@unpad.ac.id

Nicotine in tobacco causes psychological dependence through its rewarding effect in the central nervous system (CNS). Although nicotine dependence is generated by dopamine receptor as a member of G-Protein Couple Receptors (GPCS) together with nicotinic acetylcholine receptors (nAChRs), synaptic molecular mechanism underlying the interaction between dopamine receptor and nAChRs remains unclear. Since the reward signaling is mediated by dopamine receptors, we hypothesized that dopamine D2 receptor (D2R) in part mediates the synaptic modulation of nicotine dependence in addition to dopamine D1 receptor. To investigate the involvement of D2R, wild-type (WT) and dopamine D2 receptor knock out (D2RKO) mice were assessed the nicotine-dependence with conditioned placed preference (CPP) task. D2RKO mice failed to induce CPP behaviors after repeated nicotine administration (0.5 mg/kg). When kinase signaling was assessed in the nucleus accumbens and hippocampal CA1 region after repeated nicotine administration. Both Ca2+/calmodulin-dependent protein kinase (CaMKII) and extracellular signal-regulated kinase (ERK) were upregulated in WT mice but not in D2RKO mice. Taken together, dopamine D2 receptor signaling is critical for induction of nicotine dependence in mice through CaMKII and ERK.

Keywords: Nicotine dependence, D2 receptor, Conditioned placed preference, CaMKII, ERK.

OP-25

ANALYSIS OF PHYSICAL-CHEMICAL, TOXICOLOGY AND TARGET POTENTIAL OF PURE COMPOUNDS FROM ANDALAS SITAWA FITOLAB: A COMPUTATIONAL STUDY

Purnawan Pontana Putra[1], Annisa Fauzana[1], Henny Lucida[1]
[1]Department of Pharmacy, Faculty of Pharmacy, Univesitas Andalas, Padang, Indonesia
Corresponding author: purnawanpp@phar.unand.ac.id

Several studies have shown that pure compounds from west sumatera medicinal plants have beneficial therapeutic effects so that they are potential candidates for active pharmaceutical ingredients (API). Andalas Sitawa Fitolab has been able to produce 10 pure isolates. The development of a new drug candidate requires a computational study to predict physicochemical properties, potential target and toxic properties. The purpose of this study is to initially screen the structure of candidates to predict how potential the compound as an API by using big data and machine learning. The chemical structure was analyzed using software and servers. The Software used was Marvin Sketch, QSAR Toolbox, Swiss Potential Target and ChemBioDraw. Results showed that log P of compounds revealed in a range of -0.54 to 4.64, Polar Surface Area (PSA) in range of 20.23 to 315.21. Asiaticoside did not meet Lipinski's rules. Compounds with high potential hazard are Catechin, Curcumin, Andrographolide, Asiaticoside Deoxyelephantopin, Ethylmethoxycinnamate, Alpha-mangostin and Piperine. Compounds such as Curcumin, Alpha mangostin, Plumbagin, and Piperine have specific protein targets that are predicted. This study concludes that Asiaticoside compounds have a high potential hazard, if it was developed as an API.

Keywords: analysis of physical-chemical properties, computational study, pure isolate, toxicology

OP-26

IN SILICO STUDIES OF SEVERAL COMPOUNDS OF *PEPEROMIA PELLUCIDA (L.)* KUNTH. TARGETING CATHEPSIN K AND MMP-9 FOR OSTEOPOROSIS TREATMENT

I Gusti Agung Ayu Kartika[1], Catur Riani[2], Muhamad Insanu[3], and I Ketut Adnyana[1],*
[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Institut Teknologi Bandung, Ganesha 10 Bandung, 40132, Indonesia
[2]Pharmaceutical Biotechnology Laboratory, School of Pharmacy, Institut Teknologi Bandung, Ganesha 10 Bandung, 40132, Indonesia
[3]Department of Pharmaceutical Biology, School of Pharmacy, Institut Teknologi Bandung, Ganesha 10 Bandung, 40132, Indonesia
Corresponding author: ketut@fa.itb.ac.id

Peperomia pellucida has been proved to have antiosteoporotic activity. However, there is no study regarding its possible mechanism of action, especially for its phytochemical compounds. This study aims to investigate possible inhibitory effect of several compounds from P. pellucida toward bone-matrix degradable enzymes, Cathepsin K and Matrix Metalloproteinase-9. Several chromatography procedures and Nuclear Magnetic Resonances were used to prove the presence of three well known phytoestrogens compounds including quercetine, stigmasterol, and apigenin, also three marker compounds including pellucidin A, dillapiol, and apiol. Then, the possible antiosteoporotic activity of the compounds were evaluated using PASS Online WebServer. Finally, molecular docking was conducted to investigate the binding profile of the compounds toward CatK and MMP-9 using AutoDock Tools 4.0 supported by Pymol and Discovery Studio for visualization. Kushennol F and Sophoraflavanone G were used as reference compounds for Cat K binding while epigallocatechin gallate was used in MMP-9 binding. Stigmasterol has high probability to be active as antiosteoporosis agent (pa>pi, 0.714>0.005). Except stigmasterol, all of the compounds were predicted to active inhibit MMP-9 expression. Other possible mechanism as antiosteoporosis agent is inhibition of membrane integrity that correlate with the release of bone-matrix degradable enzymes. Molecular docking studies revealed that dillapiol and apiol were predicted can bind to Cat K. Also, it is notable that both compounds has suitable binding patterns with amino acid residues in the active site of the enzyme such as Cys25 and Gly66. While apigenin and pellucidin A can bind to MMP-9 through Ala189 and Tyr248. All of the compounds have their possibility as antiosteoporosis agent with their own mechanism of actions. Dillapiol and apiol also apigenin and pellucidin A can bind to CatK and MMP-9, respectively, which could be useful for further utilization of P. pellucida as a source for antiosteoporotic agents.

Keywords: osteoporosis, cathepsin-k, mmp-9, peperomia pellucida

OP-27

QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIP OF 4-(3-NITROPHENYL)-THIAZOL-2-YLHYDRAZONE AS INHIBITOR OF MONOAMINE OXIDASE B ENZYMES FOR THE TREATMENT OF PARKINSON'S DISEASE

Purwaniati, Fahmi Imanullah, Aiyi Asnawi
Pharmacy Fakulty, Universitas Bhakti Kencana
Jl. Soekarno-Hatta 754 Bandung, Indonesia
Corresponding author: purwaniati@bku.ac.id

Monoamine oxidase B (MAO-B) enzyme is one of the targets of the treatment of symptoms of Parkinson's disease. The derivatives of 4-(3-nitrophenyl)-thiazol-2-ylhydrazone is known to have potential as a MAO-B inhibitor. In this study, a quantitative structure-activity relationship (QSAR) and molecular docking of the 4-(3-nitrophenyl)-thiazol-2-ylhydrazone derivatives was carried out. The best QSAR model obtained is pIC50 = (2.210120) + (0.208611xLog_S) + (-0.024341xMW) + (-0.000002xE_Potential) + (0.237454xRMS) + (- 0.012968x E_termal) with statistical criteria R = 0.9674; R2 = 0.949; Fcount / Ftable = 25,627, and q2 = 0.869. The new compounds was designed by making a substitution based on the Topliss scheme and obtained 17 new compounds that had better activity than the training set. The molecular docking study of 17 of these compounds found that 8 of them had a better affinity for MAO-B than natural ligands and the training set that had the best activity. The interaction study shows that 7 of them have an interaction with the presence of hydrogen bonds with the amino acid residues TYR435 and CYS172 which are the binding sites. These compounds are; SB4, SB9, SB11, SB12, SB14, SB15 and SB17.

Keyword; monoamine oxidase B, QSAR, Parkinson disease

OP-28

MOLECULAR DOCKING, 3D STRUCTURE-BASED PHARMACOPHORE MODELLING, AND ADMET PREDICTION OF AMENTOFLAVONE AGAINST THE MAIN PROTEASE OF SARS-COV-2

Faisal Maulana Ibrahim[1], Holis Abdul Holik[1]
[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, Indonesia
Corresponding author: holis@unpad.ac.id

In July 2020, the pandemic COVID-19 is of global concern. COVID-19 is caused by SARS-CoV-2 infection, whose penetration is aided by protein spikes on the surface of the virus. SARS-CoV-2 main protease, abbreviated as Mpro (PDB ID: 6LU7) is a key SARS-CoV-2 enzyme that plays an important role in mediating viral replication and transcription. These characteristics make the receptor very strategic to be a drug target. Molecular docking (AutoDock 4.2.6) and 3D structure-based pharmacophore modeling (LigandScout 4.1) were performed to analyze the molecular interactions of amentoflavone and its derivatives against Mpro. Besides that, the absorption, distribution, metabolism, excretion, and toxicity (ADMET) properties were calculated. The results showed that 51 compounds had better docking scores than remdesivir (guideline therapy) with S29 as the best-docked compound (-13.06 kcal/mol). These results showed that amentoflavone and its derivatives are promising candidates of novel anti-COVID agents.

Keywords: COVID-19, SARS-CoV-2, Amentoflavone, Molecular Docking, In silico

ESTERIFICATION OF CINCHONINE ALKALOID AND ANTICANCER ACTIVITY TEST AGAINST MCF-7 BREAST CANCER

OP-29

Andini Sundowo[1], Yulia Anita[1], Puspa Dewi NL[1], Linar Zalinar Udin[1] and Muhammad Hanafi[1]

[1]Research Center for Chemistry, Indonesian Institute of Sciences,
Kawasan Puspiptek Serpong Tangerang Selatan 15314
Corresponding author: andinis@yahoo.com

Chinconine is one of the alkaloids obtained from quinine bark. The aim of this study was to investigate of anticancer activities from chinconine derivatives. These derivatives were obtained by esterification of chinconine with isobutyric and butyric acid with using dimethylaminopyridine (DMAP) as catalyst and dicyclohexylcarbodiimide (DCC) as activator. With the ester group is expected to increase the anticancer activity of chinconine. Anticancer activity assay using the Alamar Blue method. The butyric and isobutyric cinchonine compound resulted yield of 24.8% and 38.68% respectively, with molecular weight 364 and yellowish paste. The anticancer activities of butyric and isobutyric chinconine against MCF-7 breast cancer cells were acquired IC50 of 2.89 µg / mL and 3.36 µg / mL respectively.

Keywords: Esterification of chinconine, butyric acid, isobutyric acid, anticancer, MCF-7

NEW HPLC METHOD FOR CONCOMITANT QUANTIFICATION OF DOXYCYCLINE, IVERMECTINE AND ALBENDAZOLE

OP-30

Andi Dian Permana[1], Elly Wahyudin[2], Muh. Nur Amir[2], Ismail[3]
[1]Department of Pharmaceutics, Faculty of Pharmacy, University of Hasanuddin, Makassar, Indonesia
[2]Department of Pharmacology Toxicology, Faculty of Pharmacy, University of Hasanuddin, Makassar, Indonesia
[3]Department of Phytochemistry, Faculty of Pharmacy, University of Hasanuddin, Makassar, Indonesia
Corresponding author: andi.dian.permana@farmasi.unhas.ac.id

Lymphatic filariasis has caused permanent and long-term disability around the world. The combination of albendazole (ABZ), ivermectin (IVM) and doxycycline (DOX) have been recommended for the treatment of this disease. However, no analytical method has been established to quantify these compounds simultaneously. Herein, we reported a new high-performance liquid chromatographic method to quantify these drugs in plasma. After the method development, the method was validated according to ICH and FDA guidelines. Essentially, the validated method was successfully applied to determine ABZ and its metabolites (albendazole sulfoxide (ABZ-OX) and albendazole sulfone (ABZ-ON)), as well as IVM and DOX in the plasma Wistar rats after simultaneous oral administration of the drugs mentioned above. Furthermore, one-step protein precipitation and extraction method were applied to extract the all drugs and metabolites efficiently with a recovery in the range of 87.76 ± 7.19%–95.19 ± 6.53%, 83.42 ± 8.34%–91.17 ± 9.52%, 79.45 ± 8.54%–89.92 ± 9.98%, 65.98 ± 8.05%–74.91 ± 8.87% and 96.12 ± 7.41%–100.32 ± 8.91% in plasma for ABZ, ABZ-OX, ABZ-ON, IVM and DOX, respectively. An Xselect CSH™ C18 HPLC column (Waters, 3.0 x 150 mm, 3.5 µm particle size) was used a stationary phase, with gradient elution using a mobile phase consisting of 0.1% v/v trifluoracetic acid in water and acetonitrile with a run time of 20 min with a UV detector. The calibration curves in plasma samples were found to be linear across the concentration range of 0.01–50 µg/mL for ABZ, ABZ metabolites and IVM; 0.025–100 µg/mL for DOX with a correlation coefficient (r2) ≥ 0.998. The validated method was found to be selective, precise and accurate. Finally, the method developed in this study could potentially be used to assess the pharmacokinetics the combination of drugs after oral administration concomitantly to Wistar rats.

Keywords: Albendazole, Ivermectine, Doxycycline, Method Validation, HPLC

DETECTION OF PORK DNA IN BUFALLO MEATBALLS FROM TANA TORAJA USING THE PCR (POLYMERASE CHAIN REACTION) METHOD

OP-31

Maryam St[1], Muflihunna A[1], Hatta Sumarni[1]
[1]Faculty of Pharmacy, University of Muslim Indonesia, Makassar, Indonesia
Corresponding author: a.muflihunna@umi.ac.id

Halal is an important thing in processed food products. The processed food products which arw frequently consumed, especially Tana Toraja people, are bufallo meatballs. This study aimed to detect the presence or the absence of pork contamination on the samples of bufallo meatballs from Tana Toraja by Polymerase Chain Reaction (PCR). The PCR is a technique of DNA amplification in vitro which were able to deliver a brief in higher sensitivity. Zthere are three stages in the process of PCR which its amplification was performed by 30 cycles, namely denaturation of temperature 95^0C, annealing 51^0C, and extention 72^0C. In this study used bufallo meat as negative controls, pork is a positive controls, and three samples from bufallo meatballs from a meatball stall in Tana Toraja. The results PCR amplification used pork spesific primers, namely primary cyt b gene showed no tapeworm visible in UV light. So that it can be proven that the three samples of Tana Toraja meatballs do not contain pork DNA.

Keywords: DNA, Polymerase Chain Reaction, Bufallo Meatballs

OP-32

THE EFFECT OF TMEPAI PROTEIN KNOCKDOWN IN COLON CANCER CELL LINES ON AXIN2 MRNA LEVEL AND IN VITRO TUMORIGENESIS ACTIVITY

Riezki Amalia[1,2], Nita Rahmasari[3], Luthfi Hargo Siwi[3],

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
[2]Center of Excellence in Higher Education for Pharmaceutical Care Innovation, Universitas Padjadjaran, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
3Bachelor Program in Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
Corresponding author: riezki.amalia@unpad.ac.id

TMEPAI protein is constitutively and highly expressed in many types of cancers and associated with poor prognosis. Knockdown of TMEPAI in lung cancer cells reduced tumorigenic activities such as xenograft tumor formation and sphere formation. Thus, TMEPAI is thought to be a novel oncogenic protein. TMEPAI is involved in some intracellular signaling pathways such as TGF-, androgen, and PI3K/AKT signaling pathways. However, the mechanism of how TMEPAI is involved in tumorigenesis is still not well understood. Our previous finding showed that TMEPAI overexpression prevent β-catenin accumulation in the nucleus and TMEPAI knockout in triple negative breast cancer cell lines promoted β-catenin stability and nuclear accumulation together with mRNA levels of Wnt target genes, AXIN2 and c-MYC, in TGF-β signaling-independent manner. Here, we investigate the effect of TMEPAI knockdown in AXIN2 expression and in vitro tumorigenesis activity by sphere formation assay in colon cancer cell lines, Caco-2 and DLD-1, with Wnt3A ligand induction. These cell lines have activated Wnt signaling by APC mutation, while only Caco-2 cells has additional SMAD4 and CTNNB1 mutation. SMAD4 is TGF-β signaling-related protein and CTNNB1 is gene for β-catenin protein, a Wnt signaling-related protein. The mRNA quantification data showed that AXIN2 mRNA level was weakly induced in Caco-2 cells and reduced in DLD-1 cells in response to Wnt3A stimulation. This data suggested the opposite roles of Wnt signaling in Caco-2 and DLD-1 cells. Interestingly, in sphere formation assay, TMEPAI knockdown in Caco-2 cells formed bigger spheres and Wnt3A treatment further increased the size and number of spheres. On the other hand, TMEPAI knockdown reduced the size and number of spheres compared to control in DLD-1 cells and Wnt3A treatment further reduced sphere size and number. This result shows different effect of TMEPAI knockdown by different activated signaling in colon cancer cells.

LACTOCOCCUS LACTIS: HIGH-LEVEL EXPRESSION OF LECTIN-LIKE OXIDIZED-LDL RECEPTOR-1 (LOX-1)

OP-33

Valentina Yurina[1], Akemi Kakino[2], Fu Namai[3], Takeshi Shimosato[4], Tatsuya Sawamura[2]

[1]Department of Pharmacy, Faculty of Medicine, University of Brawijaya, Malang, Indonesia
[2]Department of Molecular Pathophysiology, Shinshu University School of Medicine, Matsumoto, Japan
[3]Department of Agricultural and Life Science, Graduate School of Science and Technology, Shinshu University, Nagano, Japan
[4]Department of Biomolecular Innovation, Institute for Biomedical Sciences, Shinshu University, Nagano, Japan
Corresponding author: v_yurina@ub.ac.id.com

Lactococcus lactis is a safe and well known bacteria that is often used in the food industry due to well-expressed production of bacteriocin nisin. Nisin has suitable characteristics for food preservation including high activity, a broad spectrum of antibacterial activity, rapid action, high stability against high temperature and acid. Our study aims to produce lectin-like oxidized-LDL receptor-1 (LOX-1) in L. lactis. LOX-1 is a major receptor for ox-LDL in the endothelial cells which is very promising for anti-atherosclerotic therapy development. pNZGFP-LOX-1 was constructed as a combination of CTLD-LOX-1 and GFP genes and expressed under the regulation of pNisA promoter. The recombinant gene was also conjugated with the lactococcus signal peptide (Spusp45) and a six histidine (His) tag. After nisin induction, the intracellular GFP-LOX-1 expression was detected using Western blot by the anti-his antibody. The result indicated thick bands represented intracellular GFP-LOX-1 and GFP protein, with the size around 40kDA and 26 kDa, respectively. Analysis of protein under fluorescence showed bands with similar size. Analysis of the secreted protein showed a fair band of GFP-LOX-1 and a thick band of the GFP protein. To conclude, we successfully constructed a L. lactis strain that secretes recombinant LOX-1. The L.lactis has a great potential for used in recombinant prophylactic and therapeutic protein expression.

Keywords: Lactococcus lactis, nisin, LOX-1, GFP, atherosclerosis.

UNDERSTANDING THE CHALLENGES UPON SHIFTING FROM IN VITRO TO IN VIVO SIRNA DELIVERY; HEPATOCELLULAR CARCINOMA AS A DISESASE MODEL

OP-34

Mahmoud A. Younis[1,2], Ikramy A. Khalil[2], Hideyoshi Harashima[1,*]

[1]Laboratory of Innovative Nanomedicine, Faculty of Pharmaceutical Sciences, Hokkaido University, Sapporo 060-0812, Japan
[2]Faculty of Pharmacy, Assiut University, Assiut 71526, Egypt
*Corresponding author: harasima@pharm.hokudai.ac.jp

Delivery of nucleic acids to their target is challenging resulting from their delicate nature and multiple biological obstacles. Despite the progress and achievements in nucleic acid delivery to in vitro tumor models as a proof-of-concept, the in vivo small interfering RNA (siRNA) delivery to tumors remains disappointing. In the current study, we designed multifunctional lipid nanocarriers for selective delivery of Midkine siRNA (MK-siRNA) to hepatocellular carcinoma (HCC) in vitro. After confirming their efficacy, an in vivo stroma-rich mouse model of HCC was challenged. Step-by-step optimization facilitated the elucidation of numerous challenges and their overcome through tweaking the composition and physico-chemical properties of these nanocarriers. Eventually, the optimized nanocarriers were loaded with a cocktail of MK-siRNA and the cytotoxic drug, sorafenib (SOR), for integrative eradication of HCC in mice. The designed nanocarriers showed high selectivity and efficiency in vitro with a median effective siRNA dose (ED50) as low as 7.5 nM with diminished effects on the other cell lines. Nevertheless, no significant tumor accumulation or gene silencing were achieved following intravenous administration to HCC-bearing mice. Extensive optimization of the pharmacokinetic performance, particle size and composition of the aforementioned nanocarriers resulted in a dramatic impact on their in vivo performance with a final ED50 of 0.1 mg/Kg in the tumor, the lowest reported so far, while minimal activity was shown in the healthy liver tissues. Furthermore, our nanoparticles facilitated highly-selective and efficient chemo-gene therapy of HCC in mice with a synergistic effect between SOR and MK-siRNA that lead to the eradication of the tumor at the lowest SOR dose that has ever been investigated, 2.5 mg/Kg. In a conclusion, understanding the successive obstacles encountered upon shifting from the in vitro to the in vivo microenvironments is a key factor that will determine the clinical potential of anticancer nucleic acid therapeutics.

Keywords: siRNA, Hepatocellular Carcinoma, nanoparticles, in vivo, sorafenib.

RESPONSIVE MICROPARTICLES LOADED WITH SILVER NANOPARTICLES FOR SPECIFIC DELIVERY IN THE PRESENCE OF BIOFILMS FORMER BACTERIAL

OP-35

Andi Dian Permana[1], Sartini[2], Sandra Aulia Mardisari[1], Yayu Mulsiani Evary[3]
[1]Department of Pharmaceutics, Faculty of Pharmacy, University of Hasanuddin, Makassar, Indonesia
[2]Department of Pharmaceutical Microbiology Faculty of Pharmacy, University of Hasanuddin, Makassar, Indonesia
-Department of Phytochemistry, Faculty of Pharmacy, University of Hasanuddin, Makassar, Indonesia
Corresponding author: andi.dian.permana@farmasi.unhas.ac.id

Recently, bacterial biofilm has increased the difficulty of the healing process of wounds. Moreover, the presence of bacterial resistance has decreased the effectiveness of numerous antibacterial agents. Additionally, the non-specific target of antibacterial agents has also been an issue in the delivery of antibacterial compounds. Silver nanoparticles (AgNPs) has been explored as one of the antimicrobial agents with antibiofilm activity. However, the non-specific target the NPs were reported to show toxicity issue. In this study, for the first time, we report a combination approach of AgNPs and responsive microparticles (MPs) for enhanced penetration of bacterial biofilm and specifically delivering AgNPs to the infection area. The AgNPs were optimized and synthesized with the green, friendly and cost-effective method using green tea extract. The antimicrobial activity of the optimized AgNPs was determined with minimum inhibitory concentrations of 1.25 µg/mL and 2.5 µg/mL against two main biofilms former bacterial, namely Staphylococcus aureus and Pseudomonas aeruginosa, respectively. Importantly, the optimized AgNPs exhibited antibiofilm activities in 96-well microtiter plate method and colony biofilm model in vitro with around 95% of biofilms from both bacterial were killed after 24 hours. The AgNPs were further incorporated into sensitive MPs formulated from poly (Ɛ-caprolactone) using double emulsion method. Furthermore, the formed MPs were decorated with chitosan. The in vitro release study showed that the incorporation of AgNPs into responsive MPs was able to delay the release without the presence of bacterial cultures. Importantly, the release of AgNPs from MPs was significantly enhanced with the presence of biofilms former bacterial up to 8-times. Therefore, the responsive MPs could potentially be applied to specifically deliver the AgNPs to the infected area without affecting the healthy site, leading to the reduction of toxicity of AgNPs.

Keywords: Silver Nanoparticles, Green Tea, Responsive Microparticles, Biofilm

OP-36

APPLICATION OF SIMPLEX LATTICE DESIGN FOR OPTIMIZATION OF PVA, HPMC, AND GLICERYN AS PEEL-OFF GEL MASK ANTIOXIDANT CONTAINING ETHANOL EXTRACT OF PAPAYA *LEAVES (CARICA PAPAYA L.)*

Andi Nafisah Tendri Adjeng[1], Ria Askara Suharman[1], Rini Hamsidi [2*]
[1]Department of Pharmacy, Faculty of Pharmacy, Universitas Halu Oleo, Kendari, South-East Sulawesi, 93232, Indonesia.
[2] Departement of Health, Faculty of Vokasi, Universitas Airlangga, Surabaya, Indonesia
*Corresponding author: rinihamsidi@gmail.com

Papaya leaves *(Carica papaya L.)* have many benefits, including containing flavonoid that can reduce free radicals. This study aimed to determine antioxidant activity of papaya leaves ethanol extract and optimum concentrations of PVA, HPMC, and glycerin to produce good physical characteristics of peel-off gel mask of papaya leaves ethanol extract. Physical characteristics test of the peel-off gel mask included dispersion ability, viscosity, drying time, and pH. Antioxidant activity of papaya leaves ethanol extract was performed by DPPH method and the peel-off gel mask formula was optimized by Design Expert 7.1.5 Simplex Lattice Design by varying the concentration of PVA, HPMC and glycerin. The results showe that antioxidant activity of papaya leaves extract has strong category with 94.04 ppm of IC50 value. Desirability value of recommended simplex lattice design for the optimum formula is 1,000 and a variety of components PVA, HPMC and glycerin for the optimum formula peel-off gel mask are 14%, 1% and 2% respectively. Physical characteristics of the optimal formula are: 5.8 cm for spread capacity, 430 dPa.s for viscosity, 18.3 minutes for drying time and 6.1 for pH. Antioxidant activity (IC50) of peel-off gel mask optimum formula are 150.6 ppm.

Keywords: Carica papaya L, Peel-off Gel Mask, Simplex Lattice Design

DEVELOPMENT OF NANOCALSI TOOTH PASTE FROM CRAB SHELL WASTE AS AN ANTIBACTERY OF STREPTOCOCCUS MUTANS

OP-37

Andi Tenri Nurwahidah[1], Ambar Maisa[1], Septiana Indratmoko[1], Yuhansyah Nurfauzi[1]
[1]Department of Pharmacy, STIKES Al Irsyad Al Islamiyyah Cilacap, Cilacap, Indonesia
Corresponding Author: anditenriw07@gmail.com

Crab shell waste (CSW) seems to be an abundant potential nanocalsium source for anti-caries toothpaste formulation purpose. Aiming to formulate effectively absorbed nanocalsium toothpaste, the study was divided into two stages, nanocalsium preparation and toothpaste formulation. Nanocalsium preparation was started from demineralization of CSW was carried out by soaking crushed shells in 3 N HCl solutions at a ratio of 1:15 (w/v) for hour at 90^{o}C. To separate filtate and residue of the mixtures, a Whatman paper 0,22 µm was utilized and followed by adding drop by drop 1% NaOH solution to form calcium precipitate. Obtained calcium powder was subsequently dissolved into PEG 400 and Tween 80 mixtures at a ratio of 1 : 6 and homogenized using vortex for 30 minutes to form nanocalsium. Then, the calculations of yield value and testing of water content were carried out. As-synthesized nanocalsium was characterized by turbidimetry test and Particle Size Analyzer (PSA), while toothpaste was evaluated by a series of physicochemical test (Organoleptic, Homogeneity, pH, Viscosity, and Foaming Capacity) and antibacterial inhibition test using *Streptococcus* mutans. Results showed that calsium content in crab shell waste obtained by 13.008%. Synthesized calsium was in nanometer scale proven by 98,7% transmittance in turbidimetry and confirmed by PSA which showed 21,4 nm particle size. The best formulation had gray colour, mint odor, semisolid texture, homogeneous structure, pH 7, and 25.250 cPs of viscosity. The nanocalsium toothpaste also exhibited strong inhibition of Streptococcus mutans which potentially applied for new generation anti-caries toothpaste based on crustacean waste.

Keywords: Nanocalsium, Crab Shell Waste, Toothpaste, Caries

OP-38

OPTIMIZATION AND EVALUATION OF ALGINATE-HPMC MICROSPHERES COMPOSITION FOR ENCAPSULATION OF BROMELAIN AS ANTIPLATELET

Asih Gayatri[1], Sumi Hudiyono[1], Siswati Setiasih[1]
[1]Department of Chemistry, Faculty of Mathematic and Natural Science, University of Indonesia, Depok, Indonesia
Corresponding author: sumi.hudiyono@sci.ui.ac.id

Thrombus is blood congealment process (platelet) happened in area of vein and is useful for the prevention of bleeding occurrence. The large amount of thrombus in blood leads to blocked arteries and angina pectoris. The partial purification of bromelain originated from pineapple core (*Ananas comosus* [L.] Merr) had potential as antiplatelet with the inhibition activity to the platelet aggregation 86.48%. On the other hand, proteolytic activity of bromelain is relatively stable in the first 4 hours but the 4 hours later, the proteolytic activity is significantly decrease due to the influence of gastric fluid (pH 1.2). Whereas, bromelain is well absorbed without lose its activity in intestinal fluid (pH 7.4). To overcome the problem, bromelain must be encapsulated into alginate-hpmc microspheres cross-linked by cationic ($CaCl_2$). The Optimizing process of alginate-hpmc microspheres loaded by commercial bromelain (EC 3.4.22.32) was required in order to know the optimal composition before the result of isolated bromelain was encapsulated. The determining of optimal composition was based on the result of swelling index and entrapment efficiency and microspheres with the composition of alginate:hpmc 1:1 and 1:2 were chosen. The entrapment efficiency of alginate:hpmc microspheres (1:1) was 16.07±1.10% and alginate:hpmc microspheres (1:2) was 20.81±1.52%. Furthermore, the selected microspheres formula were characterized by PSA and SEM. Alginate:hpmc microspheres (1:1) had particle size 543.7±4.2 nm and demonstrated that the microspheres were almost spherical but had a smooth surface with a lot of pores. And the particle size of alginate:hpmc microspheres (1:2) was 515.3±26.7 nm and the SEM micrographs showed the spherical microspheres with slightly rough surface. The swelling degree, entrapment efficiency, PSA, and SEM data will relate to suitability of the microspheres formulation to orally deliver bromelain.

Keywords: alginate, antiplatelet, bromelain, hpmc, microspheres.

NANOSUSPENSION FORMULATION OF ETHANOL EXTRACT OF SAFFLOWER'S (CARTHAMUS TINCTORIUS L.)

OP-39

Gabby Vanessa[1], Rachmat Mauludin[1]
[1]Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia
Corresponding author: lentreprise.gabby@gmail.com

Formulation of nanoparticles has been developed lately to improve the pharmacological activity of drug. Nanosuspension is part of nanotechnology and defined as a submicron colloidal dispersion of drug particles which are stabilized by surfactans. Safflower or kasumba turate (*Carthamus tinctorius* L.) has many pharmacological effects, such as antioxidant, antimicrobial, antitumor, antidepressant, antiinflammation, immunomodulator, and many more. The aim of this study was to produce the stable nanosuspension formula that contain kasumba turate's flower ethanol extract. The top-down technology was used to make nanosuspension with the combination methods of high speed homogenization with speed of 3,600 rpm for 13 minutes and ultrasonication of 70% amplitude and 45:15 pulse for 5 minutes. The best nanosuspension formula was obtained using a single surfactant, namely sodium lauryl sulfate (1%), with 219.9 nm particle size and 0.334 polydispersity index. Nanosuspension was physically stabled at temperatures 4±2, 25±2, and 40±2°C for 28 days. Nanosuspension in the freeze and thaw test stabled for 5 cycles. In conclusion, the nanosuspension formula that contain sodium lauryl sulfate was stabled to changes in temperature and storage conditions.

Keywords: formulation, nanosuspension, *Carthamus tinctorius*

OP-40

MOUTHWASH FORMULATION AND EVALUATION OF BUNDUNG PLANTS *(ACTINOSCIRPUS GROSSUS)* ETHANOL EXTRACT AS A MOUTH ANTISEPTIC

Noval[1], Melviani[1], Novia[1], Dahlia Syahrina[1]
[1]Department of Pharmacy, Faculty of Health, University of Sari Mulia, Banjarmasin City, Indonesia Jl. Pramuka No. 2, Pemurus Luar, Kec. Banjarmasin Timur, South Borneo 70238 ,Banjarmasin, Indonesia
Corresponding author: novalhalim10@gmail.com

Bundung plants *(Actinoscirpus grossus*) one of plants that have antimicrobial efficacy. Bundung plants contains a compound metabolite secondary flavonoids which have antibacterial activity. Utilization of plant extracts as a bottle is an alternative to replace bottle preparations which generally contain an antiseptic in the form of alcohol that can cause oral cancer. In addition, the utilization of plant Bundung as a traditional medicine is also not done and the use of extracts in the treatment has some deficiencies, such as difficult in its use and has an unpleasant taste, so that this research intends to formulate a plant extract Bundung into a bottle preparations that are useful for oral antiseptic. Research of mouthwash formulation and evaluation of bundung plants extract *(Actinoscirpus grossus)* as a oral antiseptic also has been tested in Streptococcus mutans bacteria by variation in the concentration of extract 2%, 2,5%, 3% and 3,5%, which aims to determine the most ideal formula in physical quality and has the highest antibacterial activity based on a inhibition zone of Streptococcus mutans bacteria in mouthwash formula. The methods used includes the step of extraction of Bundung plants, preparation of mouthwash with 4 formula F1 (2%), F2 (2,5%), F3 (3%) and F4 (3,5%) followed by an evaluation that includes organoleptic, pH test, viscosity test and the test of inhibition zone bacteria. The test of inhibition zone bacteria used MHA media with diffusion method. Tests performed on six weeks. The result showed variation in the concentration of extract bundung plants in a mouthwash formula has and effect on the diameter of inhibition zone. But did not have significant effect on the physical properties of mouthwash formula. Mouthwash formula which has the highest antibacterial acivity based on inhibition zone of Streptococcus mutans that is 3,5% contained in the F4.

Keywords: Bundung Plants, Mouthwash, Mouth Antiseptic

EFFECT OF SURFACTANTS TYPE ON PARTICLE SIZE AND STABILITY OF DOCETAXEL POLYMERIC MICELLES PRE-PARED BY FREEZE DRYING METHOD

OP-41

Dwianto Harry Nugraha[1,2],Heni Rachmawati[1]
[1]Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia
[2]Department of Reseach & Development, PT. Dankos Farma, Jakarta, Indonesia
Corresponding author: dwianto.harry.nugraha@gmail.com

Introduction : Taxanes is one of the classes of drugs in cancer therapy where this group has hydrophobic properties so that it is formulated as non-water based. Docetaxel is one of agent in taxane class and commercially formulated in non-water based formula consisting of polysorbate 80 and alcohol which can generates a toxic and resulting adverse effect. One promising approach to increase solubility of hydrophobic drug is polymeric micelles which is nanotechnology-based formulation. Poloxamer is an amphiphilic polymer which is a tri-block co-polymer that has been widely used and accepted by regulators has demonstrated its ability to increase drug solubility. Experimental : The effect of surfactants is done by the addition of non-ionic surfactant Polysorbate, cationic Didodecyl Dimethyl Ammonium Bromide (DDAB), and anionic Sodium Lauryl Sulfate (SLS). All formulations were carried out using the freeze drying method which was then evaluated for particle size and morphology using Dynamic Light Scattering (DLS) & Transmission Electron Microscope (TEM) and evaluated the effect on product stability. Results : Polymeric micelles of docetaxel were developed enabling an increase of solubility of docetaxel in water around 3500 fold (1 mg/mL). The effect of surfactant addition has different result for each type of surfactant. In term of D90, SLS decrease the particle size, Tween 80 increase the particle size and DDAB did not change micelles particle size significantly, while contrary in term of D10, where SLS increase the particle size, tween 80 and DDAB decrease the particle size. From TEM evaluation of Docetaxel Loaded Polymeric Micelles, it was seen that increased the addition of surfactant lead to more sperichal micelles. The stress test study has been conducted and resulted that addition of cationic surfactant can increased the stability of product. Conclusion : Addition of surfactant can effect the particle size and stability of docetaxel polymeric micelles.

Keywords: Polymeric Micelles, Docetaxel, Surfactant, Poloxamer, Freeze Drying.

MICROSPONGE DELIVERY OF GLIBENCLAMIDE: PREPARATION AND CHARACTERIZATION

OP-42

Irmayani[1], Rifka Nurul Utami[2], Aisyah Humaira[1], Nur Laila Fitrah[1] , Nurul Arfiyanti Yusuf[1]

1Sekolah Tinggi Ilmu Farmasi Makassar, Makassar, Indonesia
2Faculty of Pharmacy, Universitas Hasanuddin, Makassar, Indonesia
Corresponding author: irma.yani@stifa.ac.id

Despite its common use for the treatment for type II diabetes mellitus, glibenclamide shows unsatisfactory bioavailability due to poor water solubility. Microsponge, a type of highly porous microspheres, may be utilized to overcome this problem. In this study, we assessed the effect of polymer content used in the preparation on the physicochemical characteristics of the microsponges. Eudragit RS 100 was used as the hydrophobic polymer, while polyvinyl alcohol was used as the hydrophilic one. Drug and Eudragit RS 100 ratio were varied in the formulations, 1 : 1, 1 : 2, 1 : 3 for F1, F2, and F3, respectively. The microsponges were prepared using solvent-diffusion emulsion method. Morphology assessment using SEM showed that all the formulations were spherical in shape and pores were formed on the surface. The size of microsponges ranged between 43.146 to 47.119 µm. F3 produced the highest entrapment efficiency. In terms of dissolution profiles, the variation of drug-polymer ratio did not seem cause any significant difference in the three formulations.

Keywords: microsponge, glibenclamide, polymer, dissolution

OP-43

GREEN SYNTHESIS OF SILVER NANOPARTICLES USING AQUEOUS EXTRACT OF FRESH AND DRIED COFFEA CANEPHORA LEAVES AS BIOREDUCTOR

Mauizatul Hasanah[1], Iin Winda Sari[1], Budi Untari[2]
[1]Department of Pharmacy, School of Pharmacy Bhakti Pertiwi, Palembang, Indonesia
[2]Department of Pharmacy, Faculty of Mathematics and Natural Science, University of Sriwijaya, Palembang, Indonesia
Corresponding author: mauizatulhasanah@gmail.com

Green synthesis of silver nanoparticles has been studied and conducted to determined the differences characteristics of silver nanoparticles using aqueous extract of fresh and dried *Coffea canephora* leaves as bioreductors. Silver nanoparticles synthesized by reacted aqueous extract of fresh and dried leaves with silver nitrate. Characterization was carried out by UV-Visible spectroscopy, FTIR and X-Ray Diffractometer. The result showed that fresh and dried *Coffea canephora* leaves formed silver nanoparticles at a wavelength of 403 nm and 405 nm at UV-Vis. FTIR analysis showed there was shifted and added several different wave numbers of silver nanoparticles from silver nitrate spectra, and identified silver oxide in the nanoparticles spectra at a wave number 513,07 cm^{-1} for fresh and 522,71 cm^{-1} for dried sample. Characterization of silver nanoparticles using XRD was observed the highest peak for fresh sample was at 2Θ 38,060° with 19,71 nm particle size and dried sample at 2Θ 38,102° with 13,8 nm particle size, each of their crystal were cubic and face centered. The study concluded that aqueous extract from fresh and dried *Coffea canephora* leaves can be used as bioreductors in the synthesis of silver nanoparticles.

Keywords: green synthesis, silver nanoparticle, bioreductor, *Coffea canephora* leaves.

POLYMER DESIGN DISPLAYING ACID-INDUCING ISOTHERMAL HYDROPHILIC-TO-HYDROPHOBIC PHASE TRANSITION FOR EFFECTIVE CANCER TRAETMENT PHOTODYNAMIC THERAPY (PDT)

OP-44

Sjaikhurrizal El Muttaqien[1,2], Takahiro Nomoto[1], Hiroyasu Takemoto[1], Makoto Matsui[1], Keishiro Tomoda[1], Nobuhiro Nishiyama[1]

[1]Institute of Innovative Research, Tokyo Institute of Technology, 4259 Nagatsutacho, Midori-ku, Yokohama, Kanagawa 226-8503, Japan

+Centre for Pharmaceutical and Medical Technology, Agency for the Assessment and Application of Technology (BPPT), PUSPITEK, Serpong, 15314, Indonesia.

Corresponding author: sjaikhurrizal.el@bppt.go.id

Stimuli-responsive polymer has been exploited to design stimuli-sensitive nanocarrier because this polymer allows character transition in physiological condition by utilizing diseases-related signal, including slight acidity of tumor microenvironment (pHe). This strategy could overcome tumor heterogenicity and other biological barriers in cellular level that hamper passive and active targeting approach. For photodynamic therapy (PDT), physicochemical properties of photosensitizer (PS) play an important role on its biodistribution profile. The polymeric carrier is expected to confer hydrophilic character during blood circulation to avoid unspecific interaction with the blood protein and minimalize the reticuloendothelial system (RES) uptake to selectively accumulated at tumor tissue through enhanced retention and permeability (EPR) effect. At cancer site, polymeric carrier should undergo morphology change that is favorable to improve polymer-cell interaction, such as conformation (hydrophilic/hydrophobic) transition and charge-reversal strategy. In this study, isothermal hydrophilic-to-hydrophobic transition of pH-responsive polymer was exploited to target pHe through the modification of lower critical solution temperature (LCST) of poly(N-isopropylacrylamide) (PNIPAAm). The polymer backbone was constructed by copolymerizing PNIPAAm with NIPAAm analogue units possessing amines termed as AIPAAm (2-aminoisopropylacrylamide). To convey pH-responsive LCST character, hydrophilic acid-labile of 2-propionic-3-methylmaleic (PMM) was conjugated to free amine group of AIPAAm, forming P(NIPAAm/AIPAAm-PMM). The presence of hydrophilic moiety of PMM significantly elevated the LCST (>37°C), and subsequently endowed the polymer hydrophilic character at physiological temperature, thus limiting its interaction in the blood stream. At the acidic condition of tumor microenvironment, the detachment of PMM group decreased polymer's LCST (<37°C), inducing isothermal hydrophilic-to-hydrophobic transition. The hydrophobic character of polymer then facilitated enhanced cell internalization. Importantly, the conjugation of hydrophilic PS (700DX) did not critically affect pH-responsive phase transition character and led to pH-responsive cell uptake. Owing to this character, ultimately, in vivo PDT antitumor activity of 700DX-P(NIPAAm/AIPAAm-PMM) significantly inhibited the growth of the tumor as well as avoided skin phototoxicity..

Keywords: cancer, pH-responsive polymer, phase transition, LCST, photodynamic therapy.

OP-45

DEVELOPMENT OF MITOCHONDRIAL-TARGETED NANOCARRIER FOR PHOTODYNAMIC THERAPY USING THE MICROFLUIDIC DEVICE

Fumika Kubota[1], Yuma Yamada[1], Satrialdi[2], Yuta Takano[3], Masatoshi Maeki[4], Manabu Tokeshi[4], Hideyoshi Harashima[1]

[1] Faculty of Pharmaceutical Sciences, Hokkaido University, Sapporo, Japan
[2]School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia
[3]Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan
School of Engineering, Hokkaido University, Sapporo, Japan
Corresponding author: harasima@pharm.hokudai.ac.jp

The efficient delivery of photosensitizer to the target site is critical to increasing photodynamic therapy (PDT) outcomes. Mitochondria would be desirable as target sites for PDT because they play a role in regulating apoptosis and are major oxygen-consuming sites. In this study, we aimed to deliver rTPA, a porphyrin-type photosensitizer which has a strong capacity for absorbing near infra-red light, to mitochondria by encapsulating it in a mitochondrial-targeted nanocarrier, MITO-Porter. In the practical application of nanocarrier medicines, it is a major difficulty to scale up without affecting the physicochemical properties of the carriers. The preparation of nanocarriers using microfluidic devices could be an expected method to overcome the problem. The construction of the rTPA-encapsulated MITO-Porter (MITO-Porter (rTPA)) using a microfluidic device allowed to prepare large amounts of carriers uniformly and reproducibly. We focused on Drug/Lipid, ratio of drug (rTPA) to lipids composing MITO-Porter. The preparation of the carriers with different Drug/Lipid showed that the pharmacodynamics, such as singlet oxygen production and PDT killing effect, varied with Drug/Lipid. We successfully constructed MITO-Porter (rTPA) with a therapeutic effect by optimizing the Drug/Lipid. The finding suggests that the scale-up process with microfluidic devices needs to be validated with respect to the pharmacodynamics.

Keywords: photodynamic therapy, mitochondria, nanocarrier, microfluidic device

OP-46

THE PHARMACOKINETICS AND BIOEQUIVALENCE OF TWO OMEPRAZOLE CAPSULES IN INDONESIAN HEALTHY VOLUNTEERS: A PARTIAL REPLICATE DESIGN

Yeyet C Sumirtapura [1,2], Triswaty Winata[2], Metta B Susilo[2] , M Akbar Emberik[2] , Winda A Dewi[2], Putri A Dwitama[2]

[1]Department of Pharmaceutic, School of Pharmacy Bandung Institute of Technology, Ganesha No. 10, 40132 Bandung, Indonesia.

[2]San-Clin-Eq Laboratory, Jl Leuwi Gajah No. 174, 40532 Cimahi, Indonesia.

Correspondence: info@san-clin-eq.com ; Tel.: +6222-662-9653

The aim of this study is to assess the bioequivalence of two different capsule of omeprazole and to compare the pharmacokinetic results with Caucasian and Asian subject from other studies. The study was carried out in 27 Indonesian healthy subjects according to randomized and partial reference-replicated three-way crossover design. Test drug evaluated in this study was produced by PT Sanbe Farma, Indonesia (I) and the reference drug was Losec® produced by Astrazeneca Ab, Sweden (II). Subjects received a single dose of 20 mg of each formulation after overnight fasting in three period, separated by one week washout period. Blood samples were collected up to 10 hours after drug intake. The drug concentrations in plasma were determined by high performance liquid chromatography with UV detector. The pharmacokinetic parameter of test and reference drugs were 581.66 vs 654.78 ng/mL for C_{max}, 1261.20 vs 1351.93 ng/mL.h for AUC_{0-t}, 1335.44 vs 1434.18 g/mL.h for $AUC_{0-\infty}$, 2.04 vs 2.09 h for T_{max} and 1.07 vs 1.07 h for T1/2. The result showed that I was bioequivalent to II. The intrasubject variability of omeprazole as obtained after using replicate design is very high with Coefficient Variance Within Reference (CVwR) value of around 34% for C_{max} parameter.

Keywords: omeprazole, bioequivalence, pharmacokinetic, partial replicate, indonesian.

POSTER PRESENTER

PP-01

IDENTIFICATION OF FLAVONOIDS COMPOUNDS OF PURPLE LEAF EXTRACT (*Graptophyllum pictum* [L.] GRIFF.) USING SPECTROPHOTOMETRY UV-VIS AND INFRARED

Wahidatul Mukaromah[1], Ira Rahmiyani[1], Hendy Suhendy[1*]

[1]Department of Pharmacognosy and Phytocehmistry, Study Program of Pharmacy, STIKes Bakti Tunas Husada, Tasikmalaya, Indonesia

Corresponding author: radhwa04@gmail.com

Purple leaves (*Graptophyllum pictum* [L.] Griff) has an activity as anti-inflammatory. The major contributor of its activity is flavonoids compound. The objectives of this study is to determine the type of flavonoid compound of purple leaf extract (*Graptophyllum pictum* [L.] Griff). The extraction method use multilevel maceration with n-hexane, ethyl acetate and ethanol 70% solvents. Ethyl acetate extract is selected as a sample and its flavonoids compound is isolated by several steps such as vacuum liquid chromatography, preparative thin layer chromatography, purity test with two-dimensional thin layer chromatography, spectrophotometry UV-Vis using shear reagent and spectrophotometry infrared. Phytochemical screening of all extract showed the presence of flavonoids compound. Thin layer chromatography using mobile phase of n-hexane-ethyl acetate (7: 3) showed that purple leaf ethyl acetate extract had the best separation profile and it contained flavonoid compounds wihch indicated of yellow spots presence with a Rf value of 0.33. Identification result using UV-Vis spectrophotometry with shear reagent showed the presence of Flavonol/ khalkon, 2 OH or 4'OH and without 4-OH, 2'OH and O-di OH at B ring. Another results using spectrophotometry infrared showed the functional group presence of OH, C=C, C=O, C-H aromatic groups, and C-O. Flavonoids compound of purple leaf extract is 2,3,2 ', 4' tetrahydroxy khalcone

Keywords: Flavonoids, Purple Leaf, Spectrophotometry, UV-Vis, Infrared

PP-02

TOTAL PHENOL-FLAVONOID LEVELS AND ANTIOXIDANT ACTIVITY BY USING DPPH AND CUPRAC METHODS OF BINJAI LEAVES (*Mangifera caesia* Jack. Ex. Wall) METHANOL EXTRACT FROM SOUTH KALIMANTAN

Hafiz Ramadhan, Ahmad Fahrian Hipmi, Putri Indah Sayakti
Departement of Pharmacy, STIKES Borneo Lestari, Banjarbaru, South Kalimantan, Indonesia
Corresponding author: ramadhanhafiz05@gmail.com

Binjai (*Mangifera caesia* Jack. Ex. Wall) is one of the plants of the Mangifera genus which has nutritious as medicine and endemic plant in Kalimantan. Binjai plants contain phenolic and flavonoids compound content that play a role in producing antioxidant activity, especially the leaves. This study aimed to determine the total phenolic and flavonoids levels, and the antioxidant activity of the Binjai leaves methanol extract by using the DPPH (2,2-diphenyl-1-picrylhydrazyl) and CUPRAC (Cupric Ion Reducing Antioxidant Capacity) methods. Binjai leaves were extracted with methanol solvent by using the soxletation method. Determination of total phenolic levels used Folin-Ciocalteu reagent with a gallic acid standard solution, while the determination of total flavonoid levels used $AlCl_3$ reagent with quercetin standard solution. Qualitatively antioxidant activity test used TLC (Thin Layer Chromatography) that sprayed with the DPPH solution. Quantitatively test by measuring the absorbance of extract reducer against DPPH radicals and CUPRAC reagents used UV-Vis Spectrophotometer, compared with positive control of quercetin. The results showed that the Binjai leaves methanol extract had a total phenolic level of 559 µg GAE/mg extract, while the total flavonoid level was 738.571 µg QE/mg extract. The qualitative test results of antioxidant activity with TLC in the mobile phase of n-hexane: ethyl acetate (8:2) there were four yellow spots on a purple background after it sprayed by using the DPPH solution. Quantitative test results of antioxidant activity against DPPH radicals showed Binjai leaves methanol extract had 6.485 ppm of IC_{50}, while the antioxidant activity used the CUPRAC method obtained an EC_{50} of 5.647 ppm. The conclusion of this study is the methanol extract of Binjai leaves containing high levels of total phenolic and total flavonoids, so it can produce antioxidant activity which is included in the very strong category.

Keywords: Binjai leaves, phenol-flavonoids, antioxidants, DPPH, CUPRAC

TOTAL CAROTENOID CONTENT AND ANTIOXIDANT ACTIVITY OF *Pouteria campechiana* (Kunth) Baehni. EXTRACT

PP-03

Sani Nurlaela Fitriansyah[1,2], Irda Fidrianny[1], Rika Hartati[1]
[1]Departmen of Pharmaceutical Biology, Faculty of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia
[2]Departmen of Pharmaceutical Biology, Faculty of Pharmacy, Indonesia School of Pharmacy (Sekolah Tinggi Farmasi Indonesia), Bandung, Indonesia
Corresponding author: saninurlaela@stfi.ac.id

Free radicals can causes several diseases. Antioxidant compounds can inhibit free radicals. *Pouteria campechiana* has potential a source of natural antioxidant because it has phenolic and flavonoid compounds. A part from phenols and flavonoids, terpenoids can act as antioxidants. Carotenoids belong to the terpenoid group. *P.campechiana* fruit is rich in the carotanoid compound. However, total carotenoid content have not been reported. The aim of this research was to determine the total carotenoid content and antioxidant activity of *P.campechiana* fruit and leaf extracts. Extraction ware used maceration with n-hexane and ethyl acetate. Determination of total carotenoid content and antioxidant activity were used UV-Visible spectrophotometer. Beta-carotene is used as a carotenoid standard, and DPPH is used as free radical. IC_{50} of the scavenging DPPH was used as a parameter of antioxidant activity. The results showed that the highest total carotenoid content shown by fruit n-hexane extract (70.028 g BQ / 100 g extract), fruit ethyl acetate, leaf ethyl acetate, and leaf n-hexane extract. The smallest IC_{50} of the DPPH scavenging was shown by leaf n-hexane extract (3.09 µg / ml), leaf ethyl acetate extract (9.27 µg / ml), fruit n-hexane (45.38 µg / ml), and fruit ethyl acetate (31.51 µg / ml).

Keywords: Pouteria campechiana, carotenoid, antioxidant

PP-04

UV-VISIBLE SPECTROPHOTOMETRIC QUANTIFICATION OF TOTAL FLAVONOID CONTENT OF TIGER MILK MUSHROOM (*Lignosus rhinocerus*) FRACTION

Dina Yuspita Sari[1*], Ratna Widyasari[1], Nadiyah Sapriani[1], Gita Selfia[1]
[1]Akademi Farmasi Yarsi Pontianak, Kalimantan Barat, Indonesia
Corresponding author: dinayuspitasari7@gmail.com

Tiger milk mushroom (*Lignosus rhinocerus*) is a traditional plant from the interior of West Kalimantan, especially in Kapuas Hulu. One of the secondary metabolite compounds found is flavonoids. This study aims to determine the total flavonoid content in tiger milk mushroom fraction. The crude drug of tiger milk mushroom was macerated using 96% ethanol, then partitioned using *n*-hexane and methanol (1:1). Phytochemical screening using magnesium and amyl alcohol powder resulted in the formation of an orange color showing positive results containing flavonoids. The methanol fraction was then separated by gravity column chromatography with silica gel 60 as a stationary phase using ethyl acetate: methanol (1: 1) and methanol as eluent. This process yielded two fractions, the ethyl acetate: methanol fractions (FEAM) and the methanol fraction (FM). The determination of total flavonoid content was conducted based on coloric metric method of FEAM and FM in quercetin equivalent at the maximum wavelength of 410 nm. The results showed that total flavonoid content of FEAM and FM is 7.41% and 3.30%. This finding suggests that the total flavonoid content in the tiger's milk mushroom fraction could be developed as a natural source of antioxidant agents in drug and cosmetic products.

Keywords: Tiger Milk Mushroom, Total Flavonoid Content, Colorimetry Method

PP-05

ANTIOXIDANT ACTIVITY AND SUN PROTECTION FACTOR OF SEQUENTIALLY EXTRACTED ORGANIC SOLVENT EXTRACTS OF KATUK LEAVES (*Sauropus androgynus* (L.) Merr.)

Sofia Fatmawati[1], Ni Putu Ermi Hikmawanti[1], Akbar Fadillah[1], Awlia Mustia Putri[1]

[1]Faculty of Pharmacy and Science, Universitas Muhammadiyah Prof Dr Hamka

Corresponding author: fatmawatisofia@gmail.com

Long exposure to V radiation increases the risk of skin diseases such as cancer and photoallergic reactions. Natural substances contained phenolic and flavonoid have been recently considered as potential sunscreen resources due to their absorption in the UV region and their antioxidant activity. This study aims to determine the total phenolic and flavonoid levels, as well as the antioxidant activity and sun protection factor of sequentially extracted organic solvents extract of katuk leaves. The dried katuk leaves were sequentially macerated using organic solvents with different levels of polarity, namely n-hexane, ethyl acetate, and 70% ethanol. Total phenolic, flavonoid content, antioxidant activity and sun protection factor of extract determined using a UV-Visible spectrophotometer. The results showed that the total phenolic content of n-hexane extract was 0.57 mgGAE / g, ethyl acetate was 2.95 mgGAE / g and ethanol 70% was 16.71 mgGAE / g. The total flavonoid level of n-hexane was 55.57 mgQE / g, ethyl acetate was 88.79 mgQE / g, and ethanol 70% was 6.23 mgQE / g. The antioxidant activity was carried out using the DPPH method and calculated as IC_{50} from each extract using quercetin as reference. The sun protection factor was determined by measuring the spectral absorbance at UV wavelengths from 290 nm to 320 nm. The results showed that the ethanol extract showed the highest percentage inhibition and lowest IC_{50} amongst the other extracts. The SPF results showed that all individual extracts can be considered as a promising plant sourc to be used as sunscreen.

Keywords: katuk, antioxidant, sun protection factor, phenolic, flavonoid

PP-06

DETERMINATION OF TOTAL FLAVONOID AND TOTAL PHENOL CONTENT OF PAGODA (*Clerodendrum paniculatum*) LEAVES ETHANOL EXTRACT AND IT'S ANTIOXIDANT ACTIVITY

[1]Dewi Pertiwi, [1]Panal Sitorus, [1]Denny Satria, [2]Ihsanul Hafiz, [1]Mahatir Muhammad

[1] Department of Pharmaceutical Biology, Faculty of pharmacy, Universitas Sumatera Utara, Medan, Indonesia

[2] Department of Pharmacy, Faculty of pharmacy, Institut Kesehatan Helvetia, Medan, Indonesia

Corresponding author: dewipertiwi@usu.ac.id

Pagoda Flavonoid and phenolic molecules are antioxidant components which have the ability to donate hydrogen atoms to free radicals. Flavonoid and phenolic also can free radial scavenging because of their ideal structural characteristic. The aim of this study is to determine the total flavonoid and total phenol content of pagoda leaves ethanol extract and also to find out it's antioxidant activity. Pagoda leaves were extracted using the maceration method. The total flavonoid of pagoda leaves ethanol extract is 34,96 ± 0,10 mg/g QE and the total phenol of pagoda leaves ethanol extract is 114.62 ± 0.00 mg/g GAE. The antioxidant activity of extract ethanol was measured using ABTS method which represented as percent scavenging in concentration 50; 100; 200 and 400 ppm is 3.07 ± 0.06 ; 4.67 ± 0.08 ; 6.66 ± 0.05 ; 13.97 ± 0.06 %.

Keywords: antioxidant, *Clerodendrum paniculatum*, total flavonoid, total phenol

PP-07

DETERMINATION OF SPECIFIC STANDARDIZATION PARAMETERS OF KASTURI (*Mangifera casturi* Kosterm.) LEAVES EXTRACT FROM SOUTH KALIMANTAN

Aristha Novyra Putri[1], Revita Saputri[1], Karunita Ika Astuti[1], Ika Puspita Sari[2], Teuku Nanda Saifullah Sulaiman[2]

[1]Department of Pharmacy, Sekolah Tinggi Ilmu Kesehatan Borneo Lestari,, Banjarbaru, Indonesia

[2]Faculty of Pharmacy, Gadjah Mada University, Yogyakarta, Indonesia

Corresponding author: aristhanovyra@gmail.com

Kasturi *(Mangifera casturi Kosterm.)* is one of the Anarcadiaceae family and is one of the endemic plants of South Kalimantan. Leaves of Kasturi contain several groups of compounds potential as an aphrodisiac. This study aims to establish specific parameters of the 96% ethanol extract of Kasturi leaves. The method of setting standardization parameters refers to the Indonesian Herbal Pharmacopoeia and General Standard Extracts Parameters. The extract was obtained by the maceration method using etanol 96% with rendement of 24,77%. Specific parameters include organoleptic test, identification of compound content, chromatogram pattern by TLC method, Water and ethanol extractable material, content test. The result showed that Kasturi extract had a dark green color, distinctive smell and has a slightly bitter taste. Furthermore determine their flavonoids, steroid, and fenol. Chromatogram pattern indicates the presence of some stains and RF values are different. The water extractable material was 31,67%, while compound the extractable material was 62,58%.

Keywords: Mangifera casturi K, 96% ethanol extract , standardization, specific parameters.

PP-08

ANTIOXIDANT ACTIVITY TEST AND POLYPHENOL LEVELS OF INSTANT POWDER TAMARILLO JUICE (*Solanum betaceum* CAV.) BASED ON DIFFERENT FOAMING AGENTS

Novi Fajar Utami
Department of Pharmacy, Faculty of Mathematics and Natural Sciences,
Universitas Pakuan, Indonesia
Corresponding Author Email: novi.utami@unpak.ac.id

The fruit of tamarillo contains vitamin C, anthocyanins, flavonoids, tannins, phenols, and pectins. Vitamin C, and polyphenols (anthocyanins, flavonoids and tannins) are compounds that have potential as natural antioxidants. Dutch eggplant fruit has a soft texture, the outer layer of the fruit contains a lot of water. Unfavorable storage conditions such as temperature and storage room air can accelerate the decomposition process. One of the processes that can extend the shelf life is the manufacture of instant powders using the foam mat drying method with a foaming agent. This study aims to determine the antioxidant activity and polyphenol content of tamarillo powder based on differences in foaming agents. Three formulas were made, F0 as a comparison (without a foaming agent), F1 with the addition of tween 80 (1%) and F2 with the addition of egg white (7.5%). The results showed the differences in vitamin C levels, polyphenol levels and antioxidant activity in each formula. The pollen specification of tamarillo is known that at F0; F1; F2 obtained vitamin C levels ranging from 0.1479%; 0.1697%; 0.2013%. Polyphenol levels ranged from 3.9762 mg SAG / g; 5.0885 mg SAG / g; 5,789 mg SAG / g. The antioxidant activity obtained IC50 values of 393.9667 ppm; 339.0721 ppm; 304.4746 ppm.

Keywords : *Solanum betaceum* Cav, polyphenols, antioxidants, foaming agent.

PP-09

ACUTE TOXICITY ASSAY OF *Carthamus tintorius* Linn. FLOWER USING BRINE SHRIMP LETHALITY TEST (BSLT) METHOD

Rini Hamsidi[1], Myrna Adianti[1], Maya Septriana[1], Wahyuni[2], Adryan Fristiohady[2], Muhammad Hajrul Malaka[2], , Idin Sahidin[2], Wiwied Ekasari[3], Aty Widyawaruyanti[3,4], Ahmad Fuad Hafid[3,4]

[1]Department of Health, Faculty of Vocational Studies, Universitas Airlangga, Surabaya 60286, Indonesia

[2]Faculty of Pharmacy, Universitas Halu Oleo, Kendari 93232, Indonesia

[3]Department of Pharmacognosy and Phytochemistry, Faculty of Pharmacy, Universitas Airlangga, Surabaya 60115, Indonesia

[4]Natural Product Medicine Research and Development, Institute of Tropical Disease, Universitas Airlangga, Surabaya 60115, Indonesia

Corresponding author: rini.hamsidi@vokasi.unair.ac.id

An acute toxicity assay of Carthamus tinctorius Linn. (kasumba turate) flower of ethanolic extract and infusion water has been conducted on the Artemia salina Leach larvae using the Brine Shrimp Lethality Test (BSLT) method. Extraction of sample using ethanol 80% and infusion with aquadest solvent. Acute toxicity testing using the BSLT method uses Artemia salina Leach larvae. 48 hours of age as test animals which were then treated for 24 hours with infusion solutions at concentrations of 1%, 2.5%, 5%, 7.5% and 10% and ethanol extract solution at 100 ppm, 250 ppm, 500 ppm, 750 ppm, and 1000 ppm. Data on the mortality of Artemia salina Leach larvae. recorded and processed using *probit analysis programe* to determine the value of LC_{50}. If the LC_{50} value is less than 1000 ppm, the extract and infusin is non toxic. Based on the research that has been done, then obtanined LC50 value of the infusion of Kasumba turate flowers is 1477.33 ppm, while the ethanolic extract value is 1097.73 ppm. The results of infusion and ethanol extract of kasumba turate flower is categorized as not toxic against the larvae of *Artemia salina* Leach. Therefore it can be developed as a standardized herbal medicine.

Keywords: Acute toxicity, *Artemia salina* Leach, BSLT, *Carthamus tinctorius* Linn.

PP-10

IN-VITRO STUDY OF INHIBITORY ACTIVITY α-AMYLASE AND PANCREATIC LIPASE ON FERMENTED ROBUSTA GREEN COFFEE BEANS

Tedjo Narko[1,*], Marlia Singgih Wibowo[1], Sophi Damayanti[1], Indra Wibowo[2], Ilvan Alvian[3]
[1]Department of Pharmacochemistry, School of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia
[2] Department of Biology, School of Life Sciences and Technology, Bandung Institute of Technology, Bandung, Indonesia
[3]Department of Pharmacology, University of Garut, Garut, Indonesia

Corresponding author: tedjo.n.83.128@gmail.com

Obesity occurs because of an imbalance between energy intake and energy expenditure. Prevention of obesity can be done by consuming functional food that serves to limit calorie intake, one of which is by inhibiting the work of the enzyme α-amylase and pancreatic lipase. The purpose of this study was to determine the IC_{50} inhibitory activity of α-amylase and pancreatic lipase in vitro from fermented Robusta (*Coffea canephora* L.) water extracts. The result of fermentation is kombucha coffee which is tested for its inhibitory activity against α-amylase and pancreatic lipase by the colorimetric method. The parameter observed in the α-amylase enzyme inhibitory activity was the measurement of reducing sugars that reacted with DNS to form orange compounds, whereas the inhibitory activity of the pancreatic lipase enzyme was the measurement of fatty acids that reacted with Na-dietilditiocarbamate to form yellow compounds measured on the UV-spectrophotometer Vis. The results showed that kombucha coffee showed inhibitory activity of α-amylase and pancreatic lipase. IC_{50} value of kombucha coffee against α-amylase enzyme was 3.71 ppm and IC_{50} value of kombucha coffee against pancreatic lipase enzyme was 5.39 ppm. Based on the test data, it can be concluded that the fermented Robusta (*Coffea canephora* L.) water extract is a prospective preparation for weight loss. It is also advisable to test the IC_{50} inhibitory activity of the enzyme α-amylase and pancreatic lipase in vitro fermented from arabica green coffee beans to obtain a comparison with the fermentation results from robusta green coffee.

Keywords: Kombucha coffee, α-amylase, pancreatic lipase, robusta coffee, IC_{50}

PP-11

INTERACTION OF BITTER MELON (*Momordica charantia*) FRUIT EXTRACT WITH SGLT-2 INHIBITOR DRUG IN DIABETIC MOUSE MODEL

Zulkaida, Kurniati, N.F[1], Sukandar, E.Y[2]

[1]Department of Pharmacology and Toxicology, School of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia

[2]Research Center Laboratory of of Pharmacology and Toxicology, Bandung, Indonesia

Corresponding author: ekazulkaida@ymail.com

Diabetes mellitus (DM), as one of the five main causes of death in the world, is a metabolic chronic disease caused by reduction of insulin production and/or insulin receptor sensitivity. The number of DM patient in Indonesia according to riskesdas in 2013 was 6.9% or with an absolute number around of 12 million people. It is further estimated that in 2030 the prevalence of DM in Indonesia is around 21.3 million people. Some cases were found that DM patients use herbs as an alternative drug. One of the plants oftenly used as traditional medicine for DM in Indonesia was Bitter-melon *(Momordica charantia).* There is possibility that the herbs are consumed in combination with conventional medicine. Therefore, the aim of this research was to determine antidiabetic activity of bitter melon extract, its mechanism of action, and the possibility of pharmacodynamic interactions between one of conventional drug (dapagliflozin) with bitter melon *(Momordica charantia).* Antidiabetic test in mice was glucose tolerance test, alloxan induced diabetes, and insulin resistance test with fat induction. Dosage of bitter melon used for tolerance test, alloxan induction test, and insulin resistance test was 19.5; 39.5; and 78 mg / kg bb mice, while for Dapagliflozin (DPZ) dose was 1 mg / gbb mice. The results of this study showed that bitter melon extract could reduce blood glucose level significantly compared to positive control at all doses tested. The mechanism of action of bitter melon extract preparations were probably by increasing of insulin, secretion insulin and insulin receptor sensitivity. The combination of bitter melon extract with SGLT-2 inhibitor drug did not change antidiabetic activity of the drug. Therefore, this combination did not categorize as a harmful interaction.

Keywords: Diabetes mellitus, bitter melon *(Momordica charantia)* fruit extract dapagliflozin, pharmacodynamics interaction

PP-12

THE EFFECT OF ETHANOL EXTRACT OF LIME PEEL (*Citrus aurantifolia* (Christm) Swingle) ON DECREASING TOTAL CHOLESTEROL LEVEL IN SWISS WEBSTER STRAIN MALE WHITE MICE (*Mus musculus*)

Ratna Widyasari[1], Adhisty Kharisma Justicia[1], Faiza Hanaz[1]
[1]Academy of Pharmacy Yarsi, Pontianak, Indonesia
Corresponding author: shareeza121208@gmail.com

The lime peel (*Citrus aurantifolia* (Christm.) Swingle) contains flavonoids that could contribute to antioxidants activity that could reduce cholesterol levels in the blood. This study aimed to determine the effect of ethanol extract of the lime peel on the total blood cholesterol levels induced by alloxan. This experimental study used 30 mice divided into 6 groups. Group I (normal control) and group II (positive control) were administered simvastatin. Group III (negative control) was administered aquadest. Group (IV), (V) and (VI) were administered the extracts with the concentrations of 0.4g / KgBB, 0, 6g / KgBB and 0.8g / KgBB. Firstly, 25 mice were induced intraperitoneal by alloxan at a dose of 200 mg / KgBB. The next, on the 7th day after the induction, the mice were administered with the extracts for 14th days, and cholesterol levels were measured on the 1st, 7th and 21st days. Based on the results of the study, the percentage of cholesterol level that decreased on each group respectively at the dose of 0.4g / KgBB, 0.6g / KgBB, and the dose of 0.8g / KgBB were 49.23%, 55.08%, and 57.16%, and the dose of positive control was 58.24%. The one-way ANOVA and the LSD test Showed that the lime peel extract decrease hypercholesterolemia of mice comparing to simvastatin as positive control with significant value (P> 0.05). Therefore, the conclusion of the study is ethanol extract of Lime Peel decrease the total cholesterol of mice.

Keywords: Lime peel (*Citrus aurantifolia (Christm.) Swingle*), alloxan, total cholesterol level.

PP-13

THE EFFECT OF 1,3-Bis (*p*-Hydroxyphenyl) UREA TOWARDS VIABILITY OF RAW 264.7 CELLS-INDUCED BY LIPOPOLYSACCHARIDE

Urip Harahap[1], Hari Purnomo[2], Mahatir Muhammad[3], Denny Satria[3]

[1]Department of Pharmacology, Faculty of Pharmacy, Universitas Sumatera Utara, Indonesia.

[2]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Gadjah Mada, Indonesia.

[3]Department of Pharmaceutical Biology, Faculty of Pharmacy, Universitas Sumatera Utara, Indonesia.

Corresponding author: urip@usu.ac.id

A new molecule of 1.3-bis(*p*-hydroxyphenyl) urea was designed and predicted to have less hepatotoxic side effect and as analgetic. Synthesis of 1.3-bis(*p*-hydroxyphenyl) urea could be carried out by reaction between *p*-aminophenol and urea. The aim of this study was to determine cytotoxic activity of 1.3-bis(*p*-hydroxyphenyl) urea. Cytotoxicity activity was determined with [3- (4,5-dimethyltiazole-2-yl) -2,5 diphenyltetrazolium bromide] (MTT) method and incubation for 24 hours with concentrations 500; 250; 125; 62.5; 31.25; and 15.625 µg/mL. Cytotoxicity activity measured as percentage of cells viability were 37.38 ± 0.79%; 47.63 ± 0.38%; 63.56 ± 0.43%; 73.03 ± 0.52%; 96.42 ± 0.32%; and 116.04 ± 0.24%. The results reveal that 1.3-bis(*p*-hydroxyphenyl) urea are not cytotoxic at concentration 31.25 and 15.625 µg/mL.

Keywords: 1.3-bis(*p*-hydroxyphenyl) urea, viability, RAW 264.7 cells, cytotoxic, lipopolysaccharide.

PP-14

BIOMARKERS NON INVASIVE FOR CARDIOVASCULAR RISK FACTORS IN HYPERTENSIVE-ANIMAL MODEL: PWV AND QRS-T ANGLE

Patonah Hasimun*[1], Yani Mulyani[1], Adinda R Setiawan, Entris Sutrisno[1]
[1]Pharmacology and Clinical Pharmacy Research Group, Faculty of Pharmacy, Bhakti Kencana University, Bandung, Indonesia
Corresponding author: patonah@bku.ac.id

Arterial stiffness has been identified as a risk factor for cardiovascular morbidity and mortality in hypertensive patients. Apart from controlled blood pressure targets, assessment of arterial stiffness and changes in heart QRS-T angles are important biomarkers for early detection of cardiovascular risk, which is measured non-invasively. These two parameters are important biomarkers for assessing the success of antihypertensive drug therapy in addition to the target blood pressure that must be achieved. This study aims to create an animal model of hypertension and its effect on cardiovascular risk by measuring pulse wave velocity (PWV) and spatial angle QRS-T. The study was conducted on male Wistar rats aged 3 months. A total of 10 rats were grouped randomly into 2 consisting of the normal group receiving a standard diet and the induction group receiving a 40% high fat diet and 25% fructose for 28 days. On day 28, all groups were measured for systolic and diastolic blood pressure, heart rate, PWV, QRS-T heart angle, serum nitric oxide levels. The results of the study, the induction group showed hemodynamic changes, an increase in systolic and diastolic blood pressure (213.2±2.3 vs. 108.8±2.1 mmHg, and 173.6±2.7 vs. 77.0±1.9 mmHg; $P<0.05$ for both), heart rate (656±2.1 vs. 371±2.5 beat/min; $P<0.05$), arterial stiffness (PWV: 656±2.3 vs. 356±1.3 cm/sec; $P<0.05$), wider heart spatial QRS-T angle (120.0±1.0 vs. 86.5±2.9 ^{o}; $P<0.05$) and decreased serum nitric oxide levels (2.1±0.5 vs. 152.6±5.0), which differed significantly compared with normal group. It can be concluded that a diet high in fat 40% and fructose 25% in drinking water causes hypertension accompanied by arterial stiffness and widening of the spatial angle of the QRS-T of the heart, and is characterized by a decrease in serum nitric oxide levels.

Keywords: biomarker, cardiovascular, hypertension, pulse wave velocity, QRS-T angle

PP-15

THE CYTOTOXIC ACTIVITIES OF MARINE SPONGES EXTRACT FROM STARING BAY AGAINST CERVICAL CANCER CELL LINE (HeLa)

Syifa Hanifah[1], Annis Chumaedah Triseptiani[1], Nur Diana Hadad[1], Riezki Amalia[2,3], Ajeng Diantini[2,3], Sahidin[4]

[1]Bachelor Program in Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung – Sumedang KM 21, Jatinangor, 45363, Indonesia

[2]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung – Sumedang KM 21, Jatinangor, 45363, Indonesia

[3]Center of Excellence in Higher Education for Pharmaceutical Care Inovation, Universitas Padjadjaran, Jl. Raya Bandung – Sumedang KM 21, Jatinangor, 45363, Indonesia

[4]Faculty of Pharmacy, Universitas Halu Oleo, Kendari, Indonesia

Corresponding author: riezki.amalia@unpad.ac.id

Cervical cancer is caused by a sexually acquired infection with certain types of HPV (Human Papilloma Virus). In 2018, approximately 311.000 women died of cervical cancer, more than 85% of these deaths occurred in low-middle income countries. Marine sponges are considered one of the highest sources of bioactive compounds among other marine organisms, their ability to produce various bioactive compounds. The purpose of this study was to determine the cytotoxicity activities of various extracts of Marine Sponge isolated from Staring Bay, Southeast Sulawesi, Indonesia by WST-8 method (water soluble tetrazolium-8). The Result showed that acetone extract of *Theonella* sp has cytotoxic activity with IC_{50} 27,85 ppm, while acetone extract of *Melophlus sarassinorum* and methanol extracts of *Stylotella aurantium* show cytotoxic activity with IC_{50} values 566,44 and 873,65 ppm respectively and IC_{50}> 1000 ppm for methanol extract of *Callyspongia aerizusa*, n-hexane extract of *Callyspongia aerizusa* and *Stylotella aurantium*. This research suggests the cytotoxicity potencies of sponges extract from staring bay against cervical cancer cell line (HeLa).

Keywords: Cytotoxicity, marine sponges, HeLa cell line, WST-8

PP-16

Citrus maxima PEEL EXTRACT INHIBITS CELL GROWTH AND PROMOTES APOPTOSIS ON HIGHLY METASTATIC BREAST CANCER cells

Sri Mursiti[1], Nur Dina Amalina[2*], Aditya Marianti[3]

[1]Chemistry Department, Faculty of Mathematics and Natural Science, Universitas Negeri Semarang, Indonesia

[2]Pharmacy Study Program, Chemistry Department, Faculty of Mathematics and Natural Science, Universitas Negeri Semarang, Indonesia

[3]Biology Department, Faculty of Mathematics and Natural Science, Universitas Negeri Semarang, Indonesia

Corresponding author: dinaamalina@mail.unnes.ac.id

Waste pemelo (*Citrus maxima*) peels (CM) is a tropical medicine plant that appears to be natural cancer therapy. Various compound of CM extract possesses antitumor effects by regulating multiple signaling cellular pathways. The aims of this study is to investigate cytotoxic activity of CM extract on higly metastatic breast cancer cells (MDA-MB-231). The cytotoxic activity of CME extract was carried out using MTT assay. Cell cycle and apoptosis assay was done using flow cytometry with PI and Annexin-V PI staining, respectively. The results demonstrated that exposured of CM extract performed cytotoxic effect in a dose-dependent manner on MDA-MB-231 breast cancer cells with IC_{50} value of 350 µg/mL. The cytotoxic effect in the treatment with CM extract at 175 and 87,5 µg/mL was through Sub G0 phase cell cycle arrest and apoptosis induction. CM extract possesses cytotoxic effect by induced cell cycle arrest and apoptosis in highly mestatic breast cancer cells.

Keywords: Cytotoxic, cell cycle, apoptosis, citrus maxima peel extaract, MDA-MB-231.

STUDY OF LSMT ACTIVITY TOWARDS SPHEROID

PP-17

Fauzia Azzahra[1], Heni Rachmawati[1], Riezki Amalia[2]
[1]Research Group of Pharmaceutics, School of Pharmacy, And Research Center for Nanoscience and Nanotechnology, Bandung Institute of Technology, Ganesa 10, 40132, Bandung, Indonesia
[2]Department of Pharmacology and Clinical Pharmacy, Padjadjaran University, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
Corresponding author: h_rachmawati@fa.itb.ac.id

Light Subunit of Mushroom Tyrosinase (LSMT) is protein of unknown function from *Agaricus biporus*, which was discovered coincidentally during elucidation of the crystal structure of the enzyme. rLSMT is non-immunogenic and non-agglutinating protein, has ability to penetrate the intestinal epithelial cell barrier. It shows antiproliferative activity towards two-dimensional culture of breast cancer cell lines. Cancer Stem Cells (CSC) are subpopulation of cancer cells which have self-renewal, proliferation, differentiation capabilities and initiate and sustain tumor growth in vivo. Three-dimensional culture, Spheroids, have used as in vitro assay for analyzing CSC. The aim of this study is to evaluate anticancer activity towards spheroid. In this study, LSMT inhibits proliferation of MDA-MB-231 cell line in monolayer culture, with cell viability percentage of 98,3%; 83,6%; 76.0% and 64.9% on LSMT dose treatment 300, 400, 500, 600 µg/mL, respectively. Spheroid generated by culturing MDA-MB-231 cell line in non-adherent surface, supplemented with EGF, b-FGF and B27. Reduction size of MDA-MB-231 spheroid after LSMT treatment with 350µg/mL is negligible. This study needs further investigation upon dose treatment for spheroid.

Keywords: *Agaricus bisporus*, LSMT, Spheroid

PP-18

ANTI-INFLAMMATORY ACTIVITIES OF AQUEOUS EXTRACT OF BERINGIN (*Ficus benjamina* L.) AND KERSEN (*Muntingia calabura* L.) LEAVES IN ALBINO RATS

Dominus MBunga[1], Stefany Fernandez[2]
[1]Department of Pharmacy, Polytechnic of Health Ministry of Health, Kupang, Indonesia
[2]Department of Pharmacy, Polytechnic of Health Ministry of Health, Kupang, Indonesia
Corresponding author: noezzb@gmail.com

This research aimed to prove the anti-inflammatory activities of aqueous extract of Beringin (*Ficus Benjamina* L.) and Kersen (*Muntingia Calabura* L.) leaves scientifically. Extraction was conducted by the Dekok method. Anti-inflammatory activities were performed base on the inhibition of edema formation on the paw of the rats induced by intraplantar injection 0.05 mL of carrageenan lambda 1 % suspension. Aqueous extract of *Ficus Benjamina* L and *Muntingia Calabura* L leaves were given orally one hour before carrageenan induction. The edema formation was measured volumetrically with a plethysmometer. Diclofenac sodium in the dose of 4.5 mg/kg of body weight used as a positive control. Results showed that all of doses of the aqueous extract of *Ficus benjamina* L. and *Muntingia calabura* L. leaves had anti-inflammatory activities which was significantly different with negative control ($p<0.05$). The highest anti-inflammatory activity on the aqueous extract of *Ficus benjamina* L. leaves was showed at dose of 264 mg/kg bw with the edema volume percentage 39.71% compared to negative control group 70.12% and percentage of inflammation inhibition was 44.36%. On the aqueous extract of *Muntingia calabura* L. leaves, the highest anti-inflammatory activity was showed at dose of 1284 mg/kg bw with the edema volume percentage 38.90% and the percentage of inflammation inhibition was 46.83%.

Keywords: Anti-inflammatory, Aqueous Extract, *Ficus benjamina* L., *Muntingia calabura* L.

PP-19

ANTI-FATIGUE EFFECT OF FALOAK BARK INFUSION (*Sterculia quadrifida* R.Br.) USING THE WEIGHT-LOADED FORCED SWIMMING TEST (WFST) METHOD

Stefany S.A Fernandez[1], Marce Inggritha Taku Bessi[2]
[1]Department of Pharmacology, Health Polytechnic of ministry of health Kupang
[2]Department of Pharmachemistry, Health Polytechnic of ministry of health Kupang
fzeztephanie@gmail.com
marceinggritha@gmail.com

Fatigue is a condition of weakness or reduced ability to do a job. When there is a lack of energy, people have their way of dealing with it. One of the plants of the Family Sterculiaceae empirically used by the people of East Nusa Tenggara as a stamina enhancer in heavy workers, pre and postpartum mothers to increase energy during and after birth is Faloak (Sterculia quadrifida R.Br.). the results of acute toxicity tests on test animals indicate that Faloak infusion is safe. Phytochemical screening results show the content of flavonoids, anthraquinone, saponins, cardenolides, and tannins. The method used in this test is a Weight-loaded Forced Swimming Test (WFST), the mice are forced to swim with a load of ± 10% of body weight before and after the preparation of Faloak infusion with a concentration of 50%, 75%, and 100% for 8 days. Length of swimming time and body weight were tested using the One Way ANOVA Test and Paired T-Test, the data showed no effect of mice weight gain on swimming time ($p < 0.05$). The results showed the anti-fatigue effect of faloak infusion concentrations of 50%, 75%, and 100% and significantly different from the control group. From these results, it can be considered that infusion of faloak stem bark concentrations of 50%, 75% and 100% have anti-fatigue effects.

Keywords: Anti fatique, Faloak, Sterculia quadrifida R.Br., WFST, mice

POTENTIAL OF AFRICAN LEAF WATER EXTRACT *(Gymnanthemum amygdalinum)* AS ANTIINFLAMMATORY

PP-20

Lusi Agus Setiani[1], **Zaldy Rusli**[1]
[1]Department of Pharmacy, Faculty of Mathematics and Natural Science, University of Pakuan, Bogor, Indonesia
Corresponding author: lusi.setiani@unpak.ac.id

Inflammation is one of the immune system's main responses to infection and irritation. African leaves are a medicinal plant that is used empirically as an anti-inflammatory. The results of phytochemical screening showed that the water extract of African leaves contained flavonoid, alkaloid, tannin and saponin. This study was conducted to determine the effective anti-inflammatory dose of reducing rat foot edema using a pletismometer. The anti-inflammatory activity test was carried out in vivo using 30 male rats divided into 5 treatment groups, negative control (CMC-Na 0.5%), positive control (diclofenac sodium 12.6 mg / kgBW), dose I (100 mg / kgBW), dose II (150 mg / kgBW) and dose III (200 mg / kgBW). The extract was administered orally half an hour before induction of 0.1 ml of 2% carrageenan solution. The results showed that the best inhibition of inflammation was 85.2% at a dose of 200 mg / kgBW. The dose of 200mg / kgBW showed a significant difference ($p < 0.05$) in the negative control. From these studies it can be concluded that the water extract of African leaves has anti-inflammatory activity.

Keywords: African leaf water extract, in vivo, antiinflammatory activity

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PREVENTIVE EFFECT OF ETHANOL EXTRACT OF *Parkia speciosa* HASSK SEEDS ON BLOOD LIPID PROFILE IN HIGH-FAT DIET-INDUCED RATS

Cynthia Astiti Putri, Arba Pramundita Ramadani, Yogie Andika Tri Nanda, Desy Purnamawati

Department of Pharmacy, Universitas Islam Indonesia, Sleman, Indonesia

Corresponding author: cynthia.astiti@uii.ac.id

Lipid disorder will increase the risk of other diseases, such as stroke and heart disease. The aim of this study was to determine *Parkia speciosa* Hassk seeds' effect on blood lipid parameters in high-fat diet-induced male Wistar rats. Animals were divided into six groups: negative control (CMC Na 0.5%), positive control (CMC Na 0.5%), reference group (simvastatin 0.9 mg/kg), treatment group (ethanol extract of *P. speciosa* Hassk seeds): I (100 mg/kg), II (200 mg/kg), III (400 mg/kg). High-fat diet consists of lard and quail egg yolks. The treatment and induction were given per oral for 45 days. On day 0 and 46, blood was collected to determine cholesterol, LDL, and HDL levels. Statistical evaluation was conducted using one way Annova with significances 95%. Treatment groups had the lowest increase of cholesterol (67.38±11.09 mg/dL) and LDL (8±4.4 mg/dL) values than positive control groups (76.68±19.65 mg/dL; 13.45±7.87 mg/dL), although not significant ($p<0.05$). In addition, the extract was able to raise HDL level (40.53±11.04 mg/dL). Ethanol extract of *P. speciosa* Hassk seeds at a dose of 100 mg/kg had been able to prevent the increase of total cholesterol and LDL levels and able to raise HDL value.

Keywords: *Parkia speciosa* Hassk seeds, blood lipid profile, high fat diet

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ANTIINFLAMMATORY TEST OF DUWET LEAF ETHANOL EXTRACT (*Syzygium cumini* L. Skeels) AND HISTOPATHOLOGY TEST ON STOMACH WISTAR RAT (*Rattus norvegicus* L) IN VIVO

Dhiya Hanifan[1], Gunawan Pamudji Widodo[1], Yane Dila Keswara[1]
[1]Faculty of Pharmacy, Setia Budi University, Surakarta, Indonesia
Corresponding author: gunawanpamudjiw@gmail.com

The use of NSAID drug therapy has side effects that can adversely affect the body's biological functions such as the liver, digestive tract and other vital organs. *Syzygiumcumini* L. Skeels or duwet plants which contain several compounds including alkaloids, flavonoids, tannins, and saponin. The purpose of this study was to determine the dose of duwet leaf extract has anti-inflammatory effects and side effects on the stomach of white rats in histopathological testing *in vivo*. This research was conducted using 25 male wistar white rats divided into 5 groups consisting of 0,5 % CMC group (negative control), diclofenac sodium (positive control), and ethanol extract of duwet leaves doses of 50, 100 and 200 mg/kg BW administration orally after induction with carrageenan. The oedema volume measurement was performed at 30, 60,120,180,240,300, and 360 min. The results of edema volume calculated by AUC and percent of anti-inflammatory potency were analyzed statistically by *One-way* ANOVA, and LSD *post hoc* test. The results of this study the ethanol extract of duwet leaves doses of 100 and 200 mg/kg BW has an anti-inflammatory effect and dose of 200 mg/ kg BW has equal efficacy with sodium diclofenac. Histopathological test results showed that the ethanol extract of duwet leaf doses of 50, 100 and 200 mg/kg BW were no side effect on the stomach.

Keywords: duwet leaf, anti-inflammatory, histopathology, stomach

EVALUATION OF THE DIURETIC AND SALURETIC ACTIVITY OF CUCUMBER FRUIT (*Cucumis sativus* L.) IN WISTAR RATS

PP-23

Tomi Hendrayana, Linarti Magdalena[1], Nova Suliska[1], Elin Yulinah Sukandar[1], I Ketut Adnyana[1]

[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia

Corresponding author: tomi@fa.itb.ac.i

Hypertension is a cardiovascular disease affecting community. Guidelines for hypertension therapy had been established, but people use traditional medicinal plants as alternative/adjuvant therapy. One of the herbal remedies used for decreasing blood pressure (BP) is cucumber; however, mode of action of cucumber fruit as diuretic has not been widely studied. This research aims to evaluate the diuretic-saluretic activity of cucumber and its interaction with standard diuretic agent (furosemide). The diuretic test was carried out using modified Lipschitz method. Male Wistar rats were divided into 10 groups. Each group received either 5 mL/kg bw NaCMC (negative control), furosemide 3.6 mg/kg bw (positive control) or cucumbers 9, 18, 27, 36 mg/kg bw (experimental groups). To find out the herb-diuretic agent interaction, cucumber was combined with furosemide (0.5:0.5). About 12 hours prior to the test, the rats were fasted, and then received 50 mL/kg bw normal saline 15 minutes before drug/cucumber administration. Cumulative volume of urine was measured at 1 to 6 and 24 hours after administration and level of Na^+/K^+ in urine of 24-hr was measured using atomic absorption spectroscopy. Data was analyzed statistically using SPSS software. Result showed that rats received cucumbers 9, 18, 27, 36 mg/kg bw, NaCMC and furosemide, the average cumulative urine volume in sequence were 13.5, 10.1, 13.5, 8.6, 10.3, and 16.8 mL. Cucumber has slightly effect of diuretic–saluretic and the activity was proportional with increasing dosage that is inferior to furosemide. For combination group, rats receiving combination cucumber 13.5 mg/kg bw with furosemide 1.8 mg/kg bw compare to rats receiving cucumber 27 mg/kg bw and furosemide only, the average of cumulative urine volume were 14.6, 13.5, and 16.8 mL. Therefore, combination of cucumber and furosemide demonstrated an additive interaction, diuretic-saluretic effect from combination was equal to the sum of the effect of each taken separately.

Keywords: hypertension, cucumber (*Cucumis sativus* L.), furosemide, diuretic activity, saluretic activity.

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IMMUNOMODULATORY ACTIVITY OF *Zanthoxylum acanthopodium* DC. FRUITS ON RATS-INDUCED BY *Staphylococcus aureus*

Rosidah[1], Yuandani[1], Sry Suryani Widjaja[2], Muhammad Fauzan Lubis[3], Denny Satria[3]

[1]Department of Pharmacology, Faculty of Pharmacy, Universitas Sumatera Utara, Indonesia.

[2]Department of Biochemistry, Faculty of Medicine, Universitas Sumatera Utara, Indonesia.

[3]Department of Pharmaceutical Biology, Faculty of Pharmacy, Universitas Sumatera Utara, Indonesia.

Corresponding author: rosidah@usu.ac.id

Zanthoxylum acanthopodium is a herbaceous plant of the family rutaceae. This plant has been widely tested for its activity as a drug. In this study *Zanthoxylum acanthopodium* DC. fructus activity tests were carried out as an immunomodulator. Immunomodulators are subtances that can affect the activity of the immune system. One way to test the immunomodulatory effects of the test substance is using the carbon clearance method. The carbon clearance method is a non-specific immune response test to see the ability of phagocytosis by using carbon as a foreign substance given intravenously. The extract was prepared using maceration method with n-hexane, ethylacetate and ethanol solvent, *Zanthoxylum acanthopodium* DC. fructus ethanol extract (ZAEE), *Zanthoxylum acanthopodium* DC. fructus ethylacetate extract (ZAEAE), and *Zanthoxylum acanthopodium* DC. fructus n-hexane extract (ZAHE). Immunomodulatory effects of extracts were showed from the value of the stimulation index (SI). ZAEE, ZAEAE, and ZAHE with dosage of 200 mg/kg bw were showed the best immunomodulatory activity with a SI value of 2.02; 2.58; and 2.01. The results reveal that extract of *Zanthoxylum acanthopodium* DC. fructus has immunomodulatory potential.

Keywords: Immunomodulator, *Zanthoxylum acanthopodium* DC. fructus, extract, Stimulation index

EFFECT OF PEPPER ELDER ON HYPERTENSIVE RATS

PP-25

Afrillia Nuryanti Garmana[1], I Ketut Adnyana[1], Riadhotul[1], Salsabila Nur Anzani

[1]Department of Pharmacology,School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia

Corresponding author: afrillia@fa.itb.ac.id

Hypertension is one of the most prevalent cardiovascular disease in the world. Hypertension can be treated by using antihypertensive medicine and/or lifestyle modifications. However, antihypertensive medicines have many side effects that can complicate the clinical problem. Natural sources, such as plants, could be used as an alternative in hypertension treatment. Pepper elder (*Peperomia pellucida* (L.) Kunth is used traditionally for lowering blood pressure. *In vitro* study showed its activity as angiotensin converting enzyme inhibitor. This study aims to determine the antihypertensive activity of pepper elder in dexamethasone-induced hypertensive rats. Dexamethasone at dose of 0.5 mg/kg was injected subcutaneously for 7 days to induce hypertension. The concentrated pepper elder juice were given at dose of 15, 30, and 60 mg/kg. Blood pressures were measured by non-invasive CODA® tail-cuff blood pressure system on the day prior to induction, after induction, and throughout therapy until day-6. The result of this study showed significant systolic blood pressure reduction by 49.5 and 49.1 mmHg after administration of concentrated pepper elder juice at dose 30 and 60 mg/kg, respectively, while the diastolic blood pressure reduction was 39.5 and 49.7 mmHg. It can be concluded that concentrated pepper elder juice at dose of 30 and 60 mg/kg bw has *in vivo* antihypertensive activities.

Keywords: Pepper elder, *in vivo*, antihypertensive, dexamethasone-induced hypertensive rat.

ANTI-INFLAMMATORY ACTIVITY OF *Urena lobata* LEAF EXTRACT: STUDY *IN SILICO* AND *IN VIVO*

PP-26

Doti Wahyuningsih[a], Yudi Purnomo[b*], Andri Tilaqza[b]
[a]Department of Biomedic, Faculty of Medicine, University of Islamic Malang, Malang, Indonesia
[b]Department of Pharmacy, Faculty of Medicine, University of Islamic Malang, Malang,Indonesia
*Corresponding author : y_purnomo92@yahoo.com

Urena lobata is a herbs have been used to cure inflammation and infection empirically. However, the study and mechanism of herbs as anti-inflammatory are still limited and not complete also. The study aims to evaluate anti-inflammatory effect of *U. lobata* leaf extract by *in silico and in vivo*. This study used pre-post test control group with male wistar rats which is divided into 5 groups: control group, test group in 3 different doses and ibuprofen as a reference drug group. *Urena lobata* leaves were extracted with decoction method and the extract were orally given in dose of 125, 250 and 500 mg/kg body weight, a half hour before induction carrageenan 1 % intra plantar injection. Anti-inflammatory activity was examined by plethysmometer apparatus. Furthermore, *U. lobata* was also evaluated through *in-silico* study using docking server after their active compounds were identified by Liquid Chromatography Mass Spectra (LC-MS). The oral administration of *U.lobata* leaves extract 125, 250 and 500 mg/kg bw were able to inhibit Area Under Curve (AUC) of paw edema volume about 12 %, 6 %, 4 % respectively compared to control group ($p<0.05$), however, the percentage inhibition of inflammation from extract were lower than ibuprofen as a standart drugs. Docking studies indicated that mangiferin, stigmasterol and sitosterol in *U.lobata* leaf extract have a great activity to inhibit COX-2, therefore, it reduces cytokine pro-inflammatory production. It can be concluded that *U. lobata* leaf extract could decrease inflammation on rat induced carrageenan through the inhibition of COX-2 activity.

Keywords : animal study, inflammation, molecular docking

PP-27

ANTIFUNGAL ACTIVITY TEST FROM A STEM BARK OF TAMARIND (*TAMARINDUS INDICA* L.) TO THE PATHOGENIC FUNGUS BOTH *IN VITRO* AND *IN SITU*

Rohayati[1], Dr. I Ketut Adnyana[2], Prof. Dr. Elin Yulinah S.[3]
[1] Bandung Polytechnic of Health, Bandung, Indonesia
[2] Bandung Institute of Technology, Bandung, Indonesia
3 Bandung Institute of Technology, Bandung, Indonesia
Corresponding author: rohayati.tlm@staff.poltekkesbandung.ac.id

Tamarindus indica L. are used by people as "tangkringan" on bird cages to prevent mold from growing on the feet of birds, it was suggested that the stem bark of *T. indica* has antifungal activity. This study used *in vitro* method that is microdilution, agar diffusion, TLC bioautography, comparator drug equality test, Scanning Electron Microscope (SEM), and *in situ* testing on the backs of rabbits. The microdilution results showed that the extract and fraction stem bark of tamarind has antifungal activity in the dermatophyte fungi they are *Trichophyton mentagrophytes, Microsporum canis,* and *M. gypseum*, while on *Candida utilis*, *Candida albicans, Fusarium sp., Aspergillus niger, Aspergillus nidulan, Aspergillus flavus*, and *Aspergillus oryzae* has no antifungal activity. N-hexane extract activity against *T. mentagrophytes*, *M. canis* and *M. gypseum* at a concentration of 15% with a diameter of 26.27 ± 0.39 mm, 17.7 mm ± 0.40, 17.53 ± 0.50 mm, antifungal activity against *T. mentagrophytes* oil extract at a concentration of 30% indicated by the diameter of inhibition 15.24 ± 0.22 mm, while for *M. canis* and *M. gypseum* at a concentration of 50% inhibition with a diameter of 15.47 ± 0.17 mm and 14.0 ± 0.16 mm. The *TLC* bioautography of the n-hexane extracts and oil are able to show the presence of a clear zone as evidence of antifungal activity. A topically test on the backs of rabbits was obtained results that extract oil- based ointment had an effect of reduction erythema and edema and it recovered on day 14, while the n-hexane ointment, cream extracts n-hexane, and oil had no significant healing effect when compared with control group. it was suggested that nonpolar compounds have an important role in these activities.

Keywords: Antifungal, *Tamarindus indica* L. tamarind bark, dermatophyte fungi.

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ACUTE TOXICITY EFFECT OF ZINGIBER ZERUMBET (L.) J. E. SMITH RHIZOME ETHANOLIC EXTRACT AND FRACTION USING ZEBRAFISH (*Danio rerio*) EMBRYO MODEL

Kharina Septi Lestari[1], **Kartika Sari**[1], **Fajar Fakri**[1], **Indra Wibowo**[2], **I Ketut adnyana**[1]

[1]School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia

[2] School of life Science and Technology, Institut Teknologi Bandung, Bandung, Indonesia

Corresponding author: kharinalestari12@gmail.com

Zingiber zerumbet rhizome (ZZR) can be used as spices for cooking ingredients that will have benefits for health. ZZR is traditionally used for the treatment of inflammation, fever, toothache, indigestion, constipation, diarrhea, and for pain relief. ZZR However, using traditional drugs result in toxicity effects. Therefore, this study was designed to determine the acute toxicity activity of the ZZR ethanolic extract and fraction in zebrafish embryos. Acute toxicity testing is referring to OECD protocol No. 236 year 2013. This acute toxicity test result is obtained from comparing the normal group (DMSO 0.01%), the positive control group (3,4-dichloroaniline 4 µg/mL), the ZZR Ethanol extract group (ZZREE), the ZZR n-Hexan fraction group (ZZRNF), the ZZR ethyl acetate fraction group (ZZREF), and the ZZR water fraction group (ZZRWF) to obtain LC_{50}. It was observed that the survival rate of zebrafish larvae decrease while the concentrations of ZZREE increasing and ZZR fractions. Acute toxicity test results obtained LC_{50} values at 96 hours post fertilization (hpf) ZZREE 27.17 µg/mL, ZZRNF 1.66 µg/mL, ZZREF 3.47 µg/mL, and ZZRWF 445.21 µg/mL. The exposure effects of ethanol extraction and fractions causes malformations to the larvae of the zebrafish, several of the malformation includes udem pericardial, udem yolk-sac, heart, eye, jaw, tail, somite, and back bone deformation, which suggests that ZZRNF and ZZREF can give toxic effects, ZZREE moderate category toxicity, and ZZRWF hazardous categories based on OECD. The LC_{50} value is used as a reference for determining test the concentration of pharmacological activity.

Keywords*:* Zingiber zerumbet L., acute toxicity, Zingiber zerumbet ethanolic extract. Zingiber zerumbet fraction.

LAB SCALE CAPSULE FORMULATION OF *Centella asiatica* AND *Ipomoea aquatica*

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Neng Fisheri Kurniati[1], Kusnandar Anggadiredja[1], Elin Yulinah Sukandar[1], Rachmat Mauludin[2]

[1]Department of Pharmacology-Pharmacy Clinic, School of Pharmacy, ITB, Bandung, Indonesia

[2]Department of Pharmaceutics, School of Pharmacy, ITB, Bandung, Indonesia

Corresponding author: nfkurniati@fa.itb.ac.id

This study was aimed to formulate capsules containing a combination ethanol extract of *Centella asiatica* herbs and *Ipomoea aquatica* leaves (75:25) in order to obtain hypnotic activity with more effective and increased patient compliance. The crude drug powder of those plants was extracted by maceration method. Capsules were formulated with different weigh, which were 306 mg and 200 mg. Formula A, B, and C had total weight of 306 mg, while formula D-H had the total weight of 200 mg. All the formula consisted of various concentration of lactose, Avicel PH 102, and Magnesium stearate. Furthermore, capsules of each formulations were evaluated qualitatively and quantitatively which were organoleptic, flow test, and moisture content. The results showed that formula A had less odor and finer powder than formula B and C because formula A had higher concentration of Avicel PH 102 than formula B and C. All three formula had a good flow but did not meet the moist content criteria. While Formula D, E, and F did not meet criteria for both flow rate and moist content. However, formula G and H, that had higher magnesium stearate concentration, had better flow rate and less moist than formula D, E and F. Formula H which contain extract, Avicel PH 102, aerosil 4%, and magnesium stearate 2% gave a good organoleptic, flow rate, and moisture content outcome among others formula.

Keywords: *Centella asiatica*, *Ipomoea aquatica*, capsule, lab scale

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ANTI-OSTEOPOROSIS POTENCY OF *Vigna radiata* SEED COAT EXTRACT COMPARED TO THE SEED AND SPROUT: PHYTOCHEMICAL AND *IN SILICO* ANALYSIS

I Gusti Agung Ayu Kartika[1], Afrillia Nuryanti Garmana[1], Irda Fidrianny[2], I Ketut Adnyana[1,*]

[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Institut Teknologi Bandung, Ganesha 10 Bandung, 40132, Indonesia

[2]Department of Pharmaceutical Biology, School of Pharmacy, Institut Teknologi Bandung, Ganesha 10 Bandung, 40132, Indonesia

Corresponding author: ketut@fa.itb.ac.id

Many studies have revealed the antiosteoporosis potency of both seed and sprout extract of *Vigna radiata*. However, there is no data for waste material in food processing of *V. radiata*, its seed coat. This study aims to investigate the phytochemical profile and anti-osteoporosis potency of *V. radiata* seed coat extract compared with the seed and sprout. Extract of seed, sprout and seed coat were prepared using maceration method. Extract of seed coat was also prepared using reflux method for comparison. Thin layer chromatography, high performance liquid chromatography and liquid chromatography-mass spectroscopy were conducted to investigate the phytochemical profile of *V. radiata* samples. Then, total flavonoid content was determined. Finally, literature study and pr*ediction of biological activity using* PASS Online WebServer were conducted. Phytochemical tests showed that seed coat was the richest part of *V. radiata*. However, heat processing made some chemical content were decreasing. Some chemical compounds that successfully detected present in seed coat extract was stigmasterol, kaempferol, luteolin, apigenin, naringenin, rutin, genistin, isoorientin, and myricetine. Seed coat extract also had higher total flavonoid content (12.81±0.19 µg QE/100 mg extract) than seed (7.65±0.07 µg QE/100 mg extract) and sprout extract (2.32±0.03 µg QE/100 mg extract). Except genistin and isoorientin, all of the detected compounds demonstrated bone protective effect in preclinical studies. Using data of literature studies and PASS analysis, genistin showed its probability to be active as inhibitor of MMP-9 expression, a bone matrix degradable enzyme (pa>pi, 0.741>0.005) while isoorientin showed only supported activities such as anti-inflammatory and angiogenesis stimulant (pa>pi, 0.585>0.006). Seed coat of *V. radiata* showed high potency to be antiosteoporosis agent same as both seed and sprout due to its high beneficial phytochemical content. Further experimental study have to be done to confirm its anti-osteoporosis activity.

Keywords: flavonoid, TLC, HPLC, osteoporosis, vigna radiata

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STUDY IN SILICO OF XANTHONE, α-MANGOSTIN, AND γ-MANGOSTIN ON PPAR-γ RECEPTOR AND ALDOSA REDUCTASE ENZYMES AS ANTI-DIABETIC DRUG CANDIDATE

Rifa'atul Mahmudah[1,2]*, I Ketut Adnyana[1], Elin Yulinah Sukandar[1], Okta Nursanti[3]

[1]Pharmacology and Clinical Pharmacy Department, School of Pharmacy, Institut Teknologi Bandung, West Java, Indonesia

[2]Pharmacy, STIKES Mandala Waluya, Kendari, Southeast Sulawesi, Indonesia

[3]Faculty of Military Pharmacy, University of Defense, Bogor, West Java, Indonesia

Corresponding author: ifamahmudah11@gmail.com

Mangosteen (*Garcinia mangostana* L.) is one plant that contains many compounds that have activities in dealing with various diseases. Some compounds in the mangosteen namely xanthones, α-mangostin, and γ-mangostin are thought to play a role as antidiabetic. This effect can be seen from the mechanism against the PPAR-γ receptors and aldosa reductase enzymes which can be predicted by the in silico method. This research studies conducted using natural ligands consisting of xanthone, α-mangostin, and γ-mangostin. The training set was designed using MOE (Molecular Operating Environment) of Pioglitazone (native ligand), Lobeglitazone, and Rosiglitazone which have been known as PPAR-γ agonists, as well as against Zopolrestat (native ligand), Epalrestat, Alrestatin, Lidorestat, Imirestat, Tolrestat, Fidarestat, Minalrestat, Ponalrestat, Ranirestat, Salfredin B11, Sorbinil, dan Zenarestat known as aldosa reductase inhibitors. The molecular tethering process uses a rigid receptor docking protocol against PPAR-γ receptors (PDB ID: 5Y2O) and aldosa reductase enzymes (PDB ID: 2HV5). It is estimated that α-mangostin and γ-mangostin will be active at the PPAR-γ receptor because each of these compounds has almost similar binding affinity values, namely -149.37 and -140.88 when compared to the comparison ligands. While the aldose reductase enzyme compounds xanthones, α-mangostin, and γ-mangostin show activity with binding affinity value of -8.15; -7,24; -6.09, which is also similar to the comparison ligand. This approach shows that xanthones, α-mangostin, and γ-mangostin are thought to be active against PPAR-γ receptors and aldose reductase enzymes which can be developed as antidiabetic candidates.

Keywords: in silico, xanthones, α-mangostin, γ-mangostin, antidiabetic

EVALUATION OF ITB STUDENTS' KNOWLEDGE TO NARCOTICS, PSYCHOTROPICS, AND ADDITIVE SUBSTANCES

PP-32

Lia Amalia[1], Cindra T. Yuniar[1], Bhekti Pratiwi[1]
[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia
Corresponding author: lia_amalia@fa.itb.ac.id

Addiction of narcotics, psychotropics, and addictive substances (NAPZA) increased every year. In Indonesia, there were an estimated number of person with drug misuse, as many as 3.8 million to 4.1 million people in 2014. People with drug misuse problems are dominated by productive age people, including students. Therefore, it is important to interfere the education process to increase students' awareness to narcotics, psychotropics, and addictive substances. The aim of this research is to increase students' awareness of narcotics, psychotropics, and addictive substance by providing massive education process. The activity divided into 2 agendas: seminar and media campaign using comics. Seminar was provided by the Indonesia Narcotics Agency (BNN). Total 638 students involved in this activity, with 17.11% is FMIPA students. Most of respondents able to answer the post-test questions after seminar and comic campaign, especially about definition, type, and addiction symptomps by narcotics, psycothropics, and addictive substances. The knowledge about NAPZA was increased in total 460 respondents (72.55%) . Students' knowledge was assessed using questionnaire and analyzed in before and after the activities. Both seminar and media campaign using comics was effective in increasing students' knowledge about drug misuse and the negative effects of narcotics, psychotropics, and addictive substances.

Keywords: students' knowledge, narcotics, psychotropics, additive substances

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THE IMPACT OF QUARTET CARD AS THE MEDIA OF EDUCATION ON JUNIOR HIGH SCHOOL STUDENT'S KNOWLEDGE ABOUT DRUG ABUSE

Irianti Bahana Maulida Reyaan[1], Pratiwi Wikaningtyas[1], I Ketut Adnyana[1]
[1]Department of Pharmacology-Clinical Pharmacy, School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia
Corresponding author: irianti@fa.itb.ac.id

In recent years, the prevalence of drug abuse cases in Indonesia have increased. Children in Indonesia continue to be the target of lucrative narcotics market, due to their age that was easily persuaded. Data from the National Narcotics Agency showed that in 2019, drug abusers among children and teenagers in Indonesia was increased from 24 to 28 percent. Preventive action in the form of communication, information, and education activities for students was needed to eradicating illegal drug distribution and drug abuse. Elaboration and collaboration from academics and healthcare professionals were needed to increase knowledge about drug abuse to students. Playing using quartet card media can be one of the method to giving information and prevent drug abuse in the future. The aim of this research is to determine the impact of education through the quartet card media to the knowledge of drug abuse on junior high school students. This research method used a pre-experimental design with one group pretest-posttest design. Data about the knowledge of junior high school students were collected by administering the questionnaires with 21 items that have been tested for validity and reliability outside the study population. The pre-test and post-test were conducted before and after education. Paired t-test was used as a statistical method to compare pre-test and post-test scores. A total of 156 respondents participated in the study, aged 13 years old. 54.49% of participants were female, and 45.51% were male. Following education, questionnaire scores increased from average 13.2 at pre-test to 20.1 at post-test. The result showed that there was a significant effect of education through quartet card media on knowledge about drug abuse in junior high school students with $p \leq 0.01$. This study concluded that there is a need of education to increase knowledge of students as the prevention method of drug abuse.

Keywords: Education, quartet card, knowledge, drug abuse, junior high school students

VALIDITY TEST AND RELIABILITY OF RESEARCH INSTRUMENTS IN HOSPITALS OF MEDICINE INFORMATION SERVICES

PP-34

Heny Puspasari[1*], Dani Suryaningrat[2]
[1.2]Akademi Farmasi Yarsi Pontianak
Corresponding author : heny24puspasari@gmail.com

Measuring tools or research instruments that can be accepted in a study must comply with the standards that have been tested for validation and data reliability. A questionnaire or questionnaire is a measuring tool in the form of several questions. This measuring tool is used when the number of respondents is large and can read well and can reveal confidential matters. The validation test can use the Pearson Product Moment formula and tested using the t-test and see the interpretation of the correlation index with the total score. After measuring the validity, it is necessary to measure the reliability of the data to find out whether the measuring instrument can be used or not. Reliability measurement can be used several formulas, one of which is based on Cronbach's negligible value method. The purpose of this study was to test the validity and reliability of the questionnaire in research on drug information services in hospitals. This research was conducted with a qualitative analysis research design with the unit of analysis in the hospital pharmacy installation. Prospective data retrieval from a number of outpatients who received a prescription from a doctor by administering a questionnaire containing eight indicators of drug information services according to pharmaceutical service standards in hospital No.72/2016. The results showed that the questionnaire about drug information services for outpatients at the Pontianak City general hospital in 2020 who received drug prescriptions from doctors showed that the questionnaire was valid and reliable with a positive correlation value (Pearson correlation) with a probability value (sig. (2-tailed))] less than (α 0.05) and the Cronbach's alpha value is more than the r table value of 0.578. Based on this research, it can be concluded that the questionnaire used to measure drug information services is valid and reliable.

Keywords: Validity, Reliability, Questionnaire, Drug information service

PP-35

PHARMACOPHORE MODELING, VIRTUAL SCREENING, AND MOLECULAR DOCKING STUDIES FOR IDENTIFICATION OF INHIBITOR UROKINASE PLASMINOGEN ACTIVATOR AS ANTICANCER

Bina Lohita Sari[1,2] *, Slamet Ibrahim Surantaatmadja[1], Daryono Hadi Tjahjono[1]

[1]School of Pharmacy, Institut Teknologi Bandung, Bandung 40132, Indonesia
[2]Pharmacy Study Program, Pakuan University, Bogor 16143, Indonesia
Corresponding author: binalohitasari@unpak.co.id

Urokinase-type plasminogen activator (uPA) is a member of serine protease enzymes that play an important role in the physiological and pathological regulation process. Clinical test and experimental evidence have shown that elevated uPA expression is associated with cancer progression, that is metastasis which shortened survival in patients. This study was designed to identify the natural compounds as inhibitor uPA by in silico analysis. In order to find novel uPA inhibitors which have different scaffolds, structure-based pharmacophore model was built and used for chemical database virtual screening from Indonesian Herbal Database (HerbalDB). The pharmacophore models and all compounds from database was submitted to Pharmit by online for structure-based virtual screening. The Lipinski's rule of five was applied for physicochemical filtering of the hit compounds. The pharmacophore model_3 with aromatic rings, hydrogen bond donor/cationic/metal ligator, and metal ligator features was resulted 72 hit compounds. All 72 compounds were docked use MOE docking software tool. A total of five compounds (Rhamnetin, Kaempferol, Baicalein, Quercetin and Isorhamnetin) display higher docking scores than amiloride as a known inhibitor and the interaction maps are found to interact with Asp189 and Ser190. For bioactivity score, the Molinspiration server has shown that Quercetin has protease and enzyme inhibitor value better than the other hit compounds. This study present that Quercetin was chosen as an appropriate scaffold for further structure-activity related studies.

Keywords: In silico, hits compound, validation, free energy

PP-36

SARS-CoV-2 INACTIVATION UNDER THE PHOTODYNAMIC EFFECT OF METAL PHTHALOCYANINE COMPLEXES FOR THE FUTURE TREATMENT OF COVID-19: IN SILICO STUDY

Taufik Muhammad Fakih, Nurfadillah Hazar, Mentari Luthfika Dewi, Tanisa Maghfira Syarza, Anggi Arumsari

Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Universitas Islam Bandung, Bandung, Indonesia

Corresponding author: taufikmuhammadf@gmail.com

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) which has caused a pandemic of respiratory disease COVID-19 to date threatens global health. The main protease SARS-CoV-2 is considered a promising target because the structure of the main protease is closely related to other beta-coronaviruses. Then it plays an important role in processing polyproteins which are translated from viral RNA. Various metal phthalocyanines have been studied for their capacity to effect photodynamics in viruses. Photodynamic therapy utilizes light activation so it is considered to have good specificity and selectivity. In this research, an interaction study was conducted between two metal phthalocyanine derivative compounds, namely Gallium Phthalocyanine (Ga-Pc) and Iron Phthalocyanine (Fe-Pc) with the main protease SARS-CoV-2 using molecular docking simulations. The affinity of the two compounds was compared using AutoDock 4.2 with MGLTools 1.5.6. Molecular interactions that were formed were subsequently identified and evaluated using the BIOVIA Discovery Studio 2020. Based on this research it was found that the two metal phthalocyanines have a better affinity than Boceprevir as a natural ligand, with binding free energy values of −44.81 kJ/mol, −42.97 kJ/mol, and −33.18 kJ/mol, respectively. Interestingly, the iron metal in the Fe-Pc center has an interaction with a bond distance of 2.97 Å. Therefore, these compounds can be a reference in the development of candidates for COVID-19 therapy based on photodynamic therapy.

Keywords: COVID-19, Main protease SARS-CoV-2, Photodynamic therapy, Metal phthalocyanines, Molecular docking simulations.

PP-37

MOLECULAR DOCKING APPROACHES OF NEW SCORPION VENOM PEPTIDE ACTIVITY AGAINST CCR5 RECEPTORS FOR THE IMPROVEMENT OF HIV INFECTION THERAPY

Mentari Luthfika Dewi, Eky Syahroni, Taufik Muhammad Fakih
Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Universitas Islam Bandung, Bandung, Indonesia
Corresponding author: mentariluthfikadewi19@gmail.com

HIV/AIDS has been disastrous for humans in the world for the past thirty years. The development of new anti-HIV agents is needed because there is no effective vaccine for HIV. The entry of HIV into the host cell requires interaction with the CD4 membrane receptor and depends on the activation of the CCR5 receptors. Kn2-7 peptide from scorpion venom (*Mesobuthus martensii Karsch*) and mucroporin-S1 peptide from scorpion venom (*Lychas mucronatus*) have been shown to have strong anti-HIV activity through inhibition of chemokine receptors mediated by CCR5. Through this research will be demonstrated in silico identification and evaluation of the affinity and molecular interactions between the peptide molecule and the CCR5 receptor using the peptide-protein docking method. The peptide molecular sequence is first modeled using the PEP-FOLD 3.5. The best model from the modeling results was chosen for an interaction study against the CCR5 receptor using HPEPDock. Molecular docking simulation results were then observed using the BIOVIA Discovery Studio 2020. Based on the peptide-protein docking results, it was found that Kn2-7 peptides had a better affinity than Mucroporin-S1 peptides against CCR5 receptors, with an ACE score of −1048.51 kJ/mol and −988.42 kJ/mol, respectively. This research shows that Kn2-7 peptides can inhibit HIV more strongly through direct interaction with virus particles and can be a promising compound of candidates for further development of antimicrobial peptides against HIV.

Keywords: HIV/AIDS, CCR5 receptors, Scorpion venom, Antimicrobial peptide, In silico study.

DOCKING STUDY OF BETA-SITOSTEROL AGAINST HMG Co-A REDUCTASE, HMG SYNTHASE, LDL RECEPTOR, PPAR-ALFA AND HCAR 2

PP-38

Inarah Fajriaty[1,2], I Ketut Adnyana[2], Irda Fidrianny[3], Neng Fisheri Kurniati[2]
[1]Department of Pharmacy, Faculty of Medicine, Tanjungpura University, Indonesia.
[2]Department of Pharmacology and Clinical Pharmacy, Bandung Institute of Technology, Indonesia
[3] Department of Pharmaceutical Biology, Bandung Institute of Technology, Indonesia
Corresponding author: inarah.fajriaty@pharm.untan.ac.id

Hyperlipidemia is a lipid metabolic disorder characterized by an increase in one or a combination of total cholesterol levels, triglycerides, LDL (Low-Density Lipoprotein), and decreased levels of HDL (High-Density Lipoprotein). The aim of this research was to evaluate affinity and interactions the antihypercholesterolemic effect of chemical constituents of beta-sitosterol by determining the inhibitory effect of the compounds against receptor structure of HMG Co-A reductase, HMG synthase, LDL receptor, PPAR-alfa (Peroxisome proliferator-activated receptor-alpha) and HCAR 2 (Hydroxycarboxylic Acid Receptor 2) using in-silico molecular docking methods. Molecular docking performed includes the preparation of 3D structures validation the protein receptor using AutoDockVina software, ChemOffice to analyze permeability, and stabilize atoms bound on ligand and Discovery Studio for interaction visualization. The results showed that atorvastatin, simvastatin, gemfibrozil, nicotinic acid, and beta-sitosterol compounds had H donor less than 5, H acceptor less than 10, log P less than 5 (except beta-sitosterol had log P more than 5), and a molecular weight less than 500 g/mol. The affinity of beta-sitosterol against HMG Co-A reductase, HMG synthase, LDL receptor, PPAR-alfa and HCAR 2 were respectively -4,6; -8,7; -4,1; -6,5; -4,1 kcal/mol. Beta-sitosterol compounds have the best affinity when binding to HMG-Syntase receptors with the energy of -8,7 kcal/mol. These results indicate that beta-sitosterol compounds have a more stable bond affinity than positive control compounds (simvastatin) which have an affinity energy of -6,9 kcal/mol. The conclusion of the study is beta-sitosterol has the potential to bind to HMG Co-A reductase, HMG synthase, LDL receptor, PPAR-alfa, and HCAR 2 receptors contributing to the activity as antihyperlipidemic and more potent than simvastatin seen from a smaller energy affinity.

Keywords: Antihyperlipidemic activity, In silico molecular docking, ß-Sitosterol

PP-39

MOLECULAR DOCKING ANALYSIS OF THE CHEMICAL CONSTITUENTS OF *Luffa acutangula* RELATED TO ANTIDIABETIC MOLECULAR TARGETS

Rahmawati Hasan[1], Gunawan Pamudji Widodo[1], Rina Herowati[1]
[1] Faculty of Pharmacy, Setia Budi University, Surakarta, Indonesia
Corresponding author: gunawanpamudjiw@gmail.com

Luffa acutangula is commonly used and considerable potential as an alternative treatment of diabetic with a molecular target action are not yet known. Preliminary study of bioinformatics to decipher the various chemical constituents of *L. acutangula* able to interact with the protein targets of an antidiabetic therapeutic. This study aims to identify the chemical constituents of *L. acutangula* are thought to interact with insulin receptor, aldose reductase, α-glucosidase, PTP-1B, GSK-3B, and PPARγ, as well as the prediction of the pharmacokinetic profile by using web form SwissADME and toxicity estimated by Toxtree. The results showed that cucurbitacin B and cucurbitacin E are the most potential compounds to interact with the macromolecular with a binding energy response similar to the native ligand. Pharmacokinetic predictions show that cucurbitacin B and cucurbitacin E are deviate from one Lipinski rules (BM> 500), do not diffuse into the blood brain barrier, not metabolized by CYP450 isozymes and classified as Pgp substrates. The prediction of toxicity indicates that all potential compounds are classified as high toxicity compounds with risk of narcosis, except oleanolic acid and ferulic acid. But these compounds are not genotoxic or non-genotoxic carcinogenicity groups.

Keywords: *Luffa acutangula*, antidiabetic, docking, pharmacokinetics, toxicity

MOLECULAR DOCKING STUDY OF BROMELAIN AS VEGFR2 INHIBITORS

PP-40

Hilda Aprilia Wisnuwardhani[1], Taufik Muhammad Fakih[1]
[1]Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Universitas Islam Bandung, Bandung, Indonesia
Corresponding author: hilda.aprilia@gmail.com

Pineapple is one of the leading agricultural commodities in Indonesia. Pineapple is a tropical fruit which mainly processed for food industry. Bromelin is a complex mixture of protease enzymes that can be extracted from pineapple fruit and stem. Bromelin has been used in folks medicine for various health problems. Hepatocellular carcinoma (HCC) is a cancer that ranks third as a cause of death and ranks fifth as the most common cancer. VEGFR2 inhibition is considered to be an important strategy for the clinical treatment of HCC. This study aimed to evaluate the interaction between bromelain and the VEGFR2 receptor in comparison with its natural ligand. Molecular docking simulation are used to investigate the affinity of bromelain against VEGFR2 (PDB code: PDB 1YWN) using MGLTools 1.5.6 with AutodockTools 4.2. The visualization of each complex was observed using BIOVIA Discovery Studio Visualizer 2020. The results showed that Bromelain has better affinity compared to 4-amino-furo[2,3-d]pyrimidine as natural ligands, with binding free energy values of -984,58 kJ/mol (4-amino-furo[2,3-d]pyrimidine) and -1218,21 kJ/mol (Bromelain). Thus, Bromelain can be predicted to have anticancer activity against HCC.

Keywords: Pineapple, bromelain, Hepatocellular carcinoma, molecular docking

PP-41

MOLECULAR DOCKING AND ADMET PREDICTION OF JPH203 AS A POTENTIAL RADIOPHARMACEUTICAL KIT FOR MOLECULAR IMAGING OF CANCER

Elisha Wianatalie[1], Faisal Maulana Ibrahim[1], Holis Abdul Holik[1]
[1]Departement of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, Indonesia
Corresponding Author: holis@unpad.ac.id

JPH203 has been known to have anti-cancer activity by inhibiting Large Neutral Amino Acid Transporters type-1(LAT-1) which is highly expressed in cancer cells, makes it to become a valid target molecule in the development of cancer drugs. Various types of pharmacokinetic modifying linkers and chelators are combined with JPH203 to obtain the best-docked molecule for prospective radiopharmaceutical kit using computer-aided drug design approaches. AutoDock Vina is used to running molecular docking. ADME and Toxicity of the ligands are calculated on an online program (VNN-ADMET) to analyze the pharmacokinetics and toxicity of the ligands. The result of this study showed that JPH203-Linker K-NOTA has the best affinity with bond energy value that is -10,7 kcal/mol, and also shows interaction with amino acid tyrosine (TYR259) which is one of the role keys of the active site of LAT-1. Based on the results, JPH203-Linker K-NOTA has good potential as a radiopharmaceutical kit of anti-cancer.

Keywords: JPH203, LAT-1, Molecular Docking, ADMET.

PP-42

IN SILICO STUDIES OF 5-BENZYLOXYTRYPTOPHAN AGAINST LAT-1 AS A POTENTIAL RADIOPHARMACEUTICAL KIT OF CANCER

Ghifari Farhan Hasibuan[1], Faisal Maulana Ibrahim[1], Holis Abdul Holik[1]
[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, Indonesia
Corresponding author: holis@unpad.ac.id

According to the World Health Organization (WHO), cancer is the second-highest cause of death in the world, an estimated 9.6 million people died from cancer in 2018. One of the specific molecular targets in cancer therapy is the L-type amino transporter-1 (LAT1) which is overexpressed in cancer cells but slightly in the normal cell. LAT1 becomes a valid target molecule in the development of cancer radiotheranostic compounds. 5-Benzyloxytryptophan is an amino acid derivate that can specifically inhibit the LAT1. This research aims to define the interaction of 5-Benzyloxytryptophan with various bifunctional chelating agents (BFCA); NOTA, DOTA, TETA, CTPA, H2CB-DO2A, H2CB-TE2A against the active site of the LAT1. Molecular docking (AutoDock 4.2.6) and ADMET prediction (vNN-ADMET) were used to analyze the interaction and ADMET properties of the ligands. The results showed that 5-Benzyloxytryptophan-H2CB-TE2A had interactions with TYR259, the catalytic amino acid of LAT1, at the active site. This compound has an affinity with a Gibbs energy of -8.88 kcal/mol. The 5-Benzyloxytryptophan-H2CB-TE2A is a new compound that has the potential as a cancer radiopharmaceutical kit.

Keywords: 5-Benzyloxytryptophan, LAT1, Bifunctional chelating agents, Radiopharmaceutical kit, Molecular docking.

MYRISTICA FRAGRANTS OIL: POTENT INHIBITOR OF *CANDIDA ALBICANS* BIOFILM DEVELOPMENT *IN VITRO*

PP-43

Nadya Atika, Iskandar Adisaputra, Rizki Suranto, Ratika Rahmasari
Department of Microbiology and biotechnology, Faculty of Pharmacy, University of Indonesia
Corresponding author: ratika.rahmasari@farmasi.ui.ac.id

Candida albicans is a polymorphic-commensal fungi which cause candidiasis in immunocompromised patients. In order to manage candidiasis, azoles drugs are commonly used. However at present, Azoles resistance start to emerge. Thus, to overcome this problem, new alternative treatments are needed. Natural products is potential source for drug development and discovery because of their chemical varieties. *Myristica fragrans* Houtt. oil is one of the natural ingredients that has been known to have anticandida activity. However, its inhibition mechanism is still unknown. in this study the determination of IC_{50} value and inhibition stage were evaluated by MTT assay. For Inhibition stage, time of oil addition was performed at adhesion time (0-2 h), biofilm development time (2-24 h) and after mature biofilm developed (24 – 48 h) In current research, *Myristica fragrants* Houtt oil IC_{50} value was observed at 0.74% ±0.4. Furthermore, time of addition assay result shown that *Myristica fragrans* Houtt. oil was observed inhibited all stage of biofilm development which are adhesion stage, biofilm development and mature biofilm. *Myristica fragrants* Houtt oil could be developed as potentially multitarget alternative medicine against *Candida albicans* infection.

Keywords: *Myristica fragrants* oil, anti Candida, inhibition stage

PP-44

CYTOTOXIC ACTIVITY OF MARINE-DERIVED FUNGI *EMERICELLA* SP. AGAINST HT 29 CELL LINE

Elin Julianti[1], Marlia Singgih[1], Masayoshi arai[2], Masteria Yunovilsa Putra[3], Muhammad Azhari[1], Fitri Siti Dzurriyyah[1]

[1]Department of Pharmacochemistry, School of Pharmacy, Bandung Institute of Technologi, Bandung, Indonesia

[2]Research Center for Drug Discovery, Graduate School of Pharmaceutical Sciences, Osaka University, Osaka, Jepang

[3]Research Center for Biotechnology, the Indonesian Institute of Sciences, Cibinong, Indonesia

Corresponding author: elin_julianti@fa.itb.ac.id

The incidence of colorectal cancer continues to increase significantly every year while the available drugs are still limited. Thus, the search of new compounds for the treatment of this colorectal cancer is highly needed. Fungal marine microorganisms are prolific sources of bioactive natural products. In this present study, the ethyl acetate extract of cultured broth of *Emericella* sp marine sponge-derived fungi exhibited an activity against HT 29 cell line. The *Emericella* sp was fermented by static method in the room temperature for 30 days. The culture broth was extracted using ethyl acetate by liquid-liquid extraction method. The Ethyl extract was fractionated by C18 reversed-phase vacuum flash chromatography using mixtures of H_2O-MeOH, from 50:50 to 0:100, and 1% TFA MeOH as the eluents to yield six fractions. Among these fractions, the Fraction 1 (50:50) showed the highest cytotoxicity activity with IC_{50} of 43,6 µg/mL. The chemical compounds of fraction 1 that responsible for cytotoxic activity are potent for further investigation.

Keywords: cytotoxic, *Emericella* sp., marine-derived fungi, HT 29 cell line

EFFECT OF HEPATITIS B VIRUS X PROTEIN MUTANT T118N AND K130M/V131I ON HepG2 CELLS TRANSCRIPTOME

PP-45

Andhika Rizky Gilang Mahaputra, Ratna Annisa Utami, Debbie Soefie Retnoningrum, Anita Artarini*

Pharmaceutical Biotechnology Laboratory, Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia

*corresponding author: anita@fa.itb.ac.id

Hepatitis B virus (HBV) is a major cause of liver cirrhosis which could develop into liver carcinoma. HBV X protein (HBx) is known to have a role in the pathogenesis of liver carcinoma caused by HBV. Mutations in gene *x* could also affect the functional mechanism of HBx and play a role in the development of chronic hepatitis B into liver carcinoma. The purpose of this study is to determine the effect of HBx T118N and K130M/V131I mutants on HepG2 cells transcriptome profile using Next Generation Sequencing (NGS). HepG2 cells were cultivated in DMEM medium and then transfected with plasmids carrying HBx wild-type, HBx T118N, and HBx K130M/V131I, individually, for 48 hours. The total RNA from transfected cells were isolated using *GeneJet RNA Purification Kit*. RNA analyses were carried out to determine RNA concentrations using spectrophotometry, genomic DNA (gDNA) contamination using agarose gel electrophoresis, and RNA Integrity Number (RIN) values using Bioanalyzer. Total RNA isolated from cells transfected by HBx wild-type, HBx T118N, and K130M/V131I showed concentrations of 56.15 ng/µl, 77.69 ng/µl, and 45.38 ng/µl, respectively. Agarose gel electrophoresis of total RNA showed no gDNA contamination in isolated RNA treated with DNase. The RIN values of all samples showed results of 5-6 and could be used for NGS analysis. Transcriptomic analysis using NGS showed upregulation of the *hspa6* gene and downregulation of the *rna28s5* gene on HepG2 cells carrying HBx T118N and HBx K130M/V131I compared to HBx wild-type. Both genes are known to play a role in apoptosis and cell cycle regulation. These results indicate that the presence of HBx K130M/V131I and HBx T118N could affect liver carcinoma progression probably due to upregulation of the *hspa6* gene and downregulation of the *rna28s5* gene.

Keywords: HBx, HepG2, transcriptome, NGS.

OVERPRODUCTION, PURIFICATION, AND CHARACTERIZATION OF HEPATITIS B VIRUS X PROTEIN FUSED WITH THIOREDOXIN IN *Escherichia coli* Rosetta-gami™

PP-46

Tia Hadianti, Amira Dira Surti, Debbie S. Retnoningrum, Anita Artarini*
Pharmaceutical Biotechnology Laboratory, Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia
*Corresponding author: anita@fa.itb.ac.id

Hepatitis B virus (HBV) causes 96% of hepatitis mortality worldwide. Chronic HBV infection may lead into progression of liver cirrhosis and liver carcinoma. HBV X protein (HBx) is known to contribute to the pathogenesis of liver carcinoma. HBx consists of 4 disulfide bonds and 53.7% hydrophobic amino acids, which causes its expression in *Escherichia coli* as inclusion bodies (IB). The aim of this study is to overproduce, purify, and characterize HBx as fusion with Thioredoxin (Trx-HBx) in *E. coli* Rosetta-gami™. Trx-HBx was constructed in pET32b_HBx then succesfully transformed into *E. coli* Rosetta-gami™. Overproduction of Trx-HBx was optimized in various concentrations of IPTG (0.1 mM and 0.5 mM IPTG). The results of SDS-PAGE showed that high amount of Trx-HBx was obtained at IPTG concentration of 0.1 mM. Various induction temperature was optimized (17°C, 25°C, and 37°C) and the results showed that high amount of Trx-HBx was obtained at 17°C and 25°C. Induction time was then optimized for 8 and 16 hours and the results showed that 83% of Trx-HBx was expressed as IB, at 25°C and 16 hours induction. Further analyses using dot blot and Western blot showed weak signal in supernatant and high signal in IB. Trx-HBx was then solubilized from IB using 6 M urea solubilization buffer. Solubilized Trx-HBx was renatured simultaneously with purification step using Nickel column affinity chromatography. Trx-HBx was eluted using 200 mM imidazole at the fourth and fifth elution. The results of reducing and non-reducing SDS-PAGE did not show disulfide bonds formation after renaturation. In conclusion, overproduction of Trx-HBx in *E. coli* Rosetta-gami™ at lower temperature was expressed predominantly as IB. Trx-HBx was successfully solubilized and purified from IB, however formation of disulfide bonds was not observed after renaturation.

Keywords: Rosetta-gami, HBx, Trx, Trx-HBx

PP-47

PROMOTING A NEW INTERACTION IN THE DIMER INTERFACE OF rMnSOD *Staphylococcus equorum* THROUGH SITE-DIRECTED MUTAGENESIS OF THE CODING REGION

Ismiana Pajatiwi[1], Wangsa Tirta Ismaya[2], Anita Artarini[1], Debbie Soefie Retnoningrum[1*]

[1] Pharmaceutical Biotechnology Laboratory, Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia

[2] Dexa Laboratories of Biomolecular Sciences, Dexa Medica, Industri Selatan V PP-7, Kawasan Industri Jababeka II, Cikarang 17550, West Java, Indonesia.

*corresponding author: retnoningrum@indo.net.id

A recombinant manganese superoxide dismutase from *Staphylococcus equorum* (rMnSODSeq) is active at a wide range of pH and displays stability at high temperatures with considerable resistance towards exposure to UVC irradiation. The enzyme activity and the aforementioned characteristics are contributed from its dimeric form, hence increasing the interactions between the monomers may improve its characteristics. This study was aimed to obtain an MnSODSeq variant with additional interactions between the monomers in the dimer interface region. Selection of the appropriate amino acids for substitution was defined to meet the following criteria: They should not be part of the conserved amino acids, located far from the active cite and in the dimer interface, and at a reasonable distance for the amino acid side chains to form an interaction with the side chain from the other monomer. First, the amino acid candidates were screened *in silico*. Then, primers were designed to mutate the encoding gene. Mutagenesis was performed by polymerase chain reaction and confirmed with DNA sequencing. The *in silico* experiment promoted lysine 38 to arginine (K38R) and alanine 121 to glutamate (A121E) substitution. The DNA sequencing analysis confirmed the AAA-38-AGA and GCA-121-GAA mutations. At present, overproduction, purification, and characterization of the rMnSODSeq mutant are in progress.

Keywords: K38R-A121E, rMnSODSeq, site-directed mutagenesis, *Staphylococcus equorum*

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SCREENING FOR CRYSTALLIZATION CONDITIONS OF RECOMBINANT MANGANESE SUPEROXIDE DISMUTASE *Staphylococcus equorum* MUTANTS

Rahmat Muliadi[1], Wangsa Tirta Ismaya[2], Anita Artarini[1], Debbie Soefie Retnoningrum[1*]

[1] Pharmaceutical Biotechnology Laboratory, Department of Pharmaceutics, School of Pharmacy, Institut Teknologi Bandung, Bandung, Indonesia

[2] Dexa Laboratories of Biomolecular Sciences, Dexa Medica, Industri Selatan V PP-7, Kawasan Industri Jababeka II, Cikarang 17550, West Java, Indonesia.

*corresponding author: retnoningrum@indo.net.id

Recombinant Manganese Superoxide Dismutase *Staphylococcus equorum* (rMnSODSeq) has good stability over a wide pH range and high temperatures but is relatively unstable in upon long-term exposure to UVC. Therefore, the enzyme was engineered into introduce S126C and G125T substitutions, which were aimed to improve its stability. The mutants displayed different activities to the native enyzme and the 3-D structures of the mutants were required to explain the discrepancies. The aim of this research was to determine crystallization conditions of the rMnSODSeq mutants and the effect of substitution on crystallization conditions. Screening of the crystallization conditions was carried out as the first step to determine the three-dimensional structure of protein. rMnSODSeq mutants were overproduced using isopropyl β-D-1-thiogalactopiranoside induction in *Escherichia coli* BL21(DE3) at 37°C and purified using Ni^{2+}-NTA affinity chromatography. rMnSODSeq mutants activity was analyzed by zymography and colorimetric methods. Screening for crystallization conditions were initiated from that crystallization conditions for the native enzyme. The screening conditions were varying in protein concentration, types of precipitants, salts and buffer, droplet volumes and mother liquor to droplet to buffer ratios using hanging drop method. Upon activity assay, both mutants were active with specific activity of S126C was higher than that of G125T. Protein crystals of the G125T mutant was obtained in a mixture of 20% PEG 600 solution and while S126C was in 10% PEG 600 and 10% PEG 4000 both in Tris-HCl 0.1 M pH 7.4. The final protein concentration was ~8 mg/ml. The crystal grew in 4 µL droplet composed of the protein stock, mother liquor, and the mother liquor's buffer at 2:1:1 ratio. The results suggested that the mutation has changed the conditions at which the protein crystallized.

Keywords: crystallization, hanging drop, rMnSODSeq, *Staphylococcus equorum*

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OPTIMIZATION OF FORMULA TABLET EXTRACT RANGGAP BANANA (*Musa troglodytarum* L.) WITH A COMBINATION OF PVP-HPMC AS BINDERS USING SIMPLEX LATTICE DESIGN AND TESTING AS ANTIDIABETIC

Dolih Gozali, Lina Ratnasari Memed, Sri Adi Sumiwi and Resmi Mustarichi
Faculty of Pharmacy Universitas Padjadjaran
Email : dolihgozali@gmail.com

Banana is considered one of the plants that are used and trusted by residents of the foot of Mount Galunggung as an alternative therapy for diabetes. Ranggap bananas contain β-carotene compounds as precursors of vitamin A and antioxidants such as carotenoids, ascorbic acid, flavonoids, polyfenols, tannins, terpenoids and α-tocopherol. To make herbal preparations that are more practical to use and stable both physically and chemically, preparations are made in the form of tablets. This study aims to determine the effect of the PVP-HPMC mixture as a binder on the physical properties of ranggap banana extract (Musa troglodytarum L.) tablets which can form tablet preparations with optimum tablet physical properties. Making formula with simplex lattice design optimization method with PVP-HPMC ratio for F1 (0.5: 0.5), F2 (1: 0), F3 (0.25: 0.75), F4 (0: 1), F5 (0.5: 0.5), F6 (0: 1), F7 (1: 0) and F8 (0.75: 0.25). Tablets are made by direct pressing. Tablet press masses were tested for moisture content, flow rate, resting angle and compressibility. Tablets were tested for uniformity in weight, friability, hardness and disintegration time. Verification test occurs at the optimum point 1,000 with a PVP-HPMC ratio (0.5: 0.5). Verification results are compared with prediction results and analyzed using one sample t-test with a 95% confidence level. The results showed that the mixture of PVP-HPMC obtained optimum formula of ranggap banana extract tablets at a ratio of PVP 16.5 mg and HPMC 21 mg influenced the physical properties of the tablet, which was that the compressed mass of the tablet could increase the moisture content, increase the flow rate, decrease the resting angle and increase compressibility. While the results of evaluation of tablets can increase the uniformity of weight, reduce fragility, reduce violence and reduce disintegration time. The results of antidiabetic testing of ranggap banana extract and two optimum formulas of ranggap banana extract tablets at a dose of 250 mg / kgBB gave a decrease in blood glucose levels relative to 41.85%, 32.26%, and 29.70%, respectively. The results of this study prove that there is an effect of the formulation on the effect of decreasing blood glucose in alloxan-induced mice.

Keywords: Ranggap banana (Musa troglodytarum L.), Formula Tablet PVP-HPMC, Simplex Lattice Design, Design Expert version 11 trial

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BIODISTRIBUTION OF COUMARIN-6-LABELED URSOLIC ACID NIOSOMES WITH CHITOSAN LAYER IN MICE INDUCED WITH N-NITROSODIETHYLAMINE

Devy Maulidya Cahyani[1], Andang Miatmoko[1,2], Berlian Sarasitha Hariawan[1], Retno Sari[1]

[1]Department of Pharmaceutics, Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia

[2]Stem Cell Resarch Center, University Universitas Airlangga, Surabaya, Indonesia

Corresponding author: andang-m@ff.unair.ac.id

Ursolic Acid (UA) is a pentacyclic triterpenoid compound that effectively inhibits tumor growth through modulation of apoptosis, inhibition of cell cycle, and autophagy. However, UA has poor water solubility and permeability. Niosomes have been reported to improve the bioavailability of low water-soluble drugs. This study aimed to evaluate the in vivo biodistribution of coumarin-6-labeled UA-niosomes modified with chitosan layers. UA niosomes were prepared using a thin layer hydration method, then chitosan was added by vortexing the mixtures. The biodistribution was then determined in a liver cancer model of mice induced with hepatocarcinogenic N-Nitrosodiethylamine. The results showed the addition of chitosan layers increased the particle sizes and ζ-potentials of AU niosomes. The presence of chitosan layer produced higher plasma levels of coumarin-6-labeled AU niosomes than that of without chitosan addition. Moreover, the photomicrographs of the organs revealed that UA niosomes with the chitosan layer were highly accumulated in the liver. It can be concluded that the chitosan layer successfully improved plasma level and liver accumulation of AU niosomes.

Keywords: Ursolic Acid, Niosomes, Biodistribution, Coumarin-6

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Agaricus bisporus MANNOSE BINDING PROTEIN IS NOT AN AGGLUTINATING PROTEIN

Najwa Nabila[1], Vincencius F. Meidianto[2], Raymond R. Tjandrawinata[2], Heni Rachmawati[1], Wangsa T. Ismaya[2]

[1]Research Group of Pharmaceutics, School of Pharmacy, And Research Center for Nanoscience and Nanotechnology, Bandung Institute of Technology, Ganesa 10, 40132, Bandung, Indonesia

[2]Dexa Laboratories of Biomolecular Sciences, Industri Selatan V Blok PP-7, Jababeka II Industrial Estate, 17550, Cikarang, Indonesia

Corresponding author: h_rachmawati@fa.itb.ac.id

Agaricus bisporus mannose binding protein (Abmb) demonstrates permeability to epithelial monolayer barrier of the intestine, resistance to gastrointestinal tract conditions and to proteolysis therefore it holds potential as a drug carrier for oral route administration. Abmb also display antiproliferative activity to breast cancer cells and stimulation of immune system thus could potentially be also developed for therapeutic purpose. It is not immunogenic or toxic thereby safe for use. In this paper we further provide evidence that Abmb also lacks of agglutinating activity despite sharing high structural homology to lectins. The agglutinating activity evaluation was done on a microtiter plate, where Abmb solution is serially diluted and the lowest concentration of Abmb causing agglutination is detected, and also the result confirmed on a microscope slide and detected using a microscope. Abmb is thereby the only mannose specific binding protein that is not member of lectin family. This evidence provides further support on the use of Abmb as pharmaceutical or medicinal agent. Its molecular globularity that may contribute to its lack of agglutination capacity was also evaluated using dynamic light scattering.

Keywords: *Agaricus bisporus*, agglutination, lectin like protein, mannose binding protein

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CHARACTERIZATION AND UTILIZATION OF MICRO CRYSTALLINE CELLULOSE (MCC) FROM GALAM (*Melaleuca Leucadendron* Linn) AS BINDING AGENTS

Dyera Forestryana, Aulia Maulida, Aristha Novyra Putri
Department of Pharmacy, Sekolah Tinggi Ilmu Kesehatan Borneo Lestari, Banjarbaru, Indonesia
Corresponding author: dyeraforestryana21@gmail.com

Avicel 101 is a synthetic microcrystalline cellulose used as an additive in the tablet dosage form. In addition to Avicel 101, microcrystalline cellulose obtained in woody plants, one of which is Galam (*Melaleuca Leucadendron* Linn). This study aims to determine the characteristics of Galam microcrystalline cellulose and to compare the effect of Galam microcrystalline cellulose and Avicel 101 as a binding agent on the physical properties of tablets. Characterization of Galam microcrystalline cellulose includes organoleptic, pH, solubility, identification, XRD, FTIR, and SEM. Six tablet formulas made using the wet granulation method with various concentrations of each binding agent of 20, 40, and 60%. Granule evaluation includes a fluidity properties test consisting flow of time and angle of repose. Tablet evaluation includes uniformity of weight, uniformity of size, hardness test, friability test, and disintegration test. The result shows that Galam microcrystalline cellulose obtained was 53.33% from 200 g of alfa cellulose of Galam. The results of the characterization of Galam microcrystalline cellulose met the standard Indonesian Pharmacopeia requirements. Evaluation of granules and tablets has a similarity quality standard based on Indonesian Pharmacopeia requirements. Evaluation of granules showed granules with microcrystalline cellulose had better flow times and angles of repose than Avicel 101. Tablets with Galam microcrystalline cellulose have better hardness and disintegration time than tablets with Avicel 101. The result shows that the best formula of the tablet obtained at F6 with a concentration of Galam microcrystalline cellulose, which is 60%, has a disintegration time was 41.05 seconds, and the hardness tablet was 8.6 Kg / cm^2. Based on the results, it indicates that Galam microcrystalline cellulose can be used as a binding agent in tablet formulations.

Keywords: Galam, avicel 101, microcrystalline cellulose, binding agents, tablets

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FORMULATION AND EVALUATION OF *Graptophyllum* LEAVES EXTRACT SUPPOSITORIES USING OLEUM CACAO AND SUPPOCIRE BASES

Erni Rustiani , Novi Fajar Utami , Hala Nurazizah, Siti Rahmadani Daulay
Pharmacy Department, Faculty of Math and Science, Universitas Pakuan, Indonesia
Corresponding author: ernirustiani@unpak.ac.id

Graptophyllum pictum leaf with the content of alkaloid, flavonoid, saponin and tannin have activity as anti-inflammatory and analgesic for hemorrhoids disease. The purpose of this research is to create a suppository dosage form of *Graptophyllum* leaf extract which meets the physical requirements of suppositories with different bases i.e. oleum cacao and suppocire. The best suppository were tested for the in vitro release of active ingredients. Preparation of suppositories using cast molding method, the evaluation of physical properties of suppositories include: organoleptic, uniformity of weight, melting point, melting time and stability test. The dissolution test was carried out using USP Apparatus 2 (paddle). Phosphate buffer pH 7,4 aqueous solution was proved as dissolution mediums. Paddle were rotated at 100 rpm and drug samples were taken and quantified during 60 minutes with quercetin as markers using a UV-Vis spectrophotometer. The results showed that the suppository which provide the most excellent physical properties is suppository base suppocire with the addition 4% of cera alba. Percentage of quercetin in *Graptophyllum* leaf extract dissolved in suppositories after 60 minutes was 97.43%.

Keywords: suppository, dissolution, *Graptophyllum*, oleum cacao, suppocire

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CONTROLLED RELEASE SOLID DOSAGE FORM OF SHELL MELINJO SEED EXTRACT (*Gnetum gnemon* L)

Eni Masruriati[1,2], Heni Rachmawati[1], Evelyn Tirza [1]
[1]Sekolah Farmasi, Institut Teknologi Bandung, Bandung, Indonesia
[2] S1 Farmasi, Sekolah Tinggi Ilmu Kesehatan Kendal, Kendal, Indonesia
Corresponding author: emasruriati@gmail.com

The melinjo (Gnetum gnemon L) is one of Indonesia's natural resources. Several studies report the benefits of melinjo, as ant*ihyperuricemic*, antioxidants, antibacterial, tyrosine enzyme inhibitors, melanin biosynthesis, and others. Previous research on melinjo shells showed promising for antihyperuricemia in animal model. Melinjo seed shell contains polyphenol compounds resveratrol dimers (gnetin C and its glucoside, gnemonoside A and gnemonoside D), and trans-resveratrol. Melinjo seed shell extract in oral dosage form has short half-life and fast elimination. However, the effective does for this purpose is relatively high (2.8 g / day), facing problem during consumption. Therefore, we are developing controlled release solid dosage forms to improve the acceptability as well as the therapeutic outcome. The purpose of this study was to develop a controlled release dosage form of shell melinjo seed extract. For this purpose, the role of polymer to control the release of mlinjo extract is very important. The hydrophilic polymer (HPMC) and the hyfrophobic polymer (Eudragit RL) were investigated as matrices for solid form formulation. A set standard evaluation for the solid form formulation was performed. The evaluation data of these samples are as follow: water content 4.00 ± 0.15; Hygroscopicity 14.86 ± 0.35%; Flow rate 0.31 ± 0.28 g / sec; Carr Index 31.51 ± 1.62; Haussner comparison 1.46 ± 0.03; total phenol content of 2.45 ± 0.04g GAE / 100g. The release of active substances was done in in 0.1N HCl dissolution media with the addition of SLS of (0.5%; 1.0%; 1.5%). Among formulas we investigated, the combination of HPMC-Lactose using wet granulation method showed the most promising result, which is able to maintain the release of the bioactive in the melinjo seed for 8 hours. Further studies such as *in vivo* test of the controlled release formula in animal model is requested to complete the data as well as to confirm the *in vitro* data.

Keywords: melinjo, controlled release, HPMC, Eudragit RL, hyperuricemia

PP-55

IN SILICO PREDICTION STUDY OF MECHANISM B-CYCLODEXTRIN IN ENHANCEMENT OF FLAVONOIDS BIOAVAILABILITY BY COMPLEXATION PHENOMENON

Taufik Muhammad Fakih, Fitrianti Darusman, Hilda Aprilia Wisnuwardhani, Sani Ega Priani

Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Universitas Islam Bandung, Bandung, Indonesia

Corresponding author: taufikmuhammadf@gmail.com

Flavonoids are currently considered an indispensable component in various nutraceutical, pharmaceutical, drug, and cosmetic applications. This is due to its anti-oxidative, anti-inflammatory, anti-mutagenic, and anti-carcinogenic properties coupled with its capacity to modulate the function of key cellular enzymes. However, flavonoids have limited bioavailability due to the low solubility in water. As an effort to increase the solubility of flavonoids in water, the inclusion of guest hydrophobic molecules in hydrophilic hosts such as cyclic glucans have been recommended. This study aims to identify and evaluate the affinity of some flavonoids such as Apigenin, Baicalein, Catechin, Epigallocatechin gallate, Genistein, Isorhamnetin, Kaempferol, Luteolin, and Quercetin on β-cyclodextrin by utilizing molecular docking studies using PatchDock. The conformation formed is then visualized using BIOVIA Discovery Studio 2020. Based on the results of molecular docking studies, there is no significant difference in the complexing ability between β-cyclodextrin and the nine flavonoids. Interestingly, Epigallocatechin gallate has the best affinity with a free energy binding value of −1751.55 kJ/mol. Moreover, the molecular interactions formed in the β-cyclodextrin and Epigallocatechin gallate complexes are dominated by the presence of hydrogen bonds. Thus, through this research, the phenomenon of complexation interactions formed from β-cyclodextrin as a solubility enhancing agent for flavonoids can be predictable.

Keywords: Flavonoid, β-cyclodextrin, Bioavaibility, Future formulation, In silico study

IDENTIFICATION OF THE PHYSICAL INTERACTION GLIMEPIRIDE WITH METFORMIN HCl

PP-56

Fitrianti Darusman[1], Taufik Muhammad Fakih[2], Gina Fuji Nurfarida[3]
[1,2,3]Department of Pharmacy, Faculty of Mathematics and Natural Sciences,
Universitas Islam Bandung, Bandung, Indonesia
Corresponding author : efit.bien@gmail.com

Glimepiride is often combined with metformin HCl as an oral antidiabetic in type II diabetes mellitus which provides a complementary and synergistic effect with multiple targets of improvement of insulin secretion as well as on the action of insulin in the tissues. Glimepiride include class II of BCS which solubility practically insoluble in water but high permeability, which will impact the small bioavailability of the drug. In contrast, metformin HCl includes class III of BCS which has high solubility in water, but low permeability is absorbed approximately 50-60% in the digestive tract given orally. The method of cocrystallization can be used to improve the glimepiride solubility properties as well as the permeability properties of metformin HCl by interrupting glimepiride with metformin HCl physically. Therefore, it is necessary to identify the physical interaction between glimepiride and metformin HCl using thermal analysis of differential scanning calorimetry (DSC), the result is constructed in the form of phase diagram of the glimepiride-metformin HCl binary system. Subsequently confirmed by in cilico test using Arguslab® software. The results of the phase diagram analysis of the binary system between glimepiride and metformin HCl show a congruent pattern which indicates the formation of cocrystal or molecular compounds at a 1:1 mole ratio at 228°C. In silico test results showed that the interaction between glimepiride and metformin HCl did not form new compounds but the interactions that occurred with the formation of hydrogen bonds in the heterosinton formation with bond-free energies of -415.35 kJ/mole. Glimepiride and metformin HCl show cocrystal interactions at a mole ratio of 1:1 with very small bond-free energies.

Keywords : glimepiride, metformin HCl, physical interaction, phase diagram, in silico study.

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PHASE TRANSFORMATION OF METOCLOPRAMIDE POLYMORPHS

Yuda Prasetya Nugraha[1], Haruki Sugiyama[2], Sundani Nurono Soewandhi[1], Hidehiro Uekusa[3]

[1]Department of Pharmaceutics, School of Pharmacy, Bandung Institute of Technology, Bandung, Indonesia

[2]Research and Education Centre for Natural Sciences, Keio University, Yokohama, Japan

[3]Department of Chemistry, Tokyo Institute of Technology, Tokyo, Japan

Corresponding author: yuda@fa.itb.ac.id

Drug manufacturing process involves heating, pressure, humidity exposure, and mechanical forces which can induce phase transition between different solid forms leading to serious changes in their physicochemical properties. In this research, we have studied the phase transformation of metoclopramide polymorphs. The stable form of metoclopramide (MCP I) showed endothermic transition into the high-temperature phase (MCP II) at 127°C followed by melting of MCP II at 147°C. Heat of transition rule implies that MCP I is enantiotropically related with MCP II. Under ambient condition, MCP II was easily reverted into MCP I which further supported the enantiotropic relationship between these polymorphic forms. The structure of MCP I was determined by single crystal X-ray structure analysis. However, the unstable MCP II cannot be obtained as a single crystal. Thus, crystal structure of MCP II was solved by *ab initio* structure determination by synchrotron powder X-ray diffraction analysis. MCP I and MCP II have identical structural building block which is one-dimensional chain of metoclopramide molecules connected by N–H···O hydrogen bond. In MCP I, centrosymmetric dimer-like structure was observed, involving N–H···N hydrogen bond. Despite the structural similarity, this hydrogen bond was not observed in MCP II confirming the existence of unsatisfied hydrogen bond donor and acceptor. Theoretical calculation showed a high lattice energy difference between MCP I and MCP II (+8.375 kJ/mol). Packing similarity and unsatisfied hydrogen bond donor and acceptor accompanied by high difference in lattice energy were responsible to the facile transformation of MCP II to MCP I at room temperature. Intrinsic dissolution rate (IDR) of this polymorphic system was evaluated. MCP II showed 1.5-fold increase in IDR compared to the stable MCP I. IDR improvement can be correlated with the instability of MCP II.

Keywords: metoclopramide, polymorph, phase transformation, SDPD, lattice energy

DEVELOPMENT OF NON-ALCOHOL LIQUID DOSAGE FORM CONTAINING OF ACETAMINOPHEN BY USING COMBINATION OF CYCLODEXTRIN WITH HYDROPHILIC POLYMER

PP-58

Jessie Sofia Pamudji, Yeyet Cahyati Sumirtapura, Katarina Aprilia
School of Pharmacy, Institut Teknologi Bandung
Corresponding author: jessie @fa.itb.ac.id

Acetaminophen is analgesic and antipyretic drug that are widely use in the liquid dosage form for the children in recently years. This substance has a low solubility in water, so in the preparation of liquid dosage form of acetaminophen, the pharmacist is often used alcohol as co-solvent to improve its solubility. The dosage form that contain an alcohol was not attractive for Moslem people in related to "halal" product. The preparation of non-alcohol liquid dosage form that consist of acetaminophen is very interesting to develop. The aimed of this study is to improve the solubility of acetaminophen through formation of inclusion complex by using the combination of cyclodextrin with hydrophilic polymer such as hydroxypropyl cellulose (HPC) and polyvinyl pyrrolidone (PVP). Two type of cyclodextrin used in this study: β-cyclodextrin (BCD) and hydroxy propyl β-cyclodextrin (HPBCD). The solubility of acetaminophen in the mixture of 6% of BCD with 0.5% of HPC and 0.5% of PVP was increased significantly from 22.41± 0.32 mg/mL to 40.20±1.85 mg/mL and 39.70 ± 0.90mL respectively. But there was no significant increasing of the solubility of acetaminophen in the mixture of 20% of HPBCD with 0.5% of HPC and 0.5% of PVP. Base on the results above, it was found that the solubility of acetaminophen in 5 mL of solvent was around 200-230 mg. Thus, this technique can be used to prepare a non-alcohol liquid dosage form for acetaminophen with dose of 125 mg/5mL. The rest of the solvent can be used to dissolved other excipients in the formulation.

Keywords: Acetaminophen, cyclodextrin, solubility, hydrophilic polymer

ANTIOXIDANT ACTIVITY AND SUN PROTECTION FACTOR OF SEQUENTIALLY EXTRACTED ORGANIC SOLVENT EXTRACTS OF KATUK LEAVES (Sauropus androgynus (L.) Merr.)

Sofia Fatmawati[1], Ni Putu Ermi Hikmawanti[1], Akbar Fadillah[1], Awlia Mustia Putri[1]
[1]Faculty of Pharmacy and Science, Universitas Muhammadiyah Prof Dr Hamka

Introduction

This study aims to determine antioxidant activity and sun protection factor of sequentially extracted organic solvents (n-hexane, ethyl acetate, and ethanol 70%) extract of katuk leaves. Chronic ultraviolet light exposure from the sun will cause changes in skin structure and oxidative stress on the skin [1]. Several classes of active compounds derived from natural materials such as flavonoids, tannins, anthraquinones and glycosides are reported to have the ability to protect from UV rays as sunscreen [2] because of their absorption in the UV region and their antioxidant activity [3].

Method

EXTRACTION

PHYTOCHEMICAL SCREENING

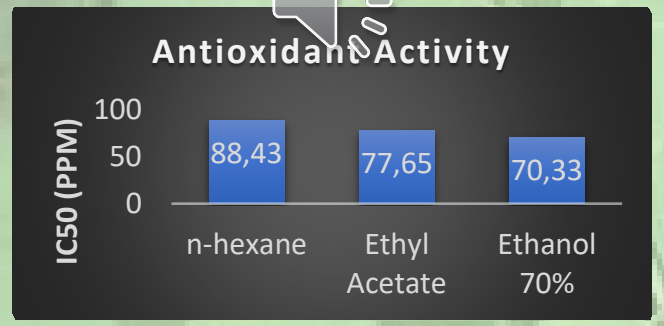
TOTAL PHENOLIC CONTENT AND FLAVONOID CONTENT

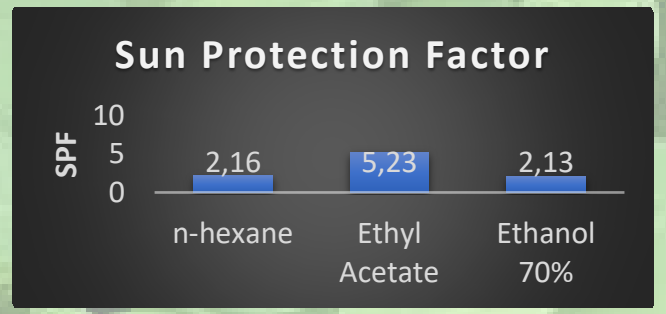
ANTIOXIDANT ACTIVITY (DPPH ASSAY)

IN VITRO SUN PROTECTION FACTOR

Result and Discussion

	N-hexane	Ethyl acetate	Ethanol 70%
Total Phenolic Content (mgGAE/g)	0,57 ± 0,02	2,95 ± 0,07	16,71 ± 0,43
Total Flavonoid (mgQE/g)	55,57 ± 0,11	88,79 ± 0,73	6,23 ± 0,05





Each extracts of katuk leaves were identified as positively containing alkaloids, flavonoids, phenols, tannins, saponins and steroids. SPF was carried out by measuring the spectral absorbance from 290 nm to 320 nm, with 5 nm interval. The SPF number was calculated by applying Mansur mathematical equation. SPF numbers gives an idea about how long one can stay in the sun without getting burn by the sun rays. [4].

Conclusion

The results showed the ethanol extract has the lowest IC50 amongst the other extracts. Ethyl acetate extract has the highest number of SPF and all individual extracts can be considered as a promising plant source to be used as sunscreen.

Source

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