# ABSTRACT BOOK

## THE 4TH INTERNATIONAL SEMINAR ON PHARMACEUTICAL SCIENCE AND TECHNOLOGY

## "FUTURE PROSPECTIVE IN THE TRANSFORMATION OF PHARMACEUTICAL RESEARCH INTO APPLICABLE INDUSTRY"

4th ISPST

International Seminar on Pharmaceutical Science and Technology 2020

## WELCOMING SPEECH
## From Chairwoman of Organizing Committee
## The Fourth International Seminar on Pharmaceutical Science and Technology 2020

Good Morning,
Assalamualaikum Wr.Wb.

On behalf of Organizing Committee, I am honored and pleased to welcome you, Dean of Faculty of Pharmacy Universitas Padjadjaran, keynote and invited speakers, and all participant to the **Fourth International Seminar and Pharmaceutical Science and Technology 2020 (ISPST 2020)**. This seminar is a biennial seminar, from 2014. The scientific content of ISPST 2020 is truly multi-disciplinary. It covers all aspects of Computer Aided and Drugs Design, Aspect on Industry and Quality Control, Pharmaceutical Analysis, Current Trend in Drug Delivery Technology, Pharmacology and Toxicology, Cosmeceuticals, and Current Technology on Drug Formulation.

Through sharing and networking, ISPST 2020 will provide an opportunity for researchers, practitioners and educators to exchange research evidence, practical experiences and innovative ideas on issues related to pharmaceuticals sciences. We realize that this event is only a small effort to contribute exchanges in researches and experiences, therefore more collaborative works and continuous relationship between researchers are still needed.

The scientific program is composed of 2 keynote speakers, 6 invited speakers, and 96 oral and poster presentations. The selected articles will be publish in three international journal Scopus indexed and one national journal Sinta indexed. The diverse scientific contents represent many exciting achievements and also point to new challenges.

I would like to express my grateful to all of you who support this seminar, especially organizing and Faculty of Pharmacy. I believe ISPST 2020 will be a very valuable meeting for all participant.

**Nyi Mekar Saptarini**
Chairwoman of the 4th ISPST 2020

## PREFACE
## From Dean of Faculty of Pharmacy Universitas Padjadjaran

**Welcome,**

Welcome,

It is a great pleasure to welcome you to **The 4th International Seminar on Pharmaceutical Science And Technology (ISPST) 2020** organized by the Department of Pharmaceutical Analysis and Medicinal Chemistry, Department of Pharmaceutical and Formulation Technology, and Department of Biological Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran.

first of all, i would like to start by wishing you and your families are in good health and safety in thIS difficult TIME. As society begins to slowly recover from the COVID-19 pandemic, it is clear that COVID-19 has reshaped the way we will live our lives for the foreseeable future. The world is nowaday facing a lot of predicaments which requires joint hands from different stakeholder that are involved in wide range of action for positive change. we also understand the importance of science, technology and innovation in this difficult situation for transforming the world.

This seminar has come along the way since 2014 and was attended by hundreds participants and researchers that are not only from Indonesia but also from other countries. However, due to pandemic situation The 4th International Seminar on Pharmaceutical Science And Technology (ISPST) 2020 will be held through a webinar. The fourth ISPST will FOCUS on "Future prospective in the transformation of pharmaceutical Research into Applicable Industry" with many topics including nanoparticles, radioactive, natural product and many other interesting topics of pharmaceutical research.

This seminar will serve as a venue for researchers, professionals, and students THAT have interestS in the area of pharmaceutical science and its related fields to build many collaborations for their own research projectS and will also enrich collaborations OF THE activity in education, research and community service of Faculty of Pharmacy Universitas Padjadjaran.

I hope this seminar will accomplish all its aims and earnestly desire that all participants will be able to benefit from the presentations and discusions and this seminar will enrich the development of pharmaceutical science, not only in indonesia but also in all over asia. i would like to thank the organizing committee for their tremendous efforts to make this program. i wish all of the speakers and participants will gain much benefit and insightful experience. hopefully, we will meet again in the 5th ISPST in the next two years.

Best Regards,
**Prof. Dr. Ajeng Diantini, M.Si., Apt.**

## STEERING COMMITTEE

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apt. Nasrul Wathoni, Ph.D
apt. Holis Abd. Holik, M.Si., Ph.D
apt. Danni Ramdhani, M.Si.
apt. Insan Sunan Kurniawan, M.KM.

# SCHEDULE OF 4th INTERNATIONAL SEMINAR ON PHARMACEUTICAL SCIENCES AND TECHNOLOGY
# 27th -28th OCTOBER, 2020

| Western Indonesian Time | Tuesday, October 27th 2020 Event | Moderator |
|---|---|---|
| 08.30-09.00 | Opening speech<br>Dean of Faculty of Pharmacy<br>Chairwoman of the 4th ISPST | |
| 09.00-09.45 | Keynote speaker: Prof. Tomoya Uehara (Japan) | Holis Abd Holik, Ph.D. |
| 09.45-10.00 | Poster presentation | |
| 10.00-10.30 | Invited speaker:<br>Assoc. Prof. Pornchai Rojsitthisak, Ph.D (Thailand) | Dr. Aliya Nur Hasanah |
| 10.30-11.00 | Prof. Dr. Yahdiana Harahap (Indonesia) | |
| 11.00-11.30 | Dr. Nyi Mekar Saptarini (Indonesia) | |
| 11.30-11.45 | Discussion | |
| 11.45-13.00 | Parallel session (Split into 6 rooms) | |

| Western Indonesian Time | Wednesday, October 28th 2020 Event | Moderator |
|---|---|---|
| 08.30-09.15 | Keynote speaker: Dr. Hien Duong (Australia) | Dr. Ida Musfiroh |
| 09.15-09.30 | Poster presentation (1 poster/min) | |
| 09.30-10.00 | Mary Jho-Anne T. Corpuz, Ph.D. (Phillipines) | Dr. Iyan Sopyan |
| 10.00-10.30 | Raymond R. Tjandrawinata, Ph.D. (Indonesia) | |
| 10.30-11.00 | Dr. Sriwidodo (Indonesia) | |
| 11.00-11.15 | Discussion | |
| 11.15-11.25 | Poster presentation | |
| 11.25-12.40 | Parallel session (Split into 6 rooms) | |
| 12.40-13.00 | Closing ceremony: announcement of best poster & oral presenter | |

## TIME SCHEDULE PARALEL SESSION
## (ORAL PRESENTATION

**Day 1**

**Tuesday, 27th October 2020**

**Room 1**

**Moderator : Dr. apt. Febrina Amelia Saputri**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.45-12.00 | OP001 | SANDRA MEGANTARA | STRUCTURE MODIFICATION OF ANDROGRAPHOLIDE AT C-14 HYDROXYL GROUP TO IMPROVE ITS POTENCY AS ANTIMALARIAL |
| 12.00-12.15 | OP003 | ALIYA NUR HASANAH | PREPARATION OF SELECTIVE ADSORBENT VIA MOLECULAR IMPRINTED POLYMER FOR SEPARATION OF DIAZEPAM |
| 12.15-12.30 | OP004 | GARNADI JAFAR | FORMULA DEVELOPMENT AND CHARACTERIZATION OF GLYCERYL BEHANATE (COMPRITOL ATO®) IN FORMULA NANOSTRUCTURED LIPID CARRIERS (NLC) USING SONICATION PROBE METHOD |
| 12.30-12.45 | OP005 | NIKEHERPIANTI LOLOK | THE ANTIDIABETIC EFFECT OF ETHYL ACETATE PARTITION OF ETHANOL EXTRACT (*Morinda citrifolia* L.) IN MICE WITH ORAL GLUCOSE TOLERANCE METHOD AND STREPTOZOTOCIN INDUCTION METHOD |
| 12.45-13.00 | OP007 | REVIKA RACHMANIAR | COMPUTATIONAL SCREENING OF CARBOXYLIC ACID GROUP AS COFORMER FOR COAMORPHOUS OF ETHYL PARA-METHOXYCINNAMATE |

**Room 2**

**Moderator : Dr. apt., Rimadani Pratiwi M.Si**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.45-12.00 | OP008 | WINASIH RACHMAWATI | COMPUTATIONAL DESIGN IN SELECTION OF FUNCTIONAL MONOMER FOR DEVELOPMENT OF MOLECULAR IMPRINTED POLYMER OF ALPHA MANGOSTIN |
| 12.00-12.15 | OP009 | INDRA TOPIK MAULANA | ANTIBACTERIAL COMPOUNDS OF *Streptococcus* mutans AND *Shigella dysenteriae* IN *Eucheuma spinosum* FROM TASIKMALAYA, WEST JAVA SCREENED WITH TLC-BIOAUTOGRAPHY |

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 12.15-12.30 | OP012 | SRI AGUNG FITRI KUSUMA | *mpt64* SYNTHETIC GENE: CODON OPTIMIZATION AND VECTOR DESIGN |
| 12.30-12.45 | OP014 | DEDEN INDRA DINATA | SECONDARY METABOLITES FROM THE ROOTS *OF Amomum compactum* (ZINGIBERACEAE) AND THEIR POTENTIAL ACTIVITY AS ANTICANCER |
| 12.45-13.00 | OP016 | R. HERNI KUSRIANI | ANTIINFLAMATION, ANTIDIABETIC AND ACUTE TOXICITY OF *Etlingera elatior* LEAVES |

**Room 3**
**Moderator : Intan Timur Ph.D**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.45-12.00 | OP017 | NYI MEKAR SAPTARINI | FORMULATION AND EVALUATION OF GRANULE OF CRUDE BROMELAIN OF PINEAPPLE (*Ananas comosus* (L.) Merr) CROWN OF SUBANG DISTRICT, INDONESIA |
| 12.00-12.15 | OP019 | LAILA SUSANTI | THE EFFECT OF ZEOLITE CLINOPTILOLITE AS CARRIERS OF NONI FRUIT (*Morinda citrifolia* L.) AS ANTIFUNGAL *Mallasezia globosa* CAUSES SEBORRHEIC DERMATITIS |
| 12.15-12.30 | OP020 | YULIET | EFFECT OF HIBISCUS SURATTENSIS L. LEAVES EXTRACT AND ACTIVE FRACTION ON GLUT-4 EXPRESSION IN GASTROCNEMIUS MUSCLE OF DIABETIC RAT INDUCED BY HIGH FAT AND FRUCTOSE DIET |
| 12.30-12.45 | OP021 | NITA ARTININGSIH SAYEKTI | ETHANOLIC AND METHANOLIC TAPAK DARA (*Catharanthus roseus* (L.) G. Don.) LEAVES EXTRACT ACTIVITY AS *Streptococcus pyogenes* ANTIBACTERIAL |
| 12.45-13.00 | OP022 | PUTRANTI ADIRESTUTI | APPLICATION OF 'MAE' METHOD ON RED MOLD RICE FOR EXTRACTION EFFICIENCY OF NATURAL FOOD ADDITIVES |

**Room 4**
**Moderator : Rina Fajri Nuwarda M.Sc**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.45-12.00 | OP023 | IKA PURWIDYANINGRUM | THE INFLUENCE OF GREEN CINCAU LEAF (CYCLEA BARBATA MIERS) ETHANOL EXTRACTS AS A DIURETIC |

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 12.00-12.15 | OP025 | IFMAILY | EFFECTIVENESS TEST OF ONION TUBER (*Allium cepa* L) EXTRACTS ON HEALING OF BURNS ON WHITE MALE RATS |
| 12.15-12.30 | OP026 | YULIANIS | ANALYSIS OF COMPONENTS OF LEMON ORANGE PEELS, LOCAL LEMON PEELS AND LIME ORANGE FEEL EXTRACTS WITH GAS CHROMATOGRAPHY - MASS SPECTROMETERY |
| 12.30-12.45 | OP028 | AULIA FIKRI HIDAYAT | PREPARATION OF MOISTURIZING LOTION CONTAINING SILKWORM (*Bombyx mori* L.) SERICIN NANOPARTICLES |
| 12.45-13.00 | OP030 | IRMA RAHMAWATI | DETERMINATION OF CHLORINE ON BREWED ROBUSTA COFFEE (*Coffea canephora var. Robusta*) WITH V60 METHOD |

**Room 5**

**Moderator : apt., Bayu Indradi M.Si**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.45-12.00 | OP034 | SYAMSURIZAL | EFFECTIVENESS OF ACTIVED CHARCOAL TOOTHPASTE (*Elaeis guineensis* J.) CONTAINING ALLANTOIN AGAINST GINGIVITIS OF RAT MODEL |
| 12.00-12.15 | OP035 | FAHRAUK FARAMAYUDA | MORPHOLOGICAL STUDY AND PHYTOCHEMICAL TEST IN TWO VARIETIES OF *Orthosiphon aristatus* (Blume) Miq. |
| 12.15-12.30 | OP036 | FAHRAUK FARAMAYUDA | CALLUS INDUCTION OF PURPLE AND WHITE-PURPLE *Orthosiphon aristatus* (Blume) Miq. on VARIOUS GROWING MEDIA |
| 12.30-12.45 | OP037 | DRIYANTI RAHAYU | ANALYSIS OF RHODAMINE B AND METANIL YELLOW IN LIPSTICK PREPARATIONS CIRCULATING IN JATINANGOR REGION |
| 12.45-13.00 | OP038 | UCE LESTARI | THE ANTIPLAQUE EFFICACY OF ACTIVATED CHARCOAL TOOTHPASTE OF Elaeis guineensis |

## Room 6

**Moderator : apt., Insan Sunan K. M.Si**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.45-12.00 | OP039 | BINA LOHITA SARI | OPTIMIZATION OF ULTRASOUND-ASSISTED EXTRACTION OF TOTAL FLAVONOID FROM BROWN ALGAE *P. Australis* |
| 12.00-12.15 | OP040 | SORAYA RATNAWULAN MITA | POTENTION PURIFIED EXTRACT OF GAMBIER (*Uncaria gambier*, Robx.) AS ANTIHYPERCHOLESTEROL |
| 12.15-12.30 | OP041 | DOLIH GOZALI | FORMULATION OF TABLET FRUIT BANANA EXTRACT (*Musa troglodytarum* L.) WITH VARIATION OF POLYVINYLPYRROLIDONE (PVP) AS BINDER |
| 12.30-12.45 | OP042 | LUSI NURDIANTI | FORMULATION, CHARACTERIZATION, AND STABILITY STUDY OF FAST DISSOLVING THIN FILM CONTAINING ASTAXANTHIN NANOEMULSION USING HYDROXYPROPYLMETHYL CELLULOSE POLYMER |
| 12.45-13.00 | OP046 | YOGA WINDHU WARDHANA | DETERMINATION OF pKa, SOLUBILITY AND DISSOLUTION KINETICS OF SELECTED EFAVIRENZ POLYMORPHS IN COMPARABLE DISSOLUTION MEDIUM |

## Day 2

**Wednesday, 28th October 2020**

**Room 1**

**Moderator : Dr. apt., Yoga Windhu Wardhana**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.25-11.40 | OP047 | DIAN EKA ERMAWATI | CHARACTERIZATION OF NANOSILVER BIOSYNTHESIS BY *Citrus sinensis* (L.) Osbeck AND PEEL-OFF MASK FORMULATION WITH VARIATION POLIETILEN GLIKOL 400-GLISERIN CONCENTRATION |
| 11.40-11.55 | OP050 | MEILINDA SETYA PRACEKA | MOLECULAR DOCKING OF SAUROPUS ANDROGYNUS COMPOUNDS FOR ANTI-ALOPECIA |
| 11.55-12.10 | OP053 | SYAHRUL TUBA | THE FREQUENCIES ALLELE DISTRIBUTION OF CYP2C9 AND CYP2C19 |

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| | | | GENE POLYMORPHISMS IN HEALTHY PAPUAN POPULATION, INDONESIA |
| 12.10-12.25 | OP054 | DHEA AQILA RAMADHANI | SYSTEMATIC REVIEW: THE ENHANCEMENT OF ANTI INFLAMATION ACTIVITY OF NON STEROIDAL ANTI-INFLAMMATORY DRUG (NSAID) BY SOLID DISPERSION MODIFICATIONS |

**Room 2**

**Moderator : Dr. apt., Sandra Megantara M.Farm**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.25-11.40 | OP056 | RICHA MARDIANINGRUM | IN SILICO STUDY OF 2-FLOROBENZOYL a-MANGOSTIN to HUMAN ESTROGEN RECEPTOR ALPHA (ERα) |
| 11.40-11.55 | OP057 | RICHA MARDIANINGRUM | IN SILICO STUDY OF 1,4-NAPHTHALENEDIONE-2-ETHYL-3-HYDROXY TO COX-2 RECEPTORS AS ANTIPIRETIC ACTIVITY TEST |
| 11.55-12.10 | OP058 | MUHAMMAD IQBAL PANGESTU | REVIEW OF PHARMACOLOGICAL PROFILE ACORUS CALAMUS L., AROMATIC PLANTS MENTIONED IN AL-QURAN AND AL-HADITS, AND ITS PROSPECT TO BE DEVELOPED INTO NANOPARTICLE |
| 12.10-12.25 | OP060 | A. M. BAGAS TRIANLOKA | CINNAMOMUM CAMPHORA: AN AROMATIC PLANT MENTIONED IN AL-QUR'AN AND AL-HADIST WITH ITS POTENTIAL AS MEDICINE AND ITS PROSPECT TO BE DEVELOPED AS HERBAL DRUG PREPARATION THROUGH NANOTECHNOLOGY |

**Room 3**

**Moderator : Norisca Aliza M.Si**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.25-11.40 | OP061 | ADNAN MUHAMMAD UNO J HIDAYAT | THERAPEUTIC POTENTIAL OF CYMBOPOGON SCHOENANTHUS (L.)SPRENG DEVELOPED INTO NANOPARTICLE TECHNOLOGY: AL QURAN AND AL HADITH BASED MEDICINE |

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.40-11.55 | OP063 | GINNA MEGAWATI | BINDING AFFINITY AND ABSORPTION PREDICTION OF OMEGA 3 FATTY ACID AS AN AGONIST NEUROTENSIN RECEPTOR FOR CONTROLING OBESITY USING MOLECULAR DOCKING |
| 11.55-12.10 | OP064 | YOLA DESNERA PUTRI | FORMULATION OF SUNSCREEN CREAM BREADFRUIT (Artocarpus altilis (Parkinson) Fosberg) LEAVES AND SPF VALUE TEST |
| 12.10-12.25 | OP065 | DEWI SETYANINGSIH | EFFECT OF POLOXAMER 407 IN A POLYVINYLPYRROLIDONE K30 BASED SOLID DISPERSION TOWARDS CURCUMIN DISSOLUTION |

**Room 4**
**Moderator : apt. Gofarana Wilar Ph.D**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.25-11.40 | OP066 | WAHYUNI | ANTIOXIDANT ACTIVITY OF ETHANOLIC EXTRACT OF *Etlingera alba* (Blume) A.D. Poulsen Rhizome |
| 11.40-11.55 | OP067 | ARMAN SURYANI | UTILIZATION OF PHARMACOLOGICAL BIOACTIVITY (*Ocimum Basilicum* L.) AROMATIC PLANTS MENTIONED IN THE QURAN AND AL-HADITH WITH THE APPLICATION OF NANOTECHNOLOGY |
| 11.55-12.10 | OP068 | SOFI NURMAY STIANI | IMPROVING SOLUBILITY AND DISSOLUTION OF A NATURAL PRODUCT APIGENIN VIA PREPARATION OF SOLID DISPERSION BY HOT MELT EXTRUSION |
| 12.10-12.25 | OP069 | SUCI NAR VIKASARI | OPTIMIZING THE SCREENING METHOD OF ANTIHYPERTENSIVE EFFECT USING EXPERIMENTAL ANIMALS |

**Room 5**
**Moderator : Driyanti Rahayu MT**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.25-11.40 | OP070 | WAHYU WIDOWATI | TURMERIC EXTRACT POTENTIAL INHIBIT INFLAMMATORY MARKER IN LPS-STIMULATED MARCOPHAGE CELLS |

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.40-11.55 | OP071 | KENI IDACAHYATI | NEPHROPROTECTIVE ACTIVITY OF ETHANOL EXTRACT OF KIRINYUH LEAVES (*Chromolaena Odorata* L) IN GENTAMICIN INDUCED NEPHROTOXICITY IN WISTAR RATS |
| 11.55-12.10 | OP072 | FIRMAN GUSTAMAN | FORMULATION OF EFFERVESCENT GRANULES FROM *Hornstedtia alliacea* EXTRACT AS ANTIOXIDANT AGENT |
| 12.10-12.25 | OP073 | FAJAR SETIAWAN | ANTI-FUNGAL ACTIVITY TEST OF EXTRACT OF DUKU FRUIT SKIN (*Lansium domesticum* Corr.) IN LIQUID SOAP CLEANING |

**Room 6**

**Moderator : Dr. apt., Dolih Gozali M.Si**

| TIME | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11.25-11.40 | OP074 | INDRA | PARTICLE DESIGN OF PARACETAMOL BY SPHERICAL CRYSTALLISATION TECHNIQUE |
| 11.40-11.55 | OP075 | ADE YENI APRILLIA | CHARACTERIZATION ITRACONAZOLE MIRCOELMUSI WITH VARIATION TWEEN 80 AS SURFACTANT AND PLANTACARE AS CO-SURFACTANT CONCENTRATION |
| 11.55-12.10 | OP077 | WAHYU WIDOWATI | EFFECT OF FLAVONOIDS ON OXIDATIVE STRESS, APOPTOSIS, AND CELL MARKERS OF PERIPHERAL BLOOD-DERIVED ENDOTHELIAL PROGENITOR CELLS : AN IN VITRO STUDY |
| 12.10-12.25 | OP043 | INSAN SUNAN KURNIAWANSYAH | STUDY OF ISOTONICITY AND OCULAR IRITATION OF CHLORAMPHENICOLE IN SITU GEL |

## TIME SCHEDULE
## (POSTER PRESENTATION)

**Day 1**

**Tuesday, 27th October 2020**

**09.45-10.00**

| NO | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 1 | PP001 | RISKA PRASETIAWATI | MOLECULAR DOCKING STUDY OF ANTHOCYANIDIN COMPOUNDS AGAINST EPIDERMALGROWTH FACTOR RECEPTOR (EGFR) AS ANTI-LUNG CANCER |
| 2 | PP003 | FITRIANTI DARUSMAN | PERCUTANEOUS DIFFUSION STUDY OF THE INCLUSION COMPLEX IBUPROFEN-B-CYCLODEXTRIN |
| 3 | PP007 | IRMA ERIKA HERAWATI | ANTIOXIDANT ACTIVITY FROM ETHANOL EXTRACT AND FRACTION HEMIGRAPHIS COLORATA Hall. F. LEAVES USING DPPH |
| 4 | PP010 | HESTI RIASARI., M.SI., APT | HISTOCHEMICAL INVESTIGATION OF *Archidendron bubalinum* (Jack) Nielsen.) FROM LAMPUNG. SUMATERA. INDONESIA |
| 5 | PP012 | EKY SYAHRONI | COMPUTATIONAL STUDY OF MAGAININ AS AN ANTIMICROBIAL PEPTIDES TARGETING SARS-COV-2 SPIKE PROTEIN FOR PROMISING COVID-19 DRUG CANDIDATES |
| 6 | PP013 | TANISA MAGHFIRA SYARZA | STRUCTURAL ANALYSIS OF PHTHALOCYANINE ON HASA PROTEIN IN SERRATIA MARCESCENS AS A PHOTODYNAMIC ANTIMICROBIAL THERAPY CANDIDATE |
| 7 | PP014 | MOHAMAD NURKAMAL FAUZAN | IMPLEMENTATION OF FUZZY LOGIC CONTROLLERS TO MAINTAIN WATER TEMPERATURE IN HYDROPONICS NFT FOR LOLLO VERDE LETUCCE (*Lactuca sativa* L.) |
| 8 | PP017 | DESAK MADE MALINI | ANTIDIABETIC EFFECTIVENESS OF ETHANOL EXTRACT OF *Archidendron Pauciflorum* FRUIT PEEL ON THE TESTICULAR STRUCTURE OF *Streptozotocin*-INDUCED DIABETIC RATS (*Rattus Norvegicus*) |
| 9 | PP018 | IYEM SHAHIRA | ANTIHYPERTENSIVE ACTIVITY TEST OF MATOA LEAVES (POMETIA PINNATA J.R. & G. FORSTER) EXTRACT AND FRACTIONS IN MALE RATS INDUCTED ANGIOTENSIN II WITH PARAMETERS RENIN AND ANGIOTENSIN II LEVELS |
| 10 | PP019 | FITH KHAIRA NURSAL | ENHANCING THE LIPOPHILICITY OF SODIUM ASCORBYL PHOSPHATE THROUGH THE FORMATION OF MIXED SURFACTANTS |

| NO | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 11 | PP020 | DENY PURIYANI AZHARY | PREPARATION AND EVALUATION OF CO-PROCESSED EXCIPIENT HPMC-PREGELATINIZED CANNA STARCH FOR DIRECT COMPRESSION TABLET |
| 12 | PP021 | KAMELIA AGUSTINI | QUANTITATIVE ANALYSIS OF DRUG PLANNING FOR PATIENTS BPJS HEALTH CARE ROAD WITH CONSUMPTION METHOD IN PHARMACEUTICAL INSTALLATION ONE OF THE REGIONAL GENERAL HOSPITALS IN BANDUNG DISTRICT |
| 13 | PP022 | PRATIWI APRIDAMAYANTI | LENGTH OF FERMENTATION WITH TOTAL PHENOL CONTENT, TOTAL FLAVONOIDS CONTENT AND ANTIOXIDANT ACTIVITY IN THE MANUFACTURE OF FERMENTED *A.malacencis* LEAF TEA |
| 14 | PP023 | YENNI PUSPITA TANJUNG | FORMULATION AND PHYSICAL EVALUATION OF EDIBLE FILM PREPARATIONS FROM ETHANOL EXTRACT OF BETEL LEAVES (*Piper betle L*) FOR CANKER SORE DRUGS |
| 15 | PP024 | TITA NOFIANTI | ANTIDIABETIC AND ANTIOXIDANT ACTIVITIES OF KLUTUK BANANA (*Musa balbisiana* Colla) PEEL SUBFRACTIONS |

## Day 2

**Wednesday, 28th October 2020**

**Section 1 : 09.15-09.30**

| NO | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 1 | PP025 | TITA NOFIANTI | COMPARISON OF ANTIHYPERGLYCEMIC ACTIVITY OF DIFFERENT PARTS OF KLUTUK BANANA (Musa balbisiana Colla) |
| 2 | PP026 | RIRIN PUSPADEWI | OPTIMIZATION OF *Lactobacillus plantarum* ACTIVITIES IN THE BIOSINTHESIS OF LIPASE ENZYMES |
| 3 | PP027 | RIANI TANJUNG | COST-EFFECTIVENESS ANALYSIS OF PROLANIS OF TYPE 2 DIABETIC PATIENTS IN THREE COMMUNITY HEALTH CENTERS IN BANDUNG, INDONESIA |
| 4 | PP035 | MENTARI LUTHFIKA DEWI | EFFECTIVE INHIBITION OF MPRO SARS-COV-2 INFECTION BY RESVERATROL IN RED GRAPE SEEDS THROUGH MOLECULAR DOCKING APPROACHES |

| NO | CODE | PRESENTER NAME | ABSTRACT TITLE |
|---|---|---|---|
| 5 | PP037 | ATHINA MARDATILLAH | THE EXPLORATION OF OTHER BIOACTIVE COMPOUNDS IN THE CHLOROFORM FRACTION OF SAPPAN WOODS (Caesalpinia sappan L) |
| 6 | PP042 | TAUFIK MUHAMMAD FAKIH | EVALUATION OF THE MOLECULAR INTERACTION FOR ANTITUBERCULOSIS AND B-CYCLODEXTRIN COMPLEXATION THROUGH MOLECULAR DOCKING STUDIES |
| 7 | PP043 | KARTIAWATI ALIPIN | CYTOTOXICITY EXTRACTS COMBINATION OF *Curcuma xanthorrhiza* AND *Averrhoa bilimbi* FRUITS ON HeLa AND MDA-MB-231 CELL LINES |
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| 4 | PP059 | MAULA EKA SRIYANI | PHYSICOCHEMICAL PROPERTIES OF 131I-RUTIN IN ACIDIC LABELING CONDITION AS A RADIOLABELED COMPOUND FOR THE DIAGNOSIS OF CANCER |
| 5 | PP060 | ARI WIBOWO | STABILITY TEST OF PHENYTOIN IN HUMAN SALIVA USING HPLC-UV METHOD FOR THERAPEUTIC DRUG MONITORING STUDY IN MEDICAL LABORATORY |
| 6 | PP061 | ISTI DARUWATI | SYNTHESIS OF IODINE-131 LABELED ESTRADIOL WITH DIRECT METHOD |
| 7 | PP066 | INE SUHARYANI | THERMODYNAMIC STUDY OF COMPLEX FORMATION BETWEEN α-MANGOSTIN WITH γ-CYCLODEXTRIN |
| 8 | PP068 | VESARA ARDHE GATERA | VITAMIN D INHIBIT LPS-INDUCED INFLAMMATION IN A549 CELLS THROUGH DOWNREGULATION OF INFLAMMATORY CYTOKINES |
| 9 | PP069 | SRI WARDATUN | REMOVING OF MIMOSINE FROM LEUCAENA LEUCOCEPHALA (LAM.) DE WIT SEEDS TO INCREASE ITS BENEFITS AS NUTRACEUTICAL |
| 10 | PP070 | BAITHA PALANGGATAN MAGGADANI | DEVELOPMENT AND VALIDATION OF A VOLUMETRIC ABSORPTIVE MICROSAMPLING ASSAY FOR ANALYSIS OF TAMOXIFEN, ENDOXIFEN, 4-OH TAMOXIFEN AND N-DESMETHYLTAMOXIFEN IN BREAST CANCER PATIENTS |
| 11 | PP038 | ANGGI ARUMSARI | LITERATURE REVIEW: THE EFFECT OF ADDITIONAL FERMENTATION STARTER ON BLACK ONION (Allium sativum L.) ON SOME CONTENTS OF SECONDARY METABOLITIC COMPOUNDS AND ANTIOXIDANT ACTIVITIES |
| 12 | PP065 | YASMIWAR SUSILAWATI | PRECLINICAL STUDY OF CARICA PAPAYA LEAVES EXTRACT AS IMMUNOMODULATORY AND ANTI-THROMBOSITOPENIA |

**KEYNOTE SPEAKER**

## CHEMICAL DESIGN OF RADIOMETAL-LABELED ANTIBODY FRAGMENTS FOR LOW RENAL RADIOACTIVITY LEVELS

**Tomoya Uehara**

Graduate Sch. Pharma-Sci., Chiba Univ.

### OBJECTIVE

Gallium -67 ($^{67}$Ga) emits γ-ray and gallium- 68 ($^{68}$Ga) emits $\beta^+$ ray, therefore, these radionuclides can use for diagnosis using SPECT and PET, respectively. On the other hand, cupper-64 ($^{64}$Cu) emits both $\beta^-$ and $\beta^+$ and cupper-67 ($^{67}$Cu) emits $\beta^-$, therefore, both radio-cupper can use for internal radiotherapy. In general, radiolabeled low molecular-weight antibody fragments (LMW Abs) such as Fab exhibit high accumulation in tumor, but also high and persistent localization of radioactivity in the kidney when they are labeled with metallic radionuclides, which has hindered tumor visualization near kidney regions and limited therapeutic effectiveness. Persistent renal radioactivity levels were attributed to the long residence time of radiometabolites generated after lysosomal proteolysis of radiolabeled LMW Abs, following glomerular filtration and subsequent reabsorption in renal cells. To solve the problem, we hypothesized that the renal radioactivity levels after injection of radiolabeled LMW Abs would be improved by liberating a radiometal chelate of urinary excretion from the LMW Abs by enzymes in the lysosome or on the renal brush border membrane (BBM). In this presentation, I will talk the evaluation of the renal radioactivity levels of newly designed $^{67/68}$Ga or $^{64/67}$Cu-labeled antibody fragments with linkages cleaved by enzymes present in the lysosome or on the BBM. $^{67}$Ga-labeled S-2-(4-isothiocyanatobenzyl)-1,4,7-triazacylononane-1,4,7-triacetic acid ($^{67}$Ga-NOTA-Bn-SCN) conjugated methionine ($^{67}$Ga-NOTA-Met) was selected as a radiometabolite because it was excreted rapidly from kidney to urine. Di- or tri-peptide, methionine-isoleucine (MI) sequence or methionine-valine-lysine (MVK) sequence were evaluated as enzyme-cleavable linkages and conjugated to NOTA-Bn-SCN to produce NOTA-MI and NOTA-MVK. These bifunctional chelates were conjugated with Fab and then biodistribution of radioactivity after injection of $^{67}$Ga-NOTA-MI-Fab, $^{67}$Ga-NOTA-MVK-Fab and $^{67}$Ga-NOTA-Fab (a conventional thiourea linkage; no enzyme-cleavable linkage) in mice were evaluated. In the biodistribution study using normal mice, $^{67}$Ga-NOTA-MI-Fab showed significantly lower renal radioactivity levels from 1 to 6 h postinjection than those of $^{67}$Ga-NOTA-Fab. Analysis of urine obtained 6 h postinjection of $^{67}$Ga-NOTA-MI-Fab in normal mice showed that $^{67}$Ga-NOTA-Met was the main radiometabolite. In the biodistribution study using tumor-bearing mice, $^{67}$Ga-NOTA-MI-Fab showed significantly lower renal radioactivity levels without impairing the tumor radioactivity levels at 3 h postinjection than those of $^{67}$Ga-NOTA-Fab. However, further studies are required to reduce renal radioactivity levels shortly after the injection of $^{67}$Ga-labeled Fabs. To liberate $^{67}$Ga-NOTA-Met at an earlier stage of antibody metabolism in the kidney, $^{67}$Ga-NOTA-MVK-Fab that contained BBM enzyme-cleavable linkage was designed. (reabsorption process vs lysosomal proteolysis) In in vitro studies using BBM vesicles showed that the MVK sequence conjugated $^{67}$Ga-NOTA was recognized by enzymes of renal BBM to liberate $^{67}$Ga-NOTA-Met. $^{67}$Ga-

NOTA-MVK-Fab showed significantly lower renal radioactivity levels from 30 min to 6 h postinjection than those of $^{67}$Ga-NOTA-Fab and $^{67}$Ga-NOTA-MI-Fab. Analysis of urine obtained 6 h postinjection of $^{67}$Ga-NOTA-MVK-Fab in normal mice showed that $^{67}$Ga-NOTA-Met was the main radiometabolite. In the biodistribution study using tumor-bearing mice, $^{67}$Ga-NOTA-MVK-Fab showed significantly lower renal radioactivity levels without impairing the tumor radioactivity levels at 3 h postinjection than those of $^{67}$Ga-NOTA-Fab and $^{67}$Ga-NOTA-MI-Fab. In the SPECT/CT images, $^{67}$Ga-NOTA-MVK-Fab provided a much higher contrast tumor image when compared with $^{67}$Ga-NOTA-Fab and $^{67}$Ga-NOTA-MI-Fab. Moreover, $^{64}$Cu-labeled NOTA-MVK-Fab also showed similar biodistribution to $^{67}$Ga-NOTA-MVK-Fab. These results suggested that the strategy of liberating a radiolabeled compound to urinary excretion from antibody fragments at the renal BBM to reduce the renal radioactivity levels was useful for the $^{67/68}$Ga/$^{64/67}$Cu-labeled antibody fragments of low renal radioactivity levels and the radiotheranostics using $^{67/68}$Ga/$^{64/67}$Cu.

**KEYNOTE SPEAKER**

## NANOPARTICLES FOR BIOMEDICAL APPLICATIONS

**Dr Hien Duong**

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Smart nanomaterials for improved nanomedicine are highly sought after. This talk will detail the latest research in the design, synthesis and characterization of soft polymeric and inorganic/organic hybrid nanomaterials bearing different functionalities which can undergo post-modification via highly efficient and orthogonal chemistry. The demonstrated application of these nanostructures is the co-delivery of anti-cancer drugs and nitric oxide for synergistic effects in cancer treatment. Successful macromolecular nitric oxide donors tested *in vitro* and *in vivo* for liver fibrosis treatment are also described. Novel dual action polymeric nanoparticle system capable of storing nitric oxide, which can provoke dispersal of biofilms into an antibiotic susceptible planktonic form, together with the aminoglycoside gentamicin, capable of killing the bacteria. The use of advanced fluorescence microscopy techniques such as Fluorescence Lifetime Imaging Microscopy (FLIM) to probe intracellular release of drugs which is impossible using conventional fluorescence microscopy techniques will be discussed. The outcomes of this research pave the way towards advanced multifunctional nanomaterials with potential biomedical applications.

**Biography**

Hien was awarded a highly competitive Endeavour Postgraduate Scholarship and joined Centre of Advanced Macromolecular Design (CAMD**)** in 2007 for her PhD. She then commenced her postdoctoral academic career in Australian Centre for NanoMedicine (established by UNSW in 2011). In November 2014, she joined the Key Centre for Polymers and Colloids, School of Chemistry, the University of Sydney, working on an ARC linkage grant with Dulux Australia. In May 2016, she joined the Institute for Biomedical Materials & Devices (IBMD), School of Mathematical and Physical Sciences, Faculty of Science, University of Technology Sydney as a Senior Research Fellow. Recently, Hien took up the position of lecturer in Pharmaceutical Sciences at the University of Sydney. Her research is multidisciplinary which focuses on the new concepts and ideas to engineer novel materials and devices at nanoscale. The ultimate goal is to utilize the nanotechnology in the form of nanoparticles to extend our life in two ways: i) early detection of life-threatening diseases and ii) improvement of their current therapy. Her research area includes polymer synthesis, fabrication and characterization of organic, inorganic and biocompatible nanomaterials for biomedical applications. She has extensive experience in understanding the interface between polymer synthesis and biomedical science. She is also interested in the development of powerful fluorescence microscopic techniques to study the fate of nanoparticles in the live cells.

**INVITED SPEAKER**

# PHARMACEUTICAL APPLICATIONS OF PRODRUGS FOR ENHANCING PHYSICOCHEMICAL PROPERTIES, BIOAVAILABILITY, AND BIOLOGICAL ACTIVITIES OF NATURAL PRODUCTS

**Pornchai Rojsitthisak**[1,2,*]

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## ABSTRACT

Several approaches to enhance physicochemical properties, bioavailability, and biological activities of natural products include structural modification, prodrug design, and nanotechnology-based delivery systems. Over the past decade, we have designed and synthesized several prodrugs of natural products by conjugating them with succinic acid, glutaric acid, poloxamer, and polyethylene glycol. Our synthesized prodrugs exhibited improved aqueous solubility, chemical stability, cellular uptake and transport, pharmacokinetics, and biological activities. We have also applied nanotechnology to develop drug delivery systems using natural polymers, including chitosan and alginate, to encapsulate the synthesized prodrugs, leading to the potential development of such prodrugs as anti-inflammatory, anti-nociceptive, and anticancer candidates.

Keywords: Natural Products, Prodrug, Drug delivery, Physicochemical properties, Cancer, Inflammation, Nociceptio

**INVITED SPEAKER**

# VOLUMETRIC ABSORPTIVE MICROSAMPLING (VAMS) AS A BIOSAMPLING ALTERNATIVE IN CLINICAL TRIALS AND THERAPEUTIC DRUG MONITORING IN THE PERIOD OF THE COVID-19 PANDEMIC

**Yahdiana Harahap**

Bioavailability/Bioequivalence Laboratory, Faculty of Pharmacy, Universitas Indonesia

## ABSTRACT

Dried blood sampling through Volumetric Absorptive Microsampling (VAMS) is an alternative dried blood sample collection technique that overcome issues related to blood volume and hematocrit effect in conventional dried blood spot. VAMS requires less blood volume and simple sampling procedure with many other advantages such as being able to take samples constantly with a sampling capacity that varies from 10 to 30 microliters. This biosampling technique can be applied for clinical trials and therapeutic drug monitoring during the Covid-19 pandemic. During this pandemic WHO recommends that people should stay at home to reduce disease transmission. Due to the quarantine, the FDA stated that this could hamper drug development clinical trial protocols. VAMS as an alternative biosampling technique allows easy sampling, can be done at home, storage and delivery at room temperature, the volume taken is small from finger prick and minimally invasive. There are some on going researches conducted using VAMS technique in combination with HPLC-PDA and LC-MS/MS for monitoring the levels of the drugs of Covid-19 treatment such as Chloroquin, Hydroxychloroquin, remdesivir, and favipiravir.

Keywords: VAMS, Covid-19 Pandemic, Bioavailability/Bioequivalence study

**INVITED SPEAKER**

# CRUDE BROMELAIN OF PINEAPPLE (*Ananas comosus* (L.) Merr) CROWN AS HERBAL IMMUNOSTIMULANT CANDIDATE

**Nyi Mekar Saptarini**

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## ABSTRACT

Common treatments for viral infections including nutritional interventions and immunostimulants have been used to immune booster. Herbal medicine is getting more attention, due to its accessibility, affordability, safety, promising properties, and environmental friendliness. *In vitro* studies show bromelain activates natural killer cells, increasing the production of tumor necrosis factor-α, interferon, IL-1, IL-2, IL-6, and granulocyte-macrophage colony-stimulating factors. Bromelain is a mixture of different thiol endopeptidase complexes and other uncharacterized components. This enzyme is spread throughout the pineapple (*Ananas comosus* (L.) Merr.). Crude bromelain of pineapple crown from Subang District, Indonesia, has been isolated by the ethanol precipitation method. The pineapple crown was chosen, due to low utilization and disposed as an agricultural waste. The crude bromelain yield of pineapple crown was very low, but high protease activity. This result showed the potential of the pineapple crown as a bromelain source. The kinetic parameters of crude bromelain, i.e. Vmax, Km, and kcat, have been determined for casein as a substrate. Crude bromelain which has antioxidant activity with DPPH method and immunostimulant activity in mice, then formulated into granules and evaluated using compendial methods.

Keywords: Subang district, protease activity, antioxidant activity, immunostimulant activity

**INVITED SPEAKER**

# POTENTIAL NATURAL PRODUCTS FOR CANCER CHEMOPREVENTION

**Mary Jho-Anne T. Corpuz**

Department of Pharmacy, Faculty of Pharmacy and Research Center for the Natural and Applied Science,
University of Santo Tomas, Manila, Philippines

## ABSTRACT

The worsening incidence of the cancer problem, and the failure of conventional chemotherapy on an advanced invasive disease to reduce the mortality rate for the common forms of epithelial malignancy, such as carcinoma of the lung, colon, breast, prostate, pancreas, and skin, indicate that new approaches to the control of cancer are critically needed. Herein, we have reported natural products to contain bioactive compounds with potential chemopreventive properties. Compounds isolated from several plants and marine sources were shown to provide a targeted approach for cancer chemoprevention, which can halt or reverse the development and progression of precancerous cells through non-cytotoxic doses of phytonutrients and pharmacologic agents. Recent evidence suggests that marine natural products have the highest potential chemopreventive properties, which may be attributed to their ability to scavenge free radicals. Reactive oxygen species (ROS) are involved in normal cell signaling pathways; increased ROS formation during oxidative stress disrupts signaling pathways causing negative consequences for normal cell function. We have provided information regarding the mechanisms of active compounds isolated from natural products in suppressing the initiation, promotion, and progression of cancer. The presented information may encourage the continuous discovery of natural products with potential chemopreventive properties.

Keywords: chemopreventive, natural product, free radicals, reactive oxygen species

**INVITED SPEAKER**

# PLANT BIOPROSPECTING AND DEVELOPMENT OF OBAT MODERN ASLI INDONESIA

**Raymond R. Tjandrawinata**
Dexa Laboratories of Biomolecular Sciences, Dexa Group

The new paradigm of natural drug discovery follows conventional, chemical drug discovery process. In the conventional process, a single pure active constituent is isolated, purified, and standardized. Multi-constituent herbal formulations can be developed using this system. One of the most important steps in developing a new drug is target identification and validation. A target is a broad term which can be applied to a range of biological entities which may include for example proteins, genes and RNA. A good target needs to be efficacious, safe, meet clinical and commercial needs and, above all, be „druggable". A „druggable" target is accessible to the putative drug molecule, be that a small molecule or larger biologicals and upon binding, elicit a biological response which may be measured both in vitro and in vivo. Natural drugs are then screened based on their biological interaction with the target inside the cells. Once the druggable lead is identified, we can then subject the lead to preclinical and clinical pharmacological studies. In additon, development of a herbal drug involves collection and authentication of the material, pharmacognostic, phytochemical, and pharmacologic evaluation, and standardization. This talk will discuss further the new paradigm to find Indonesian-origin, biodiversity-based natural drugs, including th e recently proposed OMAI classification.

**INVITED SPEAKER**

# RESEARCH AND DEVELOPMENT OF HUMAN EPIDERMAL GROWTH FACTOR (hEGF) SECRETION AND NANOPARTICLE FORMULATIONS FOR WOUND HEALING PREPARATION

**Sriwidodo et al.**

## ABSTRACT

Human Epidermal Growth Factor (hEGF) is a single-chain polypeptide with a molecular weight of 6.2 kDa and comprises 53 amino acid residues. hEGF has three intramolecular disulfide bonds that must fold appropriately to have pharmacological activity. hEGF performs various physiological functions such as healing of epidermal wounds, corneal injuries, burns, and chronic wounds. HEGF accelerates diabetic ulcers' healing, including treating acute and chronic injuries caused by radiation, burns, Stevens-Johnson syndrome wounds, and bedsores. Based on the potential of hEGF for various clinical and cosmetic applications, the research has been conducting since 2014 to increase the level of hEGF production that meets aspects of safety and quality, and effectiveness.

The research and development aimed to develop recombinant hEGF with *E. coli* BL21 as a host using extracellular techniques. Extracellular techniques allow disulfide bonds folding naturally and assure their safety and pharmacological activity. The research method was constructing a plasmid containing four signal peptides, namely the Sec-B pathway (ompA, pelB, and phoA) and the Tat pathway (torA). Then we optimized and characterized hEGF expression, produced 2L fermenter scale, harvested cultures medium, and purificated the hEGF by heating and anionic column. The evaluation results showed that the fourth pD861-hEGF plasmid's extracellular secretion could produce optimal hEGF protein in the culture medium. E. coli BL21 pD861-pelB-hEGF produced the highest hEGF at 341 µg / mL. Optimization of hEGF production on E. coli BL 21 (DE3) on the fermenter scale using statistical analysis Response Surface Methods (RSM) produces the equation: y (number of hEGF) = -35.0 + 244.8 x cm - 23.2 x $t_{ind}$ - 84, 6 x ($cm_2$) + 0.925 ($t_{ind2}$) + 6.20 x (cm x $t_{ind}$), where $c_m$ is the concentration of the cultures medium and $t_{ind}$ is the induction time. This equation can increase hEGF secretion in the culture medium on the fermenter scale by 16 times compared to the flask scale.

We then investigate the hEGF as a drug for chronic wound healing such as diabetic ulcers. The hEGF was designed into nanoparticle dosage forms to enhance its stability and efficacy. The chitosan-hEGF nano-encapsulation obtained meets the model drug criteria for wound healing. The particle sizes, zeta potential, and encapsulation efficiency obtained were 600 nm, +43 mV, and 99%, respectively. Based on TEM morphology, the hEGF was absorbed in the chitosan matrix. The hEGF at a dose of 50 ng /mL had an optimal cell viability percentage of 192% on NIH3T3 cells and 100% cell migration at 18 h. The in vivo evaluation also show a complete wound closure on day 12 at a dose of 50 ng /mL hEGF.

Our recent progress was integrating hEGF into liposome nanocarrier and delivering it by film forming spray. The hEGF-liposome particle has a nano size (238.7 nm) with zeta potential of -39.7 and PDI of 0.402. The film forming spray can delivery the hEGF-liposome through micro-size droplets with spray angle of 80$^o$ and occlusion factor of ~14%.

**OP001**

# STRUCTURE MODIFICATION OF ANDROGRAPHOLIDE AT C-14 HYDROXYL GROUP TO IMPROVE ITS POTENCY AS ANTIMALARIAL

**Sandra Megantara[1,*], Rusydina Sabila[1], Febrina Amelia Saputri[1], Ferry Ferdiansyah Sofyan[2]**

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## ABSTRACT

Andrographolide is a diterpenoid lactone contained in the bitter plant (*Andrographis paniculata*) as the main active compound. Andrographolide has many biological activities, including anti-inflammatory, anticancer, hepatoprotector, antioxidant, antidiabetic, antihyperlipidemia, antibacterial, antiviral and antimalarial properties. However, its activity as antimalarial is still weak. Therefore, to improve the physicochemical properties and optimize therapeutic activity of andrographolide, it is necessary to modify the structure of andrographolide. This research reveals the methods that can be used in modifying andrographolide structures at the C-14 hydroxyl group. There are two methods of modification, the first method is by protecting the C-3 and C-19 hydroxyl groups to produce a strong 3,19-isopropiliden andrographolide compound against nucleophile attacks and the second method is direct reaction with the desired reagent. From the results it was found that the best method for modifying andrographolide in the C-14 hydroxyl group is by protecting the C-3 and C-19 hydroxyl groups first to get more yield. This modification can improve potency of andrographolide as antimalarial.

Keywords: Andrographolide, antimalarial, hydroxyl group, modification, synthesis

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**OP003**

# PREPARATION OF SELECTIVE ADSORBENT VIA MOLECULAR IMPRINTED POLYMER FOR SEPARATION OF DIAZEPAM

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## ABSTRACT

Diazepam is a benzodiazepine drug used as an anti-drug and sedative. It is often misused to induce or create euphoria in combination with other drug (high or fly sensation) or administered alone. Excessive use without doctor's prescription potentially lead to addiction, dependency, and even overdose which results in emergencies such as coma and death. So far, screening for diazepam abuse with sensitive analytical methods is needed, mainly due to their small blood levels. Increased sensitivity of the analytical method can be obtained by using a preparation method that selectively separates the analyte from the sample matrix. Molecularly Imprinted Polymer (MIP) is one of the preparation solutions with good selectivity, specificity, and sensitivity. MIP was made of diazepam as a template, itaconic acid as functional monomer, ethylene glycol dimethacrylate (EGDMA) for cross-linker agent and benzoyl peroxide (BPO) as an initiator with porogen propanol by bulk polymerization. MIP followed Freundlich isoterm with binding capacity of 0.0325 mg/g but had imprinting factor 1.793 lower from alprazolam as competitive analyte (IF 4.8483). The FTIR results of MIP show that the polymerization reaction between the monomer and cross-linker with the initiator used was succeeded. MIP diazepam with itaconic acid as functional monomer and propanol as porogen has a potential to be developed into Molecularly Imprinted Solid Phase Extraction (MI-SPE).

Keyword: diazepam, itaconic acid, Molecularly imprinted polymer, Molecularly imprinted solid phase extraction, Solid phase extraction, propanol

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**OP004**

# FORMULA DEVELOPMENT AND CHARACTERIZATION OF GLYCERYL BEHANATE (COMPRITOL ATO®) IN FORMULA *NANOSTRUCTURED LIPID CARRIERS* (NLC) USING SONICATION PROBE METHOD

**Garnadi Jafar [1,2]**, Marline Abdassah [1], Taofik Rusdiana [1] Inge Silmi[2]
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## ABSTRACT

NLC *(Nanostructured Lipid Carriers)* is the second generation of SLN *(Solid Lipid Nanoparticle*). NLC is here to overcome the shortcomings of SLN, which is one that contains too low a capacity. The presence of liquid lipids in the NLC lipid matrix will increase the solubility and loading capacity of the drug. This study aimed to find out the characterization of raw materials for the NLC formula used; knowing the basic characterization of NLC and NLC-Adapalene and knowing the negative NLC-AdapaleneNLC was made by hot homogenization and sonicator probe to reduce particle size. Adapalene has high crystallinity, but conditions change after being melted with Compritol ATO® as solid lipids. CMP-Adapalen NLC Formula consisting of 4.5% Compritol ATO®, 2% Myritol®, 1% Plantacare® and 0.3% Adapalene produced particle composition and polydispersity index of 184.6 ± 1.8 and 0.27 ± 0.01, zeta potential and fallout according to -47.1 mV and 36.249%. NLC is adapted to be able to provide good at room temperature (25 ° C) using Compritol ATO® as solid lipid, Myritol® as liquid lipid and Plantacare® as surfactant

Keywords: Nanostructured Lipid Carriers, Compritol ATO®, Adapalene, Hot Homogenization & Sonicator Probe

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**OP005**

# THE ANTIDIABETIC EFFECT OF ETHYL ACETATE PARTITION OF ETHANOL EXTRACT (*Morinda citrifolia* L.) IN MICE WITH ORAL GLUCOSE TOLERANCE METHOD AND STREPTOZOTOCIN INDUCTION METHOD

**Nikeherpianti Lolok[1,2], I. Sahidin[3], Sri Adi Sumiwi[1], Ahmad Muhtadi[1]**
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## ABSTRACT

Diabetes mellitus (DM) is a problem that deserves attention because its prevalence is increasing every year. WHO predicts the prevalence of DM in 2030 will reach 366 million patients. Epidemiologically, it is estimated that in 2030 the prevalence of DM in Indonesia reaches 21.3 million people. This study aims to determine the effectiveness of ethyl acetate partition of noni fruit ethanol extract on reducing blood sugar levels in normal rats induced by diabetes using glucose tolerance and induction of streptozotocin (STZ) methods.Antidiabetic effect testing was divided into 8 groups namely 4 groups for oral glucose tolerance test in male mice (positive control group, negative control group, ethyl acetate partition group, and normal group), 4 other groups for testing with STZ induction (positive control group, negative control group, ethyl acetate partition group, and normal group). Oral glucose tolerance test results on normal mice showed that the ethyl acetate partition of *Morinda citrifolia* L. gave significantly different results with negative control of the 180th in minutes that was 0.003 ($p < 0.05$) and not significantly different from positive controls (0.219). Tests with the STZ induction method showed that the decrease in blood sugar levels in the ethyl acetate partition group was not significantly different ($p > 0.05$) with the positive group on day 1 (0.077), whereas on day 3 it was significantly different from the negative group (0.001) but on the positive group the value was not significant (0.630) and the results were also the same on the 7th day so it can be concluded that the ethyl acetate partition of the noni fruit ethanol extract at a dose of 150 mg / kg BW gives antidiabetic activity.

Keywords: Ethyl Acetate Partition, *Morinda citrifolia* L., Diabetes mellitus, Oral glucose tolerance, Streptozotocin (STZ).

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**OP007**

# COMPUTATIONAL SCREENING OF CARBOXYLIC ACID GROUP AS COFORMER FOR COAMORPHOUS OF ETHYL PARA-METHOXYCINNAMATE

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## ABSTRACT

Coformers are small-molecule excipient that is important in the formation of coamorphous. Coformers are materials that be able to form a hydrogen bond, Van der Waals force, and π- π interactions with active pharmaceutical ingredients (API) (1). Ethyl p-methoxycinnamate (EPMC) is poorly water-soluble so it needs to be formed as coamorphous to improve its solubility in water. However, an appropriate coformer needs to be chosen to form coamorphous with EPMC. The aim of this study is to screen the coformers which is able to form coamorphous with EPMS using the docking method (2). Eight coformers are screened from carboxylic acid groups, i.e. malonic acid, benzoic acid, fumaric acid, succinic acid, citric acid, tartaric acid, maleic acid, and oxalic acid (1,3). The parameters in this screening are hydrogen bonds, Van der Waals force, root square mean deviation (RSMD), and Gibbs Energy. Based on the screening process, there are four coformers which are showed hydrogen bonds, van der Waals force, the lowest Gibbs energy, and the shortest bond distance with EPMC, i.e. malonic acid, benzoic acid, fumaric acid, and succinic acid. Malonic acid is a coformer that can form heterosynthons with EPMC in forming coamorphous. It can be concluded that computational screening can be a method for predicting coformers that can be used to form a coamorphous with EPMC. Malonic acid, benzoic acid, fumaric acid, and succinic acid can be candidates of coformer for coamorphous of EPMC.Abstract should provide a concise summary of the work, including introduction or background, aim or objective, method, key findings and conclusions. Introduction or background of the work should be described in one or two sentences. The objective of the work should be described clearly. Method used in the

work should be provided in details. Result of the work should include significant findings that answered the problem identified previously in introduction section. Conclusions should correlate with objective of the work.

Keywords: computational screening, coformer, carboxylic acid, ethyl p-methoxycinnamate, coamorphous

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**OP008**

# COMPUTATIONAL DESIGN IN SELECTION OF FUNCTIONAL MONOMER FOR DEVELOPMENT OF MOLECULAR IMPRINTED POLYMER OF ALPHA MANGOSTIN

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## ABSTRACT

Alpha mangostin (AM) is a secondary metabolite derived from Garcinia mangostana pericarp. This compound has activity induces apoptosis in cell cancer. Selectivity was needed in the extraction process in the separation of AM from complex matrices. The molecularly imprinted technique is used to create Molecularly Imprinted Polymer (MIP), which has a higher binding capacity and specific recognition towards the template. The selective adsorption approach, where AM fits the MIP by physically and chemically. MIP will be used as a selective extraction tool to clean up and preconcentration of AM from the medicinal herbal extract. The Pre-polymerization step is crucial to design MIP. Computational design has led to major advances in monomer screening and optimization of monomer(s)-template ratio. This study aimed to investigate molecular interactions and the Gibbs free binding energies on the development of MIP. The structure of AM as a template and functional monomers were drawn in HyperChem 8.0.10. Ten monomers were used in these studies that have possible conformations with the template. Designed and simulated to geometrically optimize the complex to the lowest energy in the gas phase were obtained. The Gibbs free binding energies of each conformation were calculated using a semi-empirical PM3 simulation method. The results showed that methacrylic acid (MAA) chosen as the best functional monomer at optimum ratio (1:6) of the template: monomer and the Gibbs free energy was -27.511 kcal/mol. This study demonstrates the importance of studying intermolecular interaction among template, functional monomer, and template-monomer ratio to prepare alpha mangostin MIP.

Keywords: alpha mangostin, molecular imprinted, hyperchem, monomer

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**OP009**

# ANTIBACTERIAL COMPOUNDS OF *Streptococcus mutans* AND *Shigella dysenteriae* IN *Eucheuma spinosum* FROM TASIKMALAYA, WEST JAVA SCREENED WITH TLC-BIOAUTOGRAPHY

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## ABSTRACT

*S. mutans* (gram-positive) and *S. dysenteriae* (gram-negative) are two types of bacteria that cause many health problems. The use of synthetic antibiotics against both bacteria is known to impact on the bacteria's resistance. *E. spinosum* from Tasikmalaya is a potential macroalga as a source of an antibacterial compound for both bacteria. The research aimed was to examine the antibacterial compounds in *E. spinosum* originated from Tasikmalaya, west java against *S. mutans* and *S. dysenteriae*. The research was conducted through several stages that were phytochemical screening, gradual extraction using hexane, ethyl acetate and methanol, determination of MIC, and TLC-bioautography. Phytochemical screening showed the presence of alkaloids, flavonoids, and steroids in both the raw material and the extracts. Extracts of hexane, ethyl acetate, and methanol were known able to inhibit the growth of *S. dysenteriae* with MIC 0.4 mg / mL respectively. However, only ethyl acetate extract was known to inhibit the growth of *S. mutans* with a MIC of 0.02 mg / mL. Hexane extract's TLC using hexane:ethyl acetate eluent(4:1) showed the presence of 6 pigments in the chromatogram, ethyl acetate extract with chloroform:ethyl acetate (2:3) resulted in 5 pigments, and methanol extract with chloroform eluent: acetone (1:2) resulted in 4 pigments. TLC-Bioautographic of *S. dysenteriae* from ethyl acetate extract resulted in 3 clear zones and detected as a flavonoid group and methanol extract also resulted in 3 clear zones, but the active metabolite group was not yet known. TLC-bioautographic TLC of *S. mutans* resulted in one clear zone from the ethyl acetate extract, but its position was at the starting point location and the active secondary metabolite group was unknown.

Keyword : TLC-Bioautography, *Eucheuma spinosum, Streptococcus mutans*, *Shigella dysenteriae*

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**OP012**

# *mpt64* SYNTHETIC GENE: CODON OPTIMIZATION AND VECTOR DESIGN

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## ABSTRACT

The *mpt64* gene introduced into a different host may cause incompatibility of codon usage bias and it made the yield of the gene expression decrease significantly.[1] Therefore, the *mpt64* codon sourced from *M. tuberculosis* H37Rv must be adapted to the system of codon reading in *E. coli* as the host cell. This present study was proposed to optimize the reading of *mpt64* codon in *E. coli* BL21 (DE3) and to design the *mpt64* gene in a constructing vector. The nucleotide sequence of the *mpt64* gene was accessed on the Gen bank with access code AY208674. The sequence then adapted and optimized to the codon reading system in *E. coli* using a graphical codon usage analyzer (GCUA) application, then translated by Blastx analysis to confirm the protein identity. The optimized *mpt64* gene was designed to be inserted in an *E. coli* expression vector (pD861-SR) with the following selected characteristics: high replication, strong Ribosome Binding Site, induction system with rhamnose, kanamycin selection markers and fused with a pelB as the signal peptide. The whole sequence of the recombinant vector was then ordered as synthetic genes via ATUM (DNA 2.0). There was 31.64% codon usages differences between *M. tuberculosis* H37rv and *E. coli*. Thus, before the codon optimization, the percentage of *mpt64* codon frequency was less than 100%. The optimized of *mpt64* gene sequence resulted 58.49 % of GC content. The Blastx analysis demonstrated that the amino acid sequence producing significant alignment (100%) with the secreted MPT64 protein Of *M. tuberculosis*. The design of the recombinant vector containing the optimized *mpt64* gene produced a total size of 2990 bp. The *mpt64* synthetic gene can be optimized and designed effectively in the constructing vector to be well expressed in *E. coli* BL21 (DE3).

Keywords: *mpt64* gene, synthetic, *M. tuberculosis* H37Rv, *E. coli* BL21 (DE3), optimization, design.

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**OP014**

# SECONDARY METABOLITES FROM THE ROOTS OF *Amomum compactum* (ZINGIBERACEAE) AND THEIR POTENTIAL ACTIVITY AS ANTICANCER

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## ABSTRACT

Three compounds 5,7,4` trimethoxy kaempferol (1), (1*R*,*4S*,*5S)*-5-isopropyl-2-methylcyclohex-2-ene-1,4-diol (2), and (1*S*,4*S*,5*S*)-5-isopropyl-2-methylcyclohex-2-ene-1,4-diol (3) had been isolated from the roots of *Amomum compactum* Sol. Ex Maton. The chemical structure of compounds 1, 2, and 3 were identified by spectroscopy data including ultraviolet (UV), infrared (IR), nuclear magnetic resonance (NMR) ($^{1}$H, $^{13}$C, DEPT, HMQC, HMBC, $^{1}$H-$^{1}$H-COSY), HR-TOFMS and through comparison with previously reported spectral data. Compound 1, 2, and 3 were isolated from this plant for the first time. Information about anticancer activity of compounds 1-3 against MCF-7 breast cancer cells was also first reported.

Keywords: *Amomum compactum*, kaempferol, menthene, MCF-7, Zingiberaceae.

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**OP016**

# ANTIINFLAMATION, ANTIDIABETIC AND ACUTE TOXICITY OF *Etlingera elatior* Leaves

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## ABSTRACT

Torch ginger leaves (Etlingera elatior) were proven to have health properties and widely used in community continuously. Phytochemical analysis of torch ginger leaves extract revealed the presence of flavonoid compounds and other polyphenol compounds that are known to have anti-inflammatory and inhibition of alfa glucosidase activity. Anti-inflamamatory activity was tested with the Human Red Blood Cell Stability (HRBC) method. Inhibition of red blood cell lysis due to induction of hypotonic solution was used to measure of anti-inflammatory activity. Antidiabetic activity with evaluation the inhibition of alfa glucosidase enzyme. And the toxicity activity of torch ginger leaves (Etlingera elatior) was to determine its safety, with $LD_{50}$ value as a parameter. Torch ginger leaves were extracted using 70% ethanol and concentrated into a thick extract. Anti-inflammatory activity was expressed in $IC_{50}$ value, which means the ability of extract to inhibit 50% lysis of red blood cells as a marker of inflammation. $IC_{50}$ value as antiinflammation activity of leaves extract was 71.24 µg/mL, while the $IC_{50}$ value of diclofenac sodium as a standard was 48.94 µg /mL. An enzyme alfa glucosidase is an enzyme that catabolism carbohydrates complex polysaccharides into monosaccharides. Leaves extract of Torch ginger showed the inhibition against alfa glucosidase activity at $IC_{50}$ 165,61 µg/ml, while acarbose as standard have $IC_{50}$ 226,55 µg/ml. Acute toxicity of leaves extract was uses female mice at aged 8-12 weeks and were grouped randomly. The ethanol extract of torch ginger (Etlingera elatior) leaves showed $LD_{50}$ value> 2000mg / kgBB, it still safe for consumption by humans.

Keywords**:** Torch ginger leaves (Etlingera elatior), anti inflammatory, HRBC (Human Red Blood Cell), alfa glucosidase , acute toxicity.

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**OP017**

# FORMULATION AND EVALUATION OF GRANULE OF CRUDE BROMELAIN OF PINEAPPLE (*Ananas comosus* (L.) Merr) CROWN OF SUBANG DISTRICT, INDONESIA

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## ABSTRACT

The crown of pineapple (*Ananas comous* (L.) Merr) of Subang district, Indonesia, is proven to contain bromelain, which has been characterized and has protease and antioxidant activity. These finding show that crude bromelain has the potential to be developed into herbal preparations. The purpose of this study was to formulate and evaluate crude bromelain granules from the pineapple crown of Subang district, Indonesia. Crude bromelain was formulated by wet granulation with polyvinylpyrrolidone (PVP) as a binder. Physical granule evaluation was determined the moisture content, flow rate, repose angle, bulk density, and tapped density. The evaluation results showed that crude bromelain granules met the requirements of good granules. The protease activity of crude bromelain granule was 6.16 ± 0.58 IU/mg. It concluded that crude bromelain can be formulated into granule with protease activity.

Keywords: protease activity, antioxidant activity, PVP, wet granulation, physical evaluation

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**OP019**

# THE EFFECT OF ZEOLITE CLINOPTILOLITE AS CARRIERS OF NONI FRUIT (*Morinda citrifolia* L.) AS ANTIFUNGAL *Mallasezia globosa* CAUSES SEBORRHEIC DERMATITIS

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## ABSTRACT

Seborrheic dermatitis on the scalp causes inflammation of the skin and attacks the hair follicles, triggering hair loss to baldness[1,2]. *Mallasezia globosa* play a role in this skin disease[3,4], ketoconazole therapy as an antifungal treatment in the long term is not recommended because it has a number of side effects, so that antifungal treatment from herbs that are safe to use in the long term, given the disease often recurred in certain circumstances. Noni fruit is rich in flavonoid compounds as an antifungal[5,6] combined with the natural zeolite clinoptilolite. The use of zeolite is motivated by the fact not only safe for human skin but also zeolite has a porous three-dimensional skeletal structure that is able to carry active compounds[7,8]. This study aims to determine the antifungal activity of water, ethyl acetate and n-hexane fraction of noni fruit combined with zeolite, and how the role of zeolite as a carrier of active compounds in selected fractions in improving the performance of noni fraction in inhibiting *M. globosa*. Noni fruit extract is produced from maceration with 96% alcohol and is standardized based on the Indonesian Pharmacopoeia[9], phytochemical screening is carried out based on Fransworth's method[10], antifungal activity test is carried out by *Kirby-Bauer* disk diffusion method, zeolite surface morphology analysis combined with noni fruit fraction is conducted with SEM. The results showed that the water fraction+zeolite showed the best inhibition zone with a strong category compared to the water and n-hexane fraction without zeolite, and was equivalent to a positive control of 2% ketoconazole. The morphological analysis of SEM on zeolite showed that the difference in pore size in the water fractio+zeolite became more dense which showed that the active compound from noni fruit was trapped into the zeolite pores. The conclusion of this research is the water fraction that contains many flavonoids in noni fruit extract can be used for the treatment of seborrheic dermatitis, and zeolite is able to improve the performance of plant extracts by acting as a carrier of active compounds of plant extracts.

Keywords: *Morinda citrifolia L, Mallasezia globosa*, zeolite clinoptilolite, seborrheic dermatitis

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**OP020**

# EFFECT OF *Hibiscus surattensis* L. LEAVES EXTRACT AND ACTIVE FRACTION ON GLUT-4 EXPRESSION IN GASTROCNEMIUS MUSCLE OF DIABETIC RAT INDUCED BY HIGH FAT AND FRUCTOSE DIET

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## ABSTRACT

Type 2 diabetes mellitus (DM) is a condition, in which insulin unable bind to receptors on the insulin-dependent cells of the liver, muscles and adipose[1]. In 2019, it is estimated that 463 million people have diabetes, and it is will be an increase of up to 51% in 2030 to 2045[2]. Depletion of glucose transporter 4 (GLUT-4) affects blood glucose levels in patients with type 2 DM[3]. Traditional medicine plant such as *Hibiscus surattensis* L. are known to have antidiabetic potential[4], but their effect on GLUT-4 muscle expression has not been investigated. This study aimed to determine the effect of extracts and active fraction of *H. surattensis* L. leaves on GLUT-4 expression in gastrocnemius muscle tissue of insulin resistance diabetic rats induced by high-fat and fructose diet. This study use forty Wistar rats were divided into eight groups (five rats per group): healthy control rats (Na CMC 0.5%), negative control (Na CMC 0.5%), positive control (metformin 100 mg/kg bw), 5 groups received ethanol extract (EE) 50 mg/kg bw, ethyl acetate fraction (EAF) 25 and 50 mg/kg bw and water fraction (WF) 25 and 50 mg/kg bw. The diabetic condition was induced by giving high fat-diet and fructose 1.8 g/kg bw for 60 days. Blood glucose level and GLUT-4 expression level were measured at the 21st-day post-treatment. FBG levels were measured using a glucometer. The parameters measured by the semi-quantitative data were the expression of GLUT 4 protein in gastronecmius muscle by the immunohistochemistry method. One-way ANOVA followed by a Duncan post hoc test results showed there were significant differences between groups ($p < 0.05$) on the FBG level and GLUT4 expression. Ethanol extract (EHS) and ethyl acetate fraction (EAF) of *H. surattensis* L. leaves have the potential to reduce fasting blood sugar levels and increase GLUT 4 expression in gastronecmius muscle tissue that is significantly different than the negative control ($p < 0.05$). The result showed that *H. surattensis* L. leaves to have potentially beneficial effects on the treatment of type 2 DM with the probable mechanism of targeting GLUT4 glucose transporter included increasing GLUT4 translocation and expression.

Keywords: GLUT-4, *H. surattensis* L., type 2 DM

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**OP021**

# ETHANOLIC AND METHANOLIC TAPAK DARA (*Catharanthus roseus* (L.) G. Don.) LEAVES EXTRACT ACTIVITY AS *Streptococcus pyogenes* ANTIBACTERIAL

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## ABSTRACT

Autoimmune or lupus is immune disorders caused by various factors, one of which is *Streptococcus pyogenes* bacteria infections.[1,2,3,4,5] *S. pyogenes* activity can be suppressed by corticosteroid and antibiotic therapy, but has side effects such as resistance, cross reaction with other drugs, kidney disorders, and overdoses. [5,6,7,8] Tapak Dara (*Catharanthus roseus* (L.) G. Don) leaves has potential to be an alternative antibacterial, based from secondary metabolites.[9,10] The purpose of this research are to determine the optimum concentration of 96% ethanolic and 96% methanolic extract from tapak dara leaves, the type of solvent extract that has the best bacterial activity, and the drugs model used bioinformatics. Antibacterial potency used dilution methods and diffusion Kirby Bauer to find diameter inhibitory capability with different concentrations (45%, 555, 65%, 75% of ethanolic extract and 15%, 25%, 35%, 45% of methanolic extract). Aquadest and 10% DMSO was used to negative control and Amikacin 10 mg/L injection was used to positive control. Phytochemical tested and statistical test used Anova with $\alpha$=0.5. Based on the result of this research, optimum concentration to inhibit *S. pyogenes* bacteria growth are 55% of ethanolic extract and 45% of methanolic extract. Solvent which has the best antibacterial activity is the methanolic extract. Drugs model used molecular visualization and molecular dynamic simulation.

Keywords: Antibacteria, Tapak Dara, *Streptococcus pyogenes*

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**OP022**

# APPLICATION OF 'MAE' METHOD ON RED MOLD RICE FOR EXTRACTION EFFICIENCY OF NATURAL FOOD ADDITIVES

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## ABSTRACT

Red mold rice was produced by fermentation of *Monascus purpureus*. The pigment was red and very attractive, so that it can be applied into the food[1]. Conventionally the red pigment was obtained by soaking rice in water. However because the process requires a long time it was considered less efficient. The alternative technique of extraction was the Microwave Assisted Extraction (MAE) method[2]. Principally the rice was extracted with microwave radiation for a certain time, then the pigment stability of extract was observed during storage for 2 months. The pigment was tested against *Escherichia coli, Staphylococcus aureus, Aspergillus flavus* and *Candida albicans* growth. The results showed that 180 seconds of extraction time at 80-82$^{o}$C gave a color value of 116.69 CVU/g and was stable at room temperature for 35 days, with a decrease of light absorption was 17.83% at 488.5 nm. When the water extract contacted against *E. coli, S. aureus, A. flavus* and *C.albicans* there were no chance in its growth. 50% of ethanol extract could inhibit *E. coli* with inhibiting zone was 12.37 mm and 12.82 mm in *S. aureus*, but did not to *A. flavus* and *C. albicans*. The microdilution method method with 500,000 µg/ml concentration was able to kill *E.coli* and *S.aureus.*

Keywords: Red mold rice, red pigments, MAE, stability, inhibiting zone

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**OP023**

# THE INFLUENCE OF GREEN CINCAU LEAF (*CYCLEA BARBATA MIERS*) ETHANOL EXTRACTS AS A DIURETIC

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## ABSTRACT

Diuretic are drug wich is increasing the speed of urine formation[1]. The effect of green cincau leaves bioactive compound was urine volume increasing[2]. The purpose of this study was to determine the diuretic effect of ethanol extract of green cincau leaves (*Cyclea barbata Miers*) on urine levels, $Na^+$ and $K^+$ levels and find out the effective dose. Green cincau leaves (*Cyclea barbata* Miers.) were extracted by maceration method using 96% ethanol. Diuretic testing was divided into 5 groups, namely 0.5% CMC negative control group, positive control group furosemide 3,6 mg/kg BW and green grass jelly leaf extract group (dose 60 mg/kg BW), green grass jelly leaf extract group ( dose 120 mg/kg BW), green grass jelly leaf group (dose 240 mg/kg BW). Electrolyte level were determined by wet destruction method. $Na^+$ standard solution concentrations range of 0.1 ppm, 0.2 ppm, 0.4 ppm, 0.6 ppm, 0.8 ppm, 1 ppm, 3 ppm, 5 ppm and $K^+$ with a concentration of 0.5 ppm, 1 ppm , 2 ppm, 3 ppm, 5 ppm, 10 ppm, 15 ppm and 20 ppm. Determined the levels of sodium and potassium electrolytes in the urine using AAS. Data analysis by Kolmogorov Smirnov test followed by ANOVA test.The results showed that the ethanol extract of green grass jelly leaves could have diuretic activity. The dose of 240 mg/kg BB is an effective dose that provides diuretic activity by increasing urine volume and sodium and potassium levels in the body.

Keywords**:** Green grass jelly leaves, Furosemide, Diuretics, sodium dan potassium levels

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**OP025**

# EFFECTIVENESS TEST OF ONION TUBER ( *Allium cepa L* ) EXTRACTS ON HEALING OF BURNS ON WHITE MALE RATS

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## ABSTRACT

Research on the effectiveness of onion tuber (*Allium cepa.* L) extracts has been done on the healing of burns in white male whose backs have been injured with hot iron at 100 C. This study used experimenta rats consisting of group I Extracted Shallot Bulbs Extract negative, group II Shallot Extract Extract concentration 5%, group III Shallot Extract Extract 10% concentration, group IV Shallot Extract Extract concentration 20% and group V comparison mebo ointment. This research was carried out by measuring the percentage of wound healing, epithelialization time and histopathology of fibrocollagen tissue. The results were analyzed using a one-way ANOVA statistical test. From the results of the study, it was found that the ointment based onion tuber extract could influence the process of healing burns. And shows the percentage of wound healing area with p value = 0.041, epithelialization time with p value = 0.012 and histopathology of fibrocolagen tissue with p value = 0,000. In conclusion, the ointment based onion tuber extract can accelerate burn healing, and all concentrations exert a wound healing effect where the best concentration is 20%.

Keywords: Burns, Shallot Bulbs Extract, Histopathology

**OP026**

# ANALYSIS OF COMPONENTS OF LEMON ORANGE PEELS, LOCAL LEMON PEELS AND LIME ORANGE FEEL EXTRACTS WITH GAS CHROMATOGRAPHY - MASS SPECTROMETERY

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## ABSTRACT

Orange peel is one of the main sources of essential oils. Lemon can also be found in the city of Jambi, which is then called the local lemon, but the shape and characteristics are slightly different from the lemon. The local lemon was identified as a cross between a lemon and a lime, Citrus aurantifolia x medica. The study was conducted to analyze and determine differences in the components of compounds from the lemon peels, local lemon peels and lime peels by gas chromatography - mass spectrometry. The study was carried out by means of fruit peels from lemons, local lemons and lime extracted with acetone. Then the resulting extract was identified using components using gas chromatography - mass spectrometers. The results of the analysis of the component extract of acetone from lemon peels, local lemon peels and lime peels were obtained each of 19 compounds. The three orange peels were obtained 4 similar compounds namely 2- pentanone, 4-hydroxy-4-methyl, Beta bisabolene, bis (2-ethylhexyl) phthalate, 2H-1-Benzopyran-2-one, 5,7-dimethoxy; and 15 analyzed compounds with different ingredients. The results of the crossing of lemon and lime affect the content.

Keywords: *Lemon peels, local lemon peels, lime peels, essential oils, Gas Chromatography - Mass Spectrometer.*

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**OP028**

# PREPARATION OF MOISTURIZING LOTION CONTAINING SILKWORM (*Bombyx mori* L.) SERICIN NANOPARTICLES

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## ABSTRACT

Sericin as one of two main proteins in silkworm (*Bombyx mori L.*) cocoons was found to have the ability to increase skin moisture. The objective of this study was to determine the optimal formula of sericin nanoparticle lotion and the effectiveness of sericin nanoparticle lotion. The formation of sericin nanoparticles was mainly carried out by mixing and stirring mechanism using urea as a crosslinking agent. Temperature, stirring speed, and stirring duration were varied. Optimal sericin nanoparticles with the average particle size of 706 nm were obtained at 800 rpm stirring for 30 minutes at room temperature. Sericin nanoparticles lotion was then formulated with 5% and 10% sericin nanoparticles. Results showed that lotion containing 10% sericin nanoparticles increase skin moisture by an average of 11.24%.

Keywords: moisturizer, lotion, silkworm, sericin, nanoparticles

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**OP030**

# DETERMINATION OF CHLORINE ON BREWED ROBUSTA COFFEE (*Coffea canephora var. Robusta*) WITH V60 METHOD

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## ABSTRACT

One of the manual brewing techniques is pour-over V60 method by using a filter paper, which is suspected to contain chlorine as a paper bleaching agent which will dissolve in coffee. Health problems that can be caused by consuming chlorine-containing beverages in the long term can cause directly disease related to liver, bladder, intestinal cancers, arteriosclerosis, high blood pressure, pneumonia, bronchitis, dyspnea and allergies[1]. The aim of this research is to determine the chlorine content in brewed robusta coffee with V60 brew method. Chlorine was examined using a color reaction method and depositional test as a qualitative analysis. The quantitative analysis that used to determine the chlorine content is argentometric titration with Mohr methods. The results of this research shows that all three sample of filter paper and coffee with V60 brewing method contain chlorine. The result of titration shows that chlorine levels in filter paper brand A is 81,9 mg/L, brand B 49,9 mg/L, and brand C 69,9 mg/L. Levels of chlorine contained in V60 brewed coffee brand A is 44,6 mg/L, brand B 21,9 mg/L, brand C 28,6 mg/L. The conclusion of this research is that the chlorine content contained in filter paper and in V60 coffee brewing beverages on brand A, brand B, and brand C is unqualified according to WHO regulation about chlorine qualification for clean drinking water, which is 5 mg/L.

Keywords: chlorine analysis, robusta coffee, V60 brew method, argentometric titration

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**OP034**

# EFFECTIVENESS OF ACTIVED CHARCOAL TOOTHPASTE (*Elaeis guineensis J.)* CONTAINING ALLANTOIN AGAINST GINGIVITIS OF RAT MODEL

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## ABSTRACT

The most common cause of gingivitis is the accumulation of bacterial plaque containing tar between and around the teeth that damage the soft tissues lead to gums inflammation. This study aimed to design the toothpaste formula which has good physical properties and the effectiveness in reducing severe gingivitis. Methods used in this study included the preparation of a toothpaste formula containing 12% of activated palm charcoal combined with 1% and 2% of allantoin (F1 and F2) then compared with controls. Evaluation of physical properties and stability through cycling test. Furthermore application of each formulas against rats model and assessment of plaque index and gingival index. Both F1 and F2 showed a significantly high reducing percentage plaque and gingival index compared than control. Nevertheless F1 exhibited physical properties and the stability more better than F2.

Keywords: activated charcoal, allantoin, gingivitis, plaque index

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**OP035**

# MORPHOLOGICAL STUDY AND PHYTOCHEMICAL TEST IN TWO VARIETIES OF *Orthosiphon aristatus* (Blume) Miq.

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## ABSTRACT

*Orthosiphon aristatus* plant that grows a lot in Indonesia are purple and white-purple varieties and have been widely used in traditional medicine efforts [1]. Maximize the potential of the *O. aristatus* plant as traditional medicine, and efforts should be made to characterize and identify the secondary metabolite content of the two varieties so that the consistency of quality will be guaranteed. This study will identify differences in morphological characteristics and secondary metabolite content of the two varieties of *O. aristatus*. Plant samples were obtained from three different locations. The examination of secondary metabolite content is carried out by phytochemical screening and monitoring of thin-layer chromatography (TLC) profiles. In the purple variety, the color of the petals is green- purple, the color of the crown, the stalk of the pistil and the stamens are purple, while in the white-purple variety the color of the petal is green, the color of the crown is green, the color of the stalk is purple tinge, and the color of the stamens is white - purple. Phytochemical screening results of leaves and stems of two varieties of *O. aristatus* contain secondary metabolites of the flavonoid, tannin, polyphenol, steroid-triterpenoid, and monoterpenoid and sesquiterpenoid groups.

Keywords: purple variety *O. aristatus*, white-purple variety *O. aristatus*, morphology, phytochemical screening

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**OP036**

# CALLUS INDUCTION OF PURPLE AND WHITE-PURPLE *Orthosiphon aristatus* (Blume) Miq. ON VARIOUS GROWING MEDIA

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## ABSTRACT

*Orthosiphon aristatus* (Blume) Miq.) is one of the medicinal plants that are widely used in traditional medicine. *O. aristatus* are known to have many benefits, including anti-virus [1]. Components of the main secondary metabolites of *O. aristatus* are sinensetin, rosmarinic acid, and eupatorin, the low levels of the three primaries, secondary metabolites that need to be done early efforts to increase their levels by modification of *in-vitro* culture (callus induction). This research will look at the influence of various growth media of MS, Gamborg, N6, and SH and identification of secondary metabolite content in callus using thin-layer chromatography (TLC). The results showed the growth of callus two varieties of *O. aristatus* in various growth media (MS, Gamborg, N6, and SH) with variations in the concentration of 0.4; 0.8; 1.2 ppm. Based on the results of monitoring TLC callus obtained from SH, media has the potential to proceed to the suspension culture stage because it shows fluorescence of compounds that are brighter than other callus and plant extracts, especially for rosmarinic acid compounds. This research provides new information about the influence of various growth media to produce the best callus from two varieties of *O. aristatus*.

Keywords: purple variety *O. aristatus*, white-purple variety *O. aristatus*, modification of *in-vitro* culture, growth media, phytochemistry of callus

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**OP037**

# ANALYSIS OF RHODAMINE B AND METANIL YELLOW IN LIPSTICK PREPARATIONS CIRCULATING IN JATINANGOR REGION

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## ABSTRACT

Rhodamine B and metanil yellow are synthetic dyes that are included in 30 hazardous colouring agents. This compounds should not be found in drugs, food or cosmetics because it can give health impacts such as respiratory tract, skin or eye irritations, tissue damage, and are carcinogenic. However, rhodamine B and metanil yellow are reported to be found in cosmetics such as lipstick. This research was conducted to determine the presence of rhodamine B and metanil yellow in lipstick preparations circulating in Jatinangor region using UV-Vis spectrophotometry. The stages of the method carried out for this study were the collection of lipstick samples, preparation of samples, analysis of rhodamine B and metanil yellow in the sample, and data analysis. The results showed that there were 5 out of 21 lipstick samples contained rhodamine B with levels between 3.56 till 16.29 ppm and no samples detected containing metanil yellow. This result illustrated that even though there is a regulation that strictly forbid the use of Rhodamine B in cosmetic preparation, several samples that contain this synthetic dye were still found in Jatinangor region.

Keywords : Rhodamine B, Metanil Yellow, lipstick, UV-Vis spectrophotometry

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**OP038**

# THE ANTIPLAQUE EFFICACY OF ACTIVATED CHARCOAL TOOTHPASTE OF *Elaeis guineensis*

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## ABSTRACT

Dental plaque occurs due to accumulation of tar, food debris and microorganisms that settle on the surface of the teeth and tooth roots. This study aimed to evaluate the efficacy of 12% of palm shell active charcoal toothpaste formula which have been assessed for their physical properties and stability in accordance with SNI containing 25% of calcium carbonate act as abrasive to dental plaque of active smokers. The method used for selected the toothpaste formula was carried out by measuring plaque index scores before and after using the toothpaste towards 20 panelists of active smokers. The results showed the toothpaste formula in the first week was able to reduce dental plaque by 59% compared to positive control by 45% and without activated charcoal by 34%. Then at second week, both the toothpaste formula and positive control were able to remove dental plaque by 100%, while toothpaste without activated charcoal and calcium carbonate was only able to remove dental plaque by 68%.

Keywords**:** dental plaque, physical properties, stability, palm shells

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**OP039**

# OPTIMIZATION OF ULTRASOUND-ASSISTED EXTRACTION OF TOTAL FLAVONOID FROM BROWN ALGAE *P. australis*

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## ABSTRACT

Seaweed or sea macroalgae is rich in potential compounds which can be used for treatment of disease. *Padina australis* is one of the important macro algae brown classes (Phaeophytes). One of the bioactive compounds of *P. australis* is phenolic compound and its derivatives (flavonoid). In this research, *P. australis* were collected from Bayah beach, Banten, Indonesia. For utilizing flavonoids from *P. australis*, ultrasound assisted extraction (UAE) was employed. A three-level Box-Behnken design (BBD) and the response surface methodology (RSM) were employed to obtain the optimal combination of extraction condition. The effects of several independent variables including temperature (30, 50, 70 $^0$C), reaction time (20, 40, 60 minutes) and ethanol concentration (30, 50, 70%) were investigated. The result showed that RSM was an accurate and reliable method in predicting the total flavonoid content with $R^2$ value of 0.9935. The optimal UAE conditions for the highest yield of total flavonoid content were 49.70 $^0$C in temperature, process time under 44.03 min, and 47.80% ethanol with 0.2162% flavonoid content. Under the above conditions, the experimental value of flavonoid content was 0.2144%, which is in close agreement with the value predicted by the model. Therefore UAE using RSM is effective for extraction flavonoid from *P. australis*.

Keywords: Analysis, predicted value, temperature, reaction time, ethanol concentration

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**OP040**

# POTENTION PURIFIED EXTRACT OF GAMBIER (*Uncaria gambier*, Robx.) AS ANTIHYPERCHOLESTEROL

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## ABSTRACT

Development of alternative drugs needs to be done to reduce undesirable side effects of hypercholesterolemia synthetic drugs. Catechin is expected to be one of the candidates to become an alternative drug because of its potential in controlling the amount of cholesterol. The amount of catechin on Gambier plants (*Uncaria gambir*) is not less than 90%, therefore anticholesterol testing is needed purification with certain solvents can increase the withdrawal of the intended compound. Therefore, this study aims to determine the anticholesterol activity of purified gambier extract. Purification of gambier extract uses n-hexane, ethyl acetate, and water to increase the amount of catechins that can be taken. Anticholesterol testing of purified gambier extract in vitro using the CHOD-PAP method was divided into two extract concentrations, namely 1000 ppm and 100 ppm, negative control, and simvastatin as positive control with an incubation time of 30 minutes. The results of catechin concentrations from purified gambier extracts were 91.66%. The percentage value of cholesterol inhibition from purified catechin extraction and positive control at a concentration of 1000 ppm was 14% and 15%, respectively. The test results showed the presence of anticholesterol activity from purified gambier extract by looking at the percent reduction in cholesterol in the 1000 ppm extract by 14% compared to the positive control of 1000 ppm by 15%.

Keywords: Catechin, Purified Gambir Extract, Anticholesterol, CHOD-PAP

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**OP041**

# FORMULATION OF TABLET FRUIT BANANA EXTRACT (*Musa Troglodytarum* L.) WITH VARIATION OF POLYVINYLPYRROLIDONE (PVP) AS BINDER

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## ABSTRACT

Previous studies reported that extracts of banana fruit tongka langit (Musa troglosytarum L.) had antidiabetic activity in vivo. In order to be more efficient and easy to use by consumers, it is necessary to do a formulation of the extract of banana fruit extract tongka Langit (Musa troglodytarum L.). In this study, banana fruit extract tablets were formulated in the sky using wet granulation method through 2 stages, namely optimization and production. Optimization to see fillers suitable for the characteristics of banana extract in the sky and the result is avicel PH 101 is the best filler for extracting banana fruit in the sky. The next stage of production is using variations in the concentration of polyvinylpyrolidone (PVP) binder. Variations used are 1%, 3%, and 5%. From the three formulations, granules and tablets were evaluated physically to determine the best formula of the three formulas. From the evaluation results it was concluded that the best formulas were formulas 1 and 2. The results of TLC showed that making tablet formulations did not damage or eliminate the chemical content of the extract of banana fruit tongka Langit (Musa troglodytarum L.).

Keywords*:* Tablet, wet granulation, fruit of tongka langit banana, *Musa troglodytarum* L

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**OP042**

# FORMULATION, CHARACTERIZATION, AND STABILITY STUDY OF FAST DISSOLVING THIN FILM CONTAINING ASTAXANTHIN NANOEMULSION USING HYDROXYPROPYLMETHYL CELLULOSE POLYMER

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## ABSTRACT

The present study was conducted to formulate and characterize of thin film containing astaxanthin nanoemulsion (TF-ASN) using HydroxyPropylMethyl Cellulose (HPMC) Polymer as a film matrix system. The stability studies in different storage conditions were also performed. Astaxanthin nanoemulsion was prepared by using self-nanoemulsifying method, followed by incorporation into the HPMC matrix system by solvent casting method to forming TF-ASN. Evaluation of TF-ASN was performed by chemical, physical and mechanical characterizations. Stability study was carried out in both of accelerated (temperature of 40±2ºC/75±5%RH) and non-accelerated (at ambient temperature) conditions. TF-ASN had good physical and mechanical characteristics that suitable for intraoral administration. For the study of stability under different storage conditions, it was proven that nanoemulsion form was packaged in a HPMC matrix could enhance the stability of the astaxanthin.

Keywords: astaxanthin, nanoemulsion, thin film, solvent casting method.

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**OP046**

# DETERMINATION OF pKa, SOLUBILITY AND DISSOLUTION KINETICS OF SELECTED EFAVIRENZ POLYMORPHS IN COMPARABLE DISSOLUTION MEDIUM

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## ABSTRACT

Many factors affect the efficacy of drugs amongst the most concerns of many pharmaceutical scientists is the ability of dissolved drugs. In general, efforts to increase the solubility of drugs are carried out through formulations and various pharmaceutical techniques regardless of the intrinsic properties of the active pharmaceutical ingredients (API). One that affects the special intrinsic solubility of API is the ability of polymorphism. One sample of a drug that exhibits polymorphism is Efavirenz (EFV) with the chemical name (*S)-6-chloro-4-(cyclopropylethynyl)-1,4-dihydro-4-(trifluoromethyl)-2(H)-3,1-benzoxazin-2-one*. EFV was initially approved by the United States Food and Drug Administration (US FDA) in 1998 with no polymorphic forms, but now from literature finding discovered 23 different forms include amorphous and solvate forms. However, only stable form (Form I) with poor aqueous solubility was used in the market widespread. Meanwhile, the possibility of using metastable forms has not been much studied. This study aims to investigate the ability of selected metastable EFV polymorphs dissolved in the comparable dissolution medium including determining the pKa of each selected polymorph and its effect on the kinetics of dissolution. The differential forms of polymorphs obtained by various organic solvents such as acetonitrile, n–hexane, and methanol which called Form I, II, and III, respectively. The characteristics of each polymorph were distinguished by polarization microscopy, Differential Scanning Calorimetry (DSC), Fourier Transform Infra-Red (FTIR) and Raman spectroscopy. The nature of solubility and dissolution of each polymorph was examined by adding Sodium Lauryl Sulphate (SLS) 0.25% in the comparable dissolution medium (water, HCl pH 1.2, buffer phosphate pH 4.6 and 6.8). Various habit forms from microscopic observed turn out to give a unique fingerprint on FTIR and the Raman spectrums. The results of the thermal behavior examination show a DSC thermogram with a specific melting point for each polymorph. Based on the solubility test shows that form II is more soluble than form III. This is following the pKa value of each polymorph which is 10.12, 10.63 dan 10.37, respectively. The dissolution profile shows that products from the market have properties similar to Form I, but have different kinetics. It can be seen that the kinetics of form I dissolution is influenced by the acidity of the medium, the more acidic the medium, the faster the rate of drug release approaches zero or first order. Unlike the metastable form exhibits the ability to maintain drug loading that is not affected by pH conditions still follows the kinetic release model of Higuchi even in acidic medium.

Keywords: Polymorphism, Efavirenz, solubility, pKa, dissolution kinetics

**OP047**

# CHARACTERIZATION OF NANOSILVER BIOSYNTHESIS BY *Citrus sinensis* (L.) Osbeck AND PEEL-OFF MASK FORMULATION WITH VARIATION POLIETILEN GLIKOL 400-GLISERIN CONCENTRATION

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## ABSTRACT

Sweet orange (*Citrus sinensis* (L.) Osbeck) contains of flavonoids and citric acid that potentially as biorectors and capping agents in the biosynthesis of Nanosilver. Nanosilver can be applied to the skin as antibacterial topical in peel-off mask. The peel-off mask has the advantages of being easily applied to the skin and gives a feeling of clean. One of the important components in the peel-off mask is the humectant. PEG 400 and glycerin are humectant that has different physical-chemical properties. The research was conducted with the aim of knowing characteristic nanosilver biosynthezed by *C.sinensis* infuse and the influence of glycerin and PEG 400 against the physical and chemical properties of Nanosilver peel-off mask. The results of the biosynthesis Nanosilver are characterised by UV-Vis, Particle Size Analsi and Scanning Electrone Microscope. Nanosilver Peel-off mask is made five formulation with variations of glycerin-PEG 400 and then evaluated physical-chemical properties test which include organoleptic, viscosity, spread ability, dry time and pH. The physical-chemical properties of the preparations were evaluated for four weeks. The characterization results show the sweet orange capable of producing nanosilver with a maximum absorption characteristic at 421-423 nm, 83,17 ± 7,19 nm and rod-shaped. Statistical analysis results showed glycerin-PEG 400 affects the physical properties of viscosity, spread ability and dry time significantly but has no significant effect on the chemical properties of pH. Formula 2 and Formula 4 are the best formula because they have a viscosity, spread ability and pH that do not change significantly during four weeks of storage.

Keywords: *Citrus sinensis*, nanosilver, glycerin, Polyethylene glycol 400, peel-off mask

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**OP050**

# MOLECULAR DOCKING OF *Sauropus androgynus* COMPOUNDS FOR ANTI-ALOPECIA

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## ABSTRACT

Hair loss (Alopecia) is still a serious problem that attacks 50% of men aged 18-40 years. This para-physiological condition, can make patients experience stress to eliminate self-confidence and tend to cause psychosocial in patients. Drugs that are on the market today are generally chemical drugs that have side effects in the future. Therefore, searching for natural medicinal compounds that can be efficacious as anti-alopecia. The purpose of this study is to evaluate the potential of the katuk leaf compound (*Sauropus androgynus*) to reduce hair follicle loss as a preliminary study to obtain preliminary information using in-silico computational methods. Computational molecular docking method uses receptors (PDB: 3G1R) and tested on 12 compounds that are suspected to have potential activity as ligands for anti-alopecia drugs. Of the 12 compounds tethered there are 4 compounds that have a free energy bond value (ΔG <5), this compound is thought to have the potential to be used as an anti-alopecia drug candidate. Pyrene compounds contained in katuk leaves have the potential to be candidates for drugs used topically because they have a higher affinity than minoxidil.

Keywords: Hair Loss, Anti-alopecia, *Sauropus Androgynus*, Baldness, Katuk Leaf.

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**OP053**

# THE FREQUENCIES ALLELE DISTRIBUTION OF *CYP2C9* AND *CYP2C19* GENE POLYMORPHISMS IN HEALTHY PAPUAN POPULATION, INDONESIA

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## ABSTRACT

According to recent research, there is a decrease in the amount of *CYP2C9* and *CYP2C19* produced by humans' across the world, including Indonesia. These gene polymorphisms aid in the transmission of various endogenous and exogenous drugs in the human body[1]. Genetic factors play a prominent role estimated at 15-30% for individual discrepancies in metabolism and drug response; even some drugs indicate that genetic factors play a prominent aspect, about 95% of individual distinctions in disposition and drug effects[2]. Genetic differentiation results in variability in drug metabolism in the human body[2]. This study aims to determine the distribution of allele frequencies of *CYP2C9* and *CYP2C19* gene polymorphisms among the Papuan population, known as the second-largest ethnic group in Indonesia. A total of 98 healthy subjects comprising of 73 male and 26 female subjects, aged 20-30 years old, were used to carry out this research. *CYP2C9* and *CYP2C19* genotypes were administered on them to determine by using the polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) from New England Biolabs (Beverly, MA) *AvaII, NsiI,* and *SfaNI,* respectively. The genotype distributions were consistent with the Hardy-Weinberg equilibrium in the population ($p$<0.05). This research was approved by the Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine Universitas Gadjah Mada with written consent. It showed that *CYP2C9*2* and *CYP2C19*17* alleles were absent in Papua subjects while *CYP2C9*3* allelic frequency was the highest in 17% of the population. In conclusion, *CYP2C9*3* has the highest polymorphism frequency in Indonesia, with the absence of *CYP2C9*2* and *CYP2C19*17.* Therefore, there is a possible occurrence of genetic drift in this ethnic group.

Keywords: pharmacogenetics, Papuan ethnic, genotyping, PCR-RFLP

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**OP054**

# SYSTEMATIC REVIEW: THE ENHANCEMENT OF ANTI-INFLAMATION ACTIVITY OF NON STEROIDAL ANTI-INFLAMMATORY DRUG (NSAID) BY SOLID DISPERSION MODIFICATIONS

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## ABSTRACT

NSAIDs are very hydrophobic drugs and have low solubility[1]. This causes the bioavailability of NSAIDs to be low in the body thus affect its anti-inflammatory activity. There has been some primary research proven that solid dispersion can increase the solubility and anti-inflammatory activity of NSAIDs[2,3]. Moreover, there are no researches that conclude the effect of a solid dispersion system on the anti-inflammatory activity of NSAIDs. Therefore, it is necessary to conduct a review to assess the effect of the solid dispersion system on the solubility and anti-inflammatory activity of NSAIDs systematically.This was systematic review research, where the data were originated from PubMed and Science Direct with the keywords 'NSAID', 'solid dispersion', and 'drug effect'. The inclusion criteria formulated were English-language papers, published in 2010 – 2020, and primary research that conducted in-vivo anti-inflammatory testing. The appropriate papers by the inclusion criteria were assessed its quality by the SYRCLE's tool. Data was analyzed narratively. The results were eight papers under the inclusion criteria. As a whole is known modification of solid dispersion can increase the dissolution profile of NSAIDs. This is because the polymer used can increase the wetting of drug particles, thereby being able to increase the solubility of NSAIDs. The anti-inflammatory activity of NSAIDs by solid dispersion systems is increases compared to NSAIDs without solid dispersions.

Keywords: NSAIDs, solid dispersion, anti-inflammatory activity, systematic review

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**OP056**

# *IN SILICO* STUDY OF 2-FLOROBENZOYL-α-MANGOSTIN to HUMAN Estrogen receptor alpha (*h*ERα)

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## ABSTRACT

The α-mangostin has anti-proliferation activity against breast adenocarcinoma cells SKBR3 [1] and MDA-MB231[2]. This compound reduce lymph node metastases [3], so it has the potential as a breast anticancer drug, therefore it was needed the efforts to increase the activity of α-mangostin and its affinity as an antagonist estrogen receptor alpha through structural-based design methods. The research purpose obtain the modification of α-mangostin compounds that have stable interactions with breast cancer receptors by docking and dynamics molecular. The Topliss theory on the aromatic ring was used for designing α-mangostin derivatives. The first, the designed compound was screened in pharmacokinetic activity include: the prediction of absorption, distribution, metabolism, excretion and toxicity using preADMET. The next, it was continued by molecular docking and molecular dynamics in the human estrogen receptor alpha (*h*ERα) crystal structure using the AutoDock 1.5.6 and AMBER 16. The pharmacokinetic screening results 2-Fluorobenzoyl-α-mangostin compound was classified as a low permeability (based on PCaco-2), as well absorbed (based on the % HIA), as a low permeability (based on PCaco-2), and non-mutagen. Molecular docking and molecular dynamics results show that has binding affinity (-11.36 Kcal/mol), hydrogen bonds (ThrA:347), hydrophobic bonds (11 amino acid residues), binding free energy (-9.84 Kcal/mol), RMSD (2.5 Å). Compared to its derivative compound the α-mangostin have banding affinity (-8.82 Kcal/mol) and molecular dynamic was resulted the RMSD value (3.5 Å), the binding free energy (-1.77 Kcal/mol) and no hydrogen bonds. It can be predicted that the 2-Fluorobenzoyl-α-mangostin compound has an effective potential as a breast cancer drug (MCF-7) candidate through interactions with *h*ERα.

Keywords: α-mangostin, 2-Fluorobenzoyl-α-mangostin, (*h*ERα), molecular docking and molecular dynamics**.**

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**OP057**

# IN SILICO STUDY OF 1,4-NAPHTHALENEDIONE-2-ETHYL-3-HYDROXY TO COX-2 RECEPTORS AS ANTIPIRETIC ACTIVITY TEST

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## ABSTRACT

Generally, Fever is a symptom and is not a separate disease that indicates a reaction from the body to infection which is characterized by an increase the temperature in body above 36-37 ° C. Bangle (Zingiber purpureum R.) has several activities, one of which gives the effect of cold (astringent), antihistamines, and immune modulators. The research purposes obtained the active compound of bangle rhizome essential oil and determines its activity as an antipyretic by in silico. The method for obtaining essential oils is GC-MS (Gas Chromatography-Mass Spectrometry), then the compounds are performed computationally using molecular docking and molecular dynamics methods. The Molecular docking results show that 1,4-naphthalenedione-2-ethyl-3-hydroxy (GC-MS analysis) can bind to COX-2 enzyme (antipyretics) with the free energy value (ΔG) of -7.31 kcal / mole and it is smaller than acetaminophen. From the molecular dynamics simulation through MM-GBSA calculation method of the 1,4-naphthalenedione-2-ethyl-3-hydroxy-COX-2 was obtained $\Delta G_{TOTAL}$ values of -29.4761 kcal / mole. This result showed that the 1,4-Naphthalenedione-2-ethyl-3-hydroxy against COX-2 is predicted to be better and more potent as an antipyretic than acetaminophen.

Keywords: Antipyretic, Bangle *(Zingiber purpureum Roxb*.), GC-MS (Gas Chromatography-Mass Spektrometry), In-silico

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**OP058**

# REVIEW OF PHARMACOLOGICAL PROFILE *Acorus calamus* L., AROMATIC PLANTS MENTIONED IN AL-QURAN AND AL-HADITS, AND ITS PROSPECT TO BE DEVELOPED INTO NANOPARTICLE

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## ABSTRACT

Al-Qur'an was revealed by Allah *Subhanahu wa ta'ala* to Our Holy Prophet, Muhammad *Shalallaahu 'Alayhi Wasallam*. Al-Qur'an is a comprehensive book, which brings together all fields of science, all aspects of life, among the fields of science contained in the Qur'an are medicine. One of the medical science is herbs (an aromatic plant) for cure common disease. This study aims to review and gather information aromatic plants mentioned in the Al-Qur'an, Al Hadits, books were written on Islamic medicine and its prospect to be developed into nanoparticle. This review examined online literature via Sciendirect, Google Book, and Google Scholar. Based on data was collected from Al-Qur'an, Al-Hadits and books were written on the Islamic medicine, there are 15 aromatic plant species, which one is *Acorus calamus* L. *Acorus calamus* L. (Sweet flag) has ethnomedicinal application for treatment like nervous disorders, digestive disorders, sedative, fever, inflammation, tumors, and other[(1)]. The essential oil from *Acorus calamus* L have been isolated and characterized, alpha and beta asarone are the dominant bioactive components[(2)]. Beta asarone is lipophilic, it need to develop a watersoluble formulation[(3)]. A method which can be used to increase the availability of water-insoluble compounds in the body is by using Lipid-based self-nanoemulsifying drug delivery systems (SNEDDS), have resurged the eminence of nanoemulsions by modest adjustments and offer many valuable opportunities in drug delivery.

Keywords: Al-Qur'an and Al-Hadits, Acorus calamus L., Alpha and Beta asarone, Nanoparticle

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**OP060**

# *Cinnamomum camphora*: AN AROMATIC PLANT MENTIONED IN AL-QUR'AN AND AL-HADIST WITH ITS POTENTIAL AS MEDICINE AND ITS PROSPECT TO BE DEVELOPED AS HERBAL DRUG PREPARATION THROUGH NANOTECHNOLOGY

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## ABSTRACT

Al-Qur'an and Al-Hadist, which contains all aspects of life and science, is a guide used by all Muslims around the world in living their daily lives. One of the aspects contained in Al-Qur'an and Al-Hadist is science in medicine. There are 15 aromatic plants mentioned in either Al-Qur'an or Al-Hadist which has many benefits and potential as medicines [1]. The aim of this study is to review and gather informations on aromatic plants mentioned in Al-Qur'an and Al-Hadist which has benefits as medicines and potentially developed through nanotechnology. This review examined online literatures via PubMed, ScienceDirect, and Google Scholar. Based on the literatures, one of the aromatic plants mentioned in Al-Qur'an and Al-Hadist which is potential to be used as medicine is Cinnamomum camphora with various activities such as anti-inflamation, antispasmodic, antiseptic, antipruritic, contraceptive, lactation suppressant, and stimulant [2-3]. It is also useful in treating muscle and joint paint, as well as ingestion and congestion problems thanks to its main component of essensial oil in the form of camphor which is mostly found in the wood [4-5]. Based on this information, it is suggested that there is possibility to apply nanotechnology through Self Nano Emulsifying Drug Delivery Systems (SNEDDS) to form herbal drug preparations with good solubility, bioavailability, and stability [6-7].

Keywords: Al-Qur'an and Al-Hadist, Aromatic plants, Camphor, Nanotechnology

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**OP061**

# THERAPEUTIC POTENTIAL OF *Cymbopogon schoenanthus (L.)* Spreng DEVELOPED INTO NANOPARTICLE TECHNOLOGY: AL QURAN AND AL HADITH BASED MEDICINE

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## ABSTRACT

Al Quran was revealed by Allah *Subhanahu wa ta'ala*, while the Hadith is all actions and words conveyed by the Prophet Muhammad *Shallallaahu 'alayhi wasallam*. Al Quran and the Hadith explain all aspects of life, including the medicinal treatment. Plants are one of the natural products that can be used to cure some diseases. In Al Quran and Hadith it is mentioned that there are 15 plants that can be used as medicine, one of which is *Cymbopogon schoenanthus (L.) Spreng* or also known as Camel Grass[1]. The aim of this research is to study and gather comprehensive information about Camel Grass plants and its potential to be developed as nanotechnology drug delivery system. This review examined a variety of literature sourced from PubMed, Sciencedirect, Research Gate, and Google Scholar. Based on Al Quran, Hadith, and other supporting literature mentioned that camel grass has a lot of essential oil content which is a source of monoterpene such as piperitone and other constituents include intermedeol, δ-2-carene and elemol[2]. The essential oil from camel grass has efficacy as an antioxidant[3], antiacetylcholinesterase[3], antimicrobial[3], anti-inflammatory[4], anticancer[4], spasmolytic[2] and others. Essential oils are lipid soluble base, so they tend to have low bioavailability in the body. The development of Camel Grass's essential oil into lipid-based nanotechnology preparations can improve its bioavailability, solubility, and stability. So the potential effectiveness obtained is also getting better[5].

Keywords: Al Quran and Al Hadith, *Cymbopogon schoenanthus (L.) Spreng*, Essential oil, Nanotechnology

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**OP063**

# BINDING AFFINITY AND ABSORPTION PREDICTION OF OMEGA 3 FATTY ACID AS AN AGONIST NEUROTENSIN RECEPTOR FOR CONTROLING OBESITY USING MOLECULAR DOCKING

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## ABSTRACT

Obesity is one of the complex disease involving an excessive amount of body fat which caused by several factors includes lipid metabolism and catalysis problem. *Lipase* is an enzyme that catalyzes the hydrolysis of fats, it has regulated with gastrointestinal protein-receptor activation include neurotensin receptor. Omega-3 is essential nutrition that has been proved can control body weight by reducing the body fat accumulation This study aims to evaluate the potential effectivity of omega-3 derivative compounds as an agonist neurotensin receptor based on its binding affinity, and absorption profile prediction. 3D structure of neurotensin receptor NTS1 (4GRV) was retrieved from RSCB database with protein data bank format. Total of 9 ligand derivative compounds of omega-3 was made using Chem draw 2D software and minimized the energy using MM2+. The molecular docking study was performed by the structure-based drug design method using Autodock tools 4.0 software, while absorption prediction was done by PreADMET software. Based on the study, 3 of 9 omega-3 derivative compounds (Docosahexaenoic, Eicosapentaenoic, and Eicosatriaenoic Acid) have a good potential activity considering by the lowest of their binding energy of (-9.4, -8.72 and -8.15 Kcal/mol respectively) compare with the native ligan neurotensin (-6.31 Kcal/mol). Impressively, these compounds have similar hydrogen bonding interaction with the native ligan neurotensin (ARG327; TYR146) and have a good pharmacokinetic profile in the absorption level more than (>95%) in HIA and 30% in Caco2. As a conclusion, in our findings, omega-3 fatty acid have been identified can interact with neurotensin receptor which can be the excellent nutrition which have regulated in controlling or prevent the lipid metabolism problems and obesity

Keywords: Omega-3, Neurotensin Receptor, Body Weight, Obesity

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**OP064**

# FORMULATION OF SUNSCREEN CREAM BREADFRUIT (*Artocarpus altilis* (Parkinson) Fosberg) LEAVES AND SPF VALUE TEST

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## ABSTRACT

Excessive sun exposure can cause negative effect such as sunburned skin. That impact can be reduced by using sunscreen. Breadfruit leaves is one of the plants that contain flavonoid which can be using as a sunscreen. This research has a purpose to find out SPF value of sunscreen breadfruit leaves extract. Determination of the value of Sun Protection Factor (SPF) is using Spectrophotometer based on absorbance measurements at wavelengths of 290-320 nm. Breadfruit leaves extract was made into sunscreen cream with various emulgator that is TEA and stearic acid with a concentration ratio F1 (1:3), F2 (1:5), and F3 (1:7). The cream was evaluated organoleptic, cream type, centrifugal test, pH, viscosity, homogeneity, and cycling test. Based on the results of the study, breadfruit leaves extract at a concentration of 200 ppm gave an SPF value of 19.023 with ultra protection categories and the sunscreen cream at a concentration of 10.000 ppm gave an SPF value of 18.624 with ultra protection categories. Sunscreen cream F1 and F2 have colour from green to brown on 14$^{th}$ day. F3 cream has fulfilled whole physical evaluation tests. After 28 days the cream preparation still has sunscreen activity.

Keywords: Breadfruit leaves, cream, sunscreen, SPF

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**OP065**

# EFFECT OF POLOXAMER 407 IN A POLYVINYLPYRROLIDONE K30 BASED SOLID DISPERSION TOWARDS CURCUMIN DISSOLUTION

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## ABSTRACT

Curcumin is poor water-soluble compound showing low bioavailability after oral administration [1]. Solid dispersion is one of many strategies employed to improve curcumin dissolution. However, a lag time in dissolution profile occurred resulting in delayed release onset which can result in postpone of drug absorption. In this investigation, we aimed at avoiding lag time in dissolution profile of curcumin by preparing a solid dispersion system using binary carriers polyvinylpyrrolidone K30 (PVP K30) – poloxamer 407. Poloxamer 407 is a surfactant that can improve the wettability and stability of poorly water-soluble drugs in solid dispersion[2]. The curcumin solid dispersion was prepared at a high drug load of 50% -wt in various composition of PVP K30-Poloxamer 407 using spray drying method. The compositions of PVP K30-Poloxamer were 1:0,5 (SD 1), 1:1 (SD 2), 1:2 (SD 3). As comparison solid dispersion of curcumin using PVP K30 was prepared at drug load of 30%-wt. All formulas were tested for dissolution profile. Curcumin concentration was determined by our validated spectrophotometer method. The results show that incorporation of poloxamer 407 in the solid dispersion system improve significantly dissolution profile and diminish the lag time which frequently observed in PVP K30 based solid dispersion. In 30 minutes, fast dissolution profile was obtained for SD 1 (93,49%), SD 2 (88,63%), and SD 3 (74,15%). However, the solid dispersion which prepared with only PVP K30 at lower drug load (30%) reached only 49,42% in 30 minutes dissolution. To conclude, poloxamer 407 enhances dissolution profile of curcumin and provide fast curcumin release a in PVP K30 based solid dispersion.

Keywords: Curcuma, spectrophotometer, high drug load, solid dispersions

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**OP066**

# ANTIOXIDANT ACTIVITY OF ETHANOLIC EXTRACT OF *Etlingera alba* (Blume) A.D. Poulsen Rhizome

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## ABSTRACT

*Etlingera alba* (Blume) A.D. Poulsen is one of the plants of the genus *Etlingera* which is commonly found in Southeast Sulawesi. The research is still lacking, but we review it from other species from the genus *Etlingera* that provide antioxidant and radical scavenging activity, namely *Etlingera elatior* (Jack) R.M. Smith. Thus, this study aimed to assessthe antioxidant activity and its secondary metabolites. *E. alba* rhizome was extracted with 96% ethanol.. The radical scavenging activity was assayed with 1,1-diphenyl-2-picrylhidrazyl (DPPH) and antioxidant activity was tested with 2,2'-azino-bis-[3-ethylbenzothiazoline sulphonate (ABTS) assay for radical cation decolorization *in vitro*. Both ascorbic acid (AA) and Trolox were used as positive control methods. Ascorbic acid (AA) exhibited $IC_{50}$value 13,59 ± 0,79 mg/L for DPPH assay and 15,27 ± 0,43 mg/L for ABTS assay, meanwhile Trolox exhibited $IC_{50}$ value 17,30 ± 0,69 mg/L for DPPH assay and 20,53 ± 1,13 mg/L for ABTS assay. The extract exhibited $IC_{50}$ value 43,61 ± 0,69 mg/L for DPPH assay and 50,57 ± 0,83 mg/L for ABTS assay. The secondary metabolites were identified by Thin Layer Chromatography, the difference between compounds were analyzed by LSMS/MS. According to results performed with TLC and LCMS/MS, *E. alba* rhizome extract contains alkaloids, flavonoids, terpenoids and steroids. Both *E. alba* rhizome ethanolic extract provides antioxidant activity, and alkaloids, flavonoids, tannins, phenolic compounds, and terpenoids. contained in extract provide the antioxidant activity.

Keywords: *Etlingera alba*; 1,1-diphenyl-2-picrylhidrazyl (DPPH) assay; 2,2'-azino-bis-[3-ethylbenzothiazoline sulphonate (ABTS) assay; antioxidant activity.

**OP067**

# UTILIZATION OF PHARMACOLOGICAL BIOACTIVITY *(Ocimum Basilicum* L.*)* AROMATIC PLANTS MENTIONED IN THE QUR'AN AND AL-HADITH WITH THE APPLICATION OF NANOTECHNOLOGY

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## ABSTRACT

In Islam, the disease is cured by two ways of healing first through prayer and healing second through drugs. Plants are an important component in healing diseases and there are 50,000-70,000 plant species used in traditional and modern medicine throughout the world, with species being used more for aromatic medicines and fragrances[4]. The main objective of this research is to document the knowledge of the use of ethnobotany drugs and create awareness about the aromatic plant species mentioned in the Qur'an and Al-Hadith by applying nano technology in them. Data is collected in detail and comprehensively from the Qur'an and Al-Hadith and books were written on Islamic medicine. Of the 15 plant species studied, namely; *Acorus calamus L., Artemisia maritima L., Boswellia carterii L., Boswelia serrata Birdw., Cinnamomum camphora L., Citrus spp., Commiphora molmol Engl. Ex Tschirch., Crocus sativus L., Cymbopogon schoenanthus Spreng., Dryobalanops aromatica Gaertn F., Lawsonia Inermis L., Majorana hortensis Moench., Ocimum basilicum L., Origanum vulgare L. and Thymus serpyllum L*[4]. Of the 15 plants studied, one of which is *Ocimum basilicum L.* is known for its abundant essential oil content, essential oils rich in *monoterpenes, sesquiterpenes,* and *phenylpropane* derivatives with many pharmacological activities that have been tested *In Silico*, *In Vitro,* and *In Vivo* studies [3]. The use of natural materials has limitations, which is often a failure in the clinical phase due to low bioavailability [1]. Nanotechnology is a new strategy in drug delivery, especially for intracellular drug delivery. Nanotechnology-based drug delivery systems can encapsulate various drugs, such as small molecules (both *hydrophilic* and *hydrophobic*), proteins and peptides, and nucleic acids (DNA and RNA). By encapsulating the molecules in the nanocarrier system, solubility and stability can be improved, as well as improving the pharmacokinetic profile of the molecule [2].

Keywords : Al-Qur'an and Al-Hadith, essential oils, pharmacology, nanotechnology

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**OP068**

# IMPROVING SOLUBILITY AND DISSOLUTION OF A NATURAL PRODUCT APIGENIN VIA PREPARATION OF SOLID DISPERSION BY HOT MELT EXTRUSION

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## ABSTRACT

*Hot Melt Extrusion* (HME) is one of the techniques for preparing a solid dispersion hydrophilic excipient known as a no solvents practical method to increase the solubility of drugs. Apigenin (APG) has properties that thermal stable with melting point 345-350$^0$C but very low solubility in the water around 183 mg/L at 25$^0$C. The polymer is stable in the HME method are Soluplus and Kollidon VA 64. The study aims to optimize the kind of polymer in HME formulae to improve the solubility and dissolution rate of apigenin by solid dispersion using hot-melt extrusion. Apigenin 10–50% w/w and Kollidon®VA 64 or Soluplus® and combination of Kollidon®VA 64 and Soluplus® were mixed, and the resulting blends extruded using a twin-screw extruder (Teach-Line ZK25T). Solubility, characterization of apigenin extrudates conducted using scanning electron microscopy, thermogravimetric analysis, differential scanning calorimetry, Fourier transform infrared spectroscopy, powder X-ray diffractometry, and drug release profiles.Solubility studies demonstrated enhancement in apigenin of 10%/Soluplus®90%; 10% w/w apigenin/ Kollidon®VA 64 90%; and 33,3% w/w apigenin/ Kollidon®VA 64 33,3% mix Soluplus® 33,3% increased more than 18,26; 16,19- and 8,52-fold in water, respectively. Furthermore dissolution studies demonstrated enhancement in apigenin percent release of 10%/Soluplus®90%; 10% w/w apigenin/ Kollidon®VA 64 90%; and 33,3% w/w apigenin/ Kollidon®VA 64 33,3% mix Soluplus® 33,3% tablet apigenin HME up to 34,29%; 69,75% and 30,69%, respectively**.** The formulation of 10% w/w Apigenin and 90% soluplus® using hot-melt extrusion able to increase water solubility approximately 18,26-fold than row material apigenin.

Keywords: Apigenin, Solid dispersion, Solubility, Hot melt extrusion

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**OP069**

# OPTIMIZING THE SCREENING METHOD OF ANTIHYPERTENSIVE EFFECT USING EXPERIMENTAL ANIMALS

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## ABSTRACT

Hypertension is a non-communicable disease characterized by systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg. The prevalence of people with high blood pressure in Indonesia in 2013 reached 25.8%. Research using experimental animals is one of the ways pursued for the discovery of new antihypertensive efficacy drugs. This study aims to find a rapid method of screening for antihypertensive effects using animal models with epinephrine-induced. In this study, modeling of test animals was carried out by induction of epinephrine 0.25 mg/kg bw intraperitoneal. Test animals were divided into 7 groups, normal, control, propranolol 3.6 mg/kg bw, atenolol 4.5 mg/kg bw, amlodipine 0.45 mg/kg bw, captopril 1.125 mg/kg bw and losartan 4.5 mg/kg bb. Non-invasive blood pressure measurements were performed indirectly using the Kent Scientific CODA system at 0, 15, 30, 45, 75, and 90 minutes. The difference between systole and diastole blood pressure was calculated, and analyzed using a statistical test. The results showed that epinephrine could increase systole and diastole blood pressure compared to the control group ($p < 0.05$), and the highest increase in blood pressure is after 60 minutes of induction. In this animal model, the best inhibitory effect of increasing diastole blood pressure is amlodipine, captopril, propranolol, atenolol, and losartan. Whereas the best inhibiting effect of increasing systolic blood pressure is amlodipine, propranolol, captopril, atenolol and losartan. This result confirm that the method can be use to assay antihypertensive effect and categorized as easily and quickly. It can be concluded that epinephrine induction on experimental animals can be used for screening of antihypertensive effects.

Keyword : antihypertension, animal model, epinephrine, invasive method

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**OP070**

# TURMERIC EXTRACT POTENTIAL INHIBIT INFLAMMATORY MARKER IN LPS-STIMULATED MARCOPHAGE CELLS

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## ABSTRACT

Inflammation may be induced by physical factors, noxious chemical stimuli or microbiological toxins and plays decisive roles in inflammatory diseases. Turmeric (*Curcuma longa* L.) has been widely used to provide diverse array of biological activities antidepressant and anxiolytic effects in people with major depressive disorder; antimicrobial, antioxidant, anti-inflammatory. In this study, we assessed the anti-inflammatory potential of Turmeric extract (TE) using a Lipopolysaccharide (LPS)-induced RAW264.7 macrophage cell line by inhibiting inflammatory mediators IL6, IL1β, TNF-α, iNOS, NO level. The cytotoxic assay of TE were performed by MTS (3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl) to determine the safe concentration of TE in LPS-induced macrophage cell line for further assay. The inflammatory markers (IL6, IL1β, TNF-α, iNOS) were measured using ELISA assay and NO by the nitrate/nitrite colorimetric assay in LPS-induced RAW264.7 cell line. LPS induced inflammatory marker by increasing inflammatory marker (IL6, IL1β, TNF-α, iNOS, NO). The research resulted that TE possess anti-inflammatory potential by decreasing IL6, IL1β, TNF-α, iNOS, and NO level on LPS-induced RAW264.7 cells.

Keywords : inflammation, turmeric, inflammatory marker, TNF-α

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**OP071**

# NEPHROPROTECTIVE ACTIVITY OF ETHANOL EXTRACT OF KIRINYUH LEAVES (*Chromolaena Odorata* L) IN GENTAMICIN INDUCED NEPHROTOXICITY IN WISTAR RATS

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## ABSTRACT

The global prevalence of Chronic Kidney Disease (CKD) was 9.1% (697.5 million cases). Chronic kidney disease can occur one of which is caused by drug nephrotoxicity. Nephrotoxicity remains major problems for its effective long term clinical use. Gentamicin is known to cause many morphologic, metabolic and functional alterations in the kidney and the specificity of Gentamicin nephrotoxicity is related to its accumulation in the renal proximal convoluted tubules leading to tubular necrosis. Nephrotoxicity can be prevented by nephroprotective by giving antioxidants from outside. Kirinyuh leaves (*Chromolaena odorata L*.) has potential as a nephroprotective because it contains chemical compounds that have antioxidant activity. The purpose of this study was to determine the antioxidant activity of kirinyuh leaves as a nephroprotective. Wistar rats as many as 25 animals were divided into 5 groups, namely the normal control group, negative control (gentamicin 60 mg/BW rat), and kirinyuh leaf extract at a dose of 225 mg/BW rat, 450 mg/BW rat and 675 mg/ BW treatment was carried out for 10 days. Serum creatinine and urea levels were evaluated along with histopathological investigation in various experimental groups of rats. Data analysis using the One Way Anova test and continued LSD test. Serum creatinine and urea levels at a dose of 675 mg/BW rats showed the lowest creatinine and urea levels of the negative group and other dose groups. Renal histopathology test results showed that the group with a dose of 450 mg/BW of rats had the lowest necrosis rate compared to the negative control group and other dose groups.

Key words**:** Chronic kidney disease , gentamycin, nephroprotective, Kirinyu

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**OP072**

# FORMULATION OF EFFERVESCENT GRANULES FROM *Hornstedtia Alliacea* EXTRACT AS ANTIOXIDANT AGENT

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## ABSTRACT

Fruit Seed Pining Bawang (*Hornstedtia alliiacea*) have a metabolite compounds that is flavonoid, and have a slightly sour taste, sweet, and fresh. Suitable to be made effervesent drink which is rich in antioxidants. The aims study to find out formulation and evaluation of effervescent granules of pining bawang (*Hornstedtia alliacea*) seed extract. The process of extraction fruit Pining bawang seed (*Hornstedtia alliacea*) using method multilevel maseration, effervescent granules preparation was made from three formulas with wet granulation method. The effervescent granules of pining bawang seed extract was made from three formulas with ratio variations of sodium bicarbonate, tartrat acid and citric acid . Evaluation of granule include organoleptic test, dissolved time test, pH test and hedonic test. The effervescent granules of pining bawang seed extract can be used as effervescent granules, which have particle size distribution, brown colour, unique odor of pining bawang seed extract and have a slightly sweet and sour taste. Evaluation which has been of effervescent granules of pining bawang seed extract fulfill the requirements of granules

Keywords: Fruit, Pining Bawang , Antioxidants, Effervescent, Granules

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**OP073**

# ANTI-FUNGAL ACTIVITY TEST OF EXTRACT OF DUKU FRUIT SKIN *(Lansium domesticum* Corr.) IN LIQUID SOAP CLEANING

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## ABSTRACT

Diarrhea is one of the essential health problems because it is the third major contributor to morbidity and mortality in children in various countries, including Indonesia. One of the bacteria that can cause diarrhea is *Escherichia coli.* One of the plants that can be used in the treatment of diarrhea is guava leaf (Psidium guajava L.). To facilitate the use of *Psidium guajava* L. leaves as medicine, a formulation can be made in the form of nanosuspension dosage. Aim: To determine the activity of guava leaf extract (*Psidium guajava* L.) as an anti-bacterial against Escherichia coli, the anti-bacterial activity of guava leaf extract in nanosuspension, assess the characterization of guava leaf extract (*Psidium guajava* L. ). Method: using ionic gelation and its characteristics. Results: Minimum Inhibitory Concentration (MIC) of ethanol extract of guava leaves at a concentration of 1% had inhibition of 4.05 mm, and at nanosuspension of guava leaf extract (*Psidium guajava* L.) concentration of 0.01% showed inhibition zone values of 11 .45 mm. Conclusion: The results of nanosuspension characterization of guava (Psidium guajava L.) leaves with the best formula 0.01% produced a particle size of 245.7 nm, polydispersion index of 0.406, the zeta potential of +26.9 mV.

Key words: Leucorrhoea, antifungus, *C. albicans*, *Lansium domesticum* Corr

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**OP074**

# PARTICLE DESIGN OF PARACETAMOL BY SPHERICAL CRYSTALLISATION TECHNIQUE

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## ABSTRACT

Paracetamol is an analgesic-antipyretic drug, exhibits poor water solubility and flow properties. A spherical crystallisation of paracetamol was prepared as part of efforts to improve micromeritic properties. Neutralization technique with the addition of β-cyclodextrin adapted spherical crystallisation. Crystallization medium was used for spherical crystallisation of paracetamol consisted of 0.5 N sodium hydroxide; 0.2 N hydrochloric acid containing 0.1% β-cyclodextrin and chloroform (bridging liquid) in a ratio of 50:125:30 (v/v), respectively. The spherical crystallisation was characterized by powder X-Ray diffraction (PXRD), Differential Scanning Calorimetry (DSC), Fourier Transforms Infrared Spectrophotometry and Scanning Electron Microscope (SEM). Micromeritic behaviour studies were carried out for flowability, the angle of repose, bulk density, tapped density, true density, Carr's index, Hausner ratio, and compression percentage. Determination of the content of paracetamol and dissolution also was performed. XRD, DSC and FTIR spectrophotometry outcome showed no chemical alteration of paracetamol during the spherical crystallisation process, and SEM outcome showed that the crystal shaped becomes spherical. Further evaluation revealed that spherical crystallisation improved micromeritics properties compared with pure paracetamol. Determination of the content of paracetamol showed the percentage of 98.62%. The dissolution of the spherical crystallisation was enhanced compared to pure paracetamol.

Keywords: Paracetamol, Spherical Crystallisation, Dissolution

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**OP075**

# CHARACTERIZATION ITRACONAZOLE MIRCOELMUSI WITH VARIATION TWEEN 80 AS SURFACTANT AND PLANTACARE AS CO-SURFACTANT CONCENTRATION

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## ABSTRACT

Itraconazole is a systemic antifungal of triazole derivatives having pharmacological effects such as ketoconazole. Itraconazole has better antifungal activity whereas side effects are smaller, but side effects that patients when consumption itraconazole as oral are nausea or vomiting, dizziness, edema of the foot, and loss of libido. The solution for this problem is to formulate itraconazole in a topical microemulsion with particle size 10 - 200 nm. This research aims to know the characterization of a topical microemulsion of itraconazole, including organoleptic, particle size, polydispersity index, zeta potential, and the efficiency of trapping, and morphology of dosage form. In this study, microemulsion of itraconazole was developed with variation concentration tween 80 as the surfactant. The concentration tween 80 was used in this research, which is 20 %, 22,5 %, and 25 %. The evaluation of microemulsion in this research is organoleptic, particle size, polydispersity index, zeta potential, and efficiency of trapping and morphology of preparation. The results showed that all three formulas were fulfilled the requirement of microemulsion preparation because it is was pure, yellow, and odorless dosage form. The evaluation characteristic microemulsion was obtained particle size 27,87 - 38,21nm, polydispersity index 0,191 – 0,415 and zeta potential 16,5 - 17,1mV but for formulation F1 was not fulfilled requirement. The efficiency of itraconazole has value > 75%. The best formulation was formula 3, with 25% Tween 80 concentration. The result of the morphological test using TEM was done for the best formulation, and obtained microparticles were approached spherical. Formulation can be said that microemulsion preparation itraconazole meets the criteria of a microemulsion.

Keywords: Itrakonazol, antifungal, topical microemulsion, surfactant

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**OP077**

# EFFECT OF FLAVONOIDS ON OXIDATIVE STRESS, APOPTOSIS, AND CELL MARKERS OF PERIPHERAL BLOOD-DERIVED ENDOTHELIAL PROGENITOR CELLS : AN IN VITRO STUDY

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## ABSTRACT

Circulating endothelial progenitor cells (EPCs) are play a role in neovascularization and vascular repair. Oxidative stress impairs endothelial progenitor. Flavonoid is a phytochemical compound for antioxidant activity. Flavonoid effects toward oxidative stress, apoptosis, and expression of the cell markers on EPCs are not fully understood. The study aimed to investigate the effects of quercetin, kaempferol, and myricetin toward oxidative stress, apoptosis, and cell markers of peripheral blood endothelial progenitor cells. EPCs were isolated from peripheral blood mononuclear cells using cultivation under EPC spesific media. Oxidative stress in EPCs was induced by $H_2O_2$ treatment and treated by quercetin, kaempferol, and myricetin. Cytotoxicity was measured by MTS assay, while intracellular reactive oxygen species (ROS), apoptosis and characterization of cells, which expressed CD133 and KDR, was measured using flowcytometry. Quercetin, kaempferol, and myricetin at concentration 12.50 µg/mL were not toxic on EPCs as the cell viabilities were 96.11±4.03%, 95.42±7.75%, and 94.22±9.49% respectively. Flavonoids decreased intracellular ROS level in EPCs (quercetin:14.38±1.47%, kaempferol: 20.21±6.25%, and myricetin: 13.88±4.02%) compared to EPCs treated with $H_2O_2$ (30.70%±1.04). Percetage of EPCs that underwent apoptosis was not significantly different among each treatment. Immunophenotying showed increased CD133+ and KDR+ cell population. Quercetin, kaempferol, and myricetin were safe for EPCs, decreased ROS levels, and increased CD133 and KDR expression. However, the flavonoids did not significantly decrease EPCs apoptosis.

Keywords: Apoptosis, Endothelial Progenitor Cells, Flavonoids, Reactive Oxygen Species

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**OP043**

# STUDY OF ISOTONICITY AND OCULAR IRITATION OF CHLORAMPHENICOLE IN SITU GEL

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## ABSTRACT

In-situ gel forming system is applied as eye drops which can undergo a transition from solution to gel. The advantage of in-situ gel can be to maximize absorption of the drug in the eye and minimize drug loss before corneal penetration. The purpose of this study was to find out the isotonicity of chloramphenicol in-situ gel ophthalmic preparations and to know the irritating effect of ophthalmic gel in-situ chloramphenicol gel in the eyes of test animals. The stages in this study were started by making four aseptic formulations of in-situ gel preparations with a comparison of the baseline concentrations of different Poloxamer 407 and HPMC, F1 (5: 0.45), F2 (10: 0.45), F3 (5 : 1) and F4 (10: 1). Followed by a qualitative isotonicity test using blood cells to see the comparison between control and test preparations and ocular irritation test using the draize test method used to determine the presence or absence of irritation. The results obtained from the isotonicity test showed that blood cells that had been dripped with the test preparations were then observed under a microscope showing normal results and the results of the ocular irritation test using the draize test method showed zero values on each test parameter. Chloramphenicol *in-situ* gel are isotonic and do not cause irritation to the rabbit's eyes, so they are safe to use.

Keywords: chloramphenicol, HPMC, in-situ gel, poloxamer 407, isotonicity, draize test.

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**PP001**

# MOLECULAR DOCKING STUDY OF ANTHOCYANIDIN COMPOUNDS AGAINST EPIDERMAL GROWTH FACTOR RECEPTOR (EGFR) AS ANTI-LUNG CANCER

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## ABSTRACT

It is presumed that antiproliferative activity of Anthocyanidin has interaction with Epidermal Growth Factor Receptor (EGFR) which has effect on cancer cell growth[1,2]. This study aimed to observe the interaction between anthocyanidin and EGFR and to find out prediction, absorption, distribution activities as well as Anthocyanidin toxicity compared to Gefitinib, an EGFR inhibitor. All test compounds were optimized with Autodock Tools®, then molecular docking simulations and predictions of absorption, distribution and toxicity were carried out. Malvidin was stated to meet the Lipinski's Rule of Five, indicating good bioavailability. Result of molecular docking simulation showed that Malvidin had better affinity against EGFR than Gefitinib. Molecular docking visualization result showed that Malvidin had interaction with amino acid residue such as Met793, Gln791, Leu718, Thr854, Asp855 and Lys745. Absorption and distribution predictions included percentage scores of HIA, Caco-2 and Plasma Protein Binding. Toxicity test revealed that Malvidin was mutagenic compound but not carcinogenic one. The findings indicated that Malvidin was potential to be an anti lung cancer candidate through EGFR inhibition.

Keywords: Antiproliferative, Anthocyanidin, Epidermal Growth Factor Receptor, Molecular Docking

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**PP003**

# PERCUTANEOUS DIFFUSION STUDY OF THE INCLUSION COMPLEX IBUPROFEN-β-CYCLODEXTRIN

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## ABSTRACT

The inclusion complexes is one of method for repairing the solubility of active subtances and will be affect to medicine dissolution nor the medicine penetration. The forming of inclusion complexes is using β-siklodekstrin. Ibuprofen (2-(4-isobutylphenyl)propionate) is a propionate acid derivative and classified in class II of Biopharmaceutic Classification System (BCS) that has low dissolutions and high permeability. The forming of inclusion complexes ibuprofen-β-siklodekstrin prepared using coprecipitation method with comparison molar 1:1, 1:2 dan 2:1. Gel has made in four formulas which is ibuprofen, ibuprofen-β-siklodekstrin inclusion complexes with comparison molar 1:1, 1:2 dan 2:1, continued by difusi test in vitro using Franz diffusion cell in gel based of viscolam containing iburofen (1%). The results of particle size characterization of powder and gel form have nanoparticle size which indicates that the preparation of inclusion complex gel with a particle size of 510 nm can increase percutaneous penetration of ibuprofen compared with pure ibuprofen gel which has a particle size of 156 nm, measured against pure ibuprofen and inclusion complex powders ibuprofen-β-cyclodextrin, 763 nm and 957 nm, respectively. The Ibuprofen-β-siklodekstrin inclusion complexes gel with a molar ratio 2:1 has proven that can increase *in vitro* percutaneous diffusion of ibuprofen with cummulative penetration amount 740,3 $\mu g.cm^{-2}$ and flux 123,38 $\mu g.cm^{-2}.jam^{-1}$ compared to pure ibuprofen gel with cummulative penetration amount 294,74 $\mu g.cm^{-2}$ and flux value 49,123 $\mu g.cm^{-2}.jam^{-1}$.

Keywords : ibuprofen, β-cyclodextrin, inclusion complex, diffusion cell Franz, percutan penetration.

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**PP007**

# THE ROLE OF PLANT'S LECTIN IN APOPTOSIS AND AUTOPHAGY: AN INSIGHT FOR ANTICANCER DISCOVERY

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## ABSTRACT

Ribosome-inactivating proteins (RIPs), toxins that are apt to permanently inhibit the translation or the synthesis of protein, are categorized into three types: Type I, composed of a single polypeptide, type II is a heterodimeric protein consisting of an A subunit linked to a lectin-like B chain by a disulfide bridge, and type III consists of an N-terminal domain closely related to the A chain of RIPs and linked to an unrelated C-terminal domain with unknown function. Plant type II RIPs have been reported in possessing cytotoxicity activity against various types of cancer cells, which is predicted due to the lectin (B chain of the type II RIPs) protein synthesis inhibitory character. This article is devoted to reviewing the biological activity of plant type II RIPs and its role in apoptosis and autophagy.

Keywords: apoptosis, autophagy, *Abrus precatorius*, lectin, Ribosome-inactivating proteins

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**PP010**

# HISTOCHEMICAL INVESTIGATION OF *Archidendron bubalinum* (Jack) Nielsen.*)* FROM LAMPUNG. SUMATERA. INDONESIA.

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## ABSTRACT

Kabau belongs to the Fabaceae tribe, where the Fabaceae tribe has three sub-tribes namely Faboideae, Caesalpinoideae, Mimosoideae. Kabau belongs to the Mimosoideae sub-class, the Archidendron clan, with the name of the type Archidendron bubalinum (Jack) Nielsen)1. The purpose of this study was to describe the morpho-anatomical character of kabau seeds originating from Lampung, Sumatra Indonesia. Microscopic anatomical analysis of kabau seeds was carried out on the parts of kabau seeds with an incision as thick as 100 µm. The sample was placed on a glass object and aquadest, glycerin and choral hydrate were added and then covered with a glass cover then observed under the Olypmpus CX21LED light microscope equipped with a Model SXY-I50L digital camera, and analysis using the S-Viewer program. Histochemical tests are carried out with cross sections, which are colored with the following: Lugol iodine solution to reveal the presence of starch granules; ferric chloride, for polyphenols2 ; dragendrof, for detection of alkaloid compounds3 ; ninhydrin, for the detection of amino acids4 ; K2Cr2O7 (Potassium dichromate) for detection of Tanin / Phenolate5. The result of macroscopic characteristics, neatly arranged cylindrical cabbage seeds consisting of five to six seeds on each pod. Yellowish-white kabau seeds are covered in black seed coat, have a distinctive odor like jengkol, have a slightly bitter sweetness and a soft texture. The size of kabau seeds is 2 cm in length and 1.5 cm in diameter. Microscopic results on kabau seeds, an incision in choral hydrate showed visible parts of the epicarpium, pericarpium contained oil sacs and cell nuclei, and endosperm in each part of the sac contained starch grains and oil sac bags that gave off odors to the head, incisions in the drops of aquadest almost the same as choral hydrate except that the starch grains are more clearly visible and an average diameter of 5,176 µm starch can be calculated. The incision on kabau seeds that were dripped with K2Cr2O7 gave positive results on tannin in the endosperm, ninhydrin reagent gave positive results of amino acids in the endosperm portion of the purple rice, dragendrof reagent gave a positive reaction in the epicarpium and pericarpium parts; iodine lugol reagent gives a positive reaction in black in all parts of the part of the epicarpium, pericarpium and endosperm show a lot of starch contained; and an incision if given FeCl3 reagents gives positive results for polyphenols in the endosperm oil sac.

Keywords: Archidendron bubalinum (Jack) Nielsen., Histochemical, Macroscopic

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**PP012**

# COMPUTATIONAL STUDY OF MAGAININ AS AN ANTIMICROBIAL PEPTIDES TARGETING SARS-COV-2 SPIKE PROTEIN FOR PROMISING COVID-19 DRUG CANDIDATES

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## ABSTRACT

Viruses are still the main cause of disease in humans nowadays. Especially since the emergence of a new viral outbreak that caused the coronavirus 2019 (COVID-19) in Wuhan and has spread rapidly to almost all parts of the world. This disease which has become a pandemic has pressured researchers to investigate several active compounds that have the potential to inhibit the proliferation of SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), the cause of COVID-19. This search involves an approach to the use of antimicrobial peptides as an attractive alternative because it shows great potential to become a pharmaceutically available antiviral drug.1,2 In this research, an interaction study will be conducted using protein-peptide docking to identify the affinity of antimicrobial peptides derived from frog (Xenopus laevis), namely Magainin-1 and Magainin-2 against SARS-CoV-2 spike protein.3 Antimicrobial peptides sequencing was modeled using a PEP-FOLD server. The best conformation was chosen to observe its interaction with the SARS-COV-2 spike protein using the PatchDock algorithm. The interactions formed were observed further using BIOVIA Discovery Studio 2020. Based on the protein-peptide docking, it was proven that the Magainin-1 peptide had the best affinity for the active site of the SARS-CoV-2 spike protein binding site, with a binding free energy value of −884.50 kJ/mol. Therefore, the antimicrobial peptide Magainin-1 is thought to be a new antiviral candidate in the prevention of COVID-19 infectious diseases.

Keywords: Antimicrobial peptides, Magainin, SARS-CoV-2 spike protein, COVID-19, Computational study.

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**PP013**

# STRUCTURAL ANALYSIS OF PHTHALOCYANINE ON HASA PROTEIN IN SERRATIA MARCESCENS AS A PHOTODYNAMIC ANTIMICROBIAL THERAPY CANDIDATE

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## ABSTRACT

HasA protein from Gram-negative bacteria Serratia marcescens is the first hemophore described at the molecular level. This participates for alternating heme from hemoglobin to the outer membrane receptors, which in turn releases it into the bacteria. HasR itself can also take heme from hemoglobin but a synergy with HasA increases the efficiency of the system by a factor of around 100. This iron acquisition system allows bacteria to survive with hemoglobin as the only source of iron.1 This phenomenon can be a new strategy in the development of therapeutic methods in preventing infectious diseases caused by the bacterium Serratia marcescens.2 This study aims to identify, evaluate, and explore the mechanism of action of phthalocyanine compounds on HasA proteins, and their effects on the active side of HasR using computational studies.3 Molecular docking simulations were performed using MGLTools 1.5.6 software with AutoDock 4.2 to compare the affinity and molecular interactions between molecules of Fe-phthalocyanine (Fe-Pc) and Ga-phthalocyanine (Ga-Pc) against HasA protein macromolecules. Based on molecular docking simulations, it was found that the compound Fe-Pc had the best affinity for HasA protein, with the free binding energy value of −58.78 kJ/mol. Metal differences in the molecular structure of phthalocyanine compounds have been shown to be able to influence the mechanism of action against HasA proteins. Therefore, the results of this computational study can be a reference in designing the structure of phthalocyanine compounds as photosensitizer candidates in photodynamic antimicrobial therapy.

Keywords: Photosensitizer, Phthalocyanine, Serratia marcescens, Photodynamic antimicrobial therapy, Computational study.

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**PP014**

# IMPLEMENTATION OF FUZZY LOGIC CONTROLLERS TO MAINTAIN WATER TEMPERATURE IN HYDROPONICS NFT FOR LOLLO VERDE LETUCCE (*Lactuca sativa* L.)

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## ABSTRACT

Nutrient Film Technique (NFT) is a hydroponic system. Hydroponic plant growth is influenced by nutrient levels, acidity, and water temperature in the system. Water temperature affects the physiological processes during plant growth and development.1 The purpose of this study was to maintain the nutritional water temperature in the range of 25-27 °C for lollo verde lettuce (Lactuca sativa L.). The method was the Fuzzy Logic Mamdani (FLM) with two inputs, i.e. real time clock and temperature. The output was crisp speed PWM with the center of area method. The results showed that Fuzzy logic was succeeded in reducing water temperature in the NFT system from 28-32 °C to 26-27 °C, with an average delta of 3.5 °C. Fuzzy logic maintained the nutrient water temperature in the lollo verde lettuce with an average of 26.57 ± 0.5 °C. Water temperature affected the yield of lollo verde lettuce. It concluded that NFT FLM system was better compared to ordinary NFT system.

Keyword: Nutrient Film Technique, temperature maintenance, Fuzzy Logic Mamdani

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**PP017**

# ANTIDIABETIC EFFECTIVENESS OF ETHANOL EXTRACT OF *ARCHIDENDRON PAUCIFLORUM* FRUIT PEEL ON THE TESTICULAR STRUCTURE OF STREPTOZOTOCIN-INDUCED DIABETIC RATS (*Rattus Norvegicus*)

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## ABSTRACT

This study aimed to determine the effectiveness of antidiabetic ethanol extract of jengkol fruit peel (EEJFP) to repair the damage testicular structure on streptozotocin-induced diabetic rats. This research used experimental method in a laboratory with Completely Random Design (CRD) using 5 treatments and 5 replications. Treatment was given for 54 consecutive days consisting of negative control (NC), positive control (PC), comparison (glibenclamide dose 10 mg/kg BW), P1, and P2 (EEJFP dose 385 and 770 mg/kg BW). Diabetic induction was performed with streptozotocin dose of 65 mg/kg BW in male Wistar rats except for the NC group. The parameters that observed were morphological testis (weight, length, width, and volume of testis) and histological structure of testis (seminiferous tubule diameter, lumen diameter, spermatogenic epithelial thickness, and membrane basal thickness). The obtained data were analyzed by ANOVA test and followed by Duncan's test using the SPSS version 21 for Windows. The results showed that the morphological parameters and histological parameters in the P2 group were not significantly different from the NC group. Based on the results of the study it can be concluded that the EEJFP dose of 770 mg/kg BW is an effective dose to repair the testicular structure on streptozotocin-induced diabetic male Wistar rats.

Keywords: Antidiabetic, Antioxidant, DM, Testicular structure

**PP018**

# ANTIHYPERTENSIVE ACTIVITY TEST OF MATOA LEAVES *(POMETIA PINNATA J.R. & G. FORSTER)* EXTRACT AND FRACTIONS IN MALE RATS INDUCTED ANGIOTENSIN II WITH PARAMETERS RENIN AND ANGIOTENSIN II LEVELS

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## ABSTRACT

Hypertension is a cardiovascular disease with a population level of 25,8%1. Hypertension can cause other diseases and is one of the diseases in the world that causes deaths2. The purpose of this study was to determine extract and fractions of matoa (Pometia pinnata) leaves in decreasing renin levels and angiotensin II levels of angiotensin II induced rats. Matoa leaves were extracted by maseration followed by evaporating using rotary evaporator. Hypertension was induced by angiotensin II 0,1152 mg/kg bw intravena every day as long as 14 days and 14 days in the theraphy period . In this study used 21 test animals of male wistar strain rats divided into 7 groups, namely group I as normal control, group II as negative control given CMC Na 1%, group III as positive control given Irbesartan (2,7 mg/ kg bw), group IV given matoa leaves extract (300 mg/kg body weight), Group V was given fraction of n-hexane (2,34 mg/kg bw), Group VI was given ethylacetate fraction (9,54 mg/kg bw), Group VII was given water fraction (7,98 mg/kg bw). Measurement of systolic, diastolic blood pressure, renin levels and angiotensin II levels on the 0 days, 14 days, 21 days and 28 days direct tail-cuff of noninvasive method. Water fraction (7,98 mg/kg body weight) gave significant result in lowering blood pressure ($p<0.05$) on the 14 day of therapy and showed an equal profile with Irbesartan (2,7 mg/ kg body weight). ethylacetate fraction (9,54 mg/kg body weight) gave significant result in lowering renin levels ($p<0.05$) on the 14 day of therapy and showed an equal profile with Irbesartan (2,7 mg/ kg body weight). Extract of matoa leaves (300 mg/kg body weight) gave significant result in lowering angiotensin II levels ($p<0.05$) on the 14 day of therapy and showed an equal profile with Irbesartan (2,7 mg/ kg body weight). It could be concluded that Matoa leaves extracts and fractions (Pometia pinnata) can reduce renin and angiotensin II levels in rats induced by angiotensin II.

Keywords: Pometia pinnata, Leaves, Hypertension, renin levels, angiotensin II levels , induced angiotensin II.

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**PP019**

# ENHANCING THE LIPOPHILICITY OF SODIUM ASCORBYL PHOSPHATE THROUGH THE FORMATION OF MIXED SURFACTANTS

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## ABSTRACT

Delivery of hydrophlic compounds through the skin has limitations because it has a smaller partition into the oil layer so that its low permeability into the skin (1,2,3). Sodium Ascorbil Phosphate (SAP) is a hydrophilic derivate of ascorbic acid with low permeability and more stable as a potential antioxidant (4). SAP is known have properties which also able to regenerate collagen so that it can play a role in inhibiting wrinkling of the skin (4,5). In this study amphilic molecules of lecithin and lipophilic surfactant Span 20 and Span 80 were formulated with SAP to make the it's more lipophilic and can penetrate to skin layer. The initial stage was made a mixture of SAP- lecithin and SPA - Span 20, SAP-Span 80 through the formation of a water-in-oil (A / M) emulsion, then frozen suddenly. These methods aimed to improve the permeability of SAP, thus enhancing its permeation across the stratum corneum. The number of SPAs partitioned in oil in each mixture was 73.55% (SAP-Lecithin), 63.65% (SAP-Span 20) and 55.72% (SAP-Span 80). As a comparison, SAP solution in water was also determined and only 0.62% was partitioned in oil. This study indicates that SAP could made as lipophilic by combination with lipophilic surfactant and ampiphilic molecules and and its potential utility to improve the skin permeation of hydrophilic molecules.

Keywords: Sodium ascorbyl phosphate (SAP), lipophilicity, surfactant, partition

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**PP020**

# PREPARATION AND EVALUATION OF CO-PROCESSED EXCIPIENT HPMC-PREGELATINIZED CANNA STARCH FOR DIRECT COMPRESSION TABLET

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## ABSTRACT

The natural canna starch has poor flow and compressibility, which are essential in the process of tablet compressing1, especially in the direct compression tablets formulation. Pregelatinization and co-processed as a physical modification technique have been conducted widely2; nevertheless, the single modification shows a limitation. The purpose of this study was to preparation and evaluation of co-processed excipient HPMC-pregelatinized canna starch for direct compression tablets formulation. Pregelatinized canna starch was conducted by manufacturing a starch suspension and was heated at 70°C3. Co-processed excipient were prepared by wet granulation method from mixture of HPMC-pregelatinized canna starch in different ratios (1:2, 1:3 and 1:4)4. The co-processed excipient were evaluated for morphology, moisture content, angle of repose, flow rate of granules, compressibility index and Hausner ratio. The ibuprofen tablets were prepared using the co-processed excipient, and the characters of the obtained tablets were subsequently evaluated5. The results showed that co-processed excipient had irregular shape, moisture content in the range of 3.57 – 3.65 %, angle of repose was found to be < 350, flow rate of granules in the range of 13.11 – 16.00 g/s, compressibility index in the range of 9.07 – 12.52 % and Hausner ratio in range 1.11 – 1.14. Co-processed excipient in ratio (1:4) produced the best results. The tablets with co-processed excipient HPMC-pregelatinized canna starch showed characteristics that met the requirements of the good tablets.

Keywords: co-processed excipient, pregelatinized canna starch, direct compression tablet

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**PP021**

# QUANTITATIVE ANALYSIS OF DRUG PLANNING FOR PATIENTS BPJS HEALTH CARE ROAD WITH CONSUMPTION METHOD IN PHARMACEUTICAL INSTALLATION ONE OF THE REGIONAL GENERAL HOSPITALS IN BANDUNG DISTRICT

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## ABSTRACT

Drug management is a series of activities in which one process is planning. Planning is an activity undertaken with the aim to prepare appropriate medicinal needs and as needed to prevent the occurrence of deficiency or excess drug[1] . This study aims to determine the suitability of the process of drug availability planning with the method of consumption and factors that affect the discrepancy of the drug plan for the patient BPJS Outpatient Health in Pharmacy Installation one of the Regional General Hospital in Bandung district. This research is a descriptive research with retrospective retrieval data to report the amount of usage and the remaining drug BPJS in Pharmacy Installation one of the Regional General Hospital in Bandung District. By using the consumption method, the results showed that from 88 drug samples, the result of the matching of drug procurement in October, November and December 2017 were 56,82%, 54,55% and 80,68% respectively. Factors that affect the mismatch of planning include: pending, empty distributors, not impressive and the product is not in the e-catalog list.

Keywords: Drug Planning, Methods of Consumption, Pharmaceutical Installation

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**PP022**

# LENGTH OF FERMENTATION WITH TOTAL PHENOL CONTENT, TOTAL FLAVONOIDS CONTENT AND ANTIOXIDANT ACTIVITY IN THE MANUFACTURE OF FERMENTED AQUILARIA MALACENCIS LEAF TEA

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## ABSTRACT

Tea is a functional drink contain antioxidant compounds, which can neutralize free radicals, one of the causes of aging and several diseases1,2. Fermentation in tea is claimed to be able to increase antioxidant activity caused by metabolic results of fermentor microorganisms during the fermentation process3. Gaharu is used as a drink and have antioxidant activity. The aim of this study was to determine the fermentation time at 48 hours 96 hours and 192 hours of tea characteristics, antioxidant activity, total phenolics and flavonoids content. The results showed that the characteristics of tea after fermentation revealed pale yellow color, sour aroma, sour taste, total LAB at 48, 96, and 192 hours were 8.49x106; 7.42x106; 2.6x1010 CFU/mL, respectively.Antioxidant activity (IC50) at 48, 96, and 192 hours were 439.444; 235.309 and 190.33, respectively. Total phenolic content (mgGAE/gram) at 48, 96, and 192 hours were 22.561 ± 8.43; 18.173±3.56; and 21.14±0.62 respectively. Total Flavonoid content (mgQE/gram) at 48, 96, and 192 hours were 1.901±0.35; 1.938±0.158, and 3.76±0.14, respectively. The conclusion of this research was the fermentation with Lactobacillus plantarum revealed good characteristics, length of time of fermentation can affect the antioxidant activity, the total amount of phenols and total flavonoids contained in fermented tea.

Keywords: Fermentation tea, Aquilaria malaccensis Lamk leaves, Lactobacillus plantarum.

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**PP023**

# FORMULATION AND PHYSICAL EVALUATION OF EDIBLE FILM PREPARATIONS FROM ETHANOL EXTRACT OF BETEL LEAVES (*Piper betle* L) FOR CANKER SORE DRUGS

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## ABSTRACT

Canker sore which in medical terms is called aphthous stomatitis is a wound in the mouth that can cause pain and discomfort1. Piper betel leaf can be used for strengthening the teeth, cure canker sores, treat the bad breath and stop the gum from bleeding2. The research aimed to determine the edible film formula of betel leaf ethanol extract that met the physical evaluation requirements and to determine the effect of variation concentration of sorbitol and HPMC on the physical evaluation. Edible film preparation from betel leaf extract is a thin layer made from the basic ingredients of corn starch, sorbitol, and HPMC. In this research, 3 edible film formulas were made with variations in the concentration of sorbitol and HPMC, namely: F1 (5%;5%), F2 (4%;4%), F3 (3%;3%). Data of evaluation results were analyzed by Kruskal wallis method. The results showed that F1, F2 and F3 met the physical evaluation requirements for edible film preparation. Variations in the concentration of sorbitol and HPMC gave different results significantly influence ($p<0.05$) on weight uniformity, film thickness, solubility and dissolution time, and did not significantly influence ($p>0.05$) on the organoleptic test, fragility of edible film, water resistance (swelling) and moisture content. It can be concluded that all edible formulas met the physical evaluation.

Keywords: Betel leaf extract, edible film, HPMC, sorbitol

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**PP024**

# ANTIDIABETIC AND ANTIOXIDANT ACTIVITIES OF KLUTUK BANANA (Musa balbisiana Colla) PEEL SUBFRACTIONS

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## ABSTRACT

Indonesia has a diversity of plants that can be used for medicine, one of the plants is klutuk banana[1]. Based on several researches klutuk banana has antidiabetic and antioxidant activity[2]. The purposes of this study were to determine antidiabetic and antioxidant activities of klutuk banana (Musa balbisiana Colla) peel subfractions. The obtained ethanol extract was suspended with water, then partitioned with ethyl acetate and n-hexane and then fractionated by liquid-liquid extraction (LLE). Fraction of ethyl acetate and then subfractionated by vacuum liquid chromatography, antidiabetic activity test by alloxan-induced diabetic mice method and antioxidant activity by using DPPH method. The results of vacuum liquid chromatography was 11 subfraction, then the 11 subfractions were monitored by thin-layer chromatography (TLC). Based on the similarity of Rf values, the merger of the fraction was conducted into 5 major subfractions, i.e klutuk peels subfraction KPS1 (1-2), KPS2 (3-4), KPS3 (5-6), KPS4 (7-9), KPS5 (10-11). From the results of this study, it was known that the showed that antidiabetic activity test, to decrease blood glucose level at the 7th and 14th day of KPS1 (-57%,-68%; p. 0.000), KPS2 (-67%,-72%, ; p. 0.000), KPS3 (-69%,74%, ; p. 0.000), KPS4 (-50%,69% ; p. 0.000), KPS5 (-60%,-70%; p. 0.000) and it can be determined IC50 DPPH of KSP1 was 4.4154 µg/ml, and its AAI 3.40, KSP2 was 3.4769 µg/ml, and its AAI 4.31, KSP3 was 0.2479µg/ml, and its AAI 60.51, KSP4 was 3.2640 µg/ml and its AAI 4.60, KSP5 was 3.0109 µg/ml, and its AAI 4.98. The five subfractions of banana klutuk peel had antidiabetic and antioxidant activities

Keywords: antidiabetic, alloxan, antioxidant, Musa balbisiana, subfraction

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**PP025**

# COMPARISON OF ANTIHYPERGLYCEMIC ACTIVITY OF DIFFERENT PARTS OF KLUTUK BANANA *(Musa balbisiana Colla)*

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## ABSTRACT

Banana is a plant that grows in Indonesia and widely consumed by Indonesian people1. One of banana type is klutuk banana (Musa balbisiana Colla). There were many types of researches about klutuk banana for antidiabetic2 activity, however, antidiabetic activity of its peel and pulp are still unknown. The objective of the study was to determine of antihyperglycemic activity of different parts of klutuk banana. Animals were divided into 15 groups, namely normal control, negative control, positive control (glibenclamide 0.65 mg/kg body weight (bw), and 12 sample groups. All animals were given 2 g/kg bw glucose monohydrate and blood glucose level was measured every 30 min for 120 min. The results of oral glucose tolerance test (OGTT) showed that KPE2 (klutuk peel extract 350 mg/kg bw) gave higher activity to decrease blood glucose level compared to the other groups at the minute of 30 (-24.83%; p. 0.00), 60 (-33.93%; p. 0.000), 90 (-46.29%; p. 0.000) and 120 (-35.44%; p. 0.000). The klutuk peel extract has very strong antioxidant activity and antihyperglycemic activity at a dose of 350 mg/kg bw.

Keywords: antihyperglycemic, Musa balbisiana, different parts, OGTT

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**PP026**

# OPTIMIZATION OF Lactobacillus plantarum ACTIVITIES IN THE BIOSINTHESIS OF LIPASE ENZYMES

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## ABSTRACT

Lipase was protein compounds that can be used for many human activities. Its main function was to degrade fat including 'wrapping' cholesterol which make easily flowed in the blood. The presence lipase was important because can help the digestive healthy. These enzyme can catalyze a variety of reactions including hydrolysis, alcoholysis, esterification and aminolysis1. Lipase was utilized in various sectors, such as fat, oil, milk and pharmaceutical industries2. This enzyme biosynthesis can be carried out by Pseudomonas aeruginosa, Lactobacillus plantarum and Aspergillus niger3. The process through fermentation techniques in lipid containing substrates under optimal conditions required by microorganisms. The fermentation products produced were tested for the presence of lipase enzymes qualitatively and quantitatively. The biosynthesis process can be influence by changes in pH, temperature and the presence of glucose. This study aimed to determine the ability of L.plantarum to produce lipases with vegetables oil substrates. The research used L. plantarum carried out at 37oC for 24-48 hours and pH 6-8 in the vegetable oil substrates. The fermentation products showed hydrolysis reaction to the test media containing oil lipids with lipase levels of 2.708 - 3.3 U / mL.
It can be concluded that Lactobacillus plantarum can synthesize the lipase enzyme in vegetable oil substrates.

Key words : Lactobacillus plantarum, biosynthesis, lipase, palm oil, corn oil

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**PP027**

# COST-EFFECTIVENESS ANALYSIS OF PROLANIS OF TYPE 2 DIABETIC PATIENTS IN THREE COMMUNITY HEALTH CENTERS IN BANDUNG, INDONESIA

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## ABSTRACT

Chronic Disease Care Program (Program Pengelolaan Penyakit Kronis, Prolanis) is expected to encourage type 2 diabetic patients to achieve optimal quality of life with an effective and rational cost.1 The purpose of this study was to determine the cost-effectiveness of type 2 diabetic patients in community health centers (Pusat Kesehatan Masyarakat, Puskesmas) of Rancaekek, Linggar, and Nanjungmekar. This study was determined the alternative criteria, population criteria, outcome, research perspectives, cost components, and pharmacoeconomic analysis. The medicine was a combination of metformin and glimepiride, the outcome parameter was blood glucose level, cost components were fee of BPJS class III and transportation cost with the patient's perspective. Pharmacoeconomic methods was cost-effectiveness analysis. Respondents were given counseling of the importance of medicine consumption. In each Puskesmas, 20 respondents were selected randomly, then grouped by gender (male (15%) and female (85%)) and age (the highest in range from 56 to 65 years old, 36.67%). The average cost-effectiveness ratio of Prolanis in Puskesmas of Rancaekek, Linggar, and Nanjungmekar was 1,073, 956 and 1,885 IDR per decreased glucose level, respectively. The statistical analysis of decreased blood glucose was 0.341 and the Prolanis cost was 0.399, which no difference between decreased blood glucose and Prolanis costs in the three Puskesmas. It was concluded that the Prolanis of Linggar Puskesmas was the most cost-effective compared to the Rancaekek and Nanjungmekar Puskesmas.

Keywords: Puskesmas, cost component, pharmacoeconomic analysis, blood glucose level

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**PP035**

# EFFECTIVE INHIBITION OF MPRO SARS-COV-2 INFECTION BY RESVERATROL IN RED GRAPE SEEDS THROUGH MOLECULAR DOCKING APPROACHES

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## ABSTRACT

New coronavirus infections (COVID-19) spread rapidly throughout the world and it is mortality rates have increased dramatically, representing one of the big disasters in human history. To date, no effective therapeutic approach has been licensed, while the need to find new therapeutic strategies is urgent. Some evidence in the literature reports that resveratrol in red grape seeds (*Vitis vinifera*) exhibits a series of extraordinary biological activities, including antiviral properties. Therefore, this research aims to investigate intermolecular interactions between resveratrol and its derivatives (pterostilbene, piceatannol, and viniferin) against the main protease (Mpro) SARS-CoV-2 by utilizing molecular docking studies using MGLTools 1.5.6 with AutodockTools 4.2. Then to ensure the important interactions involved, identification around the binding site was carried out using BIOVIA Discovery Studio Visualizer 2020. The results of molecular docking studies showed that there were no significant differences in the binding affinity of resveratrol, pterostilbene, and piceatannol to main protease (Mpro) SARS- CoV-2, with free binding energy values of −28.28 kJ/mol, and −25.48 kJ/mol, and −28.74 kJ/mol, respectively. These three compounds have a better binding affinity compared to natural inhibitors of the main protease (Mpro) SARS-CoV-2, with a value of −16.82 kJ/mol. Interestingly, viniferin has a stronger affinity on the active site area of the SARS-CoV-2 main protease (Mpro), with a binding energy value of −34.10 kJ/mol. Thus, it can be concluded that resveratrol and its derivatives especially viniferin has the potential as a main protease (Mpro) SARS-CoV-2 inhibitor in the development of candidates for the treatment of COVID-19.

Keywords: COVID-19, Red grape seeds, Resveratrol, Mpro SARS-CoV-2, Molecular docking study.

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**PP037**

# THE EXPLORATION OF OTHER BIOACTIVE COMPOUNDS IN THE CHLOROFORM FRACTION OF SAPPAN WOODS (*Caesalpinia sappan* L)

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## ABSTRACT

Sappan wood (*Caesalpinia sappan* L) is very well known for its properties, such as a health drink. Wood powder which is brewed in hot water will produce a red solution that can be used to enhance immunity, improve blood circulation and treat several diseases such as diabetes, cancer, liver disorders[1]. The published researches result mainly explore compounds of the flavonoid group characteristics of sappan wood. The chemical content that was considered the most dominant is brazilin and brazilein. Other compounds contained by sappan wood are saponins, tannins, alkaloids, terpenes[2].
Sappan wood extraction using ethanol as a solvent has been carried out using maceration method. Then liquid-liquid extraction is carried out to separate some metabolites, especially alkaloids[3]. Non-polar fractions were taken and further separation has been carried out using preparative thin layer chromatography with chloroform-ethylacetate (7:3) as an eluent. Two bright blue spots formed with Rf value of 0.88 and purple spots with Rf value of 0.94 after being seen on a UV 365 lamp. Blue light colored spots were taken and tested with a spectrophotometer UV 200-400 nm obtained peak at 228.6 nm.

Exploration carried out on ethanol extract and chloroform fraction showed the presence of bioactive compounds which are potential as antimicrobial alkaloids[1].

Keyword : Exploration, *Caesalpinia sappan* L, bioactive compound, chloroform fraction, antimicrobial agent

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**PP038**

# LITERATURE REVIEW: THE EFFECT OF ADDITIONAL FERMENTATION STARTER ON BLACK ONION (*Allium sativum* L.) ON SOME CONTENTS OF SECONDARY METABOLITIC COMPOUNDS AND ANTIOXIDANT ACTIVITIES

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## ABSTRACT

Black onion is a processed product of garlic (Allium sativum L.) that has gone through a heating process for a certain period of time using high temperature and humidity. The process improves the taste and odor of garlic, increases flavonoid compounds, polyphenols, organosulfur and their antioxidant activity[10,12]. In addition to heating process several studies conducted fermentation by adding bacterial starter[9,15]. This paper aims is to determine the effect of the addition of a fermentation starter to black onions including changes that occur in flavonoid compounds, polyphenols, organosulfur and antioxidant activity using the literature study method. Results showed the levels of flavonoids and polyphenols experienced a significant increase after fermentation with *Saccharomyces kluyveri*. Fermentation also affects organosulfur compounds contained in black onions such as the survival of the alliin compound due to the addition of *Lactobacillus plantarum*, changes in alisin compounds by *Pediococcus pentosaceus* and increased S-allylcystein (SAC) compounds by *Lactobacillus rhamnosus*, *Lactobacillus paracasei* and *Lactobacillus casei*. In addition, the antioxidant activity of fermented onions with various bacteria is better than that of black onions without the starter addition.

Keywords: black onion, fermentation, starter, heating, antioxidant

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**PP042**

# EVALUATION OF THE MOLECULAR INTERACTION FOR ANTITUBERCULOSIS AND B-CYCLODEXTRIN COMPLEXATION THROUGH MOLECULAR DOCKING STUDIES

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## ABSTRACT

β-cyclodextrin is a family of cyclic oligosaccharides with a hydrophilic outer surface and a lipophilic central cavity. The β-cyclodextrin molecule is relatively large with several donors and hydrogen acceptors and generally does not penetrate the lipophilic membrane. In the pharmaceutical industry, β-cyclodextrin has mainly been used as a complexing agent to increase the water solubility of active substances which are less soluble and to increase its stability. Several active pharmaceutical substances used as molecular models in this research are first-line antituberculosis which includes Isoniazid, Pyrazinamide, Rifampicin, and Ethambutol. Through this research, an interaction study will be conducted between β-cyclodextrin and antituberculosis by molecular docking simulations to investigate its affinity using PatchDock. Moreover, visualization of the four complexes formed was observed using BIOVIA Discovery Studio Visualizer 2020. Based on the results of molecular docking simulations, it was found that Rifampicin has a better affinity than Isoniazid, Pyrazinamide, and Ethambutol, with ACE score of −747.95 kJ/mol, −179.24 kJ/mol, −175.78 kJ/mol, and −230.17 kJ/mol, respectively. Therefore, this research can predict the interaction of complexation formed between β-cyclodextrin and antituberculosis through *in silico* approaches.

Keywords: β-cyclodextrin, Antituberculosis, Targeted delivery system, Drug formulation, Molecular docking study.

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**PP043**

# CYTOTOXICITY EXTRACTS COMBINATION OF *Curcuma Xanthorrhiza* AND *Averrhoa Bilimbi* FRUITS ON HeLa AND MDA-MB-231 CELL LINES

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## ABSTRACT

The combination of *Curcuma xanthorrhiza* rhizome and *Averrhoa bilimbi* fruits is known to reduce blood glucose levels in diabetic rats. Future research on the effect of this combination as an anticancer on HeLa (Cancer Servic) and MDA-MB-231 (Breast Cancer) cell lines can be used as a complementary treatment for cancer sufferers. The purpose of this study was to determine the cytotoxic effect of a combination of *C. xanthorrhiza* and *A. bilimbi* extracts on HeLa and MDA-MB-231 cell lines. The research method uses MTT assay which consists of three treatments namely *C. xanthorrhiza* rhizome extract, *A. bilimbi* fruit extract, and its combination with six concentrations (500, 200, 100, 50, 20, 10) ppm. The measured parameter is the $IC_{50}$ value of each treatment. The results showed the $IC_{50}$ value of HeLa cell line in *C. xanthorrhiza* extract was 43.68 ppm, *A. bilimbi* fruit extract was > 500 ppm, and the combination extract ratio 1:1 was 50.77 ppm; 1:2 ratio was 49.44 ppm; 2:1 ratio was 34.53 ppm. While the $IC_{50}$ value of the MDA-MB-231 cell line in *C. xanthorrhiza* extract was 29.65, *A. bilimbi* fruit extract was 447.25; and 1:1 ratio combination was 25.02; 1:2 ratio was 26.9 and 2:1 ratio was 16.70 ppm. The conclusions of the study show that the combination of extracts with a ratio of 2:1 has a strong cytotoxic effect on MDA-MB-231 (breast cancer) cell line so that it is potentially used in complementary medicine.

Keywords: *A. bilimbi*, Cell lines, *C. xanthorrhiza*, Cytotoxic, HeLa, MDA-MB-231

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**PP045**

# INTERACTION BINDING STUDY OF SALMETEROL WITH FUNCTIONAL MONOMERS USING SEMI EMPIRICAL METHOD TO DESIGN AN IMPRINTED POLYMER OF SALMETEROL XINAFOATE

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## ABSTRACT

Salmeterol (SAL) is an inhaled bronchodilator drug used for the treatment of asthma[1]. Due to performance-enhancing effect, salmeterol appears on the prohibited list published by the World Anti-Doping Agency, and its therapeutic use is allowed but restricted to inhalation with dosage not higher than 200 µg[2]. Therefore, an efficient and selective separation method is required to detect and monitor the level of SAL in the body. Molecularly imprinted polymers (MIPs) are synthetic receptors having potential applications as a sorbent for drug extraction from biological matrices. In the present study, semi-empirical simulation and computational screening were used to identify functional monomer having the best interaction with SAL. A virtual library of 8 functional monomers was built and the possible minimum energy conformational of the monomers and SAL in the form of base and salt were calculated using PM3 semi empirical method for the synthesis Salmeterol Imprinted Polymer. The virtual template-monomer complex with the highest interaction energy is more stable during the polymerization and leads to high selectivity and specificity toward the template. The interaction energy of SAL in salt form was found to be highest with 2-Hydroxyethyl methacrylate, followed by 4-vinyl benzoic acid and least with 4-vinyl pyridine. In contrast, SAL in base form was found to be highest with 2-Hydroxyethyl methacrylate, followed by acrylamide and least with 2-(trifluoromethyl) acrylic acid.

Keywords: salmeterol, Molecularly Imprinted Polymer, semi empirical method, interaction energy.

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**PP046**

# OPTIMATION OF GENE ENCODING ANTI HER2 scFv [pD861-pelB] OVEREXPRESSION IN *Escherichia coli* BL21(DE3)

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## ABSTRACT

Breast Cancer is a malignant tumor that attacks breast tissue derived from glands, glandular channels, and breast support tissue. Overexpression of HER-2 (Human Epidermal Growth Factor Receptor 2) is one of the reasons of breast cancer occurrence. Anti-HER2 scFv recombinant protein is an alternative for breast cancer detection other than the monoclonal antibody. Anti-HER2 recombinant protein was produced in Escherichia coli BL21(DE3) through overexpression of gene encoding anti HER2 scFv within [pD861-pelB] plasmid. So, anti HER2 scFv can be delivered to the extracellular medium. To produce anti-HER2 scFv in optimum condition, optimization of gene encoding anti HER2 scFv overexpression was determined with 1x, 1.5x and 2x media strength and l-rhamnose concentrations of 40 µM, 1 mM, 2 mM, 4mM, dan 6 mM. Anti-HER2 scFv optimally was overexpressed using 1x liquid growth medium (Luria Bertani broth) and with 4 mM l-rhamnose concentration after 4 hours of induction observed in the periplasmic fraction. After optimum condition obtained, re-expression was performed using optimum condition. Extracellular protein obtained was then purified using nickel polyhistidine tag affinity chromatography (Ni-NTA). However, purification of anti-HER2 scFv had not been successful using this method.

Keywords: Overexpression, optimal condition, media strength, l-rhamnose concentration

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**PP047**

# MOLECULAR DYNAMIC SIMULATION OF ASIATIC ACID DERIVATIVES COMPLEX WITH INDUCIBLE NITRIC OXIDE SYHTHASE ENZYME AS AN ANTI INFLAMMATORY

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## ABSTRACT

Nitric Oxide Synthase (NOS) is an enzyme found in the human body that provides free radicals, namely Nitric Oxide (NO). However, NO that resulted from iNOS can be produced continuously and uncontrollably due to the imbalance of homeostasis and that will be inducing inflammation in the body. Asiatic acid is an triterpenoid compound from *Centella asiatica* has been reported about its anti-inflammatory activity. Molecular docking study showed that Asiatic acid (AA1) has better selectivity to the iNOS receptor than the COX-2 receptor[1]. Also, the Asiatic acid derivatives (AA2 - AA13) provide better stability and free energy binding than the original one (AA1)[2]. The aim of this study to ensure stability as well as binding energy using Molecular Dynamics (MD) simulations. AMBER18 was used to prepared the system of MD within 100ns also MMGBSA (Molecular Mechanics / General Birth Surface Area) was used to calculated the binding energy within complexes. As the result, Molecular dynamics simulation revealed that all of best derivative compounds (AA5, AA6, AA7, and AA9) give satisfactory results specifically for AA5, that superior to other derivatives at binding energy which value is -44.6753. Furthermore, RMSD of AA5 has lower value (0.58 Å) compared to negative control (arginine) (1.78 Å) and other derivatives; AA6 (0.7 Å), AA7 (0.84 Å) dan AA9 (1.09 Å). moreover, the RMSF graph comes up with high fluctuations in iNOS protein residues. Therefore based on the results, AA5 considerably to become a good anti-inflammatory candidate for the iNOS receptor.

Keywords: Molecular Dynamic; Asiatic acid; iNOS; MMGBSA

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**PP049**

# THE EFFECT OF VOLUME VARIATION OF SWEET ORANGE (*Citrus sinensis*) JUICE AND PEEL EXTRACT COMBINATION TOWARD THE CHARACTERISTIC AND ANTIBACTERIAL ACTIVITY OF NANOSILVER

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## ABSTRACT

Biosynthesis of silver nanoparticles (nanosilver) by using sweet orange (*Citrus sinensis*) as a bioreductor has shown nanosize results. Unfortunately, the last studies not yet monitor the stability of synthesized nanosilver. Furthermore, the effect of volume variation of sweet orange juice and peel extract combination as bioreductor toward the characteristic and antibacterial activity of synthesized nanosilver in this research will be studied.
In the formation of nanosilver, solution of silver nitrate 1 mM was first mixed with combination of sweet orange juice - peel extract (3:0 mL), (1.5:1.5 mL), (1:2 mL), (0.5:2.5 mL) and (0:3 mL). Biosyntesis was carried out with boiling mixed solution at 60˚C for 45 minutes. Color change from colorless to yellowish-brown was indicated nanosilver has formed and confirmed using UV/Vis spectrophotometer and Transmission electron microscopy analysis. The stability of nanosilver over one month storage also monitored and their antibacterial activity against *Staphylococcus aureus* and *Staphylococcus epidermidis* tested by diffusion method.
The result shows that sweet orange juice addition in bioreductor combination accelerates color change of the mixed solution and characterization of nanosilver with UV/Vis spectrophotometer confirmed SPR peak in the range 438-459 nm. The stability test showed that nanosilver reduced with bioreductor juice-peel extract (0.5:2.5 mL) was stable. That formula, has the largest average inhibition diameter among the other formulas againts *S.aureus* was 19.50 mm and *S.epidermidis* was 18.09 mm, indicates a strong inhibition. The TEM analysis of nanosilver (0.5:2.5 mL) confirmed the average size of particles is about 41 ± 10 nm with spherical form.

Keywords: *nanosilver, biosynthesis, Citrus sinensis, characteristic, antibacterial activity*.

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**PP051**

# THE EFFICACY OF CYCLODEXTRIN AS MOUTHRINSES ACTIVE COMPOUND AGAINST SARS-COV-2 MPRO IN PREVENTING COVID-19 INFECTION THROUGH MOLECULAR DOCKING STUDY

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## ABSTRACT

Cyclodextrin is a cyclic oligosaccharide derived from starch enzymatic digestion. Alpha, beta, and gamma cyclodextrin consist of 6,7,8 glucopyranose units with primary and secondary hydroxy groups. Cyclodextrin is widely used in mouth rinse preparations because of its antiviral activity. The cyclodextrin structure can be modified and will be used as an antivirus. Oral cavity is a major portal of entry of infectious agents. The oral cavity is associated with the entry of SARS-CoV-2 in its inhalation ambient particles in the air. This study was conducted to evaluate and compare interactions between cyclodextrin (alpha, beta, and gamma) against the main protease (Mpro) of SARS-CoV-2. Molecular docking simulation are used to investigate the affinity of cyclodextrin (alpha, beta, and gamma) against SARS-CoV-2 Mpro using MGLTools 1.5.6 with AutodockTools 4.2. The visualization of each complex was observed using BIOVIA Discovery Studio Visualizer 2020. The results of this study showed that cyclodextrin has better affinity compared to inhibitor N3 as natural ligands, with binding free energy values of -5.41 kcal/mol (inhibitor N3); -8.85 kcal/mol (alpha cyclodextrin); -9.09 kcal/mol (beta cyclodextrin); -9.24 kcal/mol (gamma cyclodextrin), respectively. Thus, all of three type of cyclodextrin are thought to be potential as active compounds in the mouth rinse against SARS-CoV-2.

Keywords: Cyclodextrin, SARS-CoV-2 Mpro, Mouth rinse, Molecular docking study

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**PP052**

# PHYSICAL PROPERTIES AND RATE OF DIFFUSION TRANSETHOSOME CURCUMIN USING COMBINATION OF TWEEN 60 AND SPAN 60 AS SURFACTANT

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## ABSTRACT

Curcumin penetration can be increased by formulating it into the transethosome system. Surfactant is one of the transethosome component that affect the physical properties and penetration of vesicles.In this study a combination of two surfactants was used so that it could be seen the effect of using a combination of two surfactant on physical properties and penetration of curcumin. In this study used a combination of tween 60 and span 60 with a concentration ratio 0:5 (F1), 1:1 (F2), 2:1 (F3) and 1:2 (F4). In the system then an evaluation which included testing the distribution of particle size, zeta potential and entrapment efficiency. Evaluation continued with the determination of the diffusion rate in vitro. The transethosome system formed has a particle size of 167.9 ± 4.7 nm – 396 ± 3.7 nm with a potential zeta value (-) 49.54 ± 1.77 mV - (-) 59.05 ± 0.95 mV, polydispersion index 0.0% - 57.1% and entrapment efficiency of 83.76% - 93.75%. Diffusion rate testing results show the use of a combination of surfactant can increase the diffusion rat of curcumin.

Keywords: Curcumin, transethosome, surfactant, physical properties, diffusion rate.

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**PP053**

# PHYSICAL CHARACTERIZATION AND RELEASE KINETICS OF METHACRYLIC-COATED NANO-PHYTOSOME ENCAPSULATING ALLICIN-RICH EXTRACT

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## ABSTRACT

Allicin, a natural organosulfur compound, is the main ingredient of garlic, which has extensive pharmacological activities [1], such as antimicrobials [2], antihypertensive, nephroprotective, cardioprotective and antioxidant effects [3]. Its unstable under acidic conditions [1] due to alliinase's inactivation causes the need for preparations that delay release in the stomach to maximize the absorption of allicin [5,6]. This study aimed to characterize the physical and drug release profile in the formula of garlic extract nano-phytosome methacrylate-coated to protect it from gastric acid and increase its bioavailability. Optimized garlic extract nano-phytosome (GNP) has a size of 251.6 nm; polydispersity index 0.466; zeta potential 34.11; entrapment efficiency of 62.62% and specific gravity of 1,005g/mL. Nano-phytosome methacrylate-coated (NPM) was made in three formulas with different molar ratios of GNP and methacrylate (MET) (1:1; 1:1.5 and 1:2) by spray dry. The surface topography of the three formulas shows an almost spherical shape with concave surfaces. The particle size of NPM ranges from 215 ± 6.27nm to 548.8 ± 10.15nm. Entrapment efficiency increases with an increasing number of METs with a maximum value of 65.44% at F3. The results dissolution test in vitro with the modified dissolution method showed a delayed drug release in acidic medium, and drug release occurred in alkaline medium. Drug release of the three NPM formulas followed the Korsmeyer-Peppas model with a k value of 12.7088 ± 0.1769; 17,9322 ± 1,5621; and 12,958 ± 1,2677; respectively. Based on these results, the increase in METs in all three NPM formulas can affect physical characteristics and retain drug release under acidic conditions.

Keywords: nano-phytosome, methacrylate, allicin, release kinetic, physical characterization

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**PP054**

# PAPER-BASED COLORIMETRIC DEVICE FOR DETECTING ALLOPURINOL IN TRADITIONAL MEDICINE BY ENZYMATIC REACTION

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## ABSTRACT

Allopurinol is one of the chemical drugs that is usually added to traditional medicine in Indonesia. Monitoring of allopurinol is needed to support the regulation that inhibits the presence of the chemical drug in herbal medicine due to the potential toxic effect of uncontrolled consumption [1]. The paper-based analytical device is a developing platform for easy and fast analysis [2]. In this study, the paper-based device for allopurinol detection was developed by an enzymatic reaction. The concept is that allopurinol will act by blocking the xanthine oxidase enzyme to produce uric acid and $H_2O_2$, resulting in color change from purple to pale purple until it is colorless. The concept was proofed by spectrophotometry and was applied in four types of filter paper including Whatman Qualitative No. 1, No. 4, and No. 6 and Whatman 1 chromatography. The application of this system was observed using ImageJ analysis. The performance of the paper reveals that Whatman Qualitative No. 4 has the greatest linearity with an R-square value of 0.9844 and best LOD and LOQ (1.62 and 4.91 ppm, respectively) compared to other paper. The stability study shows that all of the paper was stable for 3 day both at room temperature (around 24°C–26°C) and 4°C. The presence of another drug like paracetamol did not prevent the allopurinol detection. The real traditional medicine sample was also analyzed to confirm the applicability of this paper, and the result showed good agreement with spectrophotometry data. Each filter paper shows different characteristics; nevertheless, the paper-based device is potential for in-field allopurinol detection through an enzymatic reaction.

Keyword: Allopurinol, paper-based analytical device, colorimetric, traditional medicine

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**PP055**

# IN SILICO STUDY OF COMPOUNDS CONTAINED IN HEMIGRAPHIS ALTERNATA (BURM.F.) T. ANDER LEAVES AGAINST 5-LIPOXYGENASE (5-LOX)

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## ABSTRACT

Inflammation is a self-protection response to begin the healing process. One of the anti-inflammatory targets worth developing is lipoxygenase inhibitors, which have been studied for several diseases, including severe airways disease. The purposes of this study was to predict the affinity of 24 compounds contained in *Hemigraphis alternata* leaves in inhibiting 5-LOX. The compounds of *Hemigraphis alternata* leaves were screened for its affinity towards 5-LOX using docking software, DOCK 6.9, with zileuton as the comparator. Based on the Grid score, most of the 24 of H*emigraphis alternata* leaves compounds showed a higher affinity towards 5-LOX compare to zileuton. The highest affinity was shown by n-Hexadecanoid acid. The study showed that *Hemigraphis alternata* leaves contains potential active components that could be developed as 5-LOX-inhibitor.

Keywords: In silico, Hemigraphis alternata, Lipoxygenase

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**PP057**

# PHARMACOGNOSY, PHYTOCHEMICAL AND ANTIOXIDANT STUDIES OF DURIO KUTEJENSIS LEAVES

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## ABSTRACT

*Durio kutejensis* (Lai) belongs to family Malvaceae. Leaves extract of another Durio genus has antioxidant activity[1]. Leaves of Lai has been analyzed for pharmacognosy, phytochemical and antioxidant studies. Pharmacognosy study contain of macroscopic, microscopic and physicochemical evaluations. Phytochemical study contain of phytochemical screening. Antioxidant study was analyzed to identify the presence of antioxidant compounds. Pharmacognosy study revealed the characteristic of this leaves. Pytochemical screening revealed the presence of flavonoid, saponin, phenol and steroid/triterpenoid. Antioxidant study showed that leaves extract and fractions have antioxidant compounds.

Keywords: *Durio kutejensis*, pharmacognosy, phytochemical, antioxidant

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**PP058**

# ANTIVIRAL ACTIVITY AND TOXICITY PREDICTION OF COMPOUNDS CONTAINED IN FIGS (*FICUS CARICA* L.) BY *IN SILICO* METHOD

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## ABSTRACT

Viral infection is a global health problem that can cause endemic to pandemic. Compounds delivered from plants has been developed as an alternative antiviral agent. One of the plants that has been used traditionally as antiviral therapy is *Ficus carica* L. (figs).[1] The aim of this research is to predict the inhibitory activity and toxicity of compounds contained in figs as an antiviral for influenza A, HIV, and dengue viruses using *in silico* method. Compounds were docked to the PA-CTD of H1N1 (PBD ID: 5IEQ), PB2 of H3N2 (PDB ID: 4NCM), HIV-1 RT (PDB ID: 3LAL), and DENV-3 RdRp NS5 (PDB ID: 3VWS) protein. Three-dimentional structures were modeled using GaussView and optimized using Gaussian 09W. Optimized compounds were docked to the target protein using AutoDock Tools and the interaction to protein binding side were analyzed in comparison with the standard compounds. The standard compound used for the analysis was 1-(4-chlorophenyl)-1H-imidazole for PA-CTD H1N1, pimodivir for PB2 H3N2, nevirapine, efavirenz, and doravirine for HIV-1 RT, and ivermectin for DENV-3 RdRp NS5. The compound toxicity was analyzed using ECOSAR and Toxtree. Based on the results, the compounds that has similar interaction to the standard compounds were psoralen for PA-CTD H1N1 protein with 4 similar hydrophobic interactions, (-)-epicatechin for PB2 of H3N2 protein which has 3 hydrogen bonds with GLU361, SER324, and LYS376, campesterol for HIV-1 RT protein which has 4 similar hydrophobic interactions, and nicotiflorin for DENV-3 RdRp NS5 protein which has a hydrogen bond with GLY601. Based on the classification of Cramer Rules for toxicity test, all four compounds are classified in class 3 (high toxicity) and according to the Benigni/Bossa Rulebase classification, all four compounds are negative for genotoxic and nongenotoxic carcinogenicity except psoralen is predicted to be genotoxic carcinogenicity.

Keywords: Antivirus, influenza A, HIV, dengue, figs, molecular docking, toxicity

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**PP059**

# PHYSICOCHEMICAL PROPERTIES OF 131I-RUTIN IN ACIDIC LABELING CONDITION AS A RADIOLABELED COMPOUND FOR THE DIAGNOSIS OF CANCER

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## ABSTRACT

The labeled compound of $^{131}$I-rutin is a radiopharmaceutical that can use in the field of nuclear medicine for the diagnosis of cancer. The physicochemical characteristics of radiopharmaceutical play an important role in its spread and accumulation in the body. Therefore, to ensure the successful use of radiopharmaceuticals, it is necessary to test their physicochemical properties. The labeling of Rutin with radioisotope Iodine-131 using the oxidation method by Chloramine-T in acidic condition. Radiochemical purity testing was carried out by thin-layer chromatography (TLC-SG $F^{524}$) using 100% methanol as the mobile phase. The charge of $^{131}$I-rutin determined by the paper electrophoresis method. Its lipophilicity (P) known by determining the coefficient of its part in organic-water solvents. Plasma protein binding was determined in vitro by precipitation method using a 5% trichloroacetic acid (TCA) solution. The results showed that the labeled compound of $^{131}$I-rutin has a neutral charge with a lipophilicity value (Log P) = 0.395 ± 0.203 (hydrophilic), and bound to human blood plasma proteins with a percentage of 69.36% ± 1, 88%.

Keywords: $^{131}$I-rutin, pharmacochemical characteristic, labeled compound, iodine-131

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**PP060**

# STABILITY TEST OF PHENYTOIN IN HUMAN SALIVA USING HPLC-UV METHOD FOR THERAPEUTIC DRUG MONITORING STUDY IN MEDICAL LABORATORY

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## ABSTRACT

Clause 5.4.7 in ISO SNI 15189: 2012 requires medical laboratories to have procedures that include a time limit for storing samples before being tested[1]. The determination of phenytoin (PHT) from patient saliva for therapeutic drug monitoring has been conducted using several chromatographic conditions[2,3,4]. This research is part of the validation procedure of the PHT bioanalysis method, aiming to obtain data on the stability of PHT in spiked-saliva. Spiked-saliva samples of PHT concentrations of 1.5 and 4 μg / mL were stored at room temperature and minus 20°C for one month. Determination of PHT using the reverse phase HPLC at a wavelength of 200 nm with a stationary phase C8 (4.6 x 150 mm; 5 μm) and a mobile phase of methanol: water (55:45). The results showed the PHT stock solution in methanol was stable for up to 30 days at 4°C. However, salivary samples containing PHT showed stability for storage no more than 6 hours at room temperature and no more than seven days at minus 20ºC. Unlike spiked-salivary PHT that has been extracted, the sample shows a stable level of up to 24 hours at room temperature. If the TDM action for patients who receive PHT drugs in the hospital use saliva as biological fluids, the analyte must be extracted immediately and stored at 4°C.

Keywords: phenytoin, saliva, stability, HPLC-UV

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**PP061**

# SYNTHESIS OF IODINE-131 LABELED ESTRADIOL WITH DIRECT METHOD

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## ABSTRACT

Estradiol is a steroid hormone, works as agonist estrogen receptor. Synthesis of labeled estradiol by radioiodination method was carried out as an initial step to determine the characteristics of $^{131}$I-estradiol for radioligand binding assay. Synthesis of $^{131}$I-estradiol was carried out by the direct method using chloramine T as an oxidizer. Variations in the amount of estradiol, the amount of chloramine T and the incubation time were carried out. Percentage of radiochemical purity was determined by thin layer chromatography and paper electrophoresis. Free Iodine-131 radiochemical impurity can be separated by the Whatman 1 stationary phase and the mobile phase of methanol : water = 90 : 10 at Rf 0.8-1.0 and Na$^{131}$I impurities by electrophoresis using the stationary phase of cellulose acetate paper with a phosphate buffer solution of 0.1 M pH 7,4. The results showed that the variation of estradiol in the amount of 2, 10, 20, 50 and 100 µg obtained the percentage of radiochemical purity of 76.97±4.36%; 87.99±2.84%; 91.84±1.47%; 97,71±1,71%; 94.58 ±1.33% respectively. Optimization of 100 and 200 ug chloramine T, was obtained the radiochemical purity of 98.18±0.40% and 97.16±0.2%. In determining the incubation variations from 1, 5 and 15 minutes, radiochemical purity was obtained 67.63±27.57%; 98.41±021%; 97.57±0.20% respectively. Based on the result, the optimum condition to obtain the highest radiochemical purity used 50 µg estradiol, 100 µg chloramine T and 5 minutes incubation time.

Keywords: estradiol, iodine-131, estrogen receptor, chloramine T

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**PP065**

# PRECLINICAL STUDY OF CARICA PAPAYA LEAVES EXTRACT AS IMMUNOMODULATORY AND ANTI-THROMBOSITOPENIA

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## ABSTRACT

Papaya plant (*Carica papaya* L.) is one of the plants of the Caricaceae family that is widely cultivated in Indonesia and proved has multiple health benefits. The search for plants that have immunomodulatory and antithrombocytopenia activities are the main concern of researchers around the world, especially now, where there is a corona virus pandemic (covid-19) and epidemics of dengue hemorrhagic fever. This study aims to determine the immunomodulatory and anti-thrombocytopenia activities of ethanol extracts of papaya leaves conducted *in vivo* on Wistar strain rats. Observation of immunomodulatory activity was carried out using the CBC-Diff method, meanwhile for anti-thrombocytopenia using heparin induction on rat. Observation of immunomodulatory activity was carried out on number of monocytes, neutrophils, leukocytes, and lymphocytes parameters. Obseravation of antithrombocytopenia was carried out to count the number of platelets, erythrocytes, and hematocrit by Hematology analyzer device. Based on statistical analysis results , it was concluded that papaya leaf extract showed significant immunomodulatory activity at dose of 800 mg/kg b.w. and at a doses of 100, 200, and 400 mg/kg b.w. can increased platelets level as 68.01%, 96.46%, and 67.19%, respectively. Papaya leaf extract in 20% ethanol solvent showed the highest increase in platelet level when compared with 50% ethanol solvent.

Keywords: Carica papaya L., immunomodulatory, Dengue Hemorrhagic Fever, antithrombocytopenia, heparin induction, hematology analyzer.

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**PP066**

# THERMODYNAMIC STUDY OF COMPLEX FORMATION BETWEEN α-MANGOSTIN WITH γ-CYCLODEXTRIN

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## ABSTRACT

α-Mangostin is one of the active compounds in Garcinia mangostana rind which has several activities such as anti-inflammation, anti-cancer, antibacterial, and antioxidant. This potency does not support with the solubility as the barrier to distribute the active compound because the low solubility of α-Mangostin in water. The aim of this study is to increase the solubility of α-Mangostin in water through complex formation. The complex was made with a solubilization method. Formation of the complex studied by Job's Plot method and the thermodynamic study was done to get the formation energy of the complex formation of α-Mangostin with γ-cyclodextrin. The job's Plot showed that the complex formation occurs in α-Mangostin: γ-cyclodextrin stoichiometry ratio 1:1 with the entrapment efficiency of 87,59%. The thermodynamic study display that the complex formed spontaneously with the Gibbs energy -6.465 kcal/mol and ΔH is -0.049 kcal.

Keywords: α-Mangostin, γ-cyclodextrin, inclusion complex, Gibbs energy, entalpi

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**PP068**

# VITAMIN D INHIBIT LPS-INDUCED INFLAMMATION IN A549 CELLS THROUGH DOWNREGULATION OF INFLAMMATORY CYTOKINES

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## ABSTRACT

Lung inflammation has been reported to affects lung function and even worse threats to life. Vitamin D had been reported as potential agent which may play an important roles in inhibiting the inflammatory cytokines, furthermore, its deficiency also associated to several lung problem, including respiratory distress syndrome, alveolar inflammation, epithelial damage and hypoxia. However, there is limited about role vitamin D in preventing inflammation in alveolar cell. Thus, we developed a cell inflammation model induced by lipopolysaccharide (LPS). The effect of treatment of vitamin D to LPS-induced inflammation in A549 cells was investigated by MTT assays, while its anti-inflammatory mechanism was analysed by using western blot. Our result suggested that vitamin D promotes the A549 cells survival from LPS-induced inflammation through down-regulation of NF-KB and its inflammatory cytokines IL-1, IL-6, IL-12, and TNF-α. Our results showed the potential of vitamin in the management of lung inflammation

Keywords: cytokines, calciferol, Lipopolysaccharide, Lung, Inflammation

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**PP069**

# REMOVING OF MIMOSINE FROM *LEUCAENA LEUCOCEPHALA* (LAM.) DE WIT SEEDS TO INCREASE ITS BENEFITS AS NUTRACEUTICAL

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## ABSTRACT

The *Leucaena leucocephala* (Lam.) de Wit tree contains some pharmacological activities compounds [1,2,3,4,5,6,7]. *Leucaena leucocephala* (Lam.) de Wit trees are easily found in abundant quantities. The utilization as a source of nutraceutical's will increase the value[8]. The yield of extract shows the number of compounds extracted by the solvent[9,10]. Mimosine is another compound contained in *Leucaena leucocephala* (Lam.) de Wit seeds which can cause hair loss[11]. This research studies the process of removing mimosine from *Leucaena leucocephala* (Lam.) de Wit seeds. There are three treatments for *Leucaena leucocephala* (Lam.) de Wit seeds, the seeds without soaking, the seeds soaking with distilled water for 24 hours and the seeds splitting in half then soaked for 24 hours using distilled water, respectively. The seeds dried and grinded then extracted with different concentration of ethanol solvent. Mimosine levels in extract measured with spectrophometer JascoV-730 using ferry chloride as reagent. The results showed the soaking process and ethanol concentration have significant effect to the yield extracts and mimosine levels. The seeds without soaking extracted with 70% ethanol produce the highest ratio of yield extract to mimosine levels. The seeds without soaking and 70% ethanol as solvent can be used to utilize *Leucaena leucocephala* (Lam.) de Wit seeds.

Keywords: *Leucaena leucocephala* (Lam.) de Wit, soaking, ethanol, mimosine, yield extract.

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**PP070**

# DEVELOPMENT AND VALIDATION OF A VOLUMETRIC ABSORPTIVE MICROSAMPLING ASSAY FOR ANALYSIS OF TAMOXIFEN, ENDOXIFEN, 4-OH TAMOXIFEN AND N-DESMETHYLTAMOXIFEN IN BREAST CANCER PATIENTS

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## ABSTRACT

In this research, we use the Volumetric Absorptive Microsampling (VAMS) technique for blood sample collection. Rapid and selective sample preparation and LC-MS/MS assay were then developed and validated for the simultaneous analysis of tamoxifen and its three active metabolites. VAMS extraction was performed in methanol by sonication-assisted extraction method for 25 minutes after 2 hours of VAMS drying. Separation was carried out using Acquity UPLC BEH C18 column (2.1 x 100 mm; 1.7 µm), with a flow rate of 0.2 mL/minute, and the mobile phase gradient of formic acid 0.1% and formic acid 0.1% in acetonitrile for 5 minutes. The multiple reaction monitoring (MRM) value is set at m/z 358,22 > 58,09 for N-desmethyltamoxifen, m/z 372.2 > 72.27 for tamoxifen, m/z 388.29 > 72.19 for 4-hydroxitamoxifen, m/z 374.29 > 58.2 for endoxifen, and m/z 260.2 > 116.2 for propranolol hydrochloride. The lower limit of quantification value (LLOQ) is 2.50 ng / mL for tamoxifen, 2.50 ng/mL for endoxifen, 3.00 ng/mL for 4-hydroxitamoxifen, and 2.00 ng/mL for N-desmethyltamoxifen. This method is proven to be valid, sensitive, selective and applicable for the analysis of tamoxifen and its metabolites in 29 ER+ breast cancer patients.

Keywords : Endoxifen; LC-MS/MS; Tamoxifen;; Validation; Volumetric Absorptive Microsampling

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# IN SILICO STUDY OF COMPOUNDS CONTAINED IN HEMIGRAPHIS ALTERNATA (BURM.F.) T. ANDER LEAVES AGAINST 5-LIPOXYGENASE (5-LOX)

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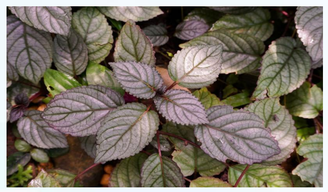
## Background and Objectives



*Hemigraphis alternata* leaves

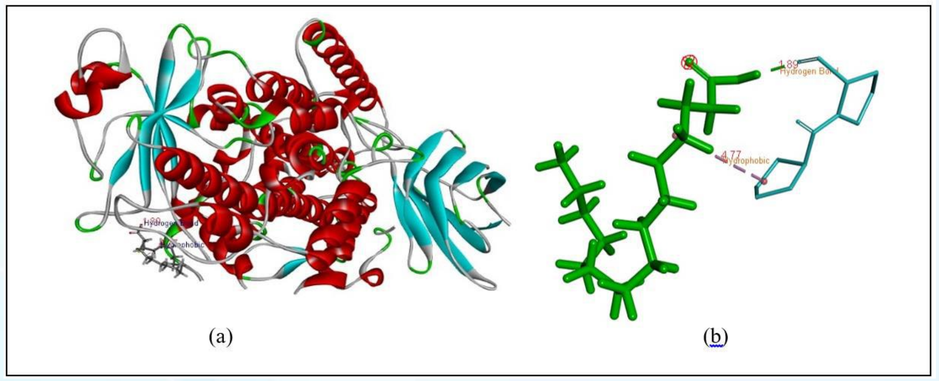
Inflammation is a self-protection response to begin the healing process. *Hemigraphis alternata* has a long history as ethnomedicine for wound healing. This plant contains compounds that are predicted to provide anti-inflammatory effects. There are 23 secondary metabolites that have been isolated in this plant. 5-LOX is an enzyme that metabolizes arachidonic acid and produces leukotriene which is an inflammatory mediator. The purposes of this study was to predict the affinity of 23 compounds contained in Hemigraphis alternata leaves in inhibiting 5-LOX.

## Method and Result

The compounds of Hemigraphis alternata leaves were screened for its affinity towards 5-LOX using DOCK 6.9, with zileuton as the comparator. Docking studies were conducted using flexible docking method.

Table of Molecular Docking Results for Test Compounds against 5-LOX

| No | Compound | *Grid Score* (kkal/mol) | No | Compound | *Grid Score (kkal/mol)* |
|---|---|---|---|---|---|
| 1 | Zileuton (senyawa pembanding) | -26,19 | 13 | Z-2-Dodecenol | -27,28 |
| 2 | 15-Chloro-4-pentadecyne | -25,90 | 14 | 15-Chloro-4-pentadecyne | -25,50 |
| 3 | 4-(2-Methoxyphenyl)piperidine | -25,60 | 15 | 2-Methylenecholestan-3-ol | -31,62 |
| 4 | Cyclobutanol | -12,86 | 16 | L- Alanine | -15,84 |
| 5 | 1-Hexadecyne | -27,62 | 17 | levodopa | -30,38 |
| 6 | 2-Propylmanonic acid | -21,69 | 18 | Glycylsarcosine | -22,65 |
| 7 | n-Hexadecanoic acid | -37,68 | 19 | 5-Hydroxymethylfurfural | -20,94 |
| 8 | 2-Hexylacrylonitrile | -21,67 | 20 | 10-Undecyn-1-ol | -22,86 |
| 9 | 3,7,11-Trimethyl-1,6,10-dodecatrien-3-ol | -26,98 | 21 | 2,5-Dimethyl-2,3-dihydro-5H-1,4-dioxepine | -19,75 |
| 10 | 8a-Methylhexahydro-1,8(2H,5H)-naphthalenedione | -16,49 | 22 | 4-Nitro-5-hydroxy-1,2-dimethylindole | -25,19 |
| 11 | Acrylonitrile β-[3-(2,2 dimethylcyclopropyl)-2,2-dimethylcyclopropyl | -21,93 | 23 | 9,9-Dimethoxybicyclo[3.3.1]nona-2,4-dione | -22,52 |
| 12 | 3,7,11,15-Tetramethyl-2-hexadecen-1-ol | -36,59 | 24 | 2,7-Dioxa-tricyclo[4.4.0.0(3,8)]deca-4,9 diene | -15,29 |




Visualization of Docking Results n-Hexadecanoic Acid and 5-LOX Complex (a) 3D (b) 2D

## Conclusion

The compound in *Hemigraphis alternata* which has the greatest affinity in inhibiting 5-LOX is n-Hexadecanoid acid with the most negative grid score, -37,68 kcal / mol. The affinity of n-Hexadecanoid acid is greater than zileuton as a comparison drug. Then, this study showed that Hemigraphis alternata leaves contains potential active components that could be developed as 5-LOX-inhibitor drug.

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SKP IAI

# CERTIFICATE

No. 173/CERT.X/ISPST/2020

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## *apt. Yeni, S.Farm., M.Si.*

## AS POSTER PRESENTER

Fourth International Seminar on Pharmaceutical Science and Technology (4th ISPST 2020)
Bandung, October 27th - 28th, 2020

Prof. Dr. apt. Ajeng Diantini, M.Si
Dean Faculty of Pharmacy

4th ISPST International Seminar on Pharmaceutical Science and Technology 2020

Dr. apt. Nyi Mekar Saptarini, M.Si
Chairman of 4th ISPST 2020

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