UCSI University®

FACULTY OF PHARMACEUTICAL SCIENCES

RESEARCH BROCHURE

VERSION 4

September 2023

About the Faculty of Pharmaceutical Sciences

The Faculty of Pharmaceutical Sciences strives to establish itself as an important research center for innovative research in the various areas of pharmaceutical sciences especially in clinical pharmacy, pharmaceutical chemistry, pharmaceutical technology and pharmaceutical biology. The Faculty of Pharmaceutical Sciences has an established track record of training pharmacists and scientists since its founding in the year 2000. The Faculty offers both undergraduate and postgraduate programmes with an emphasis on serving the community. It has collaborated with hospitals, community pharmacies, pharmaceutical and other manufacturing industries. The Faculty of Pharmaceutical Sciences conducts the Bachelor of Pharmacy (Hons) degree, Bachelor of Formulation Science (Hons), Diploma in Pharmacy, Diploma in Cosmetic Science, Diploma in Packaging Science and Technology, Master of Clinical Pharmacy Practice, Master of Science in Pharmaceutical Chemistry, Master of Science in Pharmaceutical Technology and Doctor of Philosophy (PhD) Pharmaceutical Sciences. The faculty is comprised of dedicated academics, cutting-edge teaching, and research facili- ties with seven fully equipped teaching laboratories and a research laboratory. Through its curricula at both the undergraduate and graduate levels, the school aims to train world leaders in the pharmaceutical sciences. In accordance with this, the education programmes cover not only the basic sciences, but also specialised sciences associated with industrial drug discovery and development, the theorisation of pharmacotherapy theories at medi cal institutions, and the science behind governmental pharmaceutical regulations.

Research is a significant component in the Faculty of Pharmaceutical Sciences. Lecturers who are also experienced researchers lead the Faculty's postgraduate programmes. This integration of coursework with research findings in our teaching enables learners to understand and extend their power of creativity and critical thinking in their pursuit towards acquiring new knowledge.

As the accumulated knowledge and new technologies produced by the pharmaceutical sciences fraternity increase and as the field continues to play an increasingly important role in internationalisation, society's awareness of its importance is also rising. The Faculty of Pharmaceutical Sciences seeks to expand its horizons and develop new cooperative links with various other disciplines of sciences such as medicine and information technology in order to implement its academic theories and contribute to a healthier world.

DEPARTMENT OF CLINICAL PHARMACY

Full Name:
Fazlollah Keshavarzi
Designation:
Assistant Professor
Department:
Clinical Pharmacy

Research areas or topics:

Prevalence of Atopic Dermatitis and Pattern of Drug Therapy in Malaysian Children

- Clinical Pharmacokinetics and therapeutic drug monitoring
- Pharmacoepidemiology, public health and antimicrobial stewardship programs

Summary of selected research work:

Optimization of drug therapy, especially when the patient is suffering from multiple medical conditions with polypharmacy and narrow therapeutic index drugs are in use, is a very dynamic area of investigation. Working on appropriateness of local protocols of vancomycin therapy has been one of the recent areas of Asst. Prof. Fazlollah Keshavarzi.

In addition to several knowledge, attitude and practice (KAP) studies in the field of pharmacy practice, his recent and ongoing project is on the evaluation of the clinical and financial outcomes of a local experience of antimicrobial stewardship program.

Representative Publications:

Keshavarzi, F., Nadaraja, V., Alias, A., Farrukh, M. J., & Yap, C. S. (2022). Evaluation of trough-based vancomycin therapy in achieving targeted area under the curve in haemodialysis cases. Indonesian Journal of Pharmacy, 33(3), 484-492. https://doi.org/10.22146/ijp.4433.

Goh YY, Keshavarzi F, Chew YL. Prevalence of Atopic Dermatitis and Pattern of Drug Therapy in Malaysian Children. Dermatitis. 2018:29 (3), 151-161.

Full Name:
Dr Muhammad Junaid Farrukh

Designation:
Assistant Professor

Department:
Clinical Pharmacy

Research areas or topics:

Complimentary and alternative medications and adherence to antiepileptic therapy:

- Medication Adherence
- Complementary and Alternative Medicine
- Endocrine disorders

Summary of selected research work:

Medication adherence issues are a global concern, with up to 50% of patients not following prescribed regimens due to factors like forgetfulness, complex dosing, and cost constraints. Study gaps persist in measuring adherence accurately, necessitating standardized, reliable methods. Future studies should explore personalized interventions that consider individual patient beliefs and motivations, harnessing health information technology such as mobile apps and telemedicine. Additionally, research should investigate socioeconomic factors and health disparities to address inequalities in medication adherence. Interdisciplinary collaboration between healthcare providers, researchers, and policymakers is crucial for advancing our understanding and improving medication adherence in diverse patient populations.

Representative Publications:

Jia Ean Goh, Farrukh MJ, Fazlollah Keshavarzi, Yap Chuan Sheng, Zikria Saleem, Muhammad Salman, Diana Laila Ramatillah, Wen Goh Khang and Long Ming. Assessment of Prevalence, Knowledge of Polycystic Ovary Syndrome and Health-related Practice Among Women in Klang Valley: A Cross-sectional Survey

Suet Sherilyn Pak Cheng, Farrukh MJ, Qi Hee Mei, Saleem Zikria, Salman Muhammad, ur Rahman Aziz, Goh Khang Wen, Ming Long Chiau. Are Malaysians Ready to Resume the New Norm? Findings From a Nationwide Study

Full Name:
Dr ALI QURESHI

Designation:
Lecturer

Department:
Clinical Pharmacy

Research areas or topics:

- Prevalence of post-vaccine side effects among COVID-19 immunized community of Southern Pakistan. Knowledge, perception, and fear among the global population towards newly evoked variant Omicron (B.1.1.529)

Summary of selected research work:

The response to the vaccine may vary among individuals, making it crucial to understand how frequently individuals experience side effects following COVID-19 immunization. This study aimed to assess the incidence of side effects following COVID-19 vaccination among various vaccine recipients in Southern Pakistan and to identify potential factors associated with these side effects within the population. Our results indicated that side effects resulting from COVID-19 vaccination can differ between the first and second doses as well as the type of COVID-19 vaccine administered. These findings underscore the importance of ongoing monitoring of vaccine safety and the necessity of individualized risk-benefit assessments for COVID-19 immunization.

Representative Publications:

Qureshi, A., Syed Sulaiman, S. A., Rehman, W., Mehmood, A., Idrees, S., & Kumar, N. (2023). Prevalence of post-vaccine side effects among COVID-19 immunized community of Southern Pakistan. PloS one, 18(5), e0285736. https://doi.org/10.1371/journal.pone.0285736

Qureshi A, Syed Sulaiman SA, Kumar N, Qureshi PAAA. Knowledge, perception, and fear among the global population towards newly evoked variant Omicron (B.1.1.529). PLoS One. 2022;17(7):e0270761. Published 2022 Jul 6. doi:10.1371/journal.pone.0270761.

Full Name:
Dr Audrey Kow Siew Foong

Designation:
Lecturer

Department:
Clinical Pharmacy

Research areas or topics:

- Effects of tocopherols and tocotrienols on neuroinflammatory markers of ovariectomized-induced menopausal depressive mice

Summary of selected research work:

Women are twice as likely to be affected by depression due to hormonal changes. The incidences are higher when they transition into the menopausal stage. At this period of their life, women experience a decline in their oestrogen levels. As a result, they are also at a higher risk for oxidative stress. Oxidative stress has been linked to depression as elevation of reactive oxidative species and deprivation of antioxidative defenses were shown to change the brain structure. Oxidative stress increases the production of pro-inflammatory markers such as interleukin (IL)-1 and IL-18. To reduce oxidative stress and hence menopausal-related depression and osteoporosis, these pro-inflammatory markers must be reduced in the system. Tocopherols have shown positive effect in relieving depression possibly due to its antioxidant activity. Ovariectomised mice administered with α-tocopherols have been shown to be more responsive in forced swimming test and tail suspension test. Hence, it may be possible that tocopherols could reduce the levels of pro-inflammatory markers too. Tocotrienols are abundant in palm oil and α-tocotrienol was reported to exert the most potent neuroprotective activity. In addition, α-tocopheryl succinate and γ-tocotrienol were reported to reduce the expression of RANKL in osteoblasts and inhibit osteoclastogenesis and reduce osteoblast apoptosis. Pro-inflammatory markers such as IL-1, IL-6, and tumour necrosis factor-alpha (TNF-α) were markedly increase in depressive and osteoporosis patients and this was also seen in natural or surgical menopausal women. Perhaps, by consuming tocopherols and/or palm oil derived tocotrienols, depression due to hormonal changes in menopausal women could be alleviated.

Representative Publications:

Liang, G., Kow, A. S. F., Tham, C. L., Ho, Y. C., & Lee, M. T. (2022). Ameliorative Effect of Tocotrienols on Perimenopausal-Associated Osteoporosis-A Review. Antioxidants (Basel, Switzerland), 11(11), 2179.

Full Name:
Muhammad Ahsan Iftikhar Baig

Designation:
Lecturer

Department:
Clinical Pharmacy

Research areas or topics:

- Clinical treatment outcomes of obese patients at tertiary and primary healthcare settings in Penang, Malaysia
- Knowledge, attitude, and perception of Malaysian towards obesity
- Knowledge and attitude towards sexually transmitted diseases among undergraduate Malaysian students
- Lifestyles of type II diabetic patients under treatment at Malaysian tertiary healthcare providers
- Clinical outcomes of type II diabetic patients at a Malaysian tertiary healthcare setting
- Medication therapy evaluation among hospitalised pediatric patients diagnosed with asthma at Malaysian tertiary care setting
- Compliance and prescribing pattern of antibiotics among patients with upper respiratory tract infections at Malaysian tertiary care setting
- Drug therapy pattern in acute pain management of surgery patients at Malaysian tertiary healthcare setting

Summary of selected research work:

Study on overweight and obese patients has found that majority (87.1%) of the sample had central obesity which is the real culprit in developing metabolic syndromes. The outcome has indicated a slight improvement in BMI that has minimal or no clinical significance which couldbe better with the use of anti-obesity medication (prescribed in only 1.0% of obese patients)and adhering to clinical practice guidelines.

Representative Publications:

Baig, M.A.I., Sulaiman, S.A.S., Gillani, S.W. & Hariadha, E. A preliminary study on knowledge about obesity in Penang, Malaysia. IJPLS. (2013); 4(6), 2705-2712.

Hariadha, E., Pichan, R., Ahsan Iftikhar Baig, M. Antibiotic prescribing pattern among inpatients with upper respiratory tract infections at a tertiary care hospital International Journal of Medical Toxicology and Legal Medicine, 2020, 23(1-2), pp. 165–175.

Full Name:

Por Choo Shiuan

Designation:

Lecturer

Department:

Clinical Pharmacy

Research areas or topics:

- Natural Product
- Pharmacy Practice
- Counterfeit and Adulterated Medicine
- Clinical Pharmacy Practice

Summary of selected research work:

He graduated from UCSI University with first-class honor. In his final year project, he researched the computational design of medicines. He investigated the structural activity relationship of potential novel anti-asthmatic drug. After that, he advanced his study into master's degree. He obtained his Master of Clinical Pharmacy Practice from UCSI University with previous research experience in the pharmacy practice area. He has conducted a quantitative study on knowledge, attitude, and practice of counterfeit and adulterated medicine during his master study. His study outcomes serve as a foundation in combating counterfeit and adulterated medicines. His research is structured to discover the mechanism of action of polyherbal formulation in treatment of primary dysmenorrhea. He has managed to get a national research grant worth of RM124000 from the Ministry of Higher Education. Mr Por managed to publish the research work in a Scopus-indexed journal during his bachelor study in 2017. He is gold medalist, awarded by Malaysian Pharmaceutical Society in 2017. His manuscript of his master project has been submitted to Scopus-indexed journal for review. He was a moderator of the International Research Conference on Pharmaceutical and Allied Sciences (IRCPAS 2020).

Representative Publications:

Phytochemicals and Nano-Phytopharmaceuticals Use in Skin, Urogenital and Locomotor Disorders: Are We There? Mogana R, Alok K. Paul, Ming-Tatt Lee, Anabelle Rose Joykin, Choo-Shiuan Por. Plants

Herbs for the Treatment of Primary Dysmenorrhea: A Review, Choo Shiuan Por, Mogana Sundari Rajagopal, Gabriel Akyirem Akowuah, Sasikala Chinnappan, Nor Hayati Abdullah. The Natural Products Journal

DEPARTMENT OF PHARMACEUTICAL BIOLOGY

Full Name:
Dr Sasikala Chinnappan

Designation:
Assistant Professor

Department:
Pharmaceutical Biology

Research areas or topics:

- Diabetes mellitus and its vascular complications
- Wound healing activities
- Toxicity studies
- Natural products for kidney stone

Summary of selected research work:

Research experience in natural products and their pharmacological *invivo* screening (toxicity studies, Diabetes mellitus and its vascular complication; wound healing activity; kidney stone) and *Exvivo* studies by using tissues from various species.

Representative Publications:

A.Y.M. Alabdali, R. Khalid, M. Kzar, M.O. Ezzat, G.M. Huei, T.W. Hsia, R. Mogana, H.Rahman, M.A. Razik, P.K. Issac, S. Chinnappan, S.I. Khalivulla, Design, synthesis, insilico and antibacterial evaluation of new curcumin derivatives loaded nanofiber as potential wound healing agents, Journal of King Saud University - Science 2022;34(7): 102205. https://doi.org/10.1016/j.jksus.2022.102205

Sathish Kumar Karuppannan, Jayandra Bushion, Raghavendra Ramalingam, Subhashini Swaminathan, Kantha Deivi Arunachalam, Avinash Ashok Kadam, Rajakrishnan Rajagopal, Rengasamy Sathya, Sasikala Chinnappan. Fabrication, characterization, and in vitro evaluation of Melia dubia extract infused nanofibers for wound dressing, Journal of King Saud University - Science, 2022; 34 (4): 101931. https://doi.org/10.1016/j.jksus.2022.101931.

Full Name:
Dr Mogana Sundari Rajagopal

Designation:
Dean and Professor

Department:
Pharmaceutical Biology

Research areas or topics:

- Phytopharmacology specialising in Natural Product Drug discovery
- Polyherbal Formulation for Women's Health (uterine fibroid, cervical cancer, ovarian cancer, primary dysmenorrhea, ovarian cyst)
- Novel inhibitor for MDR clinical strain

Summary of selected research work:

The research is focused on natural products that are derived from bioactive compounds and herbal formulation to produce an effective antibacterial agent especially for the multi-drug resistant (MDR) bacterial clinical isolates. Research also includes discovering dual inhibitors for inflammation specifically COX-2/5-LOX. Polyherbal formulation finger printing and mechanism of action with focus on disease related to women.

Representative Publications:

Jubair, Najwan, Mogana R, Fatima, Ayesha, Mahdi, Yasir K., Abdullah, Nor Hayati (2022) Evaluation of Catechin Synergistic and Antibacterial Efficacy on Biofilm Formation and acrA Gene Expression of Uropathogenic E. coli Clinical Isolates Antibiotics, 11 (9)

Yap, V. L., Tan, L. F., Rajagopal, M., Wiart, C., Selvaraja, M., Leong, M. Y., & Tan, P. L. (2023). Evaluation of phytochemicals and antioxidant potential of a new polyherbal formulation TC-16: additive, synergistic or antagonistic? BMC complementary medicine and therapies, 23(1), 93.

Chattaraj, B., Nandi, A., Das, A., Sharma, A., Dey, Y. N., Kumar, D., & R, M. (2023). Inhibitory activity of Enhydra fluctuans Lour. on calcium oxalate crystallisation through in silico and in vitro studies. Frontiers in pharmacology, 13, 982419.

Full Name:
Dr Ravishankar Ram Mani

Designation:
Assistant Professor

Department:
Pharmaceutical Biology

Research areas or topics:

- Impact of SARS-CoV-2 Infection on Proteomic, Microbiota Profile and Host Immune Responses: A Longitudinal Study

- Evaluation and comparison of short chain fatty acids composition in gut diseases

Summary of selected research work:

The focus of my research is aimed at studying the protective role of innate T cells (MAIT cells, iNKT cells and y8T-cells) and their association with sustaining the profile of a healthy microbiome in the context of viral infection. Therefore, our main objective is to study the role of viral infection in influencing the interaction between gut metaproteome and host immune responses. The proposed study also aims to cany out the investigation in contrasting coho1ts: the proteome signatures capture the host response to viral infection, highlighting the role of complement factors, the coagulation system, and indicate a high specificity of several inflammation modulators as well as pro-inflammatory signaling both upstream and downstream. The proteomic signatures and biomarkers identified pave the way for the development of routine assays to support clinical decision making, as well as provide hypotheses about potential viral therapeutic targets.

Representative Publications:

Ravishankar Ram Mani, Vinod Kumar Nelson, et al. Reactive Oxygen Species Mediated Apoptotic Death of Colon Cancer Cells: Therapeutic Potential of Plant Derived Alkaloids. Front. Endocrinol.Sec. Cellular Endocrinology Volume 14 - 2023 (QI, IF 6.45)

Ravishankar Ram Mani, Balasubramani Ravindran, et al. Exploring the therapeutic potential of Decalepis hamiltonii root extract: synthesis of gold nanoparticles and assessment of antimicrobial, antioxidant, and anti-proliferative activities. Applied Nanoscience 2023(QJ , IF 3.869)

Full Name:
Dr Malarvili Selvaraja

Designation:
Assistant Professor

Department:
Pharmaceutical Biology

Research areas or topics:

- Anti-cancer research using combination therapy, Anti-microbial studies, and Autoimmune Diseases

Summary of selected research work:

My interest is always about autoimmune conditions specifically on Systemic Lupus Erythematosus. Our team of researchers were interested and investigated the association of Human Leukocyte Antigen with immune markers leading to lupus nephritis in SLE. Currently, intended to expand research on Systemic Sclerosis. Apart from that, also working on antiviral research specifically Covid-19 and Newcastle disease, collaborating with research partners from Indonesia and India. Another important focus of interest is anticancer studies, specifically on colorectal cancer, investigating the synergistic effect of combination drug and compounds in preventing colorectal cancer.

Representative Publications:

Malavili Selvaraja, Chun Lai Roo, Lay Kim Tan, Bee Tee Koay, Maha Abdullah, Masita Arip, Syafinaz Amin Nordin. 2022. Human Leucocyte antigens profiling in Malay female patients with systemic lupus erythematosus: are we same or different? Lupus Science and Medicine. 9, 1-14.

Huang Feng, K. Vijya Lakshmi, Chin Tat Ng, Sasikumar Murthy, Masita Arip, Masriana Hasssan, Voon Kin Chin, Mogana Rajagopal, Omotoyo Fatokun, Parvathy, Malarvili Selvaraja. 2023. Update on REmdesvir in the treatment of novel coronavirus pneumonia. Progress in Microbes and Molecular Biology. 6.1.

Full Name:
Dr Tooba Mahboob

Designation:
Lecturer

Department:
Pharmaceutical Biology

Research areas or topics:

- Anti-Acanthameobic properties of plant extracts and phytoconstituents
- Evaluation of novel nanocomposites against Free Living Amoeba
- Anticancer and antimicrobial potential of metal-based nanocomposites

Summary of selected research work:

Acanthamoeba is a protozoan parasite, commonly found in air, water and soil. Acanthamoeba sp. can cause serious infections in human, known as Amoebic Keratitis and Granulomatous Amoebic Encephalitis. To date, there is no specific drug to treat Acanthamoebic infections with efficacy. Natural Products are the best resources to find alternative therapeutic option to deal with these infections. However, there are certain limitations in the use of natural products to treat these infections, which can be resolved with the help of novel drug delivery systems based on nanotechnology. The scope of our research focuses on the successful application of novel nanoparticles loaded with natural products (plant extracts and pure compound) in treating parasitic infection. In addition, our studies aim to improve the bioavailability, controlled release and reduce the cytotoxicity of currently available drugs in treating cancer.

Representative Publications:

Mahboob T, Ismail, A.A., Shah, M.R., Rahmatullah, M., Paul, A.K., Pereira, M.D.L., Wiart, C., Wilairatana, P., Rajagopal, M., Dolma, K.G. and Nissapatorn, V., 2023. Development of SARS-CoV-2 Vaccine: Challenges and Prospects. Diseases, 11(2), p.64. https://doi.org/10.3390/diseases11020064

Mahboob, T., Nawaz, M., de Lourdes Pereira, M., Tian-Chye, T., Samudi, C., Sekaran, S.D., Wiart, C. and Nissapatorn, V., 2020. PLGA nanoparticles loaded with Gallic acid-a constituent of Leea indica against Acanthamoeba triangularis. Scientific reports, 10(1), p.8954. https://doi.org/10.1038/s41598-020-65728-0

Full Name:
Dr Lee Ming Tatt

Designation:
Professor

Department:
Pharmaceutical Biology

Research areas or topics:

- Animal models of pathological pain and neuropsychiatric disorders
- Neuropharmacology and neurobiology of analgesia and neuropsychiatric disorders
- Complementary medicine in preclinical models

Summary of selected research work:

Employs various preclinical models of pathological pain and neuropsychiatric disorders to study the neuropharmacology of novel neurotherapeutics as well as neurobiology of diseases,eg. migraine, neuropathic pain, substance abuse, cognitive and mood disorders etc.

Representative Publications:

Lee M. T., Mackie K. and Chiou L. C. (2023). "Alternative pain management via endocannabinoids in the time of the opioid epidemic: Peripheral neuromodulation and pharmacological interventions." Br J Pharmacol 180(7): 894-909. DOI: 10.1111/bph.15771.

Sieghart W., Chiou L. C., Ernst M., Fabjan J., Savic M., and Lee M. T. (2022). "alpha6-Containing GABA(A) Receptors: Functional Roles and Therapeutic Potentials." Pharmacol Rev 74(1): 238-270. DOI: 10.1124/pharmrev.121.000293.

DEPARTMENT OF PHARMACEUTICAL CHEMISTRY

Full Name:
Dr Chun Wai Mai

Designation:
Associate Professor

Department:
Pharmaceutical Chemistry

Research areas or topics:

- **Cancer Immunology**
- **Cancer Metastasis**
- **Cancer Drug Discovery**
- **Stem Cells**

Summary of selected research work:

Currently, we are investigating immune evasion targets in cancer progression. We hypothesize that the tumour-immune resistance can be mediated by dysregulation of cell surface molecules that engage immune-inhibitory receptors on T cells and/or tumor intrinsic factors that govern tumor-specific cell death. Considering the centrality occupied by cancer cells in the immunotherapy set-up, understanding the cancer cell-autonomous mechanisms that might evade immune cells-induced cell death are expected to provide functional predictive markers and improve treatment against cancers. We are also working closely with medicinal chemists, synthetic chemists, and natural product chemists to test novel compounds, using disease-relevant phenotypic and target-based assays in a high throughput screening platform. We have identified several potential compounds with selective anticancer properties, with minimum cytotoxicity to isogenic cells. Through single-cell RNA sequencing, microarray, pool-genome shRNA knockdown and other cell signaling techniques, I will deduce the mechanism of actions of these compounds. We will confirm its mechanism of action through rescue experiments such as knock-down/overexpression of the upstream or downstream target.

Representative Publications:

Chun-Wai Mai, Kok-Yong Chin, Lian-Chee Foong, Kok-Lun Pang, Bin Yu, Yu Shu, Sisi Chen, Soon-Keng Cheong, Chee-Wai Chua. Modeling prostate cancer: what does it take to build an ideal tumor model? Cancer Letters 2022, 543: 215794

Chin-King Looi, Li-Lian Gan, Wynne Sim, Ling-Wei Hii, Felicia Fei-Lei Chung, Chee-Onn Leong, Wei-Meng Lim, Chun-Wai Mai. Histone deacetylase inhibitors restore cancer cell sensitivity towards T lymphocytes-mediated cytotoxicity in pancreatic cancer.

Full Name:
Dr Saad Tayyab

Designation:
Professor

Department:
Pharmaceutical Chemistry

Research areas or topics:

- Drug-protein interaction; Protein folding/denaturation
- Protein structure-function Drug Synthesis

Summary of selected research work:

Our group has been interested in investigating the transport of drugs through human blood circulation. Human serum albumin is the leading carrier in blood circulation which binds a variety of molecules both endogenous and exogenous, including drugs. Due to the same carrier for many drug molecules, there are greater chances of drug-drug interactions. We have used a variety of spectroscopic techniques such as fluorescence, absorption, CD and FTIR spectroscopy, voltammetry, and atomic force microscopy along with computational techniques, viz. molecular docking, and MD simulation to study such interactions between human serum albumin and several therapeutic phytochemicals, antimalarial, anticancer, and anti-hepatitis drugs. Another subject of interest has been to explore the pathways of protein folding through denaturation studies of several proteins and enzymes viz, alpha-amylase, glucoamylase, lysozyme, chempedak galactose-binding lectin, ovalbumin and serum albumin.

Representative Publications:

Abubakar, M., Mohamed, S. B., Abd Halim, A. A., & Tayyab, S. (2023). Use of computational and wet lab techniques to examine the molecular association between a potent hepatitis C virus inhibitor, PSI-6206 and human serum albumin. Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 294, 122543. https://doi.org/10.1016/j.saa.2023.122543

Kandandapani, S., Kabir, M. Z., Tayyab, H., Mohamad, S. B., & Tayyab, S. (2023). Molecular recognition between anticancer drug, regorafenib and human serum albumin: Interaction revisited. Croatica Chemica Acta, 95(2), 57-68.

Full Name:
Dr Chew Yik Ling

Designation:
Assistant Professor

Department:
Pharmaceutical Chemistry

Research areas or topics:

- Phytochemical investigation of tropical plants and medicinal herbs
- Therapeutic use of tropical plants and medicinal plant herbs
- Usage of natural products in managing skin diseases

Summary of selected research work:

The utilization of botanical extracts and traditional medicines in the treatment of various diseases, particularly dermatological conditions, has a rich history that dates back centuries. The research in this field not only aligns with traditional practices but is also supported by a growing body of scientific evidence highlighting the efficacy of these natural remedies as therapeutic agents. Botanical extracts, derived from various parts of plants, have been employed for generations by different cultures around the world. These extracts contain a myriad of bioactive compounds, including phytochemicals, which possess medicinal properties. The scientific discipline of phytochemistry delves into the analysis and identification of these compounds, unveiling their potential in the treatment of diseases. Phytomedicine, a field closely related to phytochemistry, seeks to harness the healing potential of these botanical compounds. Research in this area involves the isolation and characterization of active ingredients from plants, followed by rigorous testing to ascertain their therapeutic efficacy. Over the years, numerous studies have confirmed the remarkable healing properties of botanical extracts in managing various ailments.

Representative Publications:

Sze-Huey Sang, Kai Bin Liew, Siew-Keah Lee, Jing-Wen Keng, Sue-Kei Lee, Gabriel Akyirem Akowuah, Ching Siang Tan and Yik-Ling Chew (2023). Formulation of Botanical Shampoo Infused with Standardised Mangosteen Peel Extract for Healthy Hair and Scalp. Cosmetics, 10(4), 109.

Yon, J. A. L., Lee, S. K., Keng, J. W., Chow, S. C., Liew, K. B., Teo, S. S., Shaik Mossadeq, W.M., Marriott, P.J., Akowuah, G.A., Ming, L.C. and Goh, B.H., Chew, Y. L. (2022). Cassia alata (Linnaeus) Roxburgh for Skin: Natural Remedies for Atopic Dermatitis in Asia and Their Pharmacological Activities. Cosmetics, 10(1), 5.

Full Name:
Dr Cheong Kok Whye

Designation:
Assistant Professor

Department:
Pharmaceutical Chemistry

Research areas or topics:

- Hydrocolloids and gums
- Emulsion technology and formulations (both micro- and nanoemulsions)
- Flavour chemistry

Summary of selected research work:

Emulsion-based delivery systems are widely used for encapsulation, protection, and delivery of lipophilic flavour compounds, bioactive ingredients, and functional lipids, such as nutraceuticals. It allows these compounds to be retained in the food for a longer time period, minimise degradation or loss during processing and storage, and allow a controlled release. More importantly, the encapsulated lipophilic ingredients will allow the ease of incorporation into various food matrices. Conventionally, food emulsions are often stabilised using either food grade emulsifiers such as small molecule surfactants, phospholipids, proteins, or polysaccharides. Lately, there has been a growing interest in developing novel emulsifiers with improved functionality based on covalent conjugates between different group of emulsifiers, e.g., protein-polyphenol or polysaccharide-protein. It should also be noted that the utilisation of emulsifiers in the food industry is of great importance, estimated to be valued at USD 3.2 billion in 2020. With worldwide demand for emulsifiers projected to increase to USD 4.0 billion by 2025, designing new alternative composite emulsifiers to synthetic ones will have significant economic implications.

Representative Publications:

Ghan, S.Y., Siow, L.F., Tan, C.P., Cheong, K.W., & Thoo, Y.Y. (2022). Palm olein organogelation using mixtures of soy lecithin and glyceryl monostearate. *Gels* 8: 30.

Ghan, S.Y., Siow, L.F., Tan, C.P., Cheong, K.W., & Thoo, Y.Y. 2020. Influence of soya lecithin, sorbitan and glyceryl monostearate on physicochemical properties of organogels. *Food Biophysics* 15: 386-395.

Full Name:
Dr Low May Lee

Designation:
Assistant Professor

Department:
Pharmaceutical Chemistry

Research areas or topics:

- Metal-based compounds for therapeutic, imaging, sensing, and catalysis applications; Stimuli-responsive materials for photodynamic therapy; Metal-organic frameworks; Nanomedicine and drug delivery; Chemical education

Summary of selected research work:

One of the most challenging problems in the world today is the urgent need for new drugs having higher activity, improved selectivity, and bioavailability as well as lower side-effects than conventional drugs to treat critical diseases like cancer and resistant bacterial infections align with SGD 3 goal on good health and well-being. The resounding therapeutic success of platinum drug cisplatin and its analogues have triggered tremendous effort in search of alternative metal-based therapeutic agents over the past few decades. The rationale for these studies is that metal centers, other than platinum, might open new avenues in the development of clinically useful drugs. This area of research has a wide spectrum, ranging from sustainable synthesis approaches to many diverse therapeutic applications. In addition, metal-based photosensitizers (PS) capable of generating bacterial/cell damaging free radicals upon light induction have received increasing attention as an alternative in multi-drug resistance treatment, as free radicals may cause non-selective damage to the intracellular components of the bacteria/cancer cells, including the drug resistance machinery. However, PS' poor bacterial uptake and selectivity, solubility and stability often hinder their effective use in vivo. In our group, we are interested in the development of novel metal-based compounds and also enhancing their bioactivities through synergistic, innovative strategies.

Representative Publications:

Liew, H.S., Mai, C.W., Zulkefeli, M., Madheswaran, T., Kiew, L.V., Pua, L.J.W., Hii, L.W., Lim, W.M. and Low, M.L., 2022. Novel Gemcitabine-Re (I) Bisquinolinyl Complex Combinations and Formulations with Liquid Crystalline Nanoparticles for Pancreatic Cancer Photodynamic Therapy. Frontiers in Pharmacology, 13, p.903210.

Low, M.L., Maigre, L., Dorlet, P., Guillot, R., Pages, J.M., Crouse, K.A., Policar, C. and Delsuc, N., 2014. Conjugation of a new series of dithiocarbazate Schiff base copper(II) complexes with vectors selected to enhance antibacterial activity. Bioconjugate Chemistry, 25(12), pp.2269-2284.

DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY

Full Name:
Dr Palanirajan Vijayarajkumar

Designation:
Associate Professor

Department:
Pharmaceutical Technology

Research areas or topics:

- Nanotechnology
- Molecular modelling-based bio actives delivery system
- Formulation development

Summary of selected research work:

The research he conducts largely focuses on the transition from earlier to more recent gold nanoplatform synthesis. Because of the gold nanoplatform's exceptional qualities, including its huge surface volume, redox activity, fluorescence quenching, and optical-electronic capabilities, the electrical and electronic industries initially exploited it extensively for their products. Pharmaceutical and biotechnological companies have started to express interest in manufacturing gold nanoplatforms for their new product development due to the development of localised surface plasmonic resonance, optoacoustic, photothermal, and therapeutic properties of gold nanoplatforms and their application in biosensors and various diagnostic methods in this era.

Representative Publications:

Tan KF, In LL, Vijayaraj Kumar P. Surface Functionalization of Gold Nanoparticles for Targeting the Tumor Microenvironment to Improve Antitumor Efficiency. ACS applied biomaterials. 2023 Jul 12;6(8):2944-81.

Chyi LC, Le Yi C, Kumar PV. Dendrimer-based nanocomposites for the production of RNA delivery systems. Open Nano. 2023 Jul 10:100173.

Full Name:
Dr Ashok Kumar Janakiraman

Designation:
Assistant Professor

Department:
Pharmaceutical Technology

Research areas or topics:

- Green synthesis, characterization and in vitro cell cytotoxicity of drug loaded ZnO Nanoparticles on different cancer cell line.
- Fabrication and characterization cocoa butter-based fast-melting tablets (FMTs) as a convenient dosage form for all age groups.

Summary of selected research work:

Zinc oxide nanoparticles (ZnO-NPs) are valued in the biomedical industry for their ability to serve as medicines and drug delivery nanocarriers. Studies have shown that ZnO NPs have a direct effect on cancer cells, pathogens, and the host's immune system by causing the activation of immune cells. To fabricate metal oxide nanoparticles, chemical and physical synthesis methods (also known as bottom-up approaches) are frequently used. These methods produce a large quantity of nanoparticles, although they are more expensive, contain poisonous chemicals that can have adverse effects when used in biomedical applications, need the use of stabilisers, etc. Therefore, to overcome the drawbacks of ZnO-NPs synthesized through the typical classical routes that result in adverse effects in biomedical applications, the green synthesis of ZnO-NPs, or biosynthesis, involves the use of environmentally friendly and non-toxic reagents with diminished adverse or toxic effects and increased biocompatibility. Most importantly, environmentally friendly ZnO-NPs are non-toxic, safe, and biocompatible.

Representative Publications:

Ashok Kumar Janakiraman, Zi Yin Wong, Zenli Cheng, Kushagra Khanna, et al. Fabrication, Characterization, and In Vitro Cell Cytotoxicity of ZnO Nanoparticles on MDA-MB 231 Breast Cancer Cell Line. Chemistry Select 2023, 8, e202302669

Tamilarasan, N; Yasmin, B.M.; Anitha, P.; Umme, H.; Cheng, W.H.; Mohan, S.; Ramkanth, S.; Janakiraman, Ashok Kumar. Box–Behnken Design: Optimization of Proanthocyanidin-Loaded Transferosomes as an Effective Therapeutic Approach for Osteoarthritis. Nanomaterials 2022, 12, 2954.

Full Name:
Dr Kushagra Khanna

Designation:
Lecturer

Department:
Pharmaceutical Technology

Research areas or topics:

- Development and evaluation of novel MKR-3 based microbial triggered formulation of 5-FU for colon targeting in the treatment of colorectal cancer.
- Tetrahydro-curcumin loaded chitosan coated PLGA nanoparticles for the treatment of allergic conjunctivitis

Summary of selected research work:

Formulation development in the context of nuclear medicine primarily revolves around the design and preparation of radiopharmaceuticals – compounds labeled with radionuclides. These radiopharmaceuticals can be utilized for both diagnostic (imaging) and therapeutic purposes. The formulation of radiopharmaceuticals is a complex process, involving careful consideration of the drug's chemical, pharmacological, and radiological properties. Formulation of novel drug delivery systems (NDDS) introduce drugs into the body in a controlled manner, targeting specific cells or tissues to enhance the therapeutic effects while minimizing side effects. As new drug delivery systems are developed, it's essential to study their safety profile. Nuclear medicine imaging, in corroboration with formulations/NDDS uses techniques like single-photon emission computed tomography (SPECT) and positron emission tomography (PET), provides a non-invasive means to visualize the distribution and localization of radiolabeled agents in the body. Combining NDDS with nuclear medicine imaging can allow researchers and clinicians to track the distribution, release, and pharmacokinetics of drugs in real-time images without sacrificing of animals.

Representative Publications:

Sharma S, Sharma N, Sharma A, Kurmi BD, Khanna K, Karwasra R, Singh A.K Chaudhary A. 2023. Amelioration of experimental colitis by a site-specific novel plant polysaccharide (Opuntia ficusindica) based macroparticles containing probiotic biomass and mesalazine. Journal of Drug Delivery Science and Technology, 86, 1047-1063.

Kumari R, Sharma N, Karwasra R, Khanna K. 2023. Colon cancer and their targeting approaches through nanocarriers: A review. Asian Pacific Journal of Tropical Biomedicine. 13(3): 104-111

Full Name:

Marwan Abdelmahmoud Abdelkarim Maki

Designation:

Lecturer

Department:

Pharmaceutical Technology

Research areas or topics:

- Nanotechnology and its role in enhancing drug bioavailability and targeting.
- Peptide chemistry and its therapeutic applications

Summary of selected research work:

In the design and development of therapeutic agents, macromolecules with restricted structures have stronger competitive edges than linear biological entities since cyclization can overcome the limitations of linear structures. The unique conformational constraint of cyclic peptides provides a larger surface area to interact with the target at the same time, improving the membrane permeability and in vivo stability compared to their linear counterparts. Currently, cyclic peptides have been reported to possess various activities, such as antifungal, antiviral, and antimicrobial activities. To date, there is emerging interest in cyclic peptide therapeutics, and increasing numbers of clinically approved cyclic peptide drugs are available on the market. Another topic of interest is CD44-targeted drug delivery as a strategy that aims to enhance the cellular intake of anticancer agents by exploiting the high expression of CD44 on cancer cells and cancer stem cells. CD44-targeted drug delivery systems can be based on hyaluronic acid, which is the natural ligand of CD44, or on monoclonal antibodies that bind to specific CD44 variants, such as CD44v6. CD44-targeted drug delivery systems can improve the specificity, efficacy, and safety of anticancer drugs by increasing their accumulation and retention in tumor tissues, overcoming drug resistance, and reducing systemic toxicity.

Representative Publications:

Maki M.A.A, Teng MS, Tan KF, Kumar PV. (2023). Polyamidoamine-Stabilized and Hyaluronic Acid-Functionalized Gold Nanoparticles for Cancer Therapy. OpenNano. Published online August 2023:100182. https://doi.org/10.1007/s10989-022-10478-y

Chia, L. Y., Kumar, P. V., Maki, M. A. A., Ravichandran, G., & Thilagar, S. (2023). A review: The antiviral activity of cyclic peptides. International Journal of Peptide Research and Therapeutics, 29(1), 7. https://doi.org/10.1016/j.onano.2023.100182

Faculty of Pharmaceutical Sciences
Level 10, Block G, UCSI University
1, Jalan Menara Gading
UCSI Heights. 56000 Kuala Lumpur, Malaysia

Phone: 03-9101880
Fax: 03-91011068