Universiti Kebangsaan Malaysia
The National University of Malaysia

Research Profile

CENTRE FOR
DRUG DELIVERY TECHNOLOGY AND VACCINE (CENTRIC)
FACULTY OF PHARMACY

CENTRIC

Introduction to Research at UKM

Universiti Kebangsaan Malaysia (UKM) has been recognised as one of the five research universities in Malaysia since 2006 based on its excellent record in research for 50 years. The recognition has gained further ground when the Malaysia Genome Institute (MGI) and International Institute of Global Health and United Nations University were set up within the university. The research in UKM is currently focused into eight niche areas: Challenges to Nation Building, Sustainable Territorial Development, Renewable Energy, Health and Medical Technology, Climate Change, Nanotechnology and Advanced Materials, Biological Diversity in Biotechnology Development and ICT: Content Informatics. In 2021, UKM was ranked at position 141 by the QS World University Ranking.

Research at the Faculty of Pharmacy, UKM

The research ecosystem in the Faculty of Pharmacy, UKM consists of three research centres that represent the core areas of research in pharmacy. Our research activities cover fundamental pharmaceutical chemistry, biopharmacy, herbal development, pharmacology, formulation science, pharmaceutical technology, clinical pharmacy and professional pharmacy practice. We have a wide range of research facilities from the latest analytical instruments to a research-based teaching hospital. The faculty has managed to secure cumulatively research grants of more than RM15 million for last 10 years.

Faculty of Pharmacy research centres:

- Centre for Drug and Herbal Development (CDHD)
- Centre for Drug Delivery Technology and Vaccine (CENTRIC)
- Centre for Quality Management of Medicines (QMM)

About Us

The Centre for Drug Delivery Technology and Vaccine (CENTRIC) was previously known as Centre for Drug Delivery Technology (CDDT). The centre focuses on utilising rational strategies in the development of contemporary and advanced drug delivery system and dosage form design. An efficient drug delivery system carries a therapeutic substance to the site of action and/or controls the rate of release of the substance, thus improves its efficacy and safety. The understanding of the physiochemical properties of the therapeutic substances as well as understanding the human physiological barriers, such as transport in the circulatory system and drug movement through cells and tissues are crucial in drug delivery. In our center, we constantly seek new formulation strategies and novel design approaches to optimise therapeutic efficacy and patient safety. Our centre's strengths include nanotechnology, advanced topical and wound formulations, vaccines, brain drug delivery and the use of natural and synthetic polymers in the formulation development.

KEY RESEARCH AREAS

TOPICAL AND TRANSDERMAL DELIVERY

- The design and development of topical and transdermal formulations, ranging from the conventional such as creams, ointments and gels to advanced systems, including lyophilised hydrogels, particulate delivery systems and polymers for therapeutic cosmetic formulation and development including skin and personal care products.

WOUND HEALING DRESSINGS AND DRUG DELIVERY SYSTEMS

- Medicated dressings to accelerate and overcome infections particularly in chronic wounds.
- Formulation of bioactives for treating wounds and cutaneous diseases.
- Discover and repurpose polymer material for wound healing and tissue regenerations.

NANOTECHNOLOGY DRUG DELIVERY SYSTEMS

- The development of nanoparticles/nanocomposites and delivery systems based on biodegradable polymers to deliver bioactives.
- Nanoparticulate systems targeting cancers, and infectious diseases.

NANOVACCINES DEVELOPMENT

- Modern subunit vaccines for infectious disease and cancer.
- The utilization of nanoparticles as vaccine delivery systems.
- Immunogenicity, safety and stability evaluations.

DRUG DELIVERY TO THE BRAIN

- Drug delivery to the brain by using nanoparticles to overcome blood-brain barrier.
- Zebrafish as a new model for high throughput screening to bridge in vitro and in vivo studies in brain drug delivery research.

POLYMER SYNTHESIS AND APPLICATIONS FOR DRUG DELIVERY

- Novel polymeric composite systems for drug delivery.
- Cellulose-based systems for drug delivery.

NUCLEIC ACID THERAPEUTICS

- Delivery of nucleic acid therapeutics including siRNA and DsiRNA for various diseases.

BIOLOGICAL MODELS FOR DRUG DELIVERY AND PRE-CLINICAL STUDIES

- Zebrafish for toxicological assessment
- Murine models for formulation development, safety and efficacy.
- In vitro cell culture models for screening and toxicity studies.

RESEARCH FACILITIES

- Particle size analysis laboratory
- Pharmaceutical manufacturing laboratory
- Pharmaceutical research laboratory
- Transdermal and parenteral research laboratory
- Integrated Vaccine and Adjuvant Development Laboratory (InVade)

SELECTED LABORATORY EQUIPMENT

- Malvern Zetasizer
- Malvern Mastersizer
- Permagear Franz Diffusion cells
- Instron Universal Testing machine
- Brookfield texture analyser
- Rotary tablet machine
- High pressure homogenizer (Brand)
- Rheometer (Anton Paar)

Chairperson

ASSOC. PROF. DR. NG SHIOW FERN

Expertise : Wound delivery and regenerative medicine, Peptide and drug delivery, micro- and nanoparticulate systems, wound healing and cutaneous disoders, antibiofilms and antimicrobial

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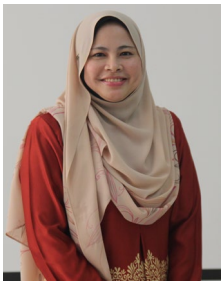

ASSOC. PROF. DR. HALIZA KATAS

Expertise : Drug and gene delivery, nanoparticles and nanocomposites, topical and transdermal delivery and biomaterial wound dressings

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PROF. DR. MOHD CAIRUL IQBAL MOHD AMIN

Expertise : Novel Drug Delivery, Nano Drug Delivery, Hydrogel, Dosage Form Design, Pharmaceutical Sciences

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ASSOC. PROF. DR. MOHD HANIF ZULFAKAR

Expertise : Topical dosage form design and delivery, oils and fatty acids in drug delivery, wound healing formulations.

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ASSOC. PROF. DR. FAZREN AZMI

Expertise : Vaccine & antibacterial agents development, peptide chemistry, lipid, nanoparticles, adjuvant, chemical conjugation, vaccine evaluation, antimicrobial testing

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DR. HANISAH AZHARI

Expertise : Drug delivery to the brain & Zebrafish model. Formulation and delivery of essential oils and plant-based ingredients through the skin. Community-based projects on environmental and sustainability issues.

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DR. FHATAHEYA BUANG

Expertise : Transmucosal drug delivery, Pharmaceutical excipients Toxicology, Cell culture (Stem cells).

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LABORATORY STAFF

Mr. Amirul Faiz bin Abd Razak
Expertise : Handling HPLC Agilent.
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Expertise : Handling lab instrument (*Rheometer MCR92, Texture Analyzer, Universal Testing Machine, Mastersizer MS2000, Tablet Hardness Tester, Friability Tester, Digital Viscometer Brookfield, Homogenizer, Stability Chamber Climacell, Single Sample Osmometer)*
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Mrs. Azlina Razimahwati Azizi
Expertise : Handling lab instrument (*Microscope : Laboratory Research Microscope Standard Set With Camera / Olympus, Inverted Fluorescence Microscope With Imaging System,Inverted Microscope (CKX-F200/Olympus), Chemiluminescent Molecular Gel Imager)*
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Mr. Mohd Fareez Faisal Bin Saad @ Asri
Expertise : Handling lab instrument (*Zetasizer Nano ZS, CoolSafe freeze dryer, Buchi mini spray dryer, SPX APV2000 High Pressure Homogenizer, Beckman Coulter Allegra 64-R Refrigerated Centrifuge, Franz Diffusion Cell)*
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SELECTED JOURNAL ARTICLES

1. **Fhataheya Buang**, Manfei Fu, Afroditi Chatzifragkou, **Mohd Cairul Iqbal Mohd Amin**, Vitaliy V. Khutoryanskiy. (2023). Hydroxyethyl Cellulose Functionalised With Maleimide Groups As A New Excipient With Enhanced Mucoadhesive Properties. - International Journal Of Pharmaceutics. 1-8.
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3. Doddy Irawan Setyo Utomo, Hamizah Suhaimi, Nor Azila Muhammad Azami, **Fazren Azmi**, **Mohd Cairul Iqbal Mohd Amin**, Jian Xu. (2023). An Overview Of Recent Developments In The Application Of Antigen Displaying Vaccine Platforms: Hints For Future Sars-Cov-2 Vlp Vaccines. - Vaccines. 1-14.
4. Fatin Hanani Mohd Fadhil, **Ng Shiow-Fern**, **Haliza Katas**. (2023). Gel Mengandungi Nanozarah Kitosan Yang Dimuatkan Dengan Dsirna Dan Kurkumin Sebagai Pembalut Luka Kencing Manis: Pelepasan Bahan Aktif Dan Kesan Kesitotoksikan. - Sains Malaysiana. 1545-1556.
5. Mohammad Aqil M. Fathil, **Haliza Katas.** (2023). Antibacterial, Anti-Biofilm And Pro-Migratory Effects Of Double Layered Hydrogels Packaged With Lactoferrin-Dsirna-Silver Nanoparticles For Chronic Wound Therapy. - Pharmaceutics. 1-34.
6. Farha Yasmin Faris Taufeq, Nur Hamizah Habideen, Loageshwari Nagaswa Rao, Promit Kumar Podder, **Haliza Katas.** (2023). Potential Hemostatic And Wound Healing Effects Of Thermoresponsive Wound Dressing Gel Loaded With Lignosus Rhinocerotis And Punica Granatum Extracts. - Gels. 1-21.
7. Lay-Hong Chuah, Hooi-Leong Loo, Choon Fu Goh, Ju-Yen Fu, **Shiow-Fern Ng.** (2023). Chitosan-Based Drug Delivery Systems For Skin Atopic Dermatitis: Recent Advancements And Patent Trends. - Drug Delivery And Translational Research. 1436-1455.
8. Milton Hongli Tsai, Rohaya Megat Abdul Wahab, Shahrul Hisham Zainal Ariffin, **Fazren Azmi**, Farinawati Yazid. (2023). Enhanced Osteogenesis Potential Of Mg-63 Cells Through Sustained Delivery Of Vegf Via Liposomal Hydrogel. - Gels. 1-17.
9. Nur Amira Mohd. Shamsuddin, **Mohd Hanif Zulfakar**. (2023). Nanostructured Lipid Carriers For The Delivery Of Natural Bioactive Compounds. - Current Drug Delivery. 127-143.
10. Ahmad Nur Afieq Idrus, Khurram Rehman, **Mohd Hanif Zulfakar**. (2023). A Systematic Review Of The Clinical Effectiveness Of Aloe Vera For The Prevention And Treatment Of Chronic Wounds. - Sains Malaysiana. 1785-1794.
11. **Mohd Hanif Zulfakar,** Grace Ting Eng Chi. (2023). Perkembangan Terkini Dalam Rawatan Topikal Ulser Tekanan: Suatu Tinjauan Sistematik. - Sains Malaysiana. 2633-2643.
12. Huai Li Wong, Jacinta Santhanam, **Shiow Fern Ng**, B Hemabarathy Bharatham. (2023). Fabrication Of Ciprofloxacin Loaded Alginate/Cockle Shell Powder Nanobiocomposite Bone Scaffold. - Life Sciences, Medicine And Biomedicine. 1-12.

CONTACT US

GEOGRAPHICAL LOCATION

The CENTRIC Faculty of Pharmacy is located at the heart of Kuala Lumpur city, Malaysia. The nearest airport is Kuala Lumpur International Airport (KLIA). The KLIA Express or Transit trains will bring you directly from the KLIA to the city centre (KL Sentral Station) in approximately 40 minutes journey. From the KL Sentral Station, you can easily access other public transport systems (the LRT and monorail) to get to the campus (Chow Kit Station).

OUR ADDRESS

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Faculty of Pharmacy

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