The 3rd

PharmCare Symposium 2026

Synergy in Personalised Medicine, Digital Health & Pharmacy Education (SPHERE)

10-11 SEP 2026

PROGRAMME BOOK

Organiser: School of Pharmaceutical Sciences, Universiti Sains Malaysia

Sponsor: Avant health

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FOREWORD FROM THE VICE-CHANCELLOR

PROFESSOR DATO' SERI IR. DR. ABDUL RAHMAN MOHAMED
VICE-CHANCELLOR
Universiti Sains Malaysia

It is my great pleasure to extend my warmest greetings and congratulations to the School of Pharmaceutical Sciences, Universiti Sains Malaysia (USM), on the organisation of the **3rd USM PharmCare Symposium and Workshop 2026**.

Themed *"Synergy in Precision Medicine, Digital Health and Pharmacy Education (SPHERE)"*, this symposium reflects the evolving landscape of healthcare, where scientific advancement, digital innovation, and education must converge to address increasingly complex healthcare needs. The integration of precision medicine, digital health, and innovative pharmacy education is essential in preparing healthcare professionals who are responsive, adaptable, and equipped to deliver patient-centred care.

As a leading research-intensive university, USM remains committed to advancing knowledge, fostering innovation, and strengthening meaningful partnerships that contribute to the well-being of society. Platforms such as this symposium are important in facilitating the exchange of knowledge and research findings while creating opportunities for academics, pharmacists, researchers, students, and healthcare professionals to establish strategic collaborations across disciplines and institutions.

I am particularly pleased that this symposium brings together perspectives from hospital and community pharmacy, pharmacogenomics and pharmacometabolomics (OMICS), pharmacometrics, precision medicine, digital health, and pharmacy education. Such multidisciplinary engagement is vital in bridging research and practice, and in strengthening the contribution of pharmacy to the transformation of healthcare.

I also commend the Organising Committee for incorporating post-symposium workshops that provide participants with opportunities for practical learning, professional development, and knowledge application. These initiatives reflect USM's commitment to lifelong learning and capacity building within the healthcare and pharmaceutical sectors.

I hope that the 3rd USM PharmCare Symposium and Workshop 2026 will serve as a catalyst for new ideas, impactful research, meaningful collaborations, and innovative solutions that ultimately contribute to better patient care and stronger healthcare systems.

On behalf of Universiti Sains Malaysia, I wish the symposium every success and extend my best wishes to all speakers, participants, collaborators, and members of the Organising Committee. May this platform continue to strengthen the role of pharmacy in advancing healthcare at the national, regional, and international levels.

Thank you.

PROFESSOR DATO' SERI IR. DR. ABDUL RAHMAN MOHAMED, FASc.
Vice-Chancellor
Universiti Sains Malaysia

FOREWORD FROM THE DEAN

ASSOCIATE PROFESSOR DR. NURZALINA ABDUL KARIM KHAN
DEAN
School of Pharmaceutical Sciences, Universiti Sains Malaysia

It is my great pleasure to welcome all distinguished speakers, delegates, academics, pharmacists, researchers, students, and healthcare professionals to the 3rd USM PharmCare Symposium & Workshop 2026, organised by the School of Pharmaceutical Sciences, Universiti Sains Malaysia (USM).

Themed "Synergy in Precision Medicine, Digital Health & Pharmacy Education (SPHERE)", this symposium highlights the importance of bringing together scientific knowledge, technological innovation, and education to advance pharmaceutical care and respond to the evolving needs of modern healthcare. The theme reflects our commitment to preparing pharmacy professionals who are capable of integrating emerging scientific evidence and digital technologies into patient-centred practice.

The field of pharmacy is continuously evolving, driven by advances in precision medicine, pharmacogenomics, pharmacometabolomics, pharmacometrics, digital health, and innovative approaches to education and healthcare delivery. In this rapidly changing environment, meaningful dialogue and collaboration among academia, clinical practice, research, industry, and the wider healthcare community are essential to translate knowledge and discoveries into better patient outcomes.

This symposium provides an important platform for participants to share research findings, exchange perspectives, explore emerging developments, and establish new professional and research collaborations. The inclusion of keynote addresses, invited lectures, oral presentations, and post-symposium workshops further strengthens the symposium as a platform for both scholarly engagement and practical professional development.

I would like to express my sincere appreciation to all invited speakers, sponsors, participants, and members of the Organising Committee whose contributions have made this symposium possible. Their commitment and collective efforts reflect the spirit of collaboration and excellence that continues to shape the School of Pharmaceutical Sciences.
I sincerely hope that the 3rd USM PharmCare Symposium & Workshop 2026 will inspire new ideas, strengthen existing partnerships, foster meaningful collaborations, and contribute to the advancement of pharmaceutical care at the national, regional, and international levels.
On behalf of the School of Pharmaceutical Sciences, I warmly welcome you to this symposium and wish everyone a productive, engaging, and rewarding experience.

Thank you.

ASSOCIATE PROFESSOR DR. NURZALINA BINTI ABDUL KARIM KHAN
Dean
School of Pharmaceutical Sciences

FOREWORD FROM THE CHAIRPERSON

DR. CHONG CHEE PING
CHAIRPERSON
3rd USM PharmCare Symposium 2026

It is with great pleasure that I welcome all distinguished speakers, delegates, academics, pharmacists, researchers, students, and healthcare professionals to the 3rd USM PharmCare Symposium & Workshop 2026, organised by the School of Pharmaceutical Sciences, Universiti Sains Malaysia.

This year's symposium, themed "Synergy in Precision Medicine, Digital Health & Pharmacy Education (SPHERE)", brings together three important dimensions that are increasingly shaping the future of healthcare. The integration of precision medicine, digital health, and innovative pharmacy education offers tremendous opportunities to strengthen patient-centred care, enhance healthcare delivery, and prepare future-ready pharmacy professionals.

The symposium provides a valuable platform for participants to share research findings, exchange ideas, discuss emerging trends, and explore opportunities for collaboration across disciplines and institutions. Through keynote addresses, invited lectures, oral presentations, and interactive post-symposium workshops, we hope to create meaningful opportunities for learning, professional development, and knowledge translation.

As pharmacy continues to evolve beyond traditional boundaries, collaboration between academia, clinical practice, research, industry, and the wider healthcare community has become increasingly important. We believe that meaningful conversations and shared experiences can serve as catalysts for new ideas, innovative solutions, and impactful partnerships that ultimately contribute to better patient care and healthcare outcomes.

I would like to express my sincere appreciation to our distinguished speakers, collaborators, sponsors, participants, and the dedicated members of the Organising Committee for their invaluable contributions and support. The successful organisation of this symposium would not have been possible without their commitment, cooperation, and enthusiasm.

It is my sincere hope that the 3rd USM PharmCare Symposium & Workshop 2026 will be an enriching and inspiring experience for all participants, while strengthening professional networks and fostering new collaborations that extend beyond the symposium.

On behalf of the Organising Committee, I warmly welcome you to the symposium and wish you a productive, engaging, and rewarding experience.
Welcome to the 3rd USM PharmCare Symposium & Workshop 2026.

Thank you.

DR CHONG CHEE PING
Chairperson
3rd USM PharmCare Symposium 2026

KEYNOTE SPEAKERS

Keynote speaker (Precision Medicine)

Professor Chonlaphat Sukasem
Head of Department
Division of Pharmacogenomics and Personalized Medicine,
Department of Pathology, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand

Keynote speaker (Digital Health)

Associate Professor Dr Roman Shrestha
Associate Professor
Department of Allied Health Sciences,
College of Agriculture, Health, and Natural Resources,
University of Connecticut (UCONN), USA.

Keynote speaker (Pharmacy Education)

Professor Ian Bates
Chair of Pharmacy Education
UCL School of Pharmacy,
University College London, UK.

INVITED SPEAKERS

Precision Medicine

Dr. Aliza Binti Alias
Senior Principal Assistant Director
Pharmaceutical Care Subdivision,
Pharmaceutical Care Services Programme,
Ministry of Health Malaysia, Malaysia.

Professor Joel Tarning
Head of Clinical Pharmacology
Nuffield Department of Medicine, University of Oxford.
Mahidol Oxford Tropical Medicine Research Unit (MORU),
Faculty of Tropical Medicine, Mahidol University, Thailand.

Professor Dr Lay Kek The
Professor
iPROMISE, Faculty of Pharmacy,
Universiti Teknologi MARA (UiTM)
Puncak Alam Campus, Malaysia.

Digital Health

Mr. William Kian Boon Law
Head of Unit
Digital Health Research & Innovation Unit (DHRi),
Institute for Clinical Research (ICR),
National Institute of Health Complex (NIH),
Ministry of Health, Malaysia.

Pharmacy Education

Dr. Leong Siew Lian
Lecturer
School of Pharmacy,
Monash University Malaysia, Malaysia.

DAY 1: 10th September 2026 (Thursday)

Time	Activity			
8.30-9.00 am	Online Registration and Participant Login			
9.00-9.30 am	Opening Remarks: • Opening speech by the Dean of the School of Pharmaceutical Sciences, USM • Officiation speech by the Deputy Vice -Chancellor of USM; representing Vice-Chancellor of USM			
Theme 1: Precision medicine				
9.30-10.15 am	**Keynote speech (Pharmacogenetics): Prof Chonlaphat Sukasem** *Translating Pharmacogenomics into Clinical Practice: Advancing Precision Medicine for Safer and More Individualised Therapy*			
10.15-10.30 am	Short break			
10.30-11.00 am	**Invited talk (Pharmacogenetics): Dr Aliza Binti Alias** *Pharmacogenetics in Malaysia: Clinical Implementation, Institutional Experience and Future Directions*			
11.00-11.30 am	**Invited talk (Pharmacometrics): Prof Joel Tarning** *Turning Pharmacometric Evidence into Clinical Decisions: Advancing Precision Dosing in Asia*			
11.30-12.00 pm	**Invited talk (Pharmacometabolomic): Prof Dr Teh Lay Kek** *Pharmacometabolomics and Precision Medicine: Translating Metabolic Signatures into Stratified Care*			
12.00-12.30 pm	Q & A for invited talks - Precision Medicine			
12.30-1.00 pm	Sponsored talk			
1.00-2.30 pm	Lunch break (ePoster viewing)			
2.30-2.50 pm	**Talk 1 (Pharmacogenetics): Dr. Nur Aizati Athirah Daud** *From Genotype to Prescription: Implementing Pharmacogenomics in a Teaching Hospital*			
2.50-3.10 pm	**Talk 2 (Pharmacometrics): Assoc Prof Dr Siti Maisharah binti Sheikh Ghadzi** *Pharmacometrics modelling in clinical practice: Insights from rifampicin therapy*			
3.10-3.20 pm	Q & A			
3.20-3.30 pm	Short break			
	Oral presentations (Breakout rooms 1, 2, 3, 4)			
3.30-3.55 pm	OP1	OP5	OP9	OP13
3.55-4.20 pm	OP2	OP6	OP10	OP14
4.20-4.45pm	OP3	OP7	OP11	OP15
4.45-5.10pm	OP4	OP8	OP12	OP16
5.10 pm	End of Day 1			

DAY 2: 11th September 2026 (Friday)

Time	Activity
8.30-9.00 am	Online Registration and Participant Login
Theme 2: Digital Health	
9.00-9.45 am	**Keynote speech (Digital Health): Assoc Prof Dr Roman Shrestha** *Digital Health in Practice: Advancing Patient-Centered Care through Innovation and Implementation*
9.45-10.15 am	**Invited talk (Digital Health): Mr William Law Kian Boon** *Digital Health in Malaysia: Current Landscape, Implementation Experience and Future Directions*
10.15-10.25	Q & A
10.25-10.50 am	**Talk 3 (Digital Health):Dr Muhammad Daoud Butt** *System Level Digital Health: Scaling AI Solutions Across National Pharmacy Services*
10.50-11.15 am	**Talk 4 (Digital Health): Dr Christina Malini Christopher** *Is Digital Healthcare Ready for Older Adults? Bridging the Digital Divide in Asia*
11.15-11.40 am	**Talk 5 (Digital Health): Dr Ali Qureshi** *Clinical Trials Without Patients: Cutting the Cost, Time, and Risk of Clinical Trials with AI-generated Patients*
11.40-11.45	Short break
Theme 3: Pharmacy Education	
11.45 am-12.20 pm	**Keynote speech (Pharmacy Education): Prof Ian Bates** *Transforming Pharmacy Education for Future-Ready Pharmacists: Competency, Innovation and Workforce Readiness*
12.20-2.20 pm	Lunch break (ePoster viewing) & Friday Prayer
2.20-3.00 pm	**Invited Talk (Pharmacy Education): Dr Leong Siew Lian** *Advancing Pharmacy Education in the Region through Digital Simulation and Competency-Based Learning*
3.00-4.20 pm	**Forum** *Synergy in Practice: How Countries Advance Personalised Medicine and Digital Health through Pharmacy Education*
4.20-4.30 pm	Announcement of the Best Oral/e-Poster presentations
4.30-4.45 pm	Closing remarks

SPECIAL THANKS TO

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PRECISION MEDICINE | KEYNOTE SPEAKER 1

Professor Chonlaphat Sukasem
Head of Department
Division of Pharmacogenomics and Personalized Medicine,
Department of Pathology, Faculty of Medicine Ramathibodi Hospital,
Mahidol University, Thailand.

Chonlaphat Sukasem is a Professor in Clinical Pathology and Pharmacogenomics at the Department of Pathology, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand. He is Head of Division of Pharmacogenomics and Personalized Medicine and also serves as Chief of Laboratory for Pharmacogenomics, Somdech Phra Debaratana Medical Center (SDMC) since 2011. Prof. Sukasem is the Founder member and appointed as a Secretariat of Southeast Asian Pharmacogenomics Association (SEAPHARM). He has been appointed as Senior Lecturer, Department of Molecular and Clinical Pharmacology, Institution of Translational Medicine, University of Liverpool. Prof.Sukasem is the Founder member and appointed Executive member (Academic affair) of Biosafety Association of Thailand (BAT). He serves as Institutional Biosafety Committee (IBC), Mahidol University. He has a background in pharmacological science and pharmacogenomics. Professor Sukasem has also published more than 180 peer-reviewed papers in the field of pharmacogenomics. His research has focused on pharmacogenomics and personalized medicine, clinical pharmacology and drug safety. His work has seen him at the forefront of translational pharmacogenomics research into clinical practices including pharmacogenetic testing, TPMT enzyme activity and therapeutic drug monitoring for the precision medicine. He has contributed the international guidelines of The Clinical Pharmacogenetics Implementation Consortium for (1) HLA Genotype and Use of Carbamazepine and Oxcarbazepine and (2) CYP2B6 and Efavirenz-containing Antiretroviral Therapy.

Abstract

Translating Pharmacogenomics into Clinical Practice: Advancing Precision Medicine for Safer and More Individualised Therapy

Pharmacogenomics (PGx) in Clinical practices for “Patient’s safety”

- Prevention SCARs: Case 1: 75 yrs female with Allopurinol-induced TEN (PGx testing: HLA-B*58:01)
- Dose optimization: Case 2: 9 yrs boy ALL with febrile neutropenia after 6-MP treatment (PGx testing: TPMT and NUDT15)
- Drug response: Case 3: 58 yrs male with stent thrombosis after clopidogrel resistance (PGx testing: CYP2C19)

Real world of patients and Precision Medicine

- Case 4: Doctor suspected “clopidogrel resistance” (no polymorphism in CYP2C19)
- Case 5: Bleeding from Dual-antiplatelet therapy (no polymorphism in CYP2C19)

Good Practices of Pharmacogenomics and Precision Pharmacy (GPPGx) and VBHC

DIGITAL HEALTH | KEYNOTE SPEAKER 2

Associate Professor Dr Roman Shrestha
Associate Professor
Department of Allied Health Sciences,
College of Agriculture, Health, and Natural Resources,
University of Connecticut (UCONN), USA.

Abstract

Digital Health in Practice: Advancing Patient-Centered Care through Innovation and Implementation

PHARMACY EDUCATION | KEYNOTE SPEAKER 3

Professor Ian Bates
Chair of Pharmacy Education
UCL School of Pharmacy,
University College London, UK.

Ian Bates is Professor of Pharmacy Education at the UCL School of Pharmacy and Director for the FIP Global Pharmaceutical Observatory. He was instrumental in authoring the global FIP Development Goals and has been leading on global workforce transformation, working with many national leadership bodies worldwide. He is Editor-in-Chief of the international peer review journal Pharmacy Education, published by the International Pharmaceutical Federation. Professor Bates is a FIP Fellow, Fellow of the Royal College of Pharmacy and a Fellow of the Royal Statistical Society. In 2017 he received the Royal Pharmaceutical Society Charter Medal for lifetime achievement, and prior to that the Lifetime Achievement Award from the UK Clinical Pharmacy Association.

Abstract

Transforming Pharmacy Education for Future-Ready Pharmacists: Competency, Innovation and Workforce Readiness

PRECISION MEDICINE | INVITED TALK 1

Dr Aliza Binti Alias
Senior Principal Assistant Director
Pharmaceutical Care Subdivision,
Pharmaceutical Care Services Programme,
Ministry of Health Malaysia, Malaysia.

Dr. Aliza binti Alias brings 20 years of experience as a clinical pharmacist, specializing in infectious diseases and clinical pharmacokinetics. Currently, she actively drives national strategic policies to strengthen clinical pharmacy services and promote rational medicine use. She serves on high-level national committees for the 13th Malaysia Plan's Precision Medicine, obesity management, non-communicable diseases (NCD) and hepatitis plans. Dr. Aliza also coordinates program and national initiatives like advanced clinical training namely Malaysia Advanced Clinical Pharmacy Programme (MyACPP) and Empowering Patient Living with Diabetes (ERAT), and serves as the focal point for a joint WHO and Temasek Foundation pediatric program.

Abstract

Pharmacogenetics in Malaysia: Clinical Implementation, Institutional Experience and Future Directions

Strategic implementation of pharmacogenetics in Malaysia is currently driving a critical transition toward precise, personalized medicine. By leveraging patient genetic profiling, this national framework aims to significantly enhance treatment efficacy while systematically minimizing adverse drug reactions (ADRs). Led by a dedicated pharmacogenomics pharmacist team comprising pharmacists specifically qualified in pharmacogenomics. The initiative outlines a comprehensive five-year roadmap designed to build sustainable capacity within the healthcare system. A core priority of this roadmap is the development of robust ADR profiling mechanisms alongside an advanced Clinical Decision Support System (CDSS). This digital infrastructure is critical for the accurate interpretation of complex genetic data, providing clinicians with real-time, evidence-based treatment recommendations to guide safer prescribing. Institutional experiences in major clinical disciplines, specifically infectious diseases and neurology, have already demonstrated the value of these genotype-guided therapies in optimizing patient care outcomes.

Moving forward, these clinical applications will be expanded to oncology, respiratory medicine, cardiology, and many more specialties based on healthcare demand and national priorities. However, the path to full integration is not without hurdles. The framework candidly addresses significant challenges, primarily the urgent need for a dedicated local population database to ensure genetic relevance and the high costs associated with genomic testing. To overcome these barriers, the strategy emphasizes a synergistic collaboration between academic institutions and clinical practitioners. Ultimately, these efforts are geared towards cultivating a future-ready pharmacy workforce capable of navigating the complexities of genomic medicine, ensuring that Malaysian healthcare remains at the forefront of global medical innovation.

PRECISION MEDICINE | INVITED TALK 2

Prof Joel Tarning
Head of Clinical Pharmacology
Nuffield Department of Medicine, University of Oxford.
Mahidol Oxford Tropical Medicine Research Unit (MORU),
Faculty of Tropical Medicine, Mahidol University, Thailand.

Dr Joel Tarning is a Professor of Clinical Pharmacology at Karolinska Institutet, Sweden, University of Oxford, UK and a visiting Professor at the Faculty of Tropical Medicine, Mahidol University, Thailand. He leads a large and diverse team of 30 people studying clinical pharmacology. The main scientific directions within the group are pharmacometric data analysis, bioanalytical method development, drug quantification of clinical study samples, omics-based research, falsified/substandard medicine, and basic pharmacology. Professor Tarning has published >280 peer-reviewed articles resulting in >20,000 citations.
https://ki.se/personer/joel-tarning
http://www.ndm.ox.ac.uk/principal-investigators/researcher/joel-tarning

Abstract

Turning Pharmacometric Evidence into Clinical Decisions: Advancing Precision Dosing in Asia
Optimal antimalarial dosing must account for differences in drug exposure, parasite biology, and host characteristics. Pharmacometric modelling provides a quantitative framework for translating these factors into clinically relevant dosing and treatment recommendations.
Here, we illustrate how population pharmacokinetic and pharmacodynamic modelling can identify vulnerable patient groups, evaluate dosing strategies, and support malaria elimination. In children with uncomplicated Plasmodium falciparum malaria, a population PK/PD analysis of dihydroartemisinin–piperaquine in 236 children demonstrated lower piperaquine exposure in young children receiving standard weight-based dosing. Population-based simulations generated an optimized dose regimen that produced comparable exposure across weight groups without increasing peak concentrations.
The same approach addressed an important treatment gap in P. vivax malaria. A mechanistic mother-to-infant model integrating maternal plasma, capillary blood, breastmilk, and infant exposure data showed that primaquine and carboxyprimaquine exposure in breastfeeding infants was more than 100-fold lower than maternal exposure. These findings indicated a low likelihood of clinically significant haemolysis after the neonatal period and provided evidence supporting the use of primaquine in breastfeeding women.
Finally, a dynamic PK/PD framework linked ivermectin and its metabolites to mosquito mortality in 26 healthy volunteers. The model quantified species-specific susceptibility, characterized drug-drug interactions, and demonstrated the duration of mosquito-lethal exposure following repeated ivermectin administration.

PRECISION MEDICINE | INVITED TALK 3

Professor Dr Lay Kek The
Professor
iPROMISE, Faculty of Pharmacy,
Universiti Teknologi MARA (UiTM)
Puncak Alam Campus, Malaysia.

Prof. Dr. Teh Lay Kek is a pharmacist and academic researcher at Universiti Teknologi MARA (UiTM). She has been with UiTM since 2003 and has extensive experience in translational research, postgraduate training, teaching, and community engagement. Her research focuses on pharmacogenomic biomarkers, pharmacometabolomics, population genomics, next-generation sequencing, and mass spectrometry, with particular interest in translating omics discoveries into personalized healthcare, molecular diagnostics, and clinically relevant precision medicine applications. She is also passionate about promoting public awareness of precision health and empowering communities through accessible, evidence-based healthcare innovations.

Abstract

Pharmacometabolomics and Precision Medicine: Translating Metabolic Signatures into Stratified Care

Unlike static pharmacogenomics, the metabolome reflects dynamic functional outputs arising from genome–environment interactions. Pharmacometabolomics bridges molecular variation and precision medicine by providing functional biomarkers for disease risk, treatment response, and drug toxicity. We present clinical metabolomic research spanning breast cancer, cardiometabolic disease, obesity, type 2 diabetes mellitus (T2DM), and genotype-guided drug safety, demonstrating the translation of metabolic signatures into potential actionable biomarkers and predictive models. In breast cancer, LC-MS Q-TOF profiling revealed systemic metabolic reprogramming, characterized by reduced plasma maltose and elevated hypoxanthine, together with intratumoral glycerophosphocholine depletion. ER-negative tumours showed polyamine pathway activation with elevated spermine, while protective eicosanoids progressively declined from Grade 1 to Grade 3 tumours.

In urbanizing Orang Asli communities, a 21-biomarker machine-learning framework, including 15(S)-HETE and phosphorylcholine, predicted myocardial infarction risk and reclassified 11.0% of apparently healthy individuals into a high-risk metabolic phenotype. In obesity, serum metabolomics identified 85 dysregulated metabolites, enabling development of a predictive machine-learning model with an AUC of 0.95 based on lipid-related risk biomarkers. In T2DM, altered amino acid and lipid metabolic pathways, including hydroxyprolyl-leucine and N-palmitoyl threonine, differentiated patients from healthy controls and revealed metabolic signatures associated with chronic kidney disease and ischemic heart disease complications, with diagnostic accuracies exceeding 70%.

Finally, integration of pharmacogenetics and metabolomics in 5-fluorouracil-treated colorectal cancer patients demonstrated that UGT1A1*28 homozygosity was associated with a >16-fold elevation of L-urobilin and systemic bilirubin retention, identifying a metabolic signature of chemotherapy-induced liver toxicity. Collectively, these findings demonstrate that pharmacometabolomics can advance beyond biomarker discovery toward actionable risk stratification, early disease detection, treatment-response prediction, and safer personalized therapy, positioning the metabolome as a dynamic functional layer of precision health and medicine.

DIGITAL HEALTH | INVITED TALK 4

William Kian Boon Law
Head of Unit
Digital Health Research & Innovation Unit (DHRi),
Institute for Clinical Research (ICR),
National Institute of Health Complex (NIH),
Ministry of Health, Malaysia.

William entered the public service in 2006 and worked as a clinical pharmacist at Hospital Sultan Ismail from 2007 to 2009. He joined the Institute for Clinical Research (ICR, formerly known as National Clinical Research Centre) in 2010 to establish the country's first phase 1 Clinical Trial Facility, located at Ampang Hospital, Selangor. William was trained in project management, research methodology, statistics, infectious disease modeling, big data analytics, artificial intelligence (AI) and digital health leadership. He got his master's in science (Statistics) from UM in 2017 and received training in infectious disease modelling from Imperial College London in 2019. During the COVID-19 pandemic, William successfully developed a time-varying SIR model that predicted the dynamics of COVID-19 under the Movement Control Order (MCO) in Malaysia. In 2020, William joined the digital health research and innovation unit (DHRi) and successfully developed the first online COVID-19 screening application using cough sounds and AI in 2022. His AI research pipeline covers diseases such as TB, asthma, thalassemia, lung health, dementia and so on.

Abstract

Digital Health in Malaysia: Current Landscape, Implementation Experience and Future Directions

Malaysia's healthcare system is undergoing a digital transformation, driven by the need to improve patient outcome, service delivery, efficiency and equity. This lecture examines the current landscape of digital health in Malaysia, tracing its evolution from early telemedicine adoption and the Total Hospital Information System (THIS) to more recent initiatives such as MySejahtera, the National Digital Health Blueprint, and efforts toward an integrated Electronic Medical Records system across public health facilities.

We review the implementation experience of these initiatives, highlighting achievements in areas such as pandemic-era digital surveillance, teleconsultation expansion, and pharmacy and laboratory system integration, while also examining persistent challenges including interoperability gaps between public and private providers, uneven digital infrastructure across urban and rural regions, data governance and privacy concerns, and workforce readiness for digital tools. Particular attention is given to the lived experience of healthcare providers and patients navigating these digital systems, offering insight into usability, trust, and adoption dynamics that are often underrepresented in policy-level analyses.

PHARMACY EDUCATION | INVITED TALK 5

Dr Leong Siew Lian
Lecturer
School of Pharmacy,
Monash University Malaysia, Malaysia.

Dr Leong Siew Lian is a registered pharmacist and lecturer at the School of Pharmacy, Monash University Malaysia, with experience in clinical practice, pharmacy education and research. Her educational interests include pharmacy practice, simulation-based learning, competency development and assessment innovation. She coordinates MyDispense initiatives and contributes to the localisation of MyDispense for Malaysian pharmacy practice. She has also served as the School of Pharmacy AI Change Champion, supporting responsible integration of artificial intelligence into teaching, learning and assessment.

Abstract

Advancing Pharmacy Education in the Region through Digital Simulation and Competency-Based Learning

Pharmacy education is evolving in response to changing healthcare needs, advances in digital technologies and increasing expectations for practice-ready graduates. This lecture shares our experience of introducing and refining educational innovations within pharmacy education, with particular emphasis on digital simulation, competency-based learning and the emerging role of artificial intelligence. Drawing on our work with MyDispense at Monash University Malaysia, the presentation will describe how digital simulation has been used to provide students with opportunities to practise dispensing, medication safety, patient counselling and professional decision-making in a safe learning environment. It will also share our experience of localising MyDispense to better reflect Malaysian pharmacy practice and of collaborating with regional and international colleagues to support simulation-based education.The presentation will then reflect on our more recent exploration of artificial intelligence in teaching and assessment, including AI-supported assessment design, staff capability building and responsible use of generative AI. These experiences have prompted us to reconsider how learning activities and assessments should be designed when students have increasing access to AI-enabled tools. Rather than focusing on technology itself, the session will highlight lessons from our ongoing educational journey: starting with the competencies we want students to develop, creating authentic opportunities for practice and feedback, learning from implementation challenges, and working collaboratively to strengthen pharmacy education. Future opportunities for integrating simulation, AI, assessment and educational research within the regional context will also be discussed.

PHARMACOGENETICS | TALK 1

Dr Nur Aizati Athirah Daud
Senior Lecturer
Discipline of Clinical Pharmacy,
School of Pharmaceutical Sciences,
Universiti Sains Malaysia, Malaysia.

Dr Nur Aizati Athirah Daud is a registered pharmacist and Senior Lecturer in Clinical Pharmacy at Universiti Sains Malaysia (USM). She holds BPharm (Hons) and MPharm (Clinical Pharmacy) degrees from USM and a PhD in pharmacoepidemiology and pharmacogenomics from the University of Groningen, the Netherlands. She serves on the editorial teams of PLOS ONE and Research in Clinical Pharmacy journals. She has also contributed to pharmacogenetic testing research and service in Human Genome Centre, USM Health Campus.

Abstract

From Genotype to Prescription: Implementing Pharmacogenomics in a Teaching Hospital

Background: Pharmacogenomics can improve medication safety and effectiveness, but translating evidence into prescribing requires locally relevant research, accessible testing and integration into clinical practice. This presentation describes research-driven pharmacogenomics initiatives implemented at Hospital Pakar Universiti Sains Malaysia (HPUSM). **Methods**: The first study investigated HLA-B genotypes associated with severe cutaneous adverse drug reactions (SCAR) caused by aromatic antiepileptic drugs. The second is an ongoing prospective study evaluating CYP2C19 genotype-guided antiplatelet selection following percutaneous coronary intervention (PCI). Findings from both studies were used to support the translation of pharmacogenomic evidence into clinical practice. **Results**: In a multicentre case-control study involving 85 patients, HLA-B*15:02 was strongly associated with SCAR (OR=10.69; 95% CI: 3.42–33.36). These findings supported the development of an HLA genotyping panel, now offered as a clinical service to guide safer antiepileptic prescribing. Since 2022, HLA genotyping service were offered in HPUSM, and samples were processed with a seven-day turnaround time. In an ongoing prospective pilot study, patients in the genotype-guided arm demonstrated greater pattern of platelet inhibition than those receiving universal clopidogrel or ticagrelor. Genotyping before treatment may help identify patients who are less likely to respond adequately to clopidogrel post-PCI. The study revealed implementation challenges involving patient recruitment, test turnaround time and integration into prescribing workflows. Close collaboration among cardiology, pharmacy, laboratory, genomics and research teams is required to support this integration in clinical practice. **Conclusion**: Teaching hospitals can serve as implementation hubs connecting pharmacogenomic research, diagnostics and clinical practice, enabling the transition from genotype discovery to precision prescribing.

PHARMACOMETRICS | TALK 2

Associate Profesor Dr Siti Maisharah binti Sheikh Ghadzi
Associate Professor
Discipline of Clinical Pharmacy,
School of Pharmaceutical Sciences,
Universiti Sains Malaysia, Malaysia.

Associate Professor Dr. Siti Maisharah Sheikh Ghadzi is a pharmacy lecturer in the Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia. She obtained her PhD in Pharmacometrics from Uppsala University, Sweden, in 2017. Her research interests include pharmacometrics, model-informed precision dosing, pharmacokinetic/pharmacodynamic modelling, therapeutic drug monitoring, and disease progression modelling across various clinical conditions. She has supervised over 20 postgraduate students, published more than 50 peer-reviewed articles, and serves as an invited speaker in pharmacometrics. Since February 2025, she has been President of PAGMAS.

Abstract

Pharmacometrics modelling in clinical practice: Insights from rifampicin therapy

Pharmacometrics has emerged as a powerful quantitative tool for understanding drug behaviour, optimizing dosing strategies, and supporting precision medicine in clinical practice. By integrating pharmacokinetic, pharmacodynamic, disease progression, and time-to-event models, pharmacometrics enables informed therapeutic decisions that improve treatment efficacy and patient outcomes. Tuberculosis (TB), particularly rifampicin-based therapy, presents an ideal clinical application due to the substantial inter-individual variability in drug exposure and treatment response.

This presentation highlights the application of pharmacometric approaches to investigate clinical outcomes and rifampicin pharmacokinetics in Malaysian patients with drug-susceptible pulmonary TB. Time-to-event modelling was employed to characterise sputum conversion and chest X-ray improvement, identifying drug abuse status and baseline chest X-ray severity as significant predictors of delayed sputum conversion, while body weight was associated with slower radiological improvement. In parallel, a population pharmacokinetic model of rifampicin was developed to quantify pharmacokinetic variability and evaluate the influence of genetic polymorphisms. The findings demonstrated considerable variability in rifampicin exposure, with physiological and clinical factors contributing more substantially than the evaluated genetic variants.

The presentation will discuss how these pharmacometric models provide quantitative insights into treatment response, facilitate the identification of patients at risk of delayed recovery, and establish the foundation for model-informed precision dosing of rifampicin. The integration of pharmacometric modelling into clinical practice offers significant opportunities to personalise tuberculosis treatment, optimise therapeutic outcomes, and support evidence-based decision-making. The principles presented are broadly applicable to other therapeutic areas, reinforcing the expanding role of pharmacometrics in modern clinical pharmacy and precision medicine.

DIGITAL HEALTH | TALK 3

Dr Muhammad Daoud Butt
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Discipline of Social & Administrative Pharmacy,
School of Pharmaceutical Sciences,
Universiti Sains Malaysia, Malaysia.

Muhammad Daoud Butt is a Senior Lecturer in Pharmacy Practice and a Health Economics and Outcomes Research researcher at the School of Pharmaceutical Sciences, Universiti Sains Malaysia. Holding a PhD in Pharmacy Practice from USM, his research bridges health systems evaluation, real-world evidence (RWE), and the integration of digital health and artificial intelligence into chronic disease management. With prior industry experience as a Project Manager leading digital patient care models, his work focuses on translating health informatics and implementation science into scalable solutions for national health services and value-based policy.

Abstract

System Level Digital Health: Scaling AI Solutions Across National

Integrating AI into pharmacy practice demands moving beyond isolated pilots to build robust, national-level digital health infrastructure. This presentation explores the strategic frameworks required to scale AI solutions across public healthcare networks, transitioning from foundational health apps to advanced clinical information systems.The session highlights core AI capabilities that transform pharmacy workflows, including predictive non-adherence modeling, intelligent supply chain forecasting, and context-aware clinical decision support. Finally, we will address how to navigate critical implementation hurdles, such as legacy system interoperability, data governance, and workforce adaptation. By sharing strategic insights, this presentation provides a roadmap for policymakers and practitioners to successfully harness AI, optimize medication safety, and elevate large-scale pharmacy services.

DIGITAL HEALTH | TALK 4

Dr Christina Malini Christopher
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Universiti Sains Malaysia, Malaysia.

Dr Christina Malini Christopher is a Senior Lecturer at the School of Pharmaceutical Sciences, Universiti Sains Malaysia (USM). She holds a PhD in Pharmacy Practice from Monash University, a Master's in Pharmacy from UniKL-RCMP, and a Bachelor of Pharmacy (Hons) from UCSI-USM. She has over 16 years of experience in the Malaysian healthcare sector, including clinical pharmacy and hospital pharmacy practice. Her professional and research expertise focuses primarily on geriatric pharmacy and healthy ageing, with particular interests in medication safety, medication optimisation, polypharmacy, deprescribing and medication adherence among older adults. She is actively involved in pharmacy education, research, postgraduate supervision, community health initiatives and professional collaborations. Her work aims to promote safe and appropriate medication use and improve health outcomes and quality of life among older adults.

Abstract

Is Digital Healthcare Ready for Older Adults? Bridging the Digital Divide in Asia

Asia's rapidly ageing population highlights the need for inclusive digital healthcare for older adults. Technologies such as telehealth, electronic health records, remote monitoring and digital medication-management tools offer opportunities to extend healthcare beyond traditional clinical settings. However, adoption remains challenging due to interconnected structural, capability-based and attitudinal barriers. This talk explores seven key barriers, including inadequate internet access, financial constraints, limited digital literacy, age-related physical and cognitive decline, lack of trust, language and literacy challenges, and mental and emotional resistance. These barriers can reinforce one another, creating a cycle of limited access, reduced digital exposure, poor skills and low confidence. A sequenced approach addressing connectivity and affordability, followed by digital literacy and personalised support, alongside sustained efforts to strengthen trust and data security, is proposed. Pharmacists can play an important role in bridging digital exclusion through hands-on technology support, medication reviews, digital safety education and advocacy for hybrid models of care. Coordinated and culturally appropriate strategies involving governments, healthcare providers, technology developers, communities and families are essential to achieving meaningful digital inclusion among older adults in Asia.

DIGITAL HEALTH | TALK 5

Dr Ali Qureshi
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Universiti Sains Malaysia, Malaysia.

Dr. Ali Qureshi is currently working as a Senior Lecturer in Clinical Pharmacy at Universiti Sains Malaysia (USM), holding a PhD in Clinical Pharmacy from USM. Dr Ali has been working on predictive modelling of COVID-19-related mechanical ventilation and mortality. Currently, he is a co-investigator for a real-world evidence study on Tirezepatide under an international grant project.

Abstract

Clinical Trials Without Patients: Cutting the Cost, Time, and Risk of Clinical Trials with AI-generated Patients

Background: Clinical trials are constrained by escalating costs, long timelines, and high rates of late-stage failure. Digital twin (DT) technology — dynamic, computationally generated virtual representations of individual patients or disease processes and has emerged as a solution, using artificial intelligence (AI). **Methods**: A structured search of PubMed/NCBI and ClinicalTrials.gov was conducted using terms combining "digital twin," "in silico trial," "quantitative systems pharmacology," "synthetic control," and "virtual patient," supplemented by citation tracking; because programmatic access to Embase, Scopus, and Web of Science was not available for this review, findings were triangulated against the overlapping coverage these databases share with PubMed-indexed and preprint literature. **Results**: Prognostic digital twins, generated from historical placebo-arm and natural-history data, can serve as individualized counterfactual controls, reducing required concurrent control-arm sample sizes by an estimated 30–50% in some statistical frameworks while preserving power. QSP-based virtual populations have supplemented or substituted control arms in rare-disease trials where recruitment is infeasible, and AI-supported trial design is streamlining eligibility criteria, site selection, and dose selection across the development pipeline. Risk reduction stems from decreased placebo/comparator exposure, earlier detection of individual deviation from expected safety trajectories, and improved representation of underrepresented subgroups. Regulatory agencies, including the U.S. Food and Drug Administration and European Medicines Agency, have begun issuing joint guiding principles on AI model credibility, but formal frameworks for qualifying virtual control arms remain immature. **Conclusion**: Digital twins offer a credible, evidence-supported pathway to faster, less costly, and lower-risk clinical trials, but their responsible adoption depends on rigorous model validation, transparent regulatory pathways, and safeguards against training-data bias. Keywords: In-silico clinical trials; digital twins; synthetic control arms; generative models; drug development; regulatory science.

FORUM

Synergy in Practice: How Countries Advance Personalized Medicine and Digital Health through Pharmacy Education

Panellist 1: Pharmacy Education

Associate Professor Dr. Nurzalina Abdul Karim Khan
Dean, School of Pharmaceutical Sciences
Universiti Sains Malaysia

Panellist 2: Pharmacogenomics, Policy and Healthcare Implementation

Mrs. Nurish Ezzantie Binti Mishan
Senior Principal Assistant Director, UF14
Secretariat, Precision Medicine Committee (JKK Precision Medicine)
Pharmacy Practice and Development Division
Ministry of Health Malaysia

Panellist 3: Artificial Intelligence, Digital Health and Pharmacy Practice

Dr. Fahmi Bin Hassan
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Hospital Tengku Ampuan Rahimah (HTAR)
Klang, Selangor

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The journey of PharmCare 2026 has been shaped by many hands, many hearts and a shared aspiration to move pharmacy education, research and practice forward. To each and every individual and organisation who has contributed to this endeavour, we offer our sincere and profound gratitude.

Thank you for being an integral part of the 3rd USM PharmCare Symposium & Workshop 2026.

With appreciation,

The Organising Committee
3rd USM PharmCare Symposium & Workshop 2026
School of Pharmaceutical Sciences, Universiti Sains Malaysia


The 3rd
PharmCare
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2026