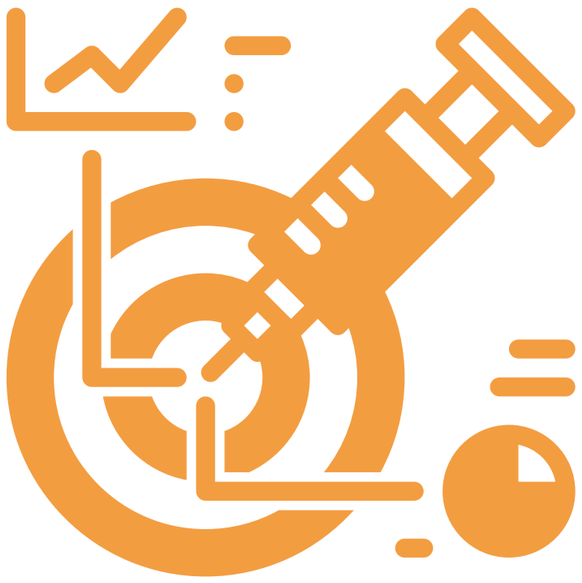
NUS National University of Singapore | Department of Biochemistry
Yong Loo Lin School of Medicine



What Precisely is Precision Medicine?

4 Feb - 25 Feb 2023 (every Sat morning) | 9am - 12.30pm

Delivery Mode: Online

NUS Course Code: BCH_PM01

Precision Medicine is here and hyped to be a game-changer, with the potential to transform modern medicine and drive health outcomes. So what precisely is Precision Medicine? How does Precision Medicine revolutionise disease identification, diagnosis, prognosis and/or treatment? With OMICs and Big Data being key features, what opportunities and challenges does Precision Medicine presents, before it can be fully realized in the clinic?

This course is Part 1 of 2 complementary Precision Medicine (PM) CET courses, which can be taken either individually or together depending on the participants' interests/inclinations.

This Part 1 PM CET course will introduce participants to the field of Precision Medicine including the hype, hope, premise, nuts & bolts (including the concept of OMICs in PM and types of PM), as well as the opportunities and challenges of PM. It will also introduce some common genomics and proteomics tools used in PM, and highlight how PM is/can be applied clinically for both genetic and complex diseases. Through experiential learning, the Part 2 PM CET course will introduce participants to some basic skills of handling big data in PM, including data wrangling, analyses, and visualization to gain insights, as well as machine learning to predict disease in PM.

Who Should Attend?

- University graduates who are interested to explore a career in:
  - Biomedical Education/Research
  - Biotechnology
  - Pharmaceutical
  - Deep Technology startup
  - Diagnostic lab
  - Academic Medicine
- Clinicians who would like to apply for Precision Medicine in their clinical practice or become clinical leaders in Precision Medicine

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Visit the Course Webpage or contact the PHM team at mscphm@nus.edu.sg

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Course Objectives

At the end of Part 1 Precision Medicine CET course, participants will be able to:

- Appreciate the role of Precision Medicine in Modern Medicine
- Appreciate the current Opportunities and Challenges in Precision Medicine
- Know some common Genomic / Proteomic / Metabolomic / Lipidomic Tools used in Precision Medicine
- Appreciate how Precision Medicine is/can be applied clinically for genetic/complex diseases

Programme Breakdown

Day 1

Nuts & Bolts, Opportunities and Challenges of Precision Medicine

Day 2

Introduction to Common Genomics Tools in Precision Medicine

Day 3

Introduction to Common Proteomic/Metabolomic Tools in Precision Medicine

Day 4

Clinical Application / Potential of Precision Medicine

- Clinical Potential of Precision Medicine in Cardiovascular Disease
- Clinical Potential of Precision Medicine for Cancer Diagnostics
- Preimplantation Genetic Testing

Course Fees

$2033 per pax (Includes GST)

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Our Trainers

Prof Markus R Wenk

Professor, Department of Biochemistry, NUS Yong Loo Lin School of Medicine
Director and Principal Investigator 'Singapore Lipidomics Incubator (SLING)',
Life Sciences Institute, NUS
Director, Precision Medicine Translational Research Programme

Prof Markus Wenk has been interested in membrane lipids, their structure and function since his undergraduate years at the Biozentrum of the University of Basel. At Yale, he introduced and established techniques for analysis of phospholipid metabolism at the neurological nerve terminal. Since then he has been spearheading novel approaches in systems scale analysis of lipids and their interactors (lipidomics) and is recognized as a thought leader in this field. His main scientific focus is determination and understanding of natural biological variation of circulating metabolites and lipids beyond the well-known examples of cholesterol.

He is Provost's Chair Professor, Department of Biochemistry at NUS Medicine, founder and Director of the Singapore Lipidomics Incubator (SLING) at NUS as well as Director of the newly formed Precision Medicine Translational Research Program at NUS.

A/Prof Caroline Lee

Vice Dean, NUS Graduate School
Associate Professor, Department of Biochemistry,
NUS Yong Loo Lin School of Medicine
Associate Professor, Duke-NUS Medical School
Principal Investigator, National Cancer Centre
Member, Precision Medicine Translational Research Programme

A/Prof Caroline Lee obtained her PhD at Baylor College of Medicine, Houston, TX, USA and did her post-doctoral training in Human Gene Therapy with Dr Michael Gottesman at the National Cancer Institute, National Institutes of Health, Bethesda, MD, USA. She was previously a part-time Assistant Professor at Johns Hopkins University School of Medicine, an Investigator at Johns Hopkins Singapore as well as a Visiting Associate Professor at Stanford University School of Medicine.

She is currently an Associate Professor at NUS Medicine and a Vice Dean of outreach and admissions at the NUS Graduate School which oversees all research graduate programs at NUS. She also has concurrent appointments at Duke-NUS Medical School and the National Cancer Centre. Her current research focuses on functional genomics of cancer, employing big data to elucidate underlying mechanisms of disease as well as machine learning / AI approaches to predict disease and/or treatment response. She won SingHealth and NUS Medicine Faculty Research Excellence Awards and has >130 publications with the majority in the genetics/genomics field.

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Our Trainers

Prof Roger Foo

MD, MBBS, FRCP, FACC, FAMS
Zayed bin Sultan Al Nahyan Professor in Medicine
NUS Yong Loo Lin School of Medicine
Director, NUHS Cardiovascular Disease Translational Research Programme
Assoc Chairman Medical Board, National University Hospital
Deputy Director, Cardiovascular Research Institute, NUS Medicine and NUHCS
Assistant Dean (Research), NUS Yong Loo Lin School of Medicine
Head, NUHS Clinician Scientist Academy
Senior Consultant, National University Heart Centre, NUHS

Prof Roger Foo is the Zayed bin Sultan Al Nahyan Professor of Medicine at the NUS Yong Loo Lin School of Medicine, Director of the NUHS Cardiovascular Disease Translational Research Programme, Assistant Dean (Research), Head NUHS Clinician Scientist Academy, and Senior Consultant lead for Cardiac Genetics, National University Heart Centre.

He is a graduate of the Medical School at NUS and spent 20 years abroad before returning to Singapore in 2013. His specialist training was undertaken at Kings College Hospital, London, and Addenbrooke's Hospital, Cambridge.

In 2003, he was awarded the Wellcome Trust Fellowship to pursue research at the Albert Einstein College of Medicine, New York, and returned to Cambridge in 2006 as a British Heart Foundation Fellow and Consultant Physician, before eventually returning to Singapore. His lab was the first to publish an epigenomic map of the failing human heart in 2012.

More recently, they have published an in-depth analysis of the cardiac chromatin 3D organisation, and also reported the discovery of new long noncoding RNAs which regulate key cardiac gene expression, and cardiomyocyte cell states. The approach of the lab deep dives into the epigenome, using advanced technology including single cell transcriptomics and Crispr-genome editing to explore frontiers. Always seeking translational opportunities, Roger was also the first to apply Next Generation sequencing-based genomics to the cardiac clinic at NUH and established multiple research and commercial networks with collaborators locally and internationally.

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Our Trainers

A/Prof Samuel S. Chong

Associate Professor, Departments of Paediatrics and Obstetrics & Gynaecology, NUS Yong Loo Lin School of Medicine
Director, Preimplantation Genetic Diagnosis Centre, National University Hospital
Scientific Advisor, Molecular Diagnosis Centre and Clinical Cytogenetics Service, Department of Laboratory Medicine, National University Hospital

A/Prof Samuel Chong obtained his undergraduate degree from the National University of Singapore, his Master's degree from the University of British Columbia (Vancouver, Canada), and his PhD in Human Molecular Genetics from Baylor College of Medicine (Houston, Texas, USA).He underwent post-doctoral training at the National Human Genome Research Institute, NIH (Bethesda, Maryland, USA), before joining the McKusick-Nathans Institute of Genetic Medicine, Johns Hopkins School of Medicine (Baltimore, Maryland, USA) as an Assistant Professor, with a concurrent appointment in the Department of Gynecology and Obstetrics. Just before the turn of the millennium, he returned to join the National University of Singapore. That same year, he received his Diplomate in Clinical Molecular Genetics from the American Board of Medical Genetics and became a Fellow of the American College of Medical Genetics the following year.

He is currently an Associate Professor in the Departments of Paediatrics and Obstetrics & Gynaecology. He also serves as Director of the Preimplantation Genetic Diagnosis Centre and Scientific Advisor in the Department of Laboratory Medicine at the National University Hospital. His research focuses on leveraging emerging technologies to develop novel and innovative cytogenomic diagnostics to simplify preimplantation, prenatal and postnatal genetic testing and screening of challenging genetic disorders, including thalassemias and repeat expansion disorders.

Dr Benedict Yan

Head and Senior Consultant, Molecular Diagnosis Centre
Department of Laboratory Medicine, National University Health System
Adjunct Associate Professor, Department of Paediatrics
NUS Yong Loo Lin School of Medicine

Dr Benedict Yan’s current primary appointment is Head and Senior Consultant at the Molecular Diagnosis Centre, Department of Laboratory Medicine, National University Hospital. A histopathologist by training, he obtained his MBBS from the National University of Singapore in 2005 and his Fellowship from the Royal College of Pathologists in 2013. He is actively involved in several genomic and precision medicine efforts in Singapore.

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