

Clinical Omics Technologies in Precision Management of Cancer Virtual Course

Thursday 15 & Friday 16 July 2021

Overview:

This clinical omics course aims to introduce the current and future challenges and opportunities of “omics techniques” in development of innovative biomarkers and the barriers for delivery of clinical diagnostics assays. You will learn the use of analytical methodologies and sequencing technologies to investigate genomic variation, and in estimating levels of gene expression profiling. You will also develop an understanding of various approaches in study design and their practicality for setting up analyses in biomarker discovery and development.

Description:

The course focuses on providing a source of practical insights for the pathologists, oncologists, trialists and translational scientists who are working to translate discovery/findings across the broad range of “omics” technologies to deliver molecular and precision medicine for patients. The genomic techniques include targeted approaches, RNA-sequencing, whole exome and whole genome sequencing.

Cost:

£60 per day/£120 for both days

Register:

www.royalmarsden.nhs.uk/studydays

Get in touch:

For further information on the course please contact the Course Coordinator:

Dr Maggie Cheang

Maggie.Cheang@icr.ac.uk

To contact the Conference Team please email

Conferenceteam@rmh.nhs.uk

Or call 020 7808 2921

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Sponsors:



The above sponsors provided funding for the study day, but they have had no input into the programme, selection of speakers or topics.

Course Instructors:

**Dr Syed Haider, Dr Isaac Garcia-Murillas,
Dr Gene Schuster, Dr Maggie Cheang**

Day 1

- 10:00** Welcome and Introductions
- 10:10** Overview in whole exome and genome sequencing, including library preparation methods, sequencing chemistries and platforms
Dr Syed Haider
- 10:40** Detection of circulating tumour cells and ctDNA in liquid biopsy
Dr Isaac Garcia-Murillas
- 11:10** Live Q&A
- 11:25** Break/Sponsor Exhibition
- 11:45** Validation of ctDNA mutation detection in clinical practice
Dr Isaac Garcia-Murillas
- 12:15** Future implications of DNA-based technologies in clinical practice (Discussion)
Dr Syed Haider, Dr Isaac Garcia-Murillas,
Dr Gene Schuster, Dr Maggie Cheang
- 12:45** Summary & Q&A

Day 2

- 10:00** Welcome and Introductions
- 10:10** Overview in RNA-sequencing, various technologies – kits, library preparation methods, chemistry and platforms
Dr Gene Schuster
- 10:40** Development and validation of gene expression signature for predicting patient outcome
Dr Maggie Cheang
- 11:10** Live Q&A
- 11:25** Break/Sponsor Exhibition
- 11:45** Future implications of DNA-based technologies in clinical practice (Discussion)
Dr Syed Haider, Dr Isaac Garcia-Murillas,
Dr Gene Schuster, Dr Maggie Cheang
- 12:15** Summary & Q&A

Please note that the content will be available for 30 days after the event online.

Learning Outcomes

By the end of the course, you will be able to:

- Critically evaluate a range of up-to-date genomic technologies used to interrogate the cancer genome in clinical and research studies
- Critically evaluate the application of statistical and bioinformatics approaches to develop genomic biomarkers in translational studies.

Course Instructors

Dr. Syed Haider, Breast Cancer Research Bioinformatics Group Leader, Breast Cancer Now Research Centre, The Institute of Cancer Research, London, UK.

Dr. Syed Haider completed his PhD at the University of Cambridge in 2012 where he specialised in statistical machine learning algorithms focussing on the identification of prognostic and predictive markers of cancer. Since joining ICR in 2016, he leads the Breast Cancer Research Bioinformatics Group at the Breast Cancer Now Research Centre. His interdisciplinary team is responsible for enabling cutting-edge bioinformatics research in breast cancer through software development, statistical modelling and machine learning. This encompasses analysis and modelling of data arising from regulatory, functional and translational genomics studies. As well as employing publically available tools, his team is developing new methods for biomarker discovery and integration of complex multi-modal biological datasets. He is investigating new ways of mining genome-scale big data for identifying correlates of patient outcome and response to therapy.

Dr. Gene Schuster, Senior Bioinformatician, Endocrinology and Endocrine Therapy Resist Teams, The Institute of Cancer Research, London, UK.

Dr. Gene Schuster is a Senior Bioinformatician in the Endocrinology and Endocrine Therapy Resist Teams at the ICR and The Ralph Lauren Centre for Breast Cancer Research. Dr. Schuster grew up in the US but got his PhD at King's College in London and for several years studied environmental and genomic alterations in model organisms that decreased susceptibility to age-related diseases (e.g. cancer and neurodegeneration) and increased lifespan. His current research has focused on understanding gene expression and genomic alterations in breast cancer associated with drug resistance in both pre-clinical and clinical studies. The goal of the work is to identify biomarkers of resistance and sensitivity to both well established and new drugs to provide better and more personalised care for breast cancer patients.

Dr Isaac Garcia-Murillas, Staff Scientist, Breast Cancer Now Research Centre, The Institute of Cancer Research, London, UK.

Dr Isaac Garcia-Murillas is a Staff Scientist at the Breast Cancer Now Research Centre at The Institute of Cancer Research in London. Dr Garcia-Murillas leads and develops the use of Next Generation Sequencing (NGS) and digital PCR (dPCR) technologies to study circulating tumour DNA (ctDNA) from liquid biopsies. His research interests converge in the clinical utility of ctDNA as a potential biomarker to quantify Minimal Residual Disease, monitor response to treatment, stratify patients to targeted therapies and identify the emergence of drug resistance. Dr Garcia-Murillas read Genetics and Immunology at the University of Aberdeen as an undergraduate student before undertaking his PhD at The University of Cambridge where he worked in the role of lipids as intracellular second messengers. Dr Garcia-Murillas continued his research on signalling pathways as a Postdoctoral Fellow at The Institute of Cancer Research before undertaking his current position.

Dr. Maggie Cheang, Team Leader, The Institute of Cancer Research, London, UK.

Dr. Maggie Cheang grew up in Vancouver, Canada and obtained her PhD in Pathology and Laboratory Medicine under the supervision of Professor Torsten Nielsen from the [University of British Columbia](#) in Canada. She then received a prestigious Canadian Cancer Society/Terry Fox Foundation Postdoctoral Fellowship to train with Professor Charles Perou, a pioneer in identifying subtypes of breast cancer, at the Lineberger Comprehensive Cancer Center at the University of North Carolina, US. Her work has been instrumental in the identification and validation of multiple clinically relevant biomarkers, one of which has been implemented into clinical practice guidelines.

Maggie's primary research focus is to identify biomarkers that would be clinically relevant by fully deciphering the extensive amount of data generated from the current "omics" approaches within clinical trials. As the ICR-CTSU Scientific Lead for genomics biomarkers analysis methodology development she also has biostatistics and bioinformatics oversight of the biomarker enriched trials and translational projects. Her research achievements have been internationally recognised by numerous awards, grants and memberships. She was a Merit Award recipient at the American Society of Clinical Oncology Meeting in 2011 and received a Clinical Science Scholar Scholarship at the CTRC-AACR San Antonio Breast Cancer Symposium in 2011. Dr Cheang was also a recipient of a Career Development Award for Junior Faculty funded by ReThink Breast Cancer Canada in 2011–12; two Novartis Oncology Young Canadian Investigator Awards (2011, 2008); and a National Cancer Institute of Canada Traveling Award for senior graduate students (2007–08). She consults on several trial management and translational research committees for phase II and III trials. As a mark of her standing in the field, she currently serves as an Associate Editor of *BMC Cancer*, Editorial board of *npj Breast Cancer* and Chair of the [National Cancer Research Institute](#) (NCRI) CM-Path Clinical Trials Pathology Advisory Group.

Dr Cheang co-invented the 50 genes-based classifiers for the breast cancer intrinsic subtypes. This assay, commonly known as PAM50, is commercially known as Prosign® and is integrated into multiple international clinical practice guidelines including the German Association of Gynecological Oncology (AGO), St. Gallen International Breast Cancer, European Society for Medical Oncology (ESMO), the UK National Institute for Health and Care Excellence Guidelines, National Comprehensive Cancer Network (NCCN) and American Society of Clinical Oncology (ASCO) Clinical Practice Guidelines for clinical subtype classification in breast cancer.

Outside of work, she enjoys playing piano and snowboarding.