OMICS TECHNIQUES AND TECHNOLOGIES AND THEIR APPLICATION TO GENOMIC MEDICINE

Duration	5 days of face-to-face teaching plus self-directed learning
Cost:	£1250. If you are an NHS employee, full funding is available through Health Education England
Tutors:	Dr Alan Hodgkinson – King's College London, Group Leader Bioinformatics and Population Genomics Group
	Dr Reiner Schulz – King's College London Department of Medical and Molecular Genetics, Senior Lecturer in Bioinformatics and Epigenomics
Location:	King's College London (London Bridge campus)

This module will cover areas of 'omics' technologies, their interpretation and application in key areas of healthcare such as cancer, rare inherited diseases and infectious diseases, as well as research. A specific focus will be on the approaches supporting the 100,000 Genomes Project. This core module will provide the underpinning knowledge to enable students to understand the remaining taught modules and to support those undertaking their research project utilising the 100,000 Genomes Project data sets.

AIMS

- Explore the state of the art genomics techniques used for DNA sequencing (e.g. targeted approaches, whole exome and whole genome sequencing) and RNA sequencing, using highly parallel techniques, together with current technologies routinely used to investigate genomic variation in the clinical setting
- Introduce the bioinformatics approaches required for the analysis of genomic data
- Cover the use of array based methodologies and RNA sequencing in estimating levels of protein expression, micro RNAs and long non–coding RNAs.
- Learn about the strategies employed to evaluate pathogenicity of variants for clinical reporting.

LEARNING OUTCOMES

On successful completion of the module, you should be able to:

- Critically evaluate a range of up-to-date genomic techniques and platforms used to interrogate targeted parts of the genome or the whole genome.
- Critically evaluate the application of current genomic techniques and technologies in clinical and research settings using examples from cancer, common and rare inherited disease, and infectious disease.
- Critically evaluate a range of techniques used to assess the transcriptome.
- Evaluate the role of metabolomics and proteomics in the functional interpretation of genomic data.
- Justify the approaches to the bioinformatics analysis and interpretation of 'omics' data.
- Evaluate the approaches required to assess the pathogenicity of variants identified in whole genome sequencing and other genomic technologies.

ENTRY REQUIREMENTS

Applicants should have a minimum of a lower second class degree (2:2) in a subject that offers an appropriate grounding in science, genetics or healthcare. Alternative professional qualifications may be considered.

PREREQUISITES

Recommended other modules from our Genomic Medicine portfolio that would form appropriate pre-learning include the Fundamentals of Human Genetics and Genomics and The Genomics of Common and Rare Disease module.

We offer Massive Open Online Courses (MOOCs) which you can study online to deepen your understanding.

We suggest the following courses:

The Genomics Era: the Future of Genetics in Medicine

Genomic Technologies in Clinical Diagnostics: Molecular Techniques

Genomic Technologies in Clinical Diagnostics: Next Generation Sequencing

These courses are available at: www.futurelearn.com/partners/sgul

More information at kcl.ac.uk/genomicmedicine
Apply via sgul.ac.uk/genomics