The Science of Molecular Diagnostics

The Science of Molecular Diagnostics is a one-day course exploring the growing role of molecular diagnostics within healthcare. Participants learn how mutations happen and cause disease, and which diagnostics are used to identify where and how disease occurs. If you have a limited science background and are new to the diagnostics sector this course is a great introduction.

Five takeaways:

1. Scientific background to understand how mutations occur and cause disease
2. An overview of the most innovative diagnostics within the biopharma industry
3. Importance of biomarkers in disease and diagnostics
4. An understanding of how DNA- and protein-based diagnostics work
5. How to interpret diagnostic results

Course Agenda

Diagnostics Overview 9:00-9:45
Diagnostic defined
Uses of diagnostics
Types of diagnostics
Biomarkers

Science Driving Molecular Diagnostics:
DNA and Proteins 9:45-10:45
DNA structure and function
Chromosomes and genes
How DNA codes for proteins
Protein structure and function
Proteome
Lab: DNA isolation and extraction

Break 10:45-11:00

Break 2:30-2:45

Genetic Variation: Basis of Disease 11:00-12:00
Alleles
Mutations: genetic variation
Genetic basis of disease
Personalized medicine
Companion diagnostics
Activity: genetic variation taste test

Lunch 12:00-1:00

How Molecular Diagnostics Work:
DNA-Based Diagnostics 1:00-2:30
Polymerase chain reaction (PCR)
Reverse-transcriptase PCR (RT-PCR)
DNA microarrays and SNP chips
Next generation sequencing
Big data and rare disease
Third generation sequencing
Activity: microarray to determine drug metabolism

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How Molecular Diagnostics Work:
Protein-Based Diagnostics 2:45-3:45
Antibodies
Enzyme-linked immunosorbant assay (ELISA)
Multiplexed ELISA
Bead immunoassay
Lateral flow immunochromatographic assay
Protein chromatography

Liquid Biopsies 3:45-4:15
Cell-free DNA
Exosomes
Circulating tumor cells

Review/Q&A 4:15-4:30