Course Agenda

2018 BioBasics™: Biotech for the Non-Scientist Agenda

BioBasics is an intensive two-day course starting with a review of the healthcare sectors and the scientific concepts required for understanding the biopharma industry. Building on this knowledge, the course delves into the cause of genetic and infectious disease, how disease is diagnosed, and the various therapeutic strategies used to mitigate disease. The latest innovations in immunotherapies, RNA technology, gene therapy, checkpoint inhibitors, CAR-T and more are explained.

**Day One**

**Industry Overview 9:00-9:30**
Healthcare industry sectors
Small molecule drugs
Large molecule drugs (biologics)
Peptide drugs
Generics and biosimilars

**Biology: Basis of Biopharma 9:30-10:15**
Biotechnology defined
Molecules critical to life
Cell structure and function
Focus on cellular cell signaling
Industry application: antagonists and agonists as drugs

**Break 10:15-10:30**

**DNA: Biotech’s Blueprint 10:30-11:15**
DNA structure, chromosomes and genes
DNA function
*Lab: DNA isolation and extraction*

**Protein’s: Biopharma’s Workhorse 11:15-12:00**
How DNA codes for proteins
Protein structure
Post-translational modifications
Post-translational modifications critical to making biologics
Chaperone therapeutics
Industry application: using the proteome for drug discovery

**Lunch 12:00-1:00**
Genetic Basis of Disease 1:00-2:30
Mutations: source of genetic variation
Epigenetics and epigenetic medicines
Genetic basis of disease
Monogenic and polygenic diseases
Industry application: identifying mutations that cause disease
Precision medicine: breast cancer
Companion diagnostics
Activity: Genetic variation taste test

Break 2:30-2:45

Genomics: Understanding the Genetic Basis of Disease 2:45-4:15
Genomics defined
Identifying mutations that cause disease
   PCR
   Microarrays
   Next generation sequencing
   Third generation sequencing
Industry application: using big data to treat rare disease
Liquid biopsies

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

Day Two
Treating Genetic Disease 9:00-10:15
Antisense therapy
Exon skipping therapy
Gene therapy
Zinc finger nuclease therapy
CRISPR/Cas9 therapy
mRNA therapy

Break 10:15-10:30

Immunology and Infectious Disease 10:30-12:00
Cells and tissues of the immune system
Non-specific immune response: inflammation
Industry application: understanding autoimmune and inflammatory disease
Specific immune response: T-cells and B-cells
Antibody structure and function
Cytotoxic T-cell structure and function
Helper T-cells and cytokines functions
Lunch 12:00-1:00

Activating an Immune Response: Vaccines 1:00-1:30
Immunological memory
How vaccines work
Types of vaccines: DNA and oncolytic vaccines
Industry application: making an HIV vaccine

Immunotherapies 1:30-2:45
Polyclonal vs. monoclonal antibodies
Therapeutic monoclonal antibody for:
  Oncology
  Autoimmune disorders
  Infectious disease
Industry application: treating cholesterol with PCSK9 inhibitors
Bispecific antibody function
Antibody-drug conjugate function
Immune system checkpoint inhibitor therapies
  PD1 & PDL-1 in the clinic
CAR-T
Other CAR therapies

Break 2:45-3:00

Producing Cures: Biomanufacturing 3:00-4:15
Production platforms: bacterial cells and mammalian cells
Cell line development
Cell bank production and qualification
Bulk upstream process: scale-up
Bulk downstream process: harvest and purification
Purification: types of chromatography
Formulation, fill and finish
Activity: Column chromatography

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