



■ BioBasics 101

The Biology of Biotech for the Non-Scientist

OVERVIEW

BioBasics 101: The Biology of Biotech for the Non-Scientist is an interactive course that explains the foundational science upon which all biopharma therapies are based. This course focuses on the function of DNA, RNA, proteins, and cell signaling and how each interacts in both healthy and diseased tissue. As the course progresses it builds on your new-found molecular biology knowledge to include a more in-depth look at genetic disease and how genetic engineering is used to create personalized medicine options for patients. The course ends with a survey of small and large molecule drugs and explains how each mitigates disease at the molecular level. BioBasics 101 will increase your scientific knowledge so you can converse more effectively with colleagues, clients, regulators, and scientists.

BioBasics 101 was developed for the non-science professional who works within or services the biopharma industry.

Five Takeaways:

1. Fluency in the essential terminology of the biopharma industry.
2. Improved ability to communicate more effectively with colleagues, clients, scientists, and regulators.
3. Increased scientific understanding of your company or client products.
4. Determination of how your employer or client organization “fits” in the healthcare landscape.
5. Integration of your business and science operations to empower staff to recognize new opportunities.

AGENDA

DAY ONE

Introductions 15 minutes

Industry Overview 60 minutes

Healthcare industry sectors
Industry hubs and associations
FDA and industry
NIH and industry
Academia and industry
Research support companies
Funding

Break 10 minutes

Biology: Basis of Biopharma 65 minutes

Process of biotechnology
Molecules critical to life
Cell structure
Industry application: receptors and drug targets
Industry application: mitochondria disease
Cell functions: signaling, protein production
Focus on cell signaling
Industry application: cell signaling and cancer

Break 10 minutes

DNA: Biopharma's Blueprint 65 minutes

History of DNA discovery
DNA structure
DNA organization: chromosomes and genes
Industry application: chromosome abnormalities
DNA function: coding for proteins
Industry application: pharmacogenomics
DNA replication
Industry application: PCR

Wrap-Up 15 minutes

DAY TWO

Proteins: Biopharma's Workhorse

70 minutes

How DNA codes for proteins
Chaperone therapeutics
Industry application: pharmacological chaperone
Post-translational modifications (PTM)
Industry application: PTM and biologics
Industry application: drug discovery
Gene expression
Epigenetics
Industry application: epigenetic medicines

Break 10 minutes

Genetic Engineering 60 minutes

Plasmids
Restriction enzymes
Recombinant DNA/plasmid
Recombinant proteins
Making recombinant proteins
Pharm animals and plants
Recombinant proteins in healthcare

Break 10 minutes



Genetic Basis of Disease 75 minutes

Alleles
Phenotype and genotype
Dominant and recessive genes
Industry application: disease and genes
Mutations: source of genetic variation
Causes of mutations
Genetic basis of disease
Industry application: genome-wide studies
Monogenic and polygenic diseases
Industry application: sickle cell anemia
Industry application: cancer
Precision medicine
Companion diagnostics
Industry application: HER2+ and Herceptin

Wrap-Up 15 minutes

DAY THREE

Genomics: Understanding the Genetic Basis of Disease 115 minutes

Genomics defined
Non-coding DNA: the regulome
Identifying mutations that cause disease
Common genetic diseases
Rare genetic diseases
Industry application: identifying mutations
DNA microarrays (gene chips)
Microarrays uses
Third generation gene sequencing
Industry application: big data and rare disease
Personalized medicine: integrating the 'omics
Industry application: comparative genomics

Break 10 minutes

Drugs Mitigate Disease: An Overview

100 minutes

Categories and characteristics of drugs
Small molecule drugs
Antibiotics
Peptide drugs
Large molecule drugs (biologics)
Vaccines
Therapeutic antibodies
Stem cell therapies
Gene therapies
Cell therapies
RNA therapies

Wrap-Up 15 minutes

