

**Educational Objectives:**

1. This course discusses various aspects of manufacturing and commercial scale production of therapeutics related to cell cultures.

**Course Outcomes**

2. As cell therapies come to market, new technologies will need to be established enabling commercial-scale production. While these therapies transform healthcare, it is believe these innovations will emerge as an important pillar of the manufacturing base so critical to the future National Bioeconomy.

3. **Course Contents**

- a. Antibody Development and Production
- b. Process Validation for Biopharmaceuticals
- c. Technology Transfer for Biopharmaceuticals
- d. Outsourcing Manufacturing of Biopharmaceuticals
- e. TIDES: Oligonucleotide and Peptide® Technology and Product Development
- f. Cell Line Development & Engineering
- g. The Next Wave of Antibody Therapeutics
- h. Oligonucleotide Therapeutics - From Concept to Implementation
- i. New Frontiers in Cancer Drug Development
- j. Targets in Context - Linking Targets to Diseases
- k. Drug Safety Strategies to De-Risk Compounds
- l. Beyond Antibodies & Protein Engineering and Design
- m. Formulation Strategies for Protein Therapeutics
- n. Well Characterized Biologicals
- o. De-Risking Next Generation Biologics
- p. Biopharmaceutical Manufacturing & Development Summit (BMD)

- q. Antibody Engineering/Antibody Therapeutics

**Recommended Books:**

1. Cell Culture Technology for Pharmaceutical and Cell-Based Therapies by Sadettin Ozturk. Taylor & Francis Publishing co.
2. Cell and Tissue Reaction Engineering by Regine Eibl, Dieter Eibl, Ralf Pörtner, Gerardo Catapano, Peter Czermak. Springer.
3. Cell Culture Engineering by Wei-Shu Hu. Springer.