

# Introduction to animal cell culture technology and engineering

Cells, media, bioreactors. Cell cultures kinetics, simulation, optimal operation

## ONLINE COURSE

On-demand

## COURSE FEE

350 € per session

## COURSE ORGANIZATION

Course divided in 3 sessions

Sessions can be taken independently

Session scheduling: suggested one per week

Effort: 2 - 3 h per session

## COURSE DESCRIPTION

This introductory course is designed for students and professionals new to the field of animal cell cultures. It offers a comprehensive overview of the technologies used to cultivate animal cells for the production of therapeutic cells, proteins and viruses. The course also introduces the core concepts and methods of bioprocess engineering used to simulate, scale-up and optimize cell cultures processes for industrial applications

## INSTRUCTOR

Jean-Marc Engasser, BioProcess Digital

## DIGITAL LEARNING

- Learning platform with course resources
- Live or recorded slideshow videos
- Simulations on spreadsheets
- Online collective or one-to-one tutoring

## COURSE PROGRAM

### Session 1: Animal cell cultures technology

Industrial suspended and adherent cells. Nutritional requirements and culture media.  
Cell culture bioreactors from laboratory to industrial scale  
Cell culture production processes with upstream and downstream purification operations

### Session 2: Cell cultures understanding and simulation

Cell culture kinetics: growth, death, consumption of nutrients, production of metabolites, proteins, viruses  
Biological and physical phenomena influencing cultures: cellular reaction, oxygen transfer, medium flow  
Knowledge driven simulation models of cell cultures

### Session 3: Optimal operation of cell culture bioreactors

Optimization of cell bioreactors operation mode and variables  
Fed-batch cultures for operation under substrates limitations  
Perfusion cultures with retained or attached cells for high cell densities