

# NCTM

NATIONAL CENTER FOR  
THERAPEUTICS MANUFACTURING

100 Discovery Drive  
College Station, TX 77845

## BIOSEPARATIONS & DOWNSTREAM PROCESSING

July 11–13, 2017

This professional development course examines the common applications of downstream processing in biopharmaceutical and vaccine manufacturing and principles behind them. Lecture and hands-on training will cover the applications, platforms, equipment, and parameters that are critical to downstream bioprocessing. On Day 1, participants will learn about the different unit operations that are commonly used to manufacture biopharmaceuticals and vaccines, learn about cell lysis methods, and apply centrifugation principles. Day 2 will focus on different membrane filtration processes with hands-on sterile filtration and tangential flow filtration labs. The final day examines the principles of chromatography and scale-up of chromatographic methods with the development and scale-up of a separation method. **Participants will receive 2.4 CEUs upon completion.**

### Course Objectives

- Understand how different unit operations are used in manufacturing biopharmaceuticals and vaccines
- Use a homogenizer to rupture cells and release GFP
- Apply centrifugation theory to transfer a lab scale centrifugation step to a tubular bowl centrifuge
- Learn the theory behind different types of filtration and reinforce concepts through hands-on activities
- Run a separation using tangential flow filtration and analyze product to run a mass balance on the process
- Evaluate the effect of pH and salt on protein binding to anion exchange resin to develop a purification method and use it at different scales



**Price: \$450** (Course fees subsidized by federal funds)

**Class size is limited to the first 12 paid registrants.**

**REGISTER ONLINE:** <https://nctmtp.teex.tamu.edu>

Create Account (if needed), being sure to make note of your User Name and Password. Once your account has been created, select "Login". Enroll in your course of choice from the course catalog.

#### ABOUT THE INSTRUCTORS

**Zivko Nikolov, PhD, PE**, is NCTM's Associate Director and Associate Department Head for the Texas A&M Department of Biological and Agricultural Engineering. A Dow Chemical Professor of Bioprocess Engineering, Dr. Nikolov guides NCTM process development efforts and provides technical expertise for coursework. Before joining Texas A&M in 2003, he was Vice President of bioprocess development with ProdiGene Inc., Professor at Iowa State University, and Senior Scientist at Michigan Biotech Institute.

**Susan Woodard, PhD**, is a Research Scientist for NCTM where she helps to develop and deliver training in the areas of downstream biotherapeutics manufacturing and analytical testing. She comes to NCTM with over 20 years of experience working in both industry and academia. She has held positions in both analytical methods and process development at four biotechnology companies and has also worked as a consultant.

**Matthew Johnson** is a Research Engineering Associate III at NCTM and is responsible for the development and delivery of new curricula for various educational and professional audiences. His focus with the NCTM is in the downstream processing and purification of biotherapeutic molecules.

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