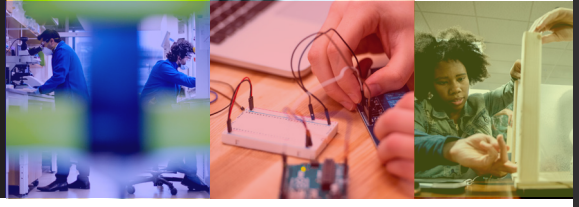
Northeastern University
College of Engineering



National Engineers Week 2021

IMAGINING TOMORROW

A Multi-Scale Approach to Plant Specialized Metabolic Engineering

CHEMICAL ENGINEERING

DESCRIPTION

Professor Roberts' research is focused on cellular engineering and design of bioprocesses using plant-based systems. She uses plant cell culture technology as both a system of study and a scalable production system due to the ability to engineer cells and the environment to optimize accumulation of products of interest. During this event Dr. Roberts will present the story of understanding and optimizing paclitaxel production in Taxus plant cell suspension culture using a multi-pronged cellular engineering approach (intracellular, intercellular and extracellular scales). She will focus on recent approaches and results in considering global specialized metabolism, specialized metabolite transport and epigenetic mechanisms. She uses a combination of traditional bioprocess engineering techniques (e.g., bioreactor design, cell culture, cell encapsulation), modern molecular biology and analytical chemistry techniques (e.g., gene transfer, transcriptomics analyses, UPLC) and mathematical modeling (e.g., genome scale modeling, metabolic flux analyses). Her research has been funded largely through the NSF, NIH and industrial collaborations.

ABOUT THE SPEAKER

Dr. Susan Roberts is Professor and Head of Chemical Engineering at Worcester Polytechnic Institute (WPI). She received her PhD in Chemical Engineering from Cornell University in 1998, served on the faculty at UMass Amherst Chemical Engineering for 17 years and joined WPI as Professor and Head in 2015. Dr. Roberts' research interests are in biomanufacturing, cellular engineering and cell culture, with a primary focus on plant-based systems for synthesis of natural products. She has received a number of awards for her research and education work including the NSF ADVANCE Program, NIIMBL Workforce Development Award, UMass President's Science and Technology Fund Award, NSF IGERT Award, NSF CAREER Award, and UMass Amherst College of Engineering Junior Faculty, Teaching and Advising awards.

WEDNESDAY
FEB. 24TH
12:00-1:00 PM EST

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Dr. Susan Roberts
Professor and Department Head, Chemical Engineering, Worcester Polytechnic Institute