



# ADVANCED PCR TECHNIQUES WEBINAR SERIES



Featuring wastewater testing, advances in agriculture, and pedagogical best practices

Produced in partnership with *InnovATEBIO*, this exciting webinar series will bring together experts in the cutting-edge applications of droplet digital PCR (ddPCR) and real-time quantitative PCR (qPCR). These guest speakers from industry, government, and academia will describe how they integrate these advanced PCR techniques into their research into topics as diverse as testing wastewater for COVID-19 monitoring, investigating the antibiotic resistome, and developing hardy, novel new winter cover crops. Also hear from experts who will offer pedagogical strategies for incorporating these powerful and engaging topics into your class.

Please register for each webinar separately.

**Friday, October 15, 3pm - 4:30pm CT**

[Registration link](#)

## Advanced PCR Techniques: From Theory to Tracking Viruses in Wastewater

Liz Jordan Dreskin, Ph.D. (R&D Manager, Bio-Rad Laboratories)

Joshua Steele, Ph.D. (Microbiologist, Southern California Coastal Water Research Project)

In this webinar, Liz Dreskin will provide an overview of the theory, technology, and applications of conventional PCR, real-time quantitative PCR (qPCR), reverse transcription qPCR, isothermal PCR, and take a deep dive into droplet digital PCR (ddPCR). Then, Josh Steele will describe how his laboratory at the Southern California Coastal Water Research Project uses ddPCR to track SARS-CoV-2 in wastewater to quantify infection rates and identify new emerging variants in communities.

**Friday, October 29, 3pm - 4:30pm CT**

[Registration link](#)

## Real-Time, Quantitative PCR (qPCR): Theory and Real-World Agricultural Applications

Liz Jordan Dreskin, Ph.D. (R&D Manager, Bio-Rad Laboratories)

O. Rahul Patharkar, Ph.D. (Vice-President, R&D at CoverCress, Inc.)

Liz Dreskin will provide a deep dive into the technology, theory, and applications of qPCR and related techniques, such as reverse transcription qPCR. Rahul Patharkar will then describe his research into the use of gene editing and qPCR to develop a new winter cover crop that gives farmers an extra crop in their annual rotations. He will also discuss how his company, CoverCress, uses PCR in combination with traditional plant breeding and multiplex gene editing to transform a weed into a cash crop by improving its flavor, oil composition, and yield.

**Friday, November 5, 3pm - 4:30pm CT**

[Registration link](#)

## Advanced PCR: Pedagogical Challenges and Strategies

Betsy Boedecker (District Director, Center for Plant and Life Sciences and BioBench CRO Coordinator, St. Louis Community College)

Linnea Fletcher, Ph.D. (PI, *InnovATEBIO* and Head of the Biotechnology Program, Austin Community College)

Leigh Brown (Curriculum Training Specialist, Bio-Rad Laboratories Explorer Program)

Interested in teaching advanced PCR techniques? Betsy Boedecker, Linnea Fletcher, and Leigh Brown will discuss the pedagogical benefits, challenges, and tactics related to teaching advanced PCR topics like ddPCR and qPCR to students. Questions from webinar participants will also be addressed.

## Speakers

### **Liz Jordan Dreskin, Ph.D. – R&D Manager at Bio-Rad Laboratories.**



Dr. Dreskin oversees the applications team for the Life Science Group at Bio-Rad Laboratories. Her team works with marketing to develop data and literature to help guide the use of any combination of tools, including electrophoresis and western blotting, PCR, qPCR, ddPCR, NGS, electroporation, flow cytometry and protein purification.

### **Joshua Steele, Ph.D. – Microbiologist, Southern California Coastal Water Research Project**



Dr. Steele specializes in environmental microbiology and microbial ecology. His research involves the development and application of molecular techniques to detect and track pathogens and natural microorganisms in coastal ocean and watersheds. Through the application of next-generation sequencing and metagenomics, he works to connect the environmental microbiome and antibiotic resistance to water quality, ecosystem health, and health risk and uses bioinformatics to measure natural populations and community-wide changes in genes or gene expression in response to environmental changes.

### **Rahul Patharkar, Ph.D. – Vice-President of R&D at CoverCress, Inc.**



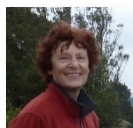
Dr. Patharkar leads the Molecular Genetics group at CoverCress, Inc., where he and his team work to develop new gene editing technologies and glucosinolate reduction processing strategies. CoverCress is a novel cover crop that also produces oil and high protein feed that can fit markets currently filled by canola. An expert in plant pathology and abiotic stress tolerance, Dr. Patharkar has a distinguished history in the application of molecular biology techniques to the improvement of crop viability and productivity, one that was inspired by his life-long fascination with both a plant's ability to grow in all conditions and the beauty and symmetry of row crops.

### **Betsy Boedeker – District Director, Center for Plant and Life Sciences and BioBench CRO Coordinator, St. Louis Community College**



Ms. Boedeker is a molecular biologist with nearly 33 years of experience in both academic and industry settings. She started her teaching career in the biotechnology program of St. Louis Community College, where she designed and taught a specialized course in forensics, and then worked as the Coordinator of the BioBench Contract Research Organization. Now the District Director for the Center for Plant and Life Sciences, she has developed one of the more popular advanced courses for the program called Quantitative PCR Methods, which includes training on droplet digital technologies along with expression analysis using qPCR. Additionally, she is the PI on an NSF grant, generating curriculum in genome editing with input from local industry.

### **Linnea Fletcher, Ph.D. – PI of InnovATEBIO and Head of the Biotechnology Program, Austin Community College**



Dr. Fletcher is passionate about combining economic development with educational opportunities. Trained in biology, chemistry, and biochemistry, she earned her PhD in microbiology and then pursued her interests in education to become Department Chair of Biology at Austin Community College (ACC). To meet the increasing need for more biotechnology technicians in the area, Dr. Fletcher started the Biotechnology Program and received an NSF-funded Advanced Technological Educational (ATE) grant to put biotechnology into area high schools and train both in-service and pre-service teachers in biotechnology. In 2015, she received an Emerging Technology Fund Grant to build a Bioscience Incubator at ACC and several Wagner Peyser Grants to equip it. Today the incubator is full of startup companies and students interning or working for these companies. She was PI of the AC2 Bio-Link Regional Center, and is now the PI of InnovATEBIO, the NSF-funded National Biotechnology Education Center.

### **Leigh Brown – Curriculum Training Specialist, Bio-Rad Laboratories Explorer Program**



As a Curriculum and Training Specialist, Ms. Brown helps teachers successfully implement relevant and engaging science labs in their classrooms. A former high school biology teacher with a background in virology research, she enjoys presenting hands-on teacher workshops and sharing innovative tips and tricks for Bio-Rad Explorer products. She also assists teachers with curriculum alignment and can provide advice regarding the lab activities and equipment that best fit the goals of a course.