

NC STATE UNIVERSITY

# The Schoenborn



## Graduate Research Symposium

Judged Competitions of Formal  
Oral and Poster Presentations of  
Graduate Research

**Tuesday, September 22, 2020**

8:00 AM - 4:00 PM

Virtual Symposium

[www.cbe.ncsu.edu/research/schoenborn](http://www.cbe.ncsu.edu/research/schoenborn)



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## Schoenborn 2020 Graduate Research Symposium

**8:15 – 8:30 AM Welcome and Opening Remarks**

**8:30 – 9:45 AM Oral Presentations Session I: Biotechnology**

**8:30 AM Justin Vento** *Cytotoxicity of the S. pyogenes Cas9 in Lactobacillus paracasei Reveals tracrRNA-Directed RNA Interference*

**8:45 AM Ankit Chandra** *Integrative Model Predicts That Myosin II Hinders Leading Edge Protrusion by Mechanically Disrupting Adhesion-based Signaling*

**9:00 AM Javier Huayta** *C. elegans Lifespan Regulation by Spatiotemporal Activity of DAF-16*

**9:15 AM Rajesh Paul** *Integrated Microneedle-Smartphone Nucleic Acid Amplification Platform for In-Field Diagnosis of Plant Diseases*

**9:30 AM Scott Baldwin** *Building a Better MEF-trap: Advancing Technologies for the Study of Mesenchymal Directed Motility*

**9:45 – 10:00 AM Break I**

**10:00 – 12:00 PM Oral Presentations Session II: Materials and Catalysis**

**10:00 AM Austin Williams** *Particles With "Gecko Legs": A New, Hierarchical Nanomaterial for Functional Coatings, Bioscaffolds, and Gels*

**10:15 AM Arnab Bose** *Degradation kinetics of an Advanced Heat-Transfer Fluid*

**10:30 AM Shravan Pradeep** *Contact Microstructure and Flow Mechanics in Dense Colloidal Suspensions*

**10:45 AM Salvatore Luiso** *Separators and Electrolytes for Next Generation Li-Ion Batteries*

**11:00 – 11:15 AM Break II**

**11:15 AM Siyao Wang** *PIM-1 Based Fiber Mat: Combining Particle Filtration and Rapid Catalytic Hydrolysis of CWA Simulants into a Highly Sorptive, Breathable, and Mechanically Robust Fiber Matrix*

**11:30 AM Camden Cutright** *Environmentally Adaptive Hydrogel Coatings: Construction, Characterization, and Application*

**11:45 PM Natasha Castellanos** *Development of Novel Magneto-Capillary Gels and Responsive 3D Printed Architectures*

**12:00 – 1:15 PM Lunch**

**1:30 PM Keynote Address: Dr. Patrick Bastek, Pfizer**  
**Senior Director for Gene Therapy Process Development**  
*A Positive Case for Viruses*

**2:30 – 4:00 PM Poster Session and Virtual Mixer (see next page)**

## Keynote Presentation

### A Positive Case for Viruses

#### Dr. Patrick Bastek

Senior Director for Gene Therapy Process Development, Pfizer

What do chemical engineers do? They do whatever chemical engineers do. After a start in protein purification, viruses in many forms have shaped my career and perspective. Viruses for making proteins. Viruses to protect from pandemics. Viruses to better patients lives. While our current Covid-19 world gives viruses primarily a bad name, viruses serve as an increasingly important part of our biopharmaceutical present and future. How we exploit and utilize them for public health and health of the smallest patient populations presents unique opportunities where chemical engineering are uniquely suited to solve key challenges.

Public and patient health require tools to understand how to make viruses of increasing complexity at increasingly larger scales. This talk will cover examples of the role in making influenza virus via a newer cell-culture based technology to better support seasonal and pandemic challenges while also offering benefits over older technology. In addition, gene therapy utilizing adeno-associated virus (AAV) vectors is emerging as a promising, clinically-validated technology with the demonstrated ability to significantly modify or even cure diseases. Many companies are committed to this new modality to lead to the next decade plus of innovative products. While AAV-based gene therapy is relatively new to the clinical and commercial space, much can be leveraged from the industry's 20+ year biologics history.

**Biography:** Dr. Patrick Bastek is Sr. Director for Gene Therapy Process Development at Pfizer where he leads a team developing drug substance manufacturing processes. The team develops and transfers processes and technologies to enable clinical and commercial-scale manufacturing while seeking to increase productivity and consistency to enable this emerging modality.

Prior to joining Pfizer, Patrick worked at Novartis Vaccines (then Seqirus) developing, establishing, and improving cell-based influenza manufacturing. Patrick had increasing responsibilities building and leading a Manufacturing Sciences team to build, validate, and license a greenfield facility, directing and implementing a next generation process improvement effort to significantly improve productivity, and serving as the Global Head of Technical Development across all influenza platforms for Seqirus. Prior to that Patrick held various roles in process development and contract manufacturing at Dendreon, Wyeth, and Abbott. Patrick received his Ph.D. from NC State under Dr. Ruben Carbonell in 2000.



## Posters: *Biotechnology*

- (B1) Shawn M. Van Bruggen
- (B2) James Lichty
- (B3) Victoria Karakis
- (B4) Deniz Durmusoglu
- (B5) Ravi Appalabhotla
- (B6) Ryan Bing
- (B7) Tunyaboon Laemthong
- (B8) Joseph Koelbl
- (B9) Daniel J. Willard

## Posters: *Catalysis, Computation, and Kinetics*

- (C1) Sudeep Sarma
- (C2) Leah Granger
- (C3) Yuan Tian
- (C4) Emily Krzystowczyk
- (C5) Junchen Liu

## Posters: *Materials*

- (M1) Rachel Nye
- (M2) Tamoghna Saha
- (M3) Zachary S. Campbell
- (M4) Sunyoung Woo
- (M5) Suyong Han
- (M6) Lilian B. Okello
- (M7) Kameel Abdel-Latif
- (M8) Shreyas Sanjay Kanetkar
- (M9) Rachel S. Bang
- (M10) Yosra Kotb
- (M11) Veenasri Vallem
- (M12) Vahid Rahmanian
- (M13) Fazel Bateni
- (M14) Bradley A. Davis
- (M15) Sooik Im

A Complete Program Book Can be Found Here

