# MICHAEL DeCORTIN

My PhD work is focused on better understanding the effects of anticoagulants on core/shell organization in thrombi using microfluidics. I am interested in using my degree to enter the biotechnology and pharmaceutical space, particularly in oncology or infectious diseases.

Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2022

## RESEARCH EXPERIENCE

### Interrogation of core/shell organization in thrombi
*Jan 2018 - present*

I developed an assay that utilizes an extended height 8-channel microfluidic device. The assay consists of a blood perfusion period to stimulate thrombus growth followed by buffer perfusion to interrogate thrombus stability and organization.

### Investigation of the effect of anticoagulants on neonatal blood
*Oct 2019 - present*

I am examining the effect of apixaban and its reversal agent on neonatal blood in patients with congenital heart disease before and after palliative surgery

### Fabrication of Hydrogels containing Opal Structures
*Jun 2015 – May 2017*

I developed a new sequential micromolding technique that incorporated polystyrene beads into hydrogel films that displayed robust and uniform color. These films shift color in response to environmental stimuli[2].

## PERSONAL HIGHLIGHTS

### Professional skills

- Flow Cytometry
- Microfluidics
- Cell Culturing
- Soft Lithography
- MATLAB, R, Prism
- DeltaV

[1]**DeCortin ME**, Brass LF, Diamond SL. Core and shell platelets of a thrombus: a new assay to study mechanics and biochemistry. Res Pract Thromb Haemost. 2020;00:1-9.
[2]Bukenya, M; Lee, J; Kalidindi, S**; DeCortin, M**; Tice, L; Yoo, P; Yi, H. A Robust Fabrication Technique for Hydrogel Films Containing Micropatterned Opal Structures via Micromolding and an Integrated Evaporative Deposition-Photopolymerization Approach. Langmuir. Under Review.
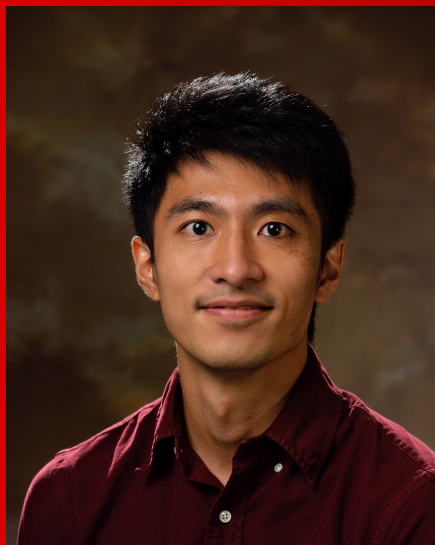
**2020 Graduate Student Symposium
Department of Chemical and Biomolecular Engineering**

**Phone**
(203)695-5562

**Email**
decortin@seas.upenn.edu

**Undergraduate**
Tufts University
B.S. in Chemical Engineering and Mathematics

**Research Interest**
Biological and Biomedical

**Penn**
UNIVERSITY of PENNSYLVANIA

# JINGYU (ALEX) WU

**Phone**
267-625-8481

**Email**
jingyuwu@seas.upenn.com

**Date of Birth**
Oct.16, 1994

**Interests:**
**Basketball, music ,reading and cooking**

I will be looking for a full-time position in Biotech companies that focus on microfluidic-related technologies.

Ph.D. Candidates in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring/Fall 2022

## RESEARCH EXPERIENCE

### Scale-up synthesis of microgels

*Jan 2018 - present*

High-throughput granular microgel on-chip photosynthesis using highly-parallelized microfluidic platform

### Packing of anisotropic microgels

*Jan 2019 – Present*

Porosity and mechanical property study of packed anisotropic microgel particles

### Wettability pattering of polymer mixture

*Jan 2021 – Present*

High resolution wettability patterning of PFPE-PEG polymer mixture for microfluidic applications

## PERSONAL HIGHLIGHTS

### Professional skills
• Photolithography, Soft lithography
• Dry-etching, thin film/metal deposition
• Laser micromachining

Wu, J., *et al.* Scaling up the throughput of microfluidic droplet-based materials synthesis: A review of recent progress and outlook. *Applied Physics Reviews* **8**, 031304 (2021).

Wu, J., *et al* Ultra-high throughput on-chip synthesis of microgels with tunable mechanical properties, Submitted, 2021

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# AMRUTHESH THIRUMALAISWAMY

**Phone**
+1-(267)-265-9829

**Email**
amru@seas.upenn.edu

**Date of Birth**
October 18, 1995

**Education**
- Ph.D., UPenn (2017-present)
- Prof. John C. Crocker
- Prof. Roebrt A. Riggelman
- M.S, UPenn (2017-2019)
- B.Tech., IIT Bombay (2013-2017)

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I'm a passionate, organized and curiosity-driven Ph.D. student with a strong research, academic background in physics, chemical engineering and data analytics, looking forward to working at the intersection of computational research and life sciences.

Ph.D. Candidate in *Chemical and Biomolecular Engineering*
**Expected Graduation**: Spring 2022

## RESEARCH EXPERIENCE

### Ph.D. RESEARCH PROJECTS

**Damped foam modeling** *Apr 2018 – Apr 2019*

A finite viscosity model for power-law rheology

**Soft-glassy dynamics** *Apr 2019 – present*

Modeling cooperative motion in high dimensions

**Landscape exploration** *Jul 2019 – present*

Algorithm development; minima exploration

### OTHER RESEARCH WORK

**RA**, Washington University, St. Louis *May – Jul 2015*

**UG-RA**, IIT Bombay *2015 – 2017*

## PERSONAL HIGHLIGHTS

### Professional skills
- **Programming Languages**: C/C++, Fortran, Python, MATLAB, Scilab, Shell Programming in Linux
- **Simulation Software**: LAMMPS, MCCCS Towhee, ANSYS Fluent, COMSOL Multiphysics, OpenFOAM

### Publications (in preparation)
- *AT*, RAR, JCC, "Energy landscape surface exploration & optimization for soft-glassy systems"
- CRC, MM, *AT*, JCC, RAR, et. al., "High-dimensional fractal landscapes in dense emulsions and stock prices

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# CHRISTIAN TABEDZKI

I am a PhD candidate looking to use the skills I've cultivated to bring about new classes of everyday materials. Currently, I am interested in working for a national lab or in industrial research position.

Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2022

## RESEARCH PROJECTS

**Mapping Phase Equilibria of Core-Shell bottlebrush Copolymers**

**Development of a New Simulation Package for LAMMPS**

**Thermodynamics of Aligned Nanoplates in a Lamellar Diblock Copolymer**

My PhD focuses on exploring the thermodynamics of block copolymers of different kinds using field-theoretic simulations and developing open-source code for it.

**Email**
tabedzki@seas.upenn.edu

**Github**
github.com/tabedzki

**Date of Birth**
linkedin.com/in/tabedzki

**Undergraduate Degree**
BS, Chemical Engineering, Rutgers University

## PERSONAL HIGHLIGHTS

### Professional skills
- Molecular dynamics simulations
- Python, C++, Rust
- Linux
- English (fluent), Polish + French (beginner)

### Hobbies
- Sailing at the local club
- Exploring local running trails
- Traveling/Hiking
- University-wide Student Government

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# Daniel (Yiyuan) Zhang

**Phone**
484-478-1986

**Email**
yiz517@seas.upenn.com

**Undergraduate College**
Lehigh University

**LinkedIn**

**Motivated scientist-engineer trained in biochemical and cellular engineering to develop innovative technologies to model disease biology**

Ph.D. Candidates in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2022

## RESEARCH EXPERIENCE

**GlaxoSmithKline, Co-op**　　　　　*Jun 2021 - present*
*Complex In Vitro Models*
- Assisted in developing a complex 3D vitro model for breast tumor in a context of building scale-able organotypic tumor microenvironment (TME) focused model for high throughput system (HTS)
- Significant contributions to assay development including optimizing ratio, cell number and culture duration and imaging endpoints for complex models

**Direct inhibition of GPVI for platelet deposition**
*Aug 2020 – May 2021*
- Differentiated the effect of direct inhibition of GPVI on clot morphology compared to Syk/SFK inhibition that showcased signaling pathway cross-talking
- Interrogated the significance of initial platelet deposition with phosphatidylserine and thrombin generation that led to a deeper understanding of clot structure and the critical hemostatic role of thrombin

**SFK/Syk inhibition for platelet deposition**
*Jun 2018 – Mar 2019*
- Interrogated the difference of platelet activation/deposition inhibited by Syk/SFK inhibitor with/without thrombin
- Proposed a possible cell signaling pathway of platelet through glycoprotein VI (GPVI), SFK and Syk to explain undesirable bleeding in current leukemia treatments

## PERSONAL HIGHLIGHTS

**Professional skills**
- Mammalian cell culture, including breast tumor cells, cancer associated fibroblasts and mammary epithelial cells
- RT-PCR, Sanger sequencing, flow cytometry and Western Blot for genetic analysis
- Robotics for high throughput screening: GNF washer dispenser, ThermoFisher Combi, Dragonfly
- Perkin Elmer's Operetta, Zeiss confocal microscope for live imaging, platelet aggregometer for drug response
- Spinner, mask aligner and profilometer for nanofabrication

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# KEVIN TRIGANI

**Phone**
732-614-8743

**Email**
trigani@seas.upenn.edu

**Undergraduate Education**
Johns Hopkins University
B.S. in Chemical &
Biomolecular Engineering

**Area of research**
Biological & Biomedical

**University of PENNSYLVANIA**

My PhD work has focused on studying the effects of agonists on platelet composition in blood clots under flow. I'm interested in pursuing a career in cellular and genetic engineering and/or cancer immunotherapies.

Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2022

## ACADEMIC/INDUSTRY EXPERIENCE

### Contraction Inhibition by ADP and TXA2 antagonists     *March 2020-present*

I developed a contraction assay to evaluate how ADP and TXA2 inhibitors affect local and global clot contraction. I have found that TXA2 inhibition has a greater effect on limiting local platelet contraction than ADP inhibition.

### CAR-T Co-op: Janssen (J&J)     *Jun – Aug 2020*

I was a Co-op on the early process development R&D team for CAR-T therapies, working primarily in lentiviral vector assay development (interpreting results and eventually automating data analysis) and flow cytometry (using FlowJo to characterize T cells from multiple process runs).

### Fibrin attenuates Phosphatidylserine-positive Platelet Sorting     *May 2018 – May 2020*

Using human whole blood, I have performed in vitro studies to evaluate how thrombin and fibrin affect PS+ platelet sorting. I developed 2 quantitative methods for quantification for both temporal and spatial sorting. I have found that PS+ platelet sorting correlates with clot contraction and correlates inversely with fibrin.

## PERSONAL HIGHLIGHTS

### Professional skills

- Cell culture
- Gel electrophoresis, western blots, PCR, ELISA
- CRISPR/Cas9 transfection
- Flow cytometry
- MATLAB, ImageJ, FlowJo

### Publications:

K.T. Trigani, S.L. Diamond. Intrathrombus Fibrin Attenuates Spatial Sorting of Phosphatidylserine Exposing Platelets During Clotting Under Flow. Thrombosis and Haemostasis. 2020.
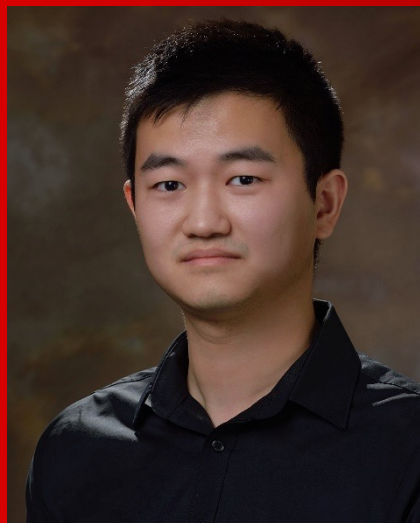
**2021 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

# ENTAO YANG

**Experienced researcher in MD simulation and machine-learning-assisted modeling of polymer nanocomposites (PNCs)**

Ph.D. Candidate in Chemical and Biomolecular Engineering

**Expected Graduation**: Spring 2022

## RESEARCH EXPERIENCE

**Mechanism of Creep Suppression in Polymer Glass and Polymer Nanocomposites**

- Decompose polymer dynamics in PNCs into two independent processes with explicit expressions by combining MD simulation and machine learning techniques;
- Develop the Structure-dependent Eyring model which reveals the physical meaning of empirical parameters in the original Eyring model.

**Effect of Polymer-Nanoparticle (NP) interaction on Strain Localization of Polymer Nanopillars**

- Connected strain localization position to the local structure of polymer nanopillars with different types of NPs;
- Probed local structure changes using a recent developed machine-learned field, softness.

## PERSONAL HIGHLIGHTS

**Professional skills**
- Polymer nanocomposites MD simulation
- Interpretable machine learning, transfer learning, and deep learning
- C++, Python, SQL, R, and MATLAB

**Publications**
- Six publications on *Soft Matter*, *Crystal Growth & Design*, *Fluid Phase Equilibria*, etc.

**Interests**
- Texas hold 'em
- Boardgame design

**2021 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

**Phone**
215-730-6562

**Email**
entaoy@seas.upenn.com

**Undergraduate**
B.S., Chemical Engineering
B.E., Finance

**Research Interest**
Polymer physics
Polymer nanocomposites
Machine learning

**Penn**
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# KESHAV PATIL

Computational Biologist passionate about using AI, ML and supplementary computational techniques to solve problems in cancer and other disease biology

Ph.D. Candidate in Chemical and Biomolecular Engineering

**Expected Graduation**: Spring 2022

## RESEARCH EXPERIENCE

**Computational studies to identify oncogenic potential of kinase mutations          - 2020**

- Developed a mechanistic understanding of the mutational activity in kinases through long time scale molecular dynamics and incorporated the computational markers in a ML algorithm.

- Guided an undergrad(co-author) and collaborated with experimentalists in this project

**Prostate Cancer disease and drug gene signature correlations          - 2021**

- Developed a computational pipeline based on R, python and bash scripting to perform differential gene expression, web scrapping and ranking medicine drugs against prostate cancer gene expressions based on gene signature. Work done in internship with RebootRx startup

## PERSONAL HIGHLIGHTS

**Professional skills**
- **Tensorflow, Keras, Python, C, MATLAB, R**
- **GROMACS, Cluster-computing, Linux**
- **Structure Biology, Gene - Data Analysis**
- **Experimental Biology Collaborations**

**Publications:**
**Google Scholar(link)**

**2021 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

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267-366-9192

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patilk@seas.upenn.edu

**Undergraduate**
B.Tech., Chemical Engineering, IIT Kharagpur

**Ph.D. Advisor: Dr. Ravi Radhakrishnan**

**Research Interest**
Computational Structure Biology, Computational Genomics, Machine learning.

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# YIWEI QIANG

**Materials Scientist with Interest in Applying Knowledge and Expertise to Advance within the Chemical/Materials Industry**

Ph.D. Candidate in Materials Science and Engineering
**Expected Graduation**: Spring/Fall 2022

## RESEARCH EXPERIENCE

### Research project 1 — *Jul 2018 - Present*
Understanding the fracture behavior of polymer-infiltrated nanoparticle films

### Research project 2 — *Jan 2018 – Summer 2020*
Polymer-infiltrated nanoplatelet films with nacre-like structure via flow coating and capillary rise infiltration (CaRI)

### Research project 3 — *Sept 2014 – Jan 2016*
Fabrication of porous carbons and their application as electrode materials for supercapacitors

## INDUSTRY EXPERIENCE

### Intermediate Sales Intern — *Summer 2017*
ExxonMobil Shanghai Technology Center (STC)

### Forming Process Engineering Intern — *Summer 2014*
Corning (Shanghai) Co., Ltd, China

## PERSONAL HIGHLIGHTS

- Passionate and knowledgeable about polymer science and engineering
- Strong laboratory skills with hands-on experience in materials fabrication and characterization
- Detail-oriented, well-organized team player with good communication and analytical skills

**2021 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

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yiweiq@seas.upenn.com

**Date of Birth**
Nov 23, 1993

**Penn**
UNIVERSITY of PENNSYLVANIA

# WILFREDO MENDEZ

Committed and adaptive student with experience in biopharmaceuticals, polymer physics, and interfacial phenomena. Interested in opportunities that apply my expertise towards the development of novel functional materials.

## Phone
787-340-5349

## Email
wmendez@seas.upenn.edu

## Date of Birth
Oct 16, 1992

**University of Pennsylvania**
Ph.D. Candidate in CBE
**Expected Graduation**: Summer 2022

**University of Puerto Rico-Mayagüez**
❑ Bachelors of Science in Chemical Engineering
❑ Bachelors of Science in Industrial Biotechnology

## RESEARCH EXPERIENCE

Assembly of Nanoparticle-Polyelectrolyte Membranes at Water-water interfaces — *Jul 2017 - present*
❑ Achieved mechanistic insight into the self-assembly of (NP-PE) membranes.

❑ These membranes are programmable, with control over their spatial arrangement and membrane material.

Industrial Co-op at Abbvie Biotechnology Limited — *Jan 2016- Jan 2017*
❑ Provided technical support on the upstream and downstream processing of Humira.

❑ Tracked purification steps (Chromatography Column) to determine any impact on the purity of the final drug.

## PERSONAL HIGHLIGHTS

### Professional skills:
❑ Lithography, optical and confocal microscopy.
❑ MATLAB, Python, C++,Minitab.
❑ Polymer physics, colloidal Science and interfacial Sciences
❑ Languages: English and Spanish

### Publications:
- Mendez, W; et.al. Assembly of Nanoparticle-Polyelectrolyte at Water-water interfaces. To be submitted to ACS Nano.
- Dey, K. K.; et al Micromotors Powered by Enzyme Catalysis. *Nano Lett.* **2015**

**2021 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

# ADAM SUPPES

**I am a PhD Candidate in Dr. Hammer's lab studying leukocyte motility**

Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Summer 2022

**Email**
asuppes@seas.upenn.com

**Date of Birth**
Sept 22, 1994

**Current Residence**
Philadelphia, PA, USA

**Post-Graduation Residence**
Chicago, IL, USA

## RESEARCH EXPERIENCE

### Hammer Lab Research          *2016- present*

My study is on the cell motility of T-cells under shear follow and the effect of protein distribution and patterning on observed upstream migration of T-cells with the binding of ICAM-1.

### Konstantopoulos Lab Research
*2014– 2016*

With Dr. Konstantopoulos at the Johns Hopkins University, I studied the effect of confinement on breast cancer cell lines as well as development of hydrogel microfluidic devices.

I have additional exposure and experience in different ChemE fields, including electrochemistry at the University of Missouri

## PERSONAL HIGHLIGHTS

### Professional skills

- Nano/microfabrication
- Microcontact Printing
- Cell Motility Analysis
- MATLAB
- Cellular Adhesion

**Feel Free to check out my profile on Linkedin for more info:**
www.linkedin.com/in/adam-suppes

**2020 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

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# ANTHONY CURTO

**PhD Candidate in the Vojvodic Lab** investigating catalysts and battery materials for energy storage applications using computational techniques.

Ph.D. Candidates in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2022

**Phone**
609-969-9884

**Email**
antcurto@seas.upenn.com

**Date of Birth**
August 1st, 1995

**Place of Birth**
New Jersey, USA

## RESEARCH EXPERIENCE

### Fe-doped $CoO_x$ catalyst for OER
*Sep 2017 - present*

Studying the role of Fe in cobalt oxide nanoislands for the oxygen evolution reaction. Hope to understand the different roles Fe has at different contents and locations

### Doping of $LiCoO_2$ cathode materials
*Jan 2018 - present*

Investigating how dopants change lithium cobalt oxide cathode interaction with common electrolytes. Working to understand why decrease in battery capacity occurs.

### Homogenous Ir catalysts for OER
*Jan 2014 - Dec 2016*

Studied the decomposition of active homogenous catalyst for OER. This work was done with the Papish Group at the University of Alabama.

## PERSONAL HIGHLIGHTS

**Professional skills**
- Density functional theory
- Mixed metal oxides modeling
- VASP, Quantum Espresso
- Electronic structure
- MATLAB, Python

**Main interests in computational chemistry work for applications in a sustainable future.**

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# R BHARATH VENKATESH

**Phone**
267-815-4050

**Email**
rbharath@seas.upenn.edu

**Date of Birth**
June 10, 1994

Graduate student seeking opportunities in research work combining modelling and simulation approaches with traditional experimental techniques to address problems and develop engineering applications in soft matter and nanotechnology.

## Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2022

## RESEARCH EXPERIENCE

**Leaching-enabled Capillary Rise Infiltration (LeCaRI) of polymers from gels into nanoparticle packings**
*Jul 2018 - present*

Manufacturing polymer-infiltrated nanoparticle films by leaching of free chains from gels into nanoparticle packings and demonstrated ability to make patterned composites

**Dynamics of entangled polymer in Capillary Rise Infiltration (CaRI) into nanoparticle packings**
*Jan 2018 – present*

Ellipsometric tracking of polymer motion in nanoparticle packing to understand polymer dynamics in highly confined spaces.

**Dynamics of Solvent Induced Infiltration of Polymers (SIP) into nanoparticle packings**
*Dec 2016 – May 2018*

Designed a model system for polymer infiltration and carried out molecular dynamics simulation to probe dynamics and understand the mechanism of an experimentally observed phenomenon

## PERSONAL HIGHLIGHTS

### Professional skills

- Nano/microfabrication
- Nanomaterial characterization – SEM, ellipsometry
- Molecular Dynamics with LAMMPS, Surface Evolver
- MATLAB, Python, C++

### Notable Publications

Patterning polymer-filled nanoparticle films via leaching-enabled capillary rise infiltration (LeCaRI)
***Nanoscale Horizons** 4 (4), 933-939*

Multifunctional composite films with vertically aligned ZnO nanowires by leaching-enabled capillary rise infiltration
***Nanoscale** 11 (45), 22099-22107*

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**Department of Chemical and Biomolecular Engineering**

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# VIKRAM SUDARSHAN

**Phone**
267-461-3749

**Email**
vsud@seas.upenn.edu

**Date of Birth**
July 30th, 1997

**Residence**
Bala Cynwyd, PA, USA

**Job Interests**
Process Systems Engineering, Data Analytics, Process Safety, Manufacturing,

## UNIVERSITY of PENNSYLVANIA

3rd year Chemical Engineering doctoral student with strong analytical and problem-solving skills. Resourceful and detail-driven team player with reliable follow- through skills, interpersonal skills and communication skills. **Interested in Internship Roles for Summer 2023**

Ph.D. Student in Chemical and Biomolecular Engineering
**Expected Graduation**: Fall 2024

## RESEARCH EXPERIENCE

Understanding Rare Safety and Reliability Events using Forward-flux Sampling    *May 2019 – July 2021*

Design of Alarms and Safety Systems for Unpostulated Rare Events    *August 2021 – present*

## WORK EXPERIENCE

Research & Development Intern
*Arkema Inc., Malaysia*    *May 2018 – August 2018*

Process Engineering Intern
*Thyssenkrupp Industrial Solutions (TKIS), Mumbai, India*    *May 2017 – June 2017*

Plant Operations Intern
*DCW Limited, India*    *Dec 2016 – Jan 2017*

## PERSONAL HIGHLIGHTS

### Professional skills

- MATLAB, R, Python
- Aspen Plus, gPROMS
- MATCONT continuation toolbox
- MS Office Suite
- LaTeX

### Publication(s)

*Sudarshan, V., Seider, W.D., Patel, A.J., Arbogast, J.E., 2021. Understanding rare safety and reliability events using forward-flux sampling. Computers and Chemical Engineering 153.*

**2021 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

# ANASTASIA NEUMAN

**Phone**
443-528-9950
**Email**
annaneu@seas.upenn.edu

**Date of Birth**
November 14, 1996

UNIVERSITY of PENNSYLVANIA

Hi, I'm Anna! I am advised by Daeyeon Lee and Robert Riggleman. My current research involves molecular modeling of the thermodynamics of multiphasic polymer nanocomposites.

## Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2025

## RESEARCH EXPERIENCE

### Penn CBE                    *Dec 2019 - present*
Using self-consistent field theory (SCFT) simulations to study the impact of confinement and polymer-nanoparticle interactions on the phase behavior of blend-filled polymer nanocomposite films.

### Voyager Therapeutics       *Jan 2019 – Aug 2019*
Optimized an in-house media formulation and fed-batch and perfusion processes for Sf9 growth, baculovirus infection, and AAV production.

### MIT ChemE                  *Mar 2016– Sept 2018*
Investigated the mechanisms behind subcellular trafficking of mRNA-loaded lipid nanoparticles. Gained relevant experience in cell culture, fluorescent microscopy, FACs analysis, in vitro assay design, immunological assays, and lipid and polymer nanoparticle formulation.

## PUBLICATIONS

- Investigating Nanoparticle Organization in Polymer Matrices During Reaction-Induced Phase Transitions and Material Processing. *ACS Appl. Mater. Interfaces.* (2021)

- Polymer-infiltrated nanoparticle films using capillary-based techniques: towards multifunctional coatings and membranes. *Annu. Rev. Chem. Biomol. Eng.* (2021)

- Cell culture medium for use in producing gene therapy products in bioreactors. *Patent.* (2021)

- Systems and methods for producing baculoviral infected insect cells (BIICs) in bioreactors. *Patent.* (2020)

- Dielectric spectroscopy to improve the production of rAAV used in gene therapy. *Processes.* (2020)

**2021 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

# ARIA ZHANG

**Phone**
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ariaczh@seas.upenn.com

**Undergraduate degree**
Materials Science and Engineering, Cornell University

I am a motivated, collaborative Ph.D. student interested in designing materials that can improve quality of people's life.

Ph.D. student in Materials Science and Engineering
**Expected Graduation**: Spring/Fall 2025

## RESEARCH EXPERIENCE

### Effect of nanoparticle (NP) size and NP concentration on NP diffusion in polymer nanocomposites

I study phase separation behaviors of NPs in polymer nanocomposite (PNC) thin films by depth profiling sample films using time-of-flight secondary ion mass spectrometry. NP-enriched surface layer can modify surface properties of the material, such as wettability, durability, and friction.

Examples of PNC systems :
- PMMA-grafted silica NPs in SAN matrix
- PS-grafted silica NPs in PS matrix

## PERSONAL HIGHLIGHTS

### Professional skills
- SAXS/WAXS, AFM, ToF-SIMS, Microtome, Organic synthesis, Glove Box techniques
- MATLAB, Mathematica
- Chinese (mandarin), English, Japanese

### Awards and Fellowships
- NSF GRFP
- REACT Fellow
- Fontaine Fellow

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# GÉNESIS QUILES-GALARZA

**Ph.D. candidate Dr. Aleksandra Vojvodic's laboratory at the University of Pennsylvania. I aspire to be a professor and mentor students who are underrepresented in the STEM field.**

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1-203-942-6326

**Email**
genesisq@seas.upenn.edu

**Date of Birth**
Dec 15, 1993

Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring/Fall 2023

## RESEARCH EXPERIENCE

### Density of States Feature Analysis
*Jul 2019 - present*

Leveraging an unsupervised machine learning approach to determine what, if any, features of the density of states (DOS) of a material surface are critical in determining its chemical reactivity.

### CoO Nanoisland Image Recognition
*Jul 2019 – present*

Using a UNet architecture to recognize CoO nanoislands supported on Au from STM images, with the goal of being able to automatically extract key features, such as basal plane:edge ratios, from the images and speed up experimental analysis.

### Hybrid Catalysts
*Dec 2018 – present*

Heterogeneous, homogeneous, and hybrid IrOx catalysts are used as a model system to study catalyst activity and stability relationships.

## PERSONAL HIGHLIGHTS

### Professional skills
- Computational Catalysis
- Density Functional Theory
- Machine Learning
- MATLAB, Python, Java
- Fluent in English, Spanish, and German

### Fun Facts
- Taught high school chemistry for 2 years
- Serving as Social Chair for Grad. Student Eng. Government as well as Latin American Grad. and Prof. Student Assoc.
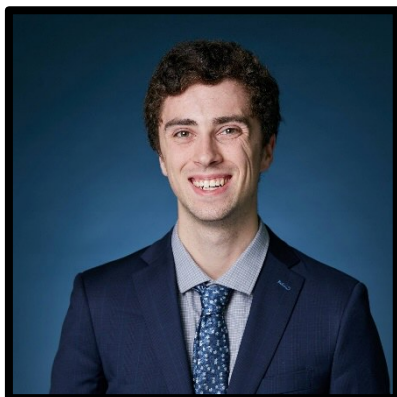
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# CHRISTOPHER JOHNSON

I am a current Doctoral Student at the University of Pennsylvania, working under Dr. Chinedum Osuji. My role within the lab is to research the fabrication and analysis of filtration membranes. My philosophy is to make science accessible through clear and engaging communication, all while producing replicable and interesting results.

## Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring/Fall 2025

## RESEARCH EXPERIENCE

### Lyotropic Mesophase Membranes — *March 2021-Present*
Investigating membrane structure and performance.
Perform scattering structure analyses.
Working with academic collaborators.

### Bulk Fibrous Membranes — *June 2021-Present*
Designing process for membrane and microcapsule fabrication.
Understanding rheological and structural properties.
Working with industrial collaborators.

### Computational Micelle Design — *May 2018 – May 2020*
Molecular dynamics study of tapered brush-coil block copolymers.
Produced a senior thesis that detailed formation of these micelles in free solution and at surfaces.

## PERSONAL HIGHLIGHTS

### Professional skills
- Membrane fabrication
- Surface characterization
- Imaging analysis
- Presentation/Design
- MATLAB, Python, COMSOL, Bash scripts

### Published work
- Poetry project published in *Caesura (2020)*, received Elda Wollaeger Poetry Award
- Recommendation report published in *A Guide to Professional Writing (2020)*

**2021 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

**Phone**
302-438-5945

**Email**
chriswj@seas.upenn.edu

**Date of Birth**
Aug. 11, 1997

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UNIVERSITY of PENNSYLVANIA

# JENNIFER CROSSEN

**4TH YEAR PHD CANDIDATE WITH OVER A YEAR OF INDUSTRY EXPERIENCE IN THE US AND ABROAD. SEEKING AN INTERNSHIP FOR FALL 2022 IN THE PHARMACEUTICAL AND BIOTECH INDUSTRIES.**

Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2023

**Phone**
585-813-8702

**Email**
jcrossen@seas.upenn.com

**Undergraduate University**
Rochester Institute of Technology (RIT)

## RESEARCH EXPERIENCE

**Diamond Research Lab - UPenn**     *Oct. 2019 - present*

**Diffusion of coagulation proteins in fibrin clots**

Used microfluidics and confocal microscopy to investigate diffusional limitations of proteins in clots formed *ex vivo*. Observed that thrombin bound to fibrin in blood clots retains its enzymatic activity.

**Fibrin(ogen) thermal shift assay**
Thermal shift assay was used to understand thermal stability of fibrin conformations and ligand binding interactions between fibrin(ogen) and thrombin.

- Crossen and Diamond. *BBA General Subjects*. 2021.

**Briggs of Burton PLC – Intern**     *Jan – Aug 2017; May – Aug 2018*

Involved in the design and implementation of projects in the distilling and pharmaceutical industries. Developed P&ID's, PFD's and generated equipment sizing calculations.

**Toyota Motor Engineering - Co-op**     *Aug – Dec 2015*

Production engineering co-op in the plastics and paint departments at North American manufacturing plants.

## PERSONAL HIGHLIGHTS

### Professional skills
- Microfluidics and soft lithography
- Confocal microscopy
- Microplate readers
- Thermal shift assay
- MATLAB

### Activities & Interests
- Penn Biotech Group Healthcare Consulting (2020-present)
- RIT Women's DIII Cross Country; Track and field (2014-2018)

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# JESSICA O'CALLAGHAN

**Phone**
(917) 435-8050

**Email**
jaoc@seas.upenn.edu

**Date of Birth**
Feb. 12, 1996

Versatile and tenacious 4th year PhD candidate actively pursuing research opportunities at the interface of cellular biology and material science.

Ph.D. Candidates in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2023

## RESEARCH EXPERIENCE

**The University of Pennsylvania**    *Nov. 2018 - present*

Harness mechanical power of enzymes to recreate active cellular motion in polymer-based microcapsules.

**Regeneron Pharmaceuticals, Inc.**

Pre-clinical Manufacturing    *June – Aug. 2018*

Devised a design of experiments (DOE) aimed at optimizing site-specific protein modifications using naturally-derive enzymes.

Formulations Development    *June – Aug. 2017*

Investigated the effects of multiple formulation conditions, including temperature and pH, on antibody drug candidate stability.

**Penn State University**    *June 2016 – May 2018*

Investigated the role of histone-remodeling factors on the activation of the *HO* promoter in budding yeast cells.

## PERSONAL HIGHLIGHTS

### Professional skills

- Microfabrication
- Particle tracking
- Interface characterization
- MATLAB, Python
- Spanish

### Awards

- 2020 NSF GFRP Honorable Mention
- Ralph Landau Fellowship
- Fontaine Fellowship

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**Department of Chemical and Biomolecular Engineering**

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# JIAN CHANG

**Phone**
267-530-9267

**Email**
cjcj@seas.upenn.edu

**Date of Birth**
Aug 14, 1992

My research interests include electrochemical ammonia synthesis, solid-state catalysis and copper-based catalysts for water gas shift.

Ph.D. Candidates in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2023

## RESEARCH EXPERIENCE

### Research project 1          *Jan 2019 - present*

A solid oxide electrolyzer using proton conducting material BZCYYb is used for electrochemical $NH_3$ synthesis.

### Research project 2          *Jan 2021 – present*

Solid state catalysts including CaO and $CaFeO_3$ are used for dehydrogenation and dehydration of alcohols as well as aldol condensation with long-chain aldehydes.

### Research project 3          *Aug 2017 – present*

Single-atom copper catalyst for super efficient water gas shift.

**I also have a lot of experience with membrane fabrication for seawater desalination and waste water treatment.**

## PERSONAL HIGHLIGHTS

### Professional Skills

- Organic Synthesis
- Fuel Cell Fabrication
- Atomic Layer deposition
- Membrane Fabrication
- FESEM, XRD, FTIR
- MATLAB

**I am a highly motivated person and a great team player.**
**I like yoga, plants, whitewater rafting.**

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**Department of Chemical and Biomolecular Engineering**

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# JIAYI DENG

**Phone**
267-787-7567

**Email**
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**Date of Birth**
July 04, 1994

- A research scientist with expertise in colloidal science, active matter, interfaces, and fluid dynamics
- Specialized in using data analysis, mathematical modeling and experiments to explore the fundamental mechanisms in biological system and soft materials

Ph.D. Candidates in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2022

## RESEARCH EXPERIENCE

### Surface active layers of bacteria at fluid interfaces
*Jan 2018 – Dec 2019*

Characterized the motion of individual bacterium on and near the fluid interfaces and constructed a gallery of distinct behaviors

### Interfacial flow around a motile bacterium
*Dec 2019 – Jan 2021*

Studied the interfacial flow induced by motile bacteria through experimental and theoretical approaches; predicted the collective phenomena and non-equilibrium behaviors in the active system

### Magnetic probes driven in a crystalline colloidal monolayer
*Jan 2021 – present*

Investigated the structural responses and long-range behaviors of colloidal monolayer perturbed hydrodynamically by magnetic probes

- Built high-throughput data analysis and image processing tools in Python and Matlab for 2D/3D particle tracking and motion analysis, correlated displacement velocimetry, 2-point microrheology, and colloidal structure characterization
- Built experimental instruments for 3D holographic imaging, particle manipulation, dynamic interfacial tension measurement

## PERSONAL HIGHLIGHTS

### Professional skills

- Statistical Analysis
- Image Processing
- 2D/3D Optical Imaging
- Colloids and Interfaces
- Biomechanics

- Fluid Mechanics and Mixing
- Microfabrication
- Cell Culture
- Python, Matlab, ANSYS Fluent

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**Department of Chemical and Biomolecular Engineering**

University of Pennsylvania

# YANGHANG HUANG

Looking for challenging career opportunities in a battery R&D position. Motivated to offer my skills, experience and professional knowledge for developing next generation energy storage devices.

Ph.D. Candidates in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2024

**Phone**
520-599-4196

**Email**
yanghang@seas.upenn.edu

## RESEARCH EXPERIENCE

### Microfabricated Battery  *Dec 2019 - present*

Micro zinc-air batteries were fabricated and optimized to deliver energy density over 1500 Wh/L and 400 Wh/kg. The degradation mechanisms were studied and modeled. The model accurately predicted discharge performance.

### Fast-charging Battery  *Jan 2018 – Apr 2019*

$Li_3VO_4$ was incorporated into the highly conductive multilayer $Ti_3C_2T_x$ MXene to develop a high capacity, fast charging and long cycle life anode materials in lithium-ion batteries.

## PERSONAL HIGHLIGHTS

### Professional skills
- Nano/microfabrication
- Battery characterizations
- MATLAB, COMSOL

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# PARADORN (JOE) RUMMANEETHORN

B.S.E., *summa cum laude*, Princeton University

**Phone**
(267) 669-9450

**Email**
pr9@seas.upenn.com

**Date of Birth**
October 1, 1995



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A leader and researcher driven towards tackling medical problems interdisciplinarily, aspiring to innovate new therapeutic & diagnostic platforms to elevate the capabilities of medical care for all.

Ph.D. Candidate in Chemical and Biomolecular Engineering (CBE)
Adviser: Dr. Daeyeon Lee
**Expected Graduation**: Spring 2023

## RESEARCH EXPERIENCE

**Contactless, Reversible droplet wetting state modulation via dielectric charge injection (DCI)**   *Jan 2019 - present*
High-voltage, simple-to-operate technology capitalizing corona discharge physics for modulating droplet wetting

**High-resolution subcellular transcriptome extraction**   *March 2020 – present*
Reimagining electrophoresis with reverse electroporation hypothesis for directional subcellular species extraction

**Pfizer: Formulations, Analytics, and Conjugation Group**   *Summer 2017*
Formulated biologics-encapsulated nanoparticles and characterized them by size, PDI, mass yield/loading, encapsulation efficiency, and *in vitro* release profile

Key Publications:
1. **Rummaneethorn, P.** et al. *International Journal of Pharmaceutics*, 601(15), 2021.
2. Lu, H.; **Rummaneethorn, P.** et al. *Molecular Pharmaceutics,* 15(1), 2018.

## PERSONAL HIGHLIGHTS

**Awards/Certificates**
- Penn-wide Prize for Excellence in Teaching
- Penn CTL Certificate in University Teaching
- Graduate Fellowship for Teaching Excellence
- STLE Philadelphia Scholarship Award
- AIST-Morrow Scholarship Award

**Leadership Experience**
- *President*, Graduate and Professional Student Assembly (AY 21-22)
- *President,* Graduate Student Engineering Government (AY 20-21)
- *President,* ACS BIOT Mid-Atlantic Student Chapter
- *Chair*, CBE Graduate Association (AY 19-20)

**2021 Graduate Student Symposium**
**Department of Chemical and Biomolecular Engineering**

# SAHLA SYED



## Phone
732-991-5380

## Email
sahla@seas.upenn.edu

## Date of Birth
May 20, 1996

**My research focuses on understanding spatiotemporal control of stochastic developmental gene activity using a combination of molecular cloning experiments, quantitative live imaging, and mathematical modeling.**

Ph.D. Candidate in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2023

## RESEARCH EXPERIENCE

**Exploring the phenotypic effects of enhancer interactions**    *Jan 2021 – present*

In this study, we will quantify enhancers' individual transcriptional competencies and characterize their effects on embryonic viability. By implementing CRISPR/Cas9 editing to delete endogenous enhancers, we can and analyze developmental defects. We can elucidate underlying information encoded in the spatial arrangement of multiple enhancers by creating variations of the wildtype locus.

**Investigating the role of DNA-protein binding in regulating gene expression**    *June 2019 – present*

We intend to understand how multiple transcription factor binding site affects the overall transcriptional competency of the enhancer. In this study, we quantitatively analyzed the developmental effects of systematically by perturbing binding sites in the *snail* distal enhancer. Using mathematical modeling, we determined that synergistic action between TFs was necessary to maintain normal expression levels.

**N/C ratio regulates zygotic genome activation through multiple modalities**    *Jan 2019 – Mar 2021*

We aim to disentangle the effects of the N/C ratio on zygotic genome activation using the MS2-MCP live imaging system. Using embryos with reduced ploidy and shortened cell cycle durations, we characterized three modalities of N/C ratio control on transcription. The findings from this study demonstrate that some genes are regulated by N/C-dependent cell cycle duration while others are directly regulated by the N/C ratio, through changes in the transcriptional kinetics or in the probability of gene activation.

## PERSONAL HIGHLIGHTS

### Professional skills

- MATLAB
- Molecular cloning
- CRISPR/Cas9 gene editing
- MS2-MCP live imaging
- Fluorescent in situ hybridization (FISH)

1. **Syed S.,** Wilky H., et al (2021) The nuclear to cytoplasmic ratio directly regulates zygotic transcription in Drosophila through multiple modalities. Proc Natl Acad Sci 118:. https://doi.org/10.1073/pnas.2010210118.
2. **Syed S**., Lim, B. Multi-labeling live imaging to quantitate gene expression dynamics during Drosophila embryonic development. *Methods Mol Biol* (submitted)

**2020 Graduate Student Symposium**
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# KATHERINE VAZ GOMES

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508-817-7068

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**UNIVERSITY of PENNSYLVANIA**

I'm completing my Ph.D. in Chemical and Biomolecular Engineering at the University of Pennsylvania, working with Prof. Jen Wilcox in Direct Air Capture and Mineralization. My background is in chemical engineering and writing.

Ph.D. Candidates in Chemical and Biomolecular Engineering
**Expected Graduation**: Spring 2025

## RESEARCH EXPERIENCE

### Carbon Storage In Mine Wastes
*May 2021 - present*

Designed experiments to extraction calcium and magnesium from mine wastes for use in carbon storage. Paired geologic samples from across the United States with many chemical extraction methods.

### Carbon Direct Consultant
*Sept 2021 – Present*

Consultant at private investment firm on carbon removal technologies and projects.

### Science Team, Stripe Climate
*Mar 2021 – Apr 2021*

Provided feedback about carbon mineralization, enhanced weathering, and direct air capture technologies for carbon offset purchases.

## PERSONAL HIGHLIGHTS

### Professional skills
- Surface Characterization
- Laser Diffractometry
- Coulometry
- Inductively Coupled Plasma: Optimal Emissions Spectroscopy
- Proficient in Portuguese

Holds undergraduate degrees in chemical engineering & professional Writing

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