

2024

# Graduate Research Symposium



July 25 - 28, 2024

**DOC Graduate Research Symposium**  
**University of Virginia, Charlottesville, VA, July 25-28, 2024**

**THURSDAY, JULY 25**

1:30 pm - 4:30 pm      Registration and **Check-In – Grove Pre-Function**

2:30 pm - 4:30 pm      Industrial Poster Session – **Grove Pre-Function**

4:30 pm - 5:45 pm      Pizza Dinner – **Grove Ballroom 3**

**THURSDAY EVENING Presiding: Jason Chruma – University of Virginia – Grove 1/2**

5:45 pm – 6:00 pm      **Welcome – P. Andrew Evans**

6:00 pm - 6:50 pm      **Javier Read De Alaniz – UC Santa Barbara**  
*Exploring Light-Responsive Materials*

6:50 pm - 7:10 pm      **Jason Wang**  
UCLA  
*Identifying Generally Applicable Reaction Conditions via Bandit Optimization*

7:10 pm – 7:30 pm      **Kaitlyn Keasler**  
Cornell University  
*Handling Fluorinated Gases as Solid Reagents Using Metal-Organic Frameworks*

7:30 pm – 7:50 pm      **Noah Bissonnette**  
Princeton University  
*Deoxygenative Phosphonylation: Development of a General Organophosphorus Radical Trap*

7:50 pm – 8:10 pm      **Camille Rubel**  
Scripps Research  
*Oxidation State Manipulation to Control Stability and Reactivity with Nickel*

8:10 pm – 8:30 pm      **Danielle Loving**  
University of Illinois Urbana-Champaign  
*Directed Coevolution of Chemicals*

8:45 pm – 11:30 pm    Reception and **Poster Session 1 – Grove Pre-Function**

**FRIDAY, JULY 26 Presiding: P. Andrew Evans, Queen's University – Grove 1/2**

7:45 am – 9:00 am      Breakfast – **Grove Ballroom 3**

9:00 am – 9:40 am      **Sabine Hadida – Vertex Pharmaceuticals**  
*Discovery of CFTR modulators for the treatment of Cystic Fibrosis*

9:40 am – 10:00 am    **Hayden Bishop**  
Purdue University  
*Catalytic Asymmetric Synthesis of Zinc Metallacycles*

10:00 am – 10:20 am    **Le Dung “July” Pham**  
University of Minnesota

*Latent Organocatalysis from Reversible N-Heterocyclic Carbene Adducts with Carbodiimides*

10:20 am – 10:50 am Coffee Break – **Grove Pre-Function**

10:50 am – 11:30 am **Rebecca Green BMS**

*Data-Rich Experimentation for Safe and Sustainable Process Development*

11:30 am – 11:50 pm **Amaechi Odoh**

Clemson University

*SuFEX-Enabled Direct Deoxy-Diversification of Alcohols via Cooperative Activation of Substrates and Nucleophiles*

11:50 pm – 12:15 pm **Group Photograph – TBA**

12:15 pm – 2:30 pm Lunch and **Poster Session 1 – Grove 3 and Pre-Function**

**WORKSHOPS: Presiding – P. Andrew Evans – Grove 1/2**

**WORKSHOP 1: Academia and Entrepreneurship**

2:30 pm – 3:00 pm **Jon Ranier – NSF**

*Chemistry at the NSF: Our Mission, Priorities, Programs, and Modus Operandi*

3:00 pm – 3:30 pm **Michael Hurst – RSC**

*Publishing with Impact with the Royal Society of Chemistry*

3:30 pm – 4:00 pm **Chuck Frazier – Temporal Agriculture**

*Building from Scratch: Startups, Entrepreneurship, and Transforming Ideas into Successful Products*

4:00 pm – 4:15 pm Coffee Break – **Grove Pre-Function**

4:15 pm - 5:15 pm **WORKSHOP 2 Academic Life**

**Erick Carreira (ETH), Javier Read De Alaniz (UCSB), Danielle Dube (Bowdoin) Jason Chruma (Virginia), Christina Cooley (Trinity) and Jon Ranier (NSF)**

5:15 pm - 6:30 pm Dinner – **Grove Ballroom 3**

**FRIDAY EVENING Presiding: Angie Angeles, Vertex Pharmaceuticals – Grove 1/2**

6:30 pm – 6:50 pm **So Young Lee**

MIT

*Selective Glycan Labeling of Mannose-Containing Glycolipids in Mycobacteria*

6:50 pm – 7:10 pm **Mark Maust**

Emory University

*Photoredox-Enabled Reactivity of (Hetero)aryl Radicals in Switchable 5-exo and 6-endo Cyclizations and Aerobic Hydroxyarylation Reactions*

7:10 pm – 7:30 pm **Alexandra Lubaev**

Baylor University

*Catalytic Chemo-, Regio-, Diastereo-, and Enantioselective Bromochlorination of Unsaturated*

*Systems Enabled by Lewis Base-Controlled Chloride Release*

7:45 – 9:15 pm      **WORKSHOP 3: Industrial Life**

*Please see the assignments in the tables at the end of the document.*

9:15 pm - 11:30 pm    Reception and **Poster Session 2 – Grove Pre-Function**

**SATURDAY, JULY 27 Presiding: Christina Cooley, Trinity University – Grove 1/2**

7:45 am - 9:00 am      Breakfast – **Grove Ballroom 3**

9:00 am – 9:50 am      **Erick Carreira – ETH**

*Strategies and Tactics in Natural Products as an Engine for Discovery*

9:50 am - 10:10 am    **Bradley Lipka**

University of Rhode Island

*Ultra-Rapid Electrophilic Cysteine Arylation*

10:10 am - 10:30 am    **Katelyn Kitzinger**

University of North Carolina at Chapel Hill

*Organocatalytic Michael-Aldol Annulations via Stereodivergent-Stereoconvergent Pathways*

10:30 am - 10:50 am    Coffee Break – **Grove Pre-Function**

10:50 am – 11:30 am    **Michael Nicastrì – Biogen**

*Enabling Medicinal Chemistry via High-throughput Experimentation: Applying sp<sup>2</sup>-sp<sup>3</sup> Cross Coupling to Multistep Library Synthesis*

11:30 am - 11:50 am    **Cher-Tian Ser**

University of Toronto

*Bulky Ligands Promote Palladium-Catalyzed Protodeborylation*

11:50 am - 12:10 pm    **Logan Bartholomew**

University of California Berkeley

*New Strategies for Core Atom Modification of Nitrogen Heteroaromatics*

12:10 pm - 2:30 pm    Lunch and **Poster Session 2 – Grove 3 and Pre-Function**

**SATURDAY AFTERNOON Presiding: Cooper Taylor, Incyte – Grove 1/2**

2:30 pm - 3:20 pm      **Danielle Dube – Bowdoin College**

*Chemical Tools to Detect, Discover, and Disrupt Sugars on Pathogenic Bacteria.*

3:20 pm – 3:40 pm      **Xuan Wu**

UCSB

*Chiral Bifunctional Ligand Enables Asymmetric Trapping of Vinyl Gold Carbene*

3:40 pm - 4:10 pm      Coffee Break – **Grove Pre-Function**

4:10 pm - 4:30 pm      **Daniel Arriaga**

Texas A&M University

*Constructive Ozonolysis: Capturing Primary Ozonides*

4:30 pm - 4:50 pm      **Melody Guo**

Yale University

*Differential Catalyst-Substrate Pairs for Carbocyclic and Heterocyclic Systems in  
Atroposelective Quinazolinone Synthesis*

4:50 pm - 5:10 pm **Evan Savelson**

University of Virginia

*A Tetrazine-Based Synthesis for Underutilized Aza-Indole Analogues*

5:10 pm - 5:30 pm **Stephanie Tsang**

University of Delaware

*Mechanism of Photocatalytic Activation of Tetrazine Ligation*

8:30 pm Drinks and Games: **The Graduate**

**SUNDAY, JULY 28 Presiding: Thomas Greshock, Merck – Grove 1/2**

7:45 am - 9:00 am Breakfast – **Grove Ballroom 3**

9:00 am - 9:40 am **John Curto – Pfizer**

*Design and Synthesis of Small Molecule GLP-1 Receptor Agonists*

9:40 am – 10:00 am **Joseph Edgecomb**

University of Wisconsin-Madison

*Leveraging Potent Photoreductants for Intermolecular Ketyl Radical Coupling*

10:00 am – 10:20 am Coffee Break – **Grove Pre-Function**

10:30 am – 10:50 am **Riley Roberts**

Portland State University

*Formal Dehydrogenation of Arenes: New Paths in Aryne Synthesis*

10:50 am – 11:10 am **Grace Ibsen**

Montana State University

*Phosphine Mono-Oxides Formed in Situ Implicated in Chemoselectivity of Suzuki Cross-  
Couplings of Bromoaryl Triflates*

11:10 am – 11:30 am **Yufei Zhang**

University of Buffalo

*Direct 1,2-Diazolation of Alkyl Halide via Photoredox-Catalyzed Halogen Transposition*

11:30 am – 12:10 pm **Veronika Kottisch – BASF**

*Coatings Research at BASF*

12:10 pm – 1:00 pm Lunch – **Grove Ballroom 3**

12:10 pm – 2:00 pm Check out and Depart

**Friday, JULY 26: POSTER SESSION 1 – Grove Ballrooms 1/2**

1. **Souvik Adak – Indiana University**  
*Boron Enabled Photosensitized Directed Cycloadditions*
2. **Sophie Bender – Princeton University**  
*Enantioselective Hydroalkylation of Alkenes using Photoenzymatic Catalysis*
3. **Kevin Blanco-Herrero – University of California Davis**  
*Silanols: From Ligand Design to Blue Light Reactions*
4. **Alexander Bunnell – University of Michigan**  
*Mechanism Guided Development of Directed C-H Functionalization of Bicyclo[1.1.1]Pentanes*
5. **Kevin Burns – University of Virginia**  
*C-H Functionalization via Amine Organocatalysis*
6. **Deepta Chattapadhyay – Texas A&M University**  
*Development of a Universal SuFEx Reagent for Deaminative C-C Cross-Couplings*
7. **Andrew Cruz – University of Michigan**  
*Palladium-Catalyzed Alkene Difunctionalization Reactions for the Synthesis of Amine-Substituted Tetralin Derivatives*
8. **Noah Daniecki – University of Delaware**  
*Insights into the Nature of C-H/O and N-H/N Interactions and Implications for Conformationally Biased Molecular Design*
9. **Parag Das – University of Florida**  
*Designing Small-Molecule Photoswitches Inspired from Popular Organic Photovoltaics Materials*
10. **Serena DiLiberti – University of Minnesota**  
*Total Synthesis of (+)-Eburnamonine via Asymmetric Alkene Cyanoamidation and C-CN Bond Activation*
11. **Lauren Ehehalt – University of Wisconsin-Madison**  
*Decarbonylative Cross-Electrophile Coupling: Synthesis of C(sp<sup>2</sup>)-C(sp<sup>3</sup>) Bonds from Carboxylic Acid and Amine Substrate Pools*
12. **Martina Golden – Emory University**  
*Target Guided Synthesis of Aryl-Functionalized (-)-Promysalin Analogs via Reductive Ni-Catalyzed Cross Electrophile Coupling*
13. **Blaik Hopewell – Oregon State University**  
*The Total Synthesis of 1,9-diepi-Mensacarcin*
14. **Jenny Hu – Cornell University**  
*Designing Plastics: Machine Learning to Predict Polymer Properties from Molar Mass Distributions*
15. **Julian Kellner-Rogers – Cornell University**  
*Hydrazine-Catalyzed Ring-Opening Metathesis Polymerization of Cyclobutenes*
16. **Samuel Kwain – Clemson University**  
*Selective Inhibition of Polysaccharide Metabolism in Human Gut Microbes through Small Molecules*



17. **Tanya Lazarus – University of North Carolina at Chapel Hill**  
*Enantioselective Amino- and Oxycyanation of Alkenes via Organic Photoredox and Copper Catalysis*
18. **Jaehoo Lee – Yale University**  
*Progress Towards the Total Synthesis of Phragmalin Natural Products*
19. **Angela Lin – Princeton University**  
*Intermolecular Anti-Markovnikov Hydroamination of Alkenes with Sulfonamides, Sulfamides, and Sulfamates*
20. **Huitao Ling – University of California Davis**  
*The Development of Dyes and Fuels from Sustainable Feedstocks*
21. **Sabina Maurer – University of Pennsylvania**  
*Cryptic Sulfotransferases for Aziridine Formation*
22. **Morgan Mayieka – Michigan State University**  
*Development of a Synthetic Strategy to Prepare Mimetics of Heparin Sulfate*
- Saturday, JULY 27: POSTER SESSION 2 – Grove Ballrooms 1/2**
23. **Jenna Cailin C. Molas – Yale University**  
*Cp\*Rh(III)-Catalyzed N-H Functionalization for the Synthesis of Nitrogen Heterocycles*
24. **Ashley Nensel – Northwestern University**  
*Proteomimetic Polymers Exhibit Anti-Angiogenic Activity for Applications in Age-Related Macular Degeneration*
25. **Blake Ocampo – University of Illinois at Urbana-Champaign**  
*Regression Modeling of Substrate Effects on Enantioselectivity in the Sharpless Asymmetric Dihydrosylation*
26. **Karl Ocius – University of Virginia**  
*Cell Free Screening Platform for the Identification of Inhibitors of the L,D-Transpeptidase LdtMt2 of Mycobacterium Tuberculosis*
27. **Elizabeth Park – Stanford University**  
*Electrical Signaling at the Molecular Level: Chemogenetic Inhibition of Sodium Channels*
28. **Harrison Reid – University of Oregon**  
*Synthesis and Materials Applications of Cycloparaphenylene-Based Polymers*
29. **Christopher Reid – University of Virginia**  
*Rhodium-Catalyzed Oxidative Alkenylation of Anisole: Control of Regioselectivity*
30. **Joshua Sailer – Emory University**  
*Development of Diruthenium Tetracarboxylate Catalysts for Selective Carbene Insertion Reactions*
31. **Samya Samanta – Texas A&M University**  
 *$\beta$ -Phenethylamine Synthesis: N-Pyridinium Aziridnes as Latent Dual Electrophiles*
32. **Nathan Schmitt – UT Southwestern**  
*Synthesis, Isolation, and Derivation of Unique Clerodane Diterpenes*
33. **Chris Seong – University of Minnesota**

*Arynes in a Bottle: Thermally Activated Additive-Free Aryne Precursors*

34. **Yao Shi – University of British Columbia**  
*The Mechanistic Duality of the Suzuki-Miyaura Cross-Couplings*
35. **Paolo Siano – University of Virginia**  
*Synthesis of Polycyclic Cores from Phenyl Sulfones*
36. **Aniket Sole – University of Florida**  
*Asymmetric Bronsted Acid Catalyzed Hydroamination Reactions Provide Access to Elusive Pictet-Spengler Products*
37. **Annika Tharp – University of Michigan**  
*Late-Stage Chlorination of Kinase Inhibitors*
38. **Garrett Toth-Williams – University of California Davis**  
*Desymmetrization of Heterocyclic Sulfonimidamides via Asymmetric Allylation*
39. **Brendan Wall – Iowa State University**  
*General Installation of (4H)-Imidazolone cis-Amide Bioisosteres Along the Peptide Backbone*
40. **Zihao Wang – Boston University**  
*Assessment of Rocaglates as Selective Inhibitors of Glioblastoma Cancer Stem Cells: Enhancing B-ring Diversity of Rocaglates Through Diazonium Coupling*
41. **Aiden Wang – MIT**  
*Synthesis of Branched-Linker PROTACs for Next-Generation Targeted Protein Degradation*
42. **Dominick Witkowski – UCLA**  
*Exploring the Reactivity and Utility of Strained Cyclic Cumulenes*
43. **Sicheng “Marina” Xie – Indiana University**  
*Developing Effective Fluorescent and Fluorogenic Probes for Monitoring the Biological Processes of Micro-Organisms*

**Industrial Workshop Panels – Organized by Student Last Name**

<b>Group A (Angeles)</b>	<b>Group B (Cooley)</b>	<b>Group C (Evans)</b>	<b>Group D (Chruma)</b>
<b>Last Name: Adak to Eehalt</b>	<b>Last Name: Golden to Lubaev</b>	<b>Last Name: Maurer to Savelson</b>	<b>Last Name: Schmitt to Zhang</b>
<i>Grove Ballroom 1/2</i>	<i>Grove Ballroom 3</i>	<i>Academy Room</i>	<i>Oak Boardroom</i>
Wenhan Zhang – Amgen Grace Trammel – Corteva Peter Gildner – FMC Cooper Taylor – Incyte Ving Lee – UDC Brian Laforteza – Janssen Rachel Knapp – Lilly Michael Hurst – RSC Jared Piper – Pfizer	Carolyn Wei – Amgen Zachary Buchan – Corteva Michael Nicastrì – Biogen Tarek Sammakia – Loxo Jing Li – PharmaBlock Thomas Greshock – Merck Jiang Wang – Lilly Jon Rainer – NSF Rebecca Green – BMS	Robert Dyer – Adesis Evan Hurlow – Snapdragon Nicola Webb – BMS Stephen Ammann – Gilead Hannah Shenouda – GSK Christopher Kelly – Janssen Austin Smith – Loxo Veronika Kottisch – BASF Sabine Hadida – Vertex	Chuck Frazier – Temporal Ag Trevor Sherwood – BMS Dane Holte – Gilead Marshall Law – Incyte Richard Jackson – FMC Danielle Schultz – Merck John Curto – Pfizer Zachary Garlets – Zoetis Heather Hintz – GSK



## Speakers

Erick Carreira, ETH

John Curto, Pfizer

Danielle Dube, Bowdoin College

Rebecca Green, BMS

Sabine Hadida, Vertex

Veronika Kottisch, BASF

Michael Nicastrì, Biogen

Javier Read DeAlaniz, UC Santa Barbara

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