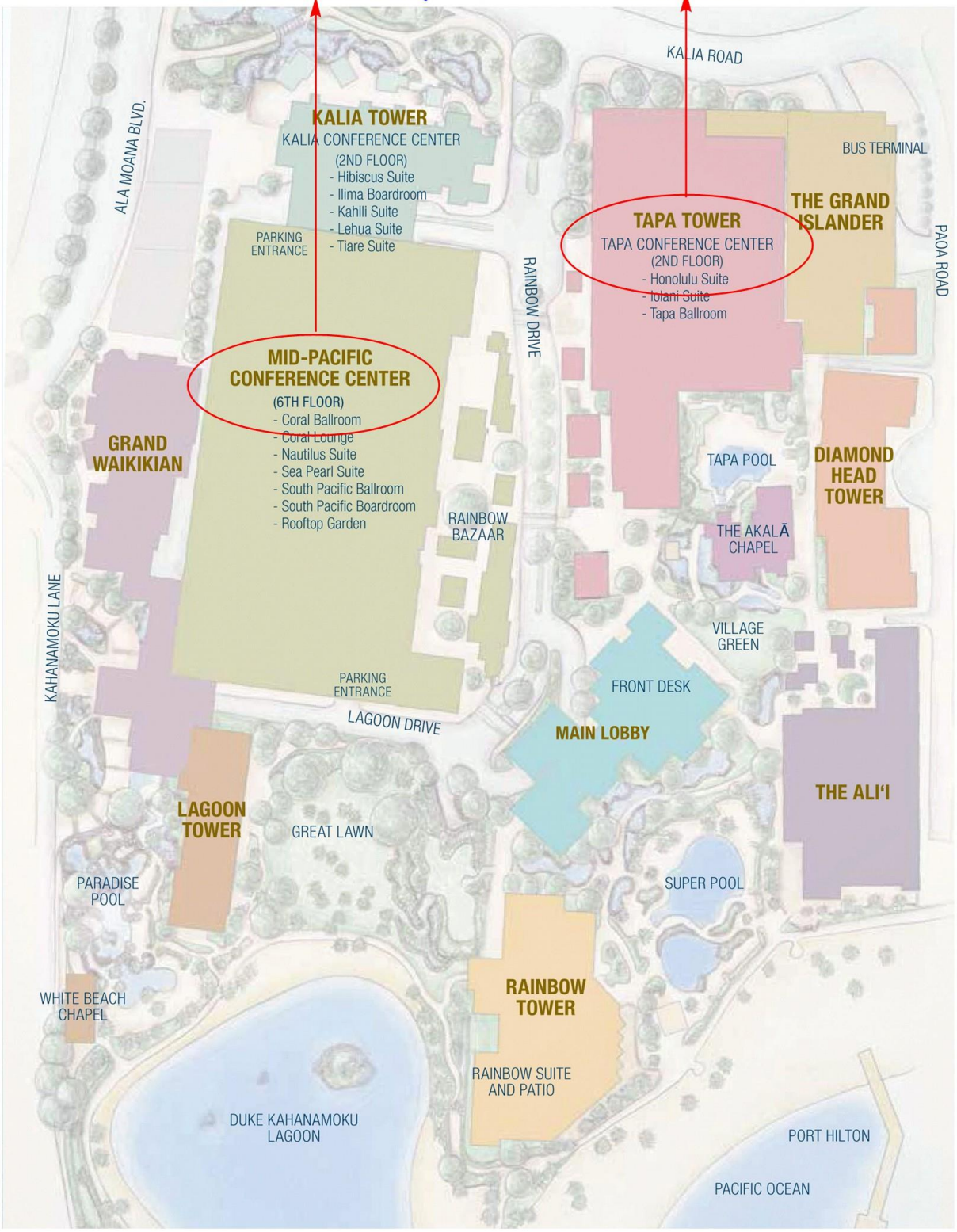
BOOK OF ABSTRACTS

HILTON HAWAIIAN VILLAGE PROPERTY MAP

VENUE of WIPOS 2023
Coral III Ballroom
Monday-Thursday, Dec 18-21, 2023
7:30 AM - 3:30 PM Daily

WELCOME RECEPTION
Honolulu Suites
SUNDAY, December 17, 2023
4 PM - 7 PM



3rd WINTER IN-PERSON ORGANIC SYMPOSIUM

WIPOS 2023

December 18-21, 2023

SYMPOSIUM SCHEDULE & BOOK OF ABSTRACTS

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WE THANK OUR GENEROUS SPONSORS!

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Welcome to the Enchanting City of Honolulu!

On behalf of the Organizing Committee, I am delighted to extend a warm welcome to ALL the participants of the 3rd Winter In-Person Organic Symposium, WIPOS 2023! We are looking forward to meeting each of you and being part of a successful and memorable symposium.

Please allow me to begin with a bit of recent history. The 1st Winter In-Person Organic Symposium (WIPOS 2021) emerged from the ashes of PACIFICHEM 2020/21 when it was switched to a virtual format in early October of 2021. WIPOS 2021 was organized in just 6 weeks and held between December 16-18, 2021 in Honolulu. It was attended by a total of 40 chemists, including 31 speakers out of which five were from the pharmaceutical industry and 26 from academic/research institutions. The participation in WIPOS 2021 was truly global, as we had attendees from Canada, France, Israel, Singapore, Sweden and the USA. The 2nd Winter In-Person Organic Symposium (WIPOS 2022) took place between December 19-22, 2022 with 43 speakers and 92 total participants representing 14 countries. Our Plenary Speaker was Sir David W. C. MacMillan whose outstanding lecture kicked off a series of 19 lectures by young/emerging investigators over a day and half. Given the resounding successes of both WIPOS 2021 & 2022, we have decided to organize this symposium annually at a suitable tropical/subtropical location. It has been a great pleasure for me, and for the members of the Organizing Committee, to roll up our sleeves and spare no effort to make WIPOS 2023 reality!

We have been delighted to see the enthusiasm and resounding support for WIPOS 2023 from colleagues all around the world during the past eleven months. By early December, ninety-one participants have registered for WIPOS 2023 and they made the long journey to Hawaii from all over the globe in the past few days, representing 12 countries (i.e., Austria, Australia, Canada, China, Germany, Japan, Poland, Singapore, Spain, Switzerland, UK and the USA). Among the participants there are 45 chemistry faculty members from 40 academic institutions, 6 medicinal and process chemists from 4 companies, 6 postdoctoral associates from 5 universities as well as 24 graduate students and 5 undergraduates from 15 academic institutions.

I am especially grateful to Professor Scott Miller who graciously accepted our invitation to be the Plenary Speaker at WIPOS 2023. In the next four days we will hear lectures from 42 speakers and will also enjoy a continuous poster session with 44 posters on display. A full day will be dedicated to lectures from 11 young investigators (i.e. ≤10 years from starting their independent careers including 5 junior faculty members). The remaining 3 days will feature a combined 30 speakers from both academia and the pharmaceutical/biotech industry. The speakers will deliver 20- or 25-minute lectures on new and exciting chemistries, while allowing all of us to be fully immersed in the science and learn first-hand about the frontiers of our field. There will also be about 5 minutes set aside for Q/A after each lecture.

I am deeply thankful to the members of the Organizing Committee for effectively spreading the word about WIPOS 2023 throughout the year among colleagues in academia and industry as well as for alerting various organizations to the sponsorship opportunity that our international symposium represents. Our special thanks go to Ms. Abby Vacek (Treasurer & Master Coordinator of WIPOS, Rice University) who has been working tirelessly behind the scenes to ensure a very smooth symposium, so that this week we can all focus on learning about new chemistries, make new friends and enjoy each other's company.

We greatly appreciate the generous financial and other direct support by our academic and industrial sponsors.

I am particularly indebted to my home institution, **Rice University**, which is by far the largest sponsor of this event. WIPOS 2023 has received substantial support from:

- **Rice Creative Venture Funds**
- **Rice Office of Innovation**
- **Rice School of Natural Sciences** and also from
- **Rice Department of Chemistry**

Specifically, I would like to acknowledge the continued strong support of WIPOS by the following administrators at Rice University:

- **Professor Ramesh Ramamoorthy**, VP of Research (Office of Research)
- **Dr. Paul Cherukuri**, VP of Innovation (Office of Innovation)
- **Professor Thomas Killian**, Dean (School of Natural Sciences) and
- **Professor Angel Marti**, Chair (Department of Chemistry)

Furthermore, we extend our gratitude to the following companies who extended generous financial support for WIPOS 2023:

- **Biotage, LLC**
- **Absolute Palate, LLC**
- **Corteva Agricience**
- **Pharmaron, Inc.**
- **FMC Agricultural Solutions**
- **Heidolph, Inc.**
- **Wiley-Patai Series**
- **Avantor-VWR**

Their combined generous sponsorship allowed us to rent this beautiful venue at the Hilton Hawaiian Village, bring all the necessary A/V equipment all the way from Houston, serve delicious food and drinks as well as refreshments throughout all four days of WIPOS 2023. In addition, we were able to offer registration waivers for ten undergraduate/graduate students, postdoctoral fellows as well as award poster prizes on the last day of our symposium. In summary, without our sponsors' generous financial support, this symposium would have been nearly impossible to organize and execute.

In closing, I am thrilled that we are all able to gather here in Honolulu, Hawaii this week to meet and network with each other, share our breakthrough results, engage in deep scientific conversations that tend to lead to fruitful collaborations and also find time to relax and enjoy life in this amazing tropical paradise.

László Kürti

László Kürti, Ph.D.
Chair of the WIPOS Organizing Committee (Prof., Rice University)
Organizing Committee Members:
Prof. Sarah Wengryniuk (Temple University, NSF) and
Prof. Ilan Marek (Technion, Israel)

SYMPOSIUM SCHEDULE/PROGRAM

WELCOME RECEPTION

SUNDAY, December 17, 2023

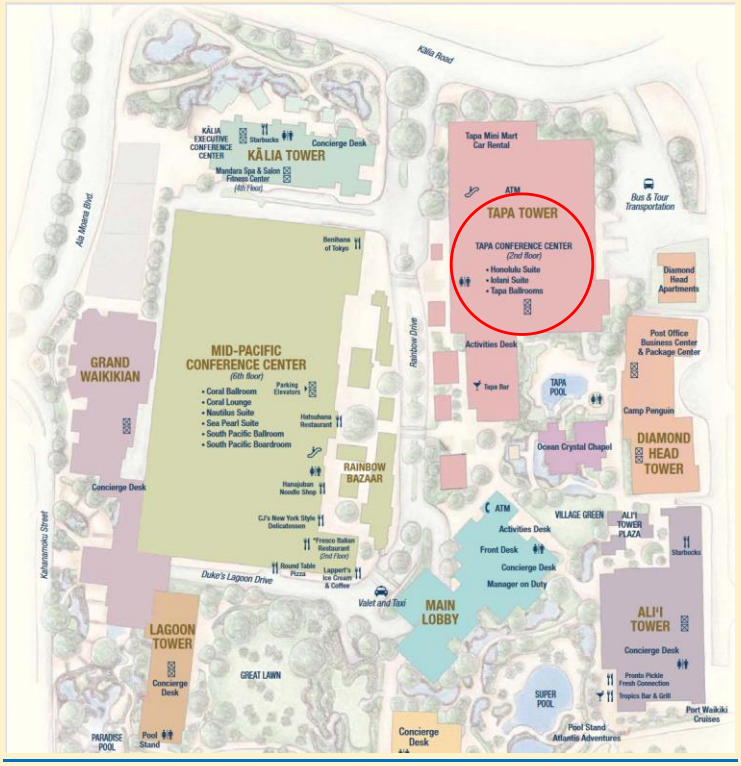
Lanai in front of the Honolulu Suites, Tapa Tower, Hilton Hawaiian Village

2005 Kalia Rd, Honolulu, HI 96815

Spouses, significant others and children are all welcome to attend!

4:00 – 7:00 PM	• **Join us and enjoy wine, beer, soft drinks, juices & tasty bites** • **Mingle with fellow WIPOS participants & pick up your symposium credentials.**

Map of the Hilton Hawaiian Village Resort



SYMPOSIUM SCHEDULE/PROGRAM

DAY #1

MORNING SESSION – PART I. MONDAY, December 18, 2023 Coral III Ballroom, Mid-Pacific Conference Center, Hilton Hawaiian Village 8:15 AM – 10:30 AM	
7:30 – 8:15 AM	**Welcome! Please check-in and pick-up your badges. Enjoy your breakfast and mingle with fellow WIPOS 2023 participants.** Breakfast items: Freshly brewed Hawaiian blend coffee, herbal teas, bagels & cream cheese, muffins, assorted pastries and whole fresh fruits. (Serve time is between 7:30 AM – 9:30 AM)
8:15-8:22 AM	Welcome & Opening Remarks by Symposium Chair **László Kürti** (Rice U.)
8:22-8:30 AM	Welcome Remarks from **Dr. Jan Odegard**, Executive Director @ Ion, Rice University
Session #1 Chair: László Kürti (Rice University, USA)	
8:30 – 9:00 AM	**Hélène Lebel** (University of Montreal, Canada) – *see* page #23 *Hydroxylamine Umpolung in Copper-Catalyzed Cross-Coupling Reactions*
9:00 – 9:30 AM	**Simon Blakey** (Emory University, USA) – *see* page #24 *Planar Chiral Catalysis for Enantioselective Synthesis*
9:30 – 10:00 AM	**Xumu Zhang** (SUSTech, Shenzen, China) – *see* page #25 *Developing Chiral Multidentate Ate (@) Catalyst for Practical Asymmetric Hydrogenation*
10:00 – 10:30 AM	**Paul Chirik** (Princeton University, USA)– *see* page #26 *First-Row Transition Metal Catalysts for C(sp^2)–C(sp^3) Bond Formation*
10:30 – 11:15 AM	**COFFEE BREAK & POSTER SESSION (45 MIN)** **Sponsored by:** RICE UNIVERSITY Office of Innovation

SYMPOSIUM SCHEDULE/PROGRAM

DAY #1

MORNING SESSION – PART II. MONDAY, December 18, 2023 Coral III Ballroom, Mid-Pacific Conference Center, Hilton Hawaiian Village 11:15 AM – 12:45 PM	
Session #2 Chair: Oleg Larionov (University of Texas at San Antonio)	
11:15 – 11:45 AM	**Jeffrey Aubé** (UNC Chapel Hill, USA) – *see* page #27 *New Approaches to Antituberculosis Agents*
11:45 – 12:15 PM	**Masayuki Inoue** (University of Tokyo, Japan) – *see* page #28 *Radical-Based Approach for Synthesis of Complex Natural Products*
12:15 – 12:45 PM	**Zachary Ball** (Rice University, USA) – *see* page #29 *Selective X–H coupling for peptide and protein chemistry*
12:45 – 2:00 PM	**LUNCH SERVED (75 MIN)** **Buffet Lunch is sponsored by:** Biotage®

AFTERNOON SESSION 2:00 PM – 3:30 PM	
Session #3 Chair: Chad Lewis (K36 Therapeutics, USA)	
2:00 – 2:30 PM	**Cindy Hong** (Merck, USA) – *see* page #30 *The empowering impact of a biocatalytic hydroxylation in the commercial manufacturing route for Belzutifan*
2:30 – 3:00 PM	**Guigen Li** (Texas Tech University, USA) – *see* page #31 *New Chirality and Aggregation-Induced Asymmetric Catalysis*
3:00 – 3:30 PM	**Karol Grela** (Polish Academy of Sciences, Poland) – *see* page #32 *Ruthenium catalyzed formation of tetrasubstituted or crowded C–C double bonds—a chemical story in three acts*
END OF DAY #1 PRESENTATIONS – ENJOY HAWAII!	

SYMPOSIUM SCHEDULE/PROGRAM

DAY #2 – YOUNG & EMERGING INVESTIGATORS' SESSION

MORNING SESSION – PART I. **TUESDAY, December 19, 2023** **Coral III Ballroom, Mid-Pacific Conference Center, Hilton Hawaiian Village** **8:25 AM – 10:25 AM**	
7:30 – 8:25 AM	**Enjoy your breakfast and mingle with fellow WIPOS 2023 participants.** Breakfast items: Freshly brewed Hawaiian blend coffee, herbal teas, bagels & cream cheese, muffins, assorted pastries and whole fresh fruits. (Serve time is between 7:30 AM – 9:30 AM)
Session #1 Chairs: Sarah Wengryniuk (Temple University, USA) & Cindy Hong (Merck, USA)	
8:25-8:30 AM	Introduction of our Plenary Speaker by Symposium co-Chair **Sarah Wengryniuk**
8:30 – 9:10 AM	**PLENARY LECTURE** **Scott Miller** (Yale University, USA) – *see* page #33 *Searching for Selective Catalytic Reactions in Complex Molecular Environments*
9:10 – 9:35 AM	**Julia Kalow** (Northwestern University, USA) – *see* page #34 *Light as a selection pressure for materials discovery*
9:35 – 10:00 AM	**Wesley Farrell** (US Naval Academy, USA) – *see* page #35 *Olefin Metathesis Using Earth Abundant Vanadium*
10:00 – 10:25 AM	**Osvaldo Gutierrez** (Texas A&M, USA) – *see* page #36 *Decoupled Fe-Catalyzed Radical Cross-Couplings*
10:25 – 11:10 AM	**COFFEE BREAK & POSTER SESSION (45 MIN)** **Sponsored by:** ABSOLUTELY kona .COM Single Estate 100% Kona Coffee

SYMPOSIUM SCHEDULE/PROGRAM

DAY #2 – YOUNG & EMERGING INVESTIGATORS' SESSION

MORNING SESSION – PART II. TUESDAY, December 19, 2023 Coral III Ballroom, Mid-Pacific Conference Center, Hilton Hawaiian Village 11:10 AM – 12:50 PM	
Session #2 Chair: Zachary Ball (Rice University, USA)	
11:10 – 11:35 AM	**Lara Malins** (Australian National University, Australia) – *see* page #37 *Late-Stage Peptide Modifications*
11:35 – 12:00 PM	**Roberto Gomes** (North Dakota State University, USA) – *see* page #38 *Functionalization of Cyclic Imides for Biomedical Application*
12:00 – 12:25 PM	**Baihua Ye** (Shanghai Tech University, China)– *see* page #39 *Tactics of Precision Synthesis with Harnessing Zirconocene*
12:25 – 12:50 PM	**Christian Malapit** (Northwestern University, USA) – *see* page #40 *Electrosynthesis for selective new reactions*
12:50 – 2:05 PM	**LUNCH SERVED (75 MIN)** **Buffet Lunch is sponsored by:**

AFTERNOON SESSION 2:05 PM – 3:45 PM	
Session #3 Chair: Paul Chirik (Princeton University, USA)	
2:05 – 2:30 PM	**Martin Conda-Sheridan** (University of Nebraska, USA) – *see* page #41 *Killing bacteria by modulating cylindrical proteases*
2:30 – 2:55 PM	**Zuxiao Zhang** (University of Hawai'i at Mānoa, USA) – *see* page #42 *Selective Halogen Functionalization in Multicomponent Reactions via Photocatalytic Radical Polar Crossover*
2:55 – 3:20 PM	**Christopher Newton** (University of Georgia, USA) – *see* page #43 *Design and Application of New Pericyclic Strategies*
3:20 – 3:45 PM	**Marvin Parasram** (New York University, USA) – *see* page #44 *Anaerobic Heteroatom-Transfer Reactions Promoted by Photoexcited 1,3-Dipoles*
END OF DAY #2 PRESENTATIONS – BANQUET DINNER IS TONIGHT!	

SYMPOSIUM BANQUET DINNER

@

CHEF CHAI RESTAURANT

QR Code for the Location:

SCAN ME

SYMPOSIUM BANQUET DINNER

TUESDAY, December 19, 2023

CHEF CHAI RESTAURANT

https://chefchai.com

7:30 PM – 11:00 PM

1009 Kapiolani Blvd., Honolulu, HI 96814

DO NOT FORGET TO BRING YOUR BRACELETS!

(PLEASE PICK THEM UP FROM MS. ABBY VACEK)

Chef Chai's Special Menu

Tuesday December 19, 2023

Appetizer Sampler

Fresh Ahi Tartar in a mini Waffle Cone DF, NF

Chicken Tenderloin Sate' with Thai Peanut Sauce DF

Gravlax Salmon Roulade with Cream Cheese & Crab Meat GF, NF

Kataifi Crusted Jumbo Black Tiger Prawns with Pineapple Sauce DF, NF

Alaskan King Crab Cake with Roasted Garlic Aioli and Mango Salsa DF, NF

Smoked Duck Taco with Fresh Mango Salsa DF, NF

Choice of Entrée

Grilled Beef Tenderloin with Mushroom Foie Gras Puff NF (Prepare Medium-Medium Rare)
Mashed Yukon Gold Potato, Haricot Vert, Baby Carrot and Merlot Demi

Mogolian Style Lamb Chops with Brandy Demi NF (Prepare Medium-Medium Rare)
Mashed Yukon Gold Potato, Sugar Snap Peas, Cauliflower and Bell Pepper

Miso Fresh Chilean Seabass with Pickled Vegetables GF, NF
and Steamed Coconut Milk Ginger Brown Rice

Vegetarian Terrine with Thai Green Curry Sauce V, GF, DF, NF
Naan Bread

Choice of Dessert

Heart Shaped White Chocolate Amore Truffle with Fresh Raspberry Guava Puree GF, NF

Coconut Cake with Tahitian Vanilla Crème Anglaise NF

Chocolate Lave Cake with Fresh Berries NF

V=Vegetarian, GF= Gluten Free, DF=Dairy Free, NF=Nut Free

"Mahalo for celebrating with us"

SYMPOSIUM SCHEDULE/PROGRAM

DAY #3

MORNING SESSION – PART I. **WEDNESDAY, December 20, 2023** **Coral III Ballroom, Mid-Pacific Conference Center, Hilton Hawaiian Village** **8:30 AM – 10:30 AM**	
7:30 – 8:30 AM	**Enjoy your breakfast and mingle with fellow WIPOS 2023 participants.** Breakfast items: Freshly brewed Hawaiian blend coffee, herbal teas, bagels & cream cheese, muffins, assorted pastries and whole fresh fruits. (Serve time is between 7:30 AM – 9:30 AM)
Session #1 Chair: Jeffrey Aubé (UNC Chapel Hill, USA)	
8:30 – 9:00 AM	**Yee Hwee Lim** (A*STAR, Singapore)– *see* page #45 *Harnessing the gems from Nature & its application in fine chemicals biomanufacturing*
9:00 – 9:30 AM	**Igor Alabugin** (Florida State University, USA) – *see* page #46 *Energy of chemical bonds as a driving force for organic reactions: from stereoelectronic frustration to electron upconversion*
9:30 – 10:00 AM	**László Kürti** (Rice University, USA) – *see* page #47 *Aminating Agents, C-H Amination & Nitrogen Heterocycles: New Directions*
10:00 – 10:30 AM	**Marcos Suero** (ICIQ, Spain) – *see* page #48 *Carbyne Transfer in Organic Synthesis*
10:30 – 11:15 AM	**COFFEE BREAK & POSTER SESSION (45 MIN)** **Sponsored by:** RICE UNIVERSITY Creative Venture Funds Office of Research

SYMPOSIUM SCHEDULE/PROGRAM

DAY #3

MORNING SESSION – PART II. WEDNESDAY, December 20, 2023 Coral III Ballroom, Mid-Pacific Conference Center, Hilton Hawaiian Village 11:15 AM – 12:45 PM	
Session #2 Chair: Hélène Lebel (University of Montreal, Canada)	
11:15 – 11:45 AM	**Franziska Schoenebeck** (RWTH Aachen Univ., Germany) – *see* page #49 *Recent Developments with Organogermanes*
11:45 – 12:15 PM	**Petr Vachal** (Merck, USA)– *see* page #50 *Invention of MK-0616, an Orally Bioavailable Macrocyclic Peptide PCSK9 Inhibitor*
12:15 – 12:45 PM	**L.-C. Campeau** (Merck, USA) – *see* page #51 *Teaching an Old Dog New Tricks: Advances in Macrocyclic Peptide Synthesis*
12:45 – 2:00 PM	**LUNCH SERVED (75 MIN)** **Buffet Lunch is sponsored by:** CORTEVA™ agriscience

AFTERNOON SESSION 2:00 PM – 3:30 PM	
Session #3 Chair: Franziska Schoenebeck (RWTH Aachen University, Germany)	
2:00 – 2:30 PM	**Oleg Larionov** (UT San Antonio, USA) – *see* page #52 *New Synthetic Methods for the Construction of Carbon-Heteroatom Bonds*
2:30 – 3:00 PM	**Yanli Zhao** (NTU, Singapore)– *see* page #53 *Integrating Supramolecular Interactions into Covalent Organic Frameworks toward Advanced Catalysis*
3:00 – 3:30 PM	**Jon Njardarson** (University of Arizona, USA) – *see* page #54 *Asymmetric Anionic-Amino Cope Adventures*
END OF DAY #3 PRESENTATIONS – SUNSET BOAT TOUR IS TONIGHT!	

WAIKIKI SUNSET

&

CITY LIGHTS BOAT TOUR

WITH LIVING OCEAN TOURS

QR Code for the Location:

SCAN ME

The Boat Tour Operator requires that each passenger fills out a Waiver Form prior to arriving on site. If you made this booking for multiple people, each one must complete the waiver before arriving. Check your email to access and complete your Waiver Form online.

WAIKIKI BYOB SUNSET/CITY LIGHTS BOAT TOUR

WEDNESDAY, December 20, 2023

LIVING OCEAN TOURS

https:// livingoceantours.com

5:00 PM – 6:30 PM

1125 Ala Moana Blvd Slip B1 Honolulu, HI 96814

(808) 436-3483 • info@livingoceantours.com

DO NOT FORGET TO BRING YOUR BRACELETS!

(PLEASE PICK THEM UP FROM MS. ABBY VACEK)

Please check in 15 minutes prior to your departure time at our boat "Coral Kai". Living Ocean Tours is located at Kewalo Basin Boat Harbor. The boat departs at your scheduled time.

Parking To avoid issues with parking we suggest that you take a taxi/Uber/Lyft to your tour. If you are driving yourself please plan for additional time as parking can be limited during peak hours. Pay machines in the parking lot accept cash and credit card at a rate of $2 per hour. Please refer to the Kewalo Basin Boat Harbor Map for parking areas and our boat's location.

What to Bring

- Hat, Sunglasses, Sunscreen
- Non-Alcoholic Beverages Included, BYOB for Adult Beverages (21+)
- Please do not bring glass containers
- Cameras
- Crew Gratuity (not required)

Additional Information

Sea Sickness - Generally the ocean is calm near Waikiki, but if you are prone to sea sickness or are not accustomed to being aboard ocean going boats we suggest you consult your doctor or pharmacist about taking preventative measures prior to your trip.

Departure Time / Late Arrivals - Out of respect to our guests we attempt to leave on time for every trip. If you are running late and do not arrive at the boat prior to the scheduled departure time your ticket will be forfeited. Refunds cannot be processed for no-shows / late arrivals so please plan ahead and arrive on time.

SYMPOSIUM SCHEDULE/PROGRAM

DAY #4

MORNING SESSION – PART I. **THURSDAY, December 21, 2023** **Coral III Ballroom, Mid-Pacific Conference Center, Hilton Hawaiian Village** **8:30 AM – 10:30 AM**	
7:30 – 8:30 AM	**Enjoy your breakfast and mingle with fellow WIPOS 2023 participants.** Breakfast items: Freshly brewed Hawaiian blend coffee, herbal teas, bagels & cream cheese, muffins, assorted pastries and whole fresh fruits. (Serve time is between 7:30 AM – 9:30 AM)
Session #1 Chair: Simon Blakey (Emory University, USA)	
8:30 – 9:00 AM	**Kaori Sakurai** (Tokyo Univ. of Agric. & Technology, Japan) – *see* page #55 *Multivalent Affinity Labeling Probes for Exploration of Carbohydrate-Binding Proteins*
9:00 – 9:30 AM	**André Beauchemin** (University of Ottawa, USA) – *see* page #56 *Strategies to Build Nitrogen Heterocycles*
9:30 – 10:00 AM	**Marcus Tius** (University of Hawaii at Manoa, USA) – *see* page #57 *Escape from Flatland*
10:00 – 10:30 AM	**Chad Lewis** (K36 Therapeutics, USA) – *see* page #58 *Synthetic Route Development of a Commercial Active Pharmaceutical Ingredient*
10:30 – 11:15 AM	**COFFEE BREAK & POSTER SESSION (45 MIN)** **Sponsored by:** 康龙化成 PHARMARON heidolph research made easy

SYMPOSIUM SCHEDULE/PROGRAM

DAY #4

MORNING SESSION – PART II. THURSDAY, December 21, 2023 Coral III Ballroom, Mid-Pacific Conference Center, Hilton Hawaiian Village 11:15 AM – 12:45 PM	
Session #2 Chair: Osvaldo Gutierrez (Texas A&M, USA)	
11:15 – 11:45 AM	**Oliver Thiel** (Amgen, Cambridge, USA) – *see* page #59 *Development of a Commercial Manufacturing Process for LUMAKRAS™ (sotorasib)*
11:45 – 12:15 PM	**Bill Morandi** (ETH Zurich, Switzerland) – *see* page #60 *Recent Adventures in Catalysis and Beyond*
12:15 – 12:45 PM	**Zhen Yang** (Peking University Shenzen Grad School, China)– *see* page #61 *Application of Norrish Yang Photocyclization to the Total Synthesis of Complex Natural Product*
12:45 – 2:00 PM	**LUNCH SERVED (75 MIN)** **Buffet Lunch is sponsored by:** FMC

AFTERNOON SESSION 2:00 PM – 3:45 PM	
Session #3 Chair: Masayuki Inoue (University of Tokyo, Japan)	
2:00 – 2:30 PM	**Zhi-Xiang Yu** (Peking University, China) – *see* page #62 *Development/Application/Mechanisms of Metal-Catalyzed Cycloadditions*
2:30 – 3:00 PM	**Andrew L. Lawrence** (The University of Edinburgh, UK) – *see* page #63 *Rethinking Enantioconvergent Reactions*
3:00 – 3:30 PM	**Jeremy May** (University of Houston, USA) – *see* page #64 *Electrophilic Deboronation in Synthesis*
3:30 – 3:45 PM	POSTER AWARDS & Farewell Remarks by **Scott Miller** & **László Kürti**
END OF DAY #4 PRESENTATIONS – END OF WIPOS 2023 **HAVE A WONDERFUL HOLIDAY AND A SAFE TRIP HOME!**	

LIST OF SPEAKERS IN ALPHABETICAL ORDER

Name of Speaker Last name, First Name	Affiliation	Scheduled Talk Day #/Session #	Abstr Page#
1. **Alabugin, Igor**	Florida State University (**Faculty**, USA)	**Day #3 / S #1**	**46**
2. **Aubé, Jeffrey**	UNC Chapel Hill (**Faculty**, USA)	**Day #1 / S #2**	**27**
3. **Ball, Zachary T**	Rice University (**Faculty**, USA)	**Day #1 / S #2**	**29**
4. **Beauchemin, André**	University of Ottawa (**Faculty**, Canada)	**Day #4 / S #1**	**56**
5. **Blakey, Simon**	Emory University (**Faculty**, USA)	**Day #1 / S #1**	**24**
6. **Campeau, L.-C.**	Merck (**Industry**, USA)	**Day #3 / S #2**	**51**
7. **Chirik, Paul**	Princeton University (**Faculty**, USA)	**Day #1 / S #1**	**26**
8. **Conda-Sheridan, Martin**	University of Nebraska – Medical Center, Omaha (**Faculty**, USA)	**Day #2 / S #3**	**41**
9. **Farrell, Wesley**	US Naval Academy (**Faculty**, USA)	**Day #2 / S #1**	**35**
10. **Gomes, Roberto**	N. Dakota State Univ. (**Faculty**, USA)	**Day #2 / S #2**	**38**
11. **Grela, Karol**	Inst. of Org. Chem., Polish Acad. of Sci. (**Faculty**, Poland)	**Day #1 / S #3**	**32**
12. **Gutierrez, Osvaldo**	Texas A&M (**Faculty**, USA)	**Day #2 / S #1**	**36**
13. **Hong, Cindy**	Merck (**Industry**, USA)	**Day #1 / S #3**	**30**
14. **Inoue, Masayuki**	University of Tokyo (**Faculty**, Japan)	**Day #1 / S #2**	**28**
15. **Kalow, Julia**	Northwestern University (**Faculty**, USA)	**Day #2 / S #1**	**34**
16. **Kürti, László**	Rice University (**Faculty**, USA)	**Day #3 / S #1**	**47**
17. **Larionov, Oleg**	UT San Antonio (**Faculty**, USA)	**Day #3 / S #3**	**52**
18. **Lawrence, Andrew L.**	The University of Edinburgh (**Faculty**, UK)	**Day #4 / S #3**	**63**
19. **Lebel, Hélène**	University of Montreal (**Faculty**, Canada)	**Day #1 / S #1**	**23**
20. **Lewis, Chad**	K36 Therapeutics (**Industry**, USA)	**Day #4 / S #1**	**58**
21. **Li, Guigen**	Texas Tech University (**Faculty**, USA)	**Day #1 / S #3**	**31**
22. **Lim, Yee Hwee**	A*STAR (**Faculty**, Singapore)	**Day #3 / S #1**	**45**
23. **Malapit, Christian**	Northwestern University (**Faculty**, USA)	**Day #2 / S #2**	**40**
24. **Malins, Lara**	Australian Nat. University (**Faculty**, Australia)	**Day #2 / S #2**	**37**
25. **May, Jeremy**	U of Houston (**Faculty**, USA)	**Day #4 / S #3**	**64**
26. **Miller, Scott**	Yale University (**Faculty**, USA)	**Day #2 / S #1**	**33**
27. **Morandi, Bill**	ETH Zurich (**Faculty**, Switzerland)	**Day #4 / S #2**	**60**
28. **Newton, Christopher**	University of Georgia (**Faculty**, USA)	**Day #2 / S #3**	**43**
29. **Njardarson, Jon**	University of Arizona (**Faculty**, USA)	**Day #3 / S #3**	**54**
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31. **Sakurai, Kaori**	Tokyo U. of Agri. & Technol. (**Faculty**, Japan)	**Day #4 / S #1**	**55**
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SPEAKER ABSTRACTS

&

SHORT BIOSKETCHES

(Listed in the order of the scheduled presentations)

Hélène Lebel

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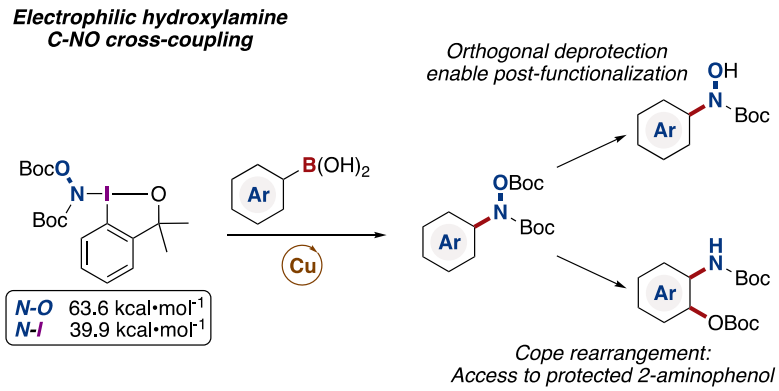
Hélène Lebel received her PhD from Université de Montréal under the supervision of Prof. André B. Charette in 1998. She then joined the group of Eric N. Jacobsen at Harvard University as a NSERC Postdoctoral Fellow. She began her independent academic career at the Université de Montréal as an assistant professor in 1999, under a NSERC University Faculty Award. She was promoted to the rank of Associate Professor in 2005, and Full Professor in 2010. The quality of her research has been recognized with many awards, including the Enantioselective Synthetic Chemistry Research Award in 2005, the Johnson & Johnson Focused Funding Grant Award in 2008, the Merck Frosst Centre for Therapeutic Research Award in 2009 and the Clara Benson Award in 2014. She held the Canada Research Chair in Organometallic Catalysis (Tier II) from 2006 to 2016. She has published >100 publications/book chapters, cited >6000 times (h-index GS: 38) and presented >100 invited lectures around the world. She serves as Editorial Board Chair for the journal "Chemistry Select" and she is member of the Editorial Advisory Board, for the journal "Reaction Chemistry & Engineering".

Hydroxylamine Umpolung in Copper-Catalyzed Cross-Coupling Reactions

Hydroxylamine derivatives are well-established nitrogen precursors that undergo various transition metal-catalyzed transformations via the cleavage of the nitrogen-oxygen bond. Conversely, the development of a reagent containing a *transferable electrophilic hydroxylamine* has been elusive, due to the inherent fragility of the N–O bond. This talk will discuss the utility of hypervalent iodine chemistry to synthesize a new reagent for the transfer of an electrophilic *N–O* moiety. The novel reagent is the first hydroxylamine umpolung that allows the formation of highly valuable *N*-arylhydroxylamine synthons via a copper-catalyzed cross-coupling reaction with boronic acids. The resulting *N*-arylhydroxylamine derivatives can be subjected to Cope rearrangement and post-functionalization, affording a variety of nitrogen-containing building blocks. Experimental and *in-silico* mechanistic studies suggest a catalytic cycle involving the oxidative addition of the hydroxylamine hypervalent iodine reagent to the copper (I) catalyst as the first step, without the intermediacy of a discrete radical intermediate.



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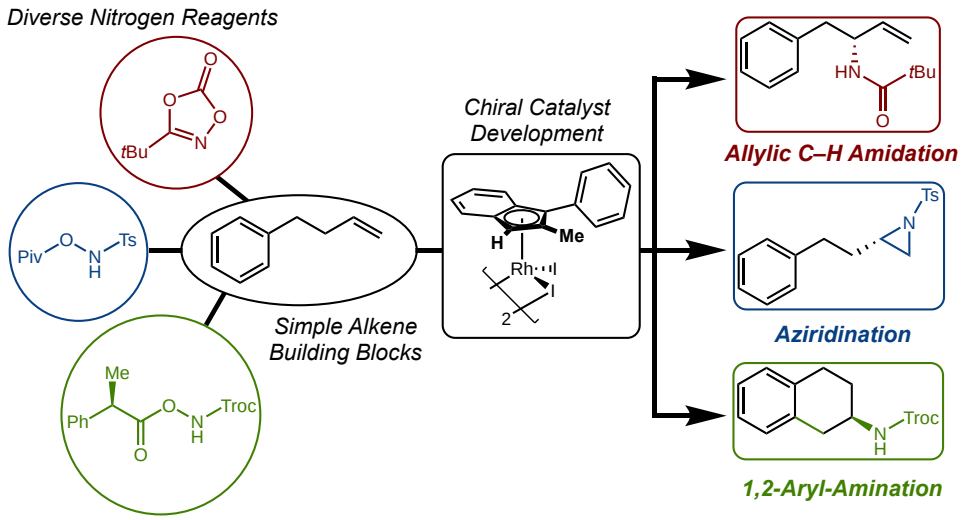
Simon Blakey was born in Auckland, New Zealand in 1975. He received his B.Sc. degree in Chemistry and Biochemistry at the University of Auckland in 1997, before moving to the U.K. to complete his Ph.D. with Professor Ian Paterson at the University of Cambridge. After three years as a postdoctoral fellow with Professor David MacMillan at the California Institute of Technology, Simon joined the faculty at Emory University in the fall of 2005. Today his research interests revolve around the invention of new chiral catalysts enabling new enantioselective reactions and the implementation of this technology to impact drug discovery.

Planar Chiral Rhodium Complexes for Enantioselective Catalysis

The development of new reactions and catalysts for the oxidative cross-coupling of C-H bonds with C-H, N-H and O-H bonds will be discussed. Strategically, these reactions allow for the synthesis of complex molecules from their constituent components, minimizing the need for functional group activation and manipulation. A novel planar chiral catalyst platform for enantioselective reactions will be presented. Illustrative examples of emergent applications will be provided, and a new traceless directing group concept for C-H annulation to form heterocycles will be presented.



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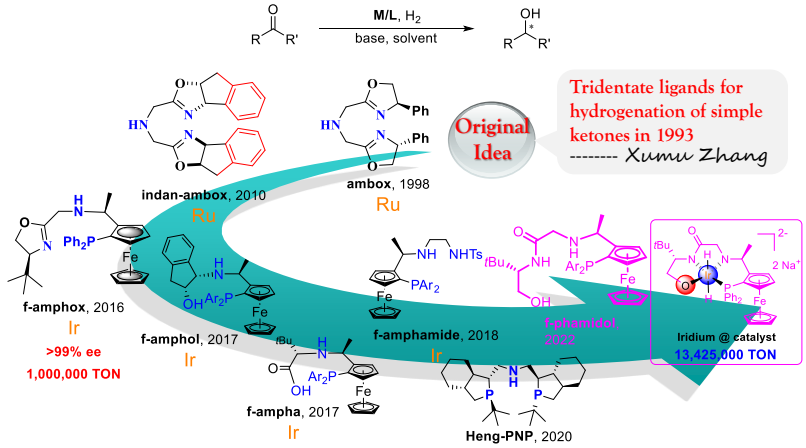
Xumu Zhang, born in 1961, is a famous expert on coordination chemistry of organometallic chemistry. He is currently the associate dean of College of Science and chair professor of the department of chemistry in SUSTech. Xumu Zhang received his BS from Wuhan University (1982) and MS from Chinese Science Academy (1985) with Professor Jiaxi Lu and University of California, San Diego (1987) with Professor Gerhard N. Schrauzer. He received his Ph.D. in chemistry in 1992 from Stanford University under the guidance of Professor James P. Collman. He pursued postdoctoral research at Stanford University from 1992 to 1994. Before joining SUSTech in 2015, he was a professor of chemistry in The Pennsylvania State University and distinguished professor in Rutgers University. He was elected as a foreign academician of the Russian Academy of Engineering in 2022.

Developing Chiral Ate (@) Catalysts for Practical Asymmetric Hydrogenation

Highly efficient and enantioselective hydrogenation is a key generic technology for green drug synthesis. In 2016, Zhang and coworkers creatively introduced ferrocene skeleton into the tridentate ligand and designed and synthesized a new f-amphox ligand, which showed ultra-high activity and enantioselectivity (>1,000,000 TON, 99% ee) in the hydrogenation of ketones. On this basis of amphox, Zhang and coworkers successively developed chiral tridentate ligands f-amphol, f-ampha and f-amphamide based on ferrocene skeleton, as well as electron-rich Heng-PNP based on rigid skeleton. In 2022, Xumu Zhang proposed the concept of ate catalysis (@ catalysis) and a tetradentate ligand based on the ferrocene skeleton, termed as f-phamidol, was developed based on this concept, which can obtain a TON of up to 13,425,000 in asymmetric hydrogenation of ketones. These multidentate ligands have been applied to the green synthesis of many important drugs such as Ezetimibe, Montelukast, Phenylephrine, Nicotine, etc.



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Paul Chirik

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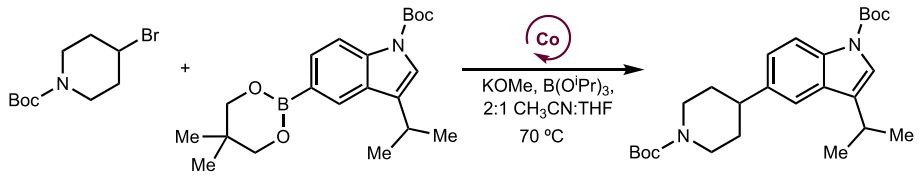
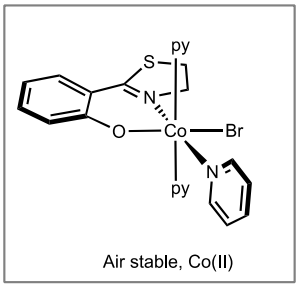
Paul was born outside of Philadelphia, PA and received his B.S. degree in chemistry from Virginia Tech. He went on to obtain his Ph.D. in the group of Prof. John Bercaw at Caltech. Following a brief postdoc at MIT with Kit Cummins, Paul began his academic career at Cornell University in 2001. He rose through the ranks and become the Peter J. W. Debye Professor of Chemistry in 2009. In 2011, he moved to Princeton University and is the Edwards S. Sanford Professor of Chemistry and Department Chair. He is the author of over 250 scientific publications that are principally focused on catalysis with earth-abundant metals and sustainable ammonia synthesis.

First Row Transition Metals for C(sp^2)–C(sp^3) Bond Formation

One-electron redox chemistry is often cited as deleterious in developing catalysts with earth-abundant, first-row transition metals. Are there transformations, however, where this unique electron flow can be viewed as an opportunity? While palladium catalysis has been overwhelming successful and impactful for C(sp^2)–C(sp^2) bond formation, the growing interest in more three-dimensional molecules inspires the discovery of new C–C bond-forming reactions beyond the scope of precious metal catalysts. Our group, in collaboration with BMS, has discovered that cobalt(II)[1,2] and iron(II)[3] precatalysts are effective for the C(sp^2)–C(sp^3) Suzuki-Miyaura cross coupling. Mechanistic investigations support a Co(II)–Co(III) redox cycle with transmetallation to a cobalt(II) alkoxide as turnover limiting.[4] These insights have enabled rational design of next-generation air-stable cobalt(II) precatalysts that are effective for a key C(sp^2)–C(sp^3) bond formation in the synthesis of the TLR 7/8 inhibitor, afimetoran.[5] Further insights into catalyst improvements and reaction mechanism will be presented.





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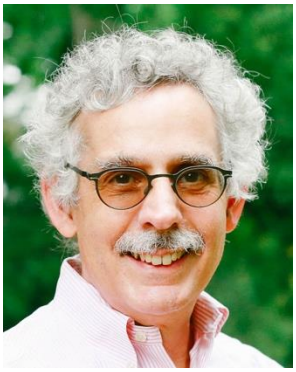
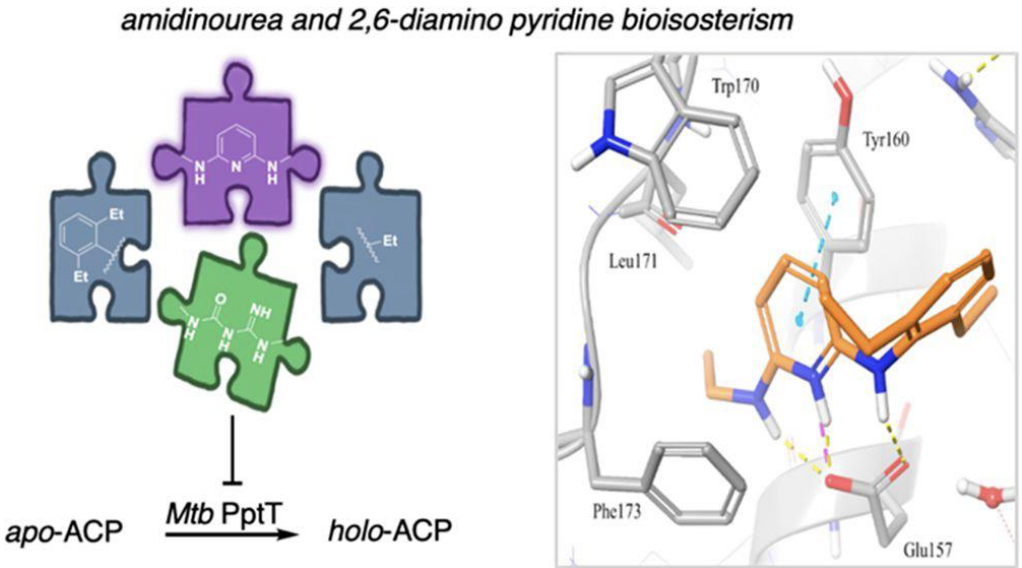


Jeffrey Aubé attended the University of Miami, where he did undergraduate research with Professor Robert Gawley (with whom he later co-authored the graduate text "Principles of Asymmetric Synthesis"). He received his Ph.D. in 1984 from Duke University, working with Professor Steven Baldwin, and was an NIH postdoctoral fellow at Yale University with Professor Samuel Danishefsky. From 1986 until 2015, he held faculty positions in the Department of Medicinal Chemistry at the University of Kansas. In 2015, he moved to the University of North Carolina, where he is an Eshelman Distinguished Professor in the Division of Chemical Biology and Medicinal Chemistry and holds a joint appointment in the Department of Chemistry. Jeff's research interests lie in the chemistry of heterocyclic compounds and their applications to problems in medicinal chemistry.

New Approaches to Antituberculosis Agents

Known since antiquity, tuberculosis remains a major public health challenge throughout the world despite the availability of therapeutic interventions. The long treatment times of existing drugs along with the emergence of resistant variations have led researchers to seek new drugs. This seminar will describe ongoing projects to contribute to this goal, including the study of new b-lactam antitubercular agents and inhibitors of the TB phosphopantetheinyl transferase, a newly validated target.



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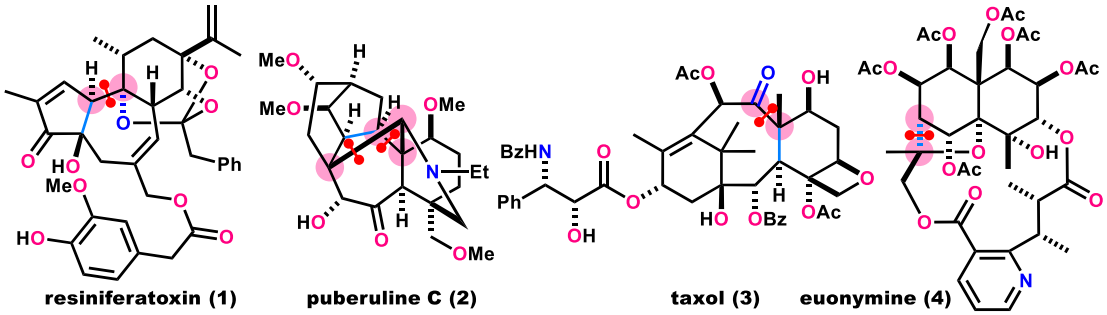
Masayuki Inoue received a B.Sc. degree in Chemistry from the University of Tokyo in 1993. In 1998, he obtained his Ph.D. from the same university, working under the supervision of Prof. Kazuo Tachibana. After spending two years with Prof. Samuel J. Danishefsky at the Sloan-Kettering Institute for Cancer Research (1998-2000), he joined the Graduate School of Science at Tohoku University as an assistant professor in the research group of Prof. Masahiro Hirama. At Tohoku University, he was promoted to lecturer in 2003 and then to associate professor in 2004. In 2007, he moved to the Graduate School of Pharmaceutical Sciences, The University of Tokyo as a full professor. His research interests include the synthesis, design, and study of biologically important molecules, with particular emphasis on the total synthesis of structurally complex natural products. He has been honored with Novartis Chemistry Lectureship 2008/2009, the 5th JSPS Prize (2008), the Mukaiyama Award 2014, the Swiss Chemical Society Lectureship Award 2017/2018, and the 64th Synthetic Organic Chemistry Award, Japan (2022).

Radical-Based Approach for Synthesis of Complex Natural Products

Natural products with a high ratio of sp^3-hybridized atoms and oxygen-substituted stereogenic centers represent privileged structures for the development of pharmaceuticals and chemical probes. The multiple oxygen functionalities of these natural products endow their potent and selective biological activities, although they significantly heighten the challenge of their chemical assemblies. We focused on developing efficient strategies for the total syntheses of this biologically and chemically important class of molecules. Specifically, we have designed and devised radical-based strategies for assembling highly oxygenated natural products.[1] In this lecture, we report the development of the radical coupling reactions and the synthetic routes to resiniferatoxin (**1**),[2,3] puberuline (**2**),[4] taxol (**3**),[5,6] and euonymine (**4**)[7] by applying the radical chemistry.



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Zachary Ball

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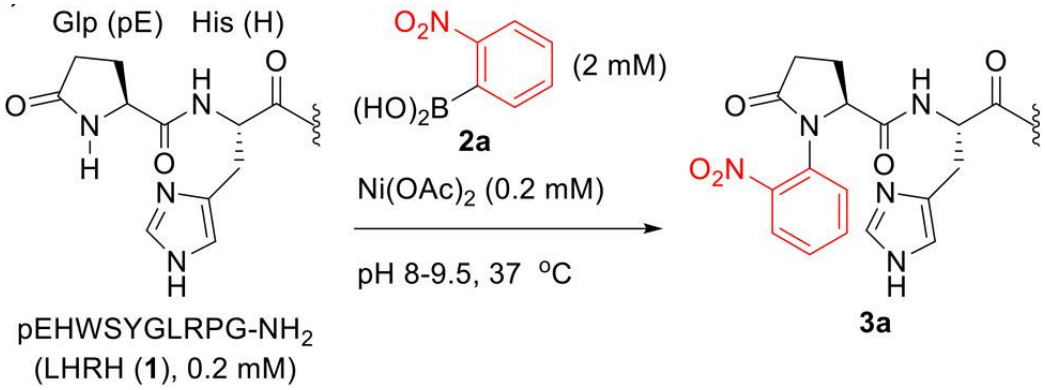
Zach completed his bachelor's degree at Harvard University (1999), working with Greg Verdine on combinatorial chemistry and organic synthesis. His graduate work at Stanford University, under the supervision of Barry Trost, focused on ruthenium catalysis and organosilicon chemistry. Zach was a Miller Fellow at UC–Berkeley, where he worked with Jean Fréchet on the development of light-harvesting polymers. Zach has a professor at Rice University since 2006. His research program centers on transition metal complexes and reactivity for applications in chemical biology. A major focus is the development of bioconjugation reactions and novel selectivity paradigms for selective manipulation of natural peptides and proteins. The lab has also developed transition-metal complexes as inhibitors of protein–protein interactions, as well as tools to understand transition-metal speciation in cellulo.

Selective X–H coupling for peptide and protein chemistry

The talk will focus on selectivity paradigms for selective arylation/alkenylation of biological X–H bonds. Peptides and proteins contain ubiquitous X–H bonds: amides, alcohols, thiols, and carboxylic acids, and typically require protic solvents for solubility. The talk will focus on reaction discovery of copper- and nickel-catalyzed processes for selective manipulation of complex structures. For example, a two-step method for methionine modification via copper-catalyzed arylation of sulfoximine moieties allows direct preparation of useful glutaminyl transferase inhibitors.[1] Most recently, we have focused on the unique reactivity of pyroglutamate (Glp, pE), a common posttranslational modification with remarkable reactivity in several different N–H arylation reactions.[2,3]



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Cindy Hong

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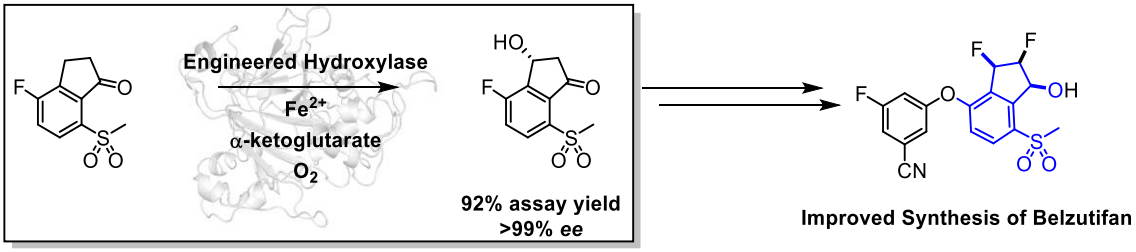
Cindy is a Texan, born in Nebraska and raised in Michigan, Oklahoma, and Texas. She earned her BA/MS in Chemistry at Northwestern University while training under Alexander Statsyuk. She then went on to earn her Ph.D. in chemistry under the mentorship of Dean Toste, Ken Raymond, and Bob Bergman from the University of California, Berkeley in 2018. She then joined the process chemistry group at Merck in Rahway, NJ as a Senior Scientist. Here, she developed a process and oversaw late-stage development of an unnatural nucleobase for Islatravir. Looking to expand her scientific horizons, Cindy then joined the Biocatalysis group at Merck, where she learned the tools of the trade for enzyme discovery and directed evolution. Here, she applied these tools towards the development of greener manufacturing processes, including an enzymatic cascade for MK-0616, a drug candidate for an orally bioavailable PCSK9 inhibitor.

The empowering impact of a biocatalytic hydroxylation in the commercial manufacturing route for Belzutifan



The application of enzymatic catalysis in commercial manufacturing routes has become a familiar feature in the pharmaceutical industry. In some cases, the engineering of bespoke, evolved enzymes and the commitment to a mechanism-based approach to process development yields remarkable advantages in accomplishing the aspirational manufacturing route. The commercial manufacturing route toward belzutifan - a treatment for renal cell carcinoma - relies on a regio- and stereoselective biocatalytic C-H hydroxylation by a Fe/a-ketoglutarate-dependent dioxygenase. Thus far, all industrial applications of hydroxylation reactions catalyzed by this class of enzymes operate on native amino acid substrates and their derivatives. Here we report the development of a biocatalytic hydroxylation on a non-native indanone substrate, including mechanistic investigations to identify a key impurity and potent enzyme inhibitor. These studies were key for enabling accelerated engineering of a robust dioxygenase that met demands for scalable process performance. Importantly, this also highlights how concurrent process development and enzyme evolution can enable the efficient progress of the other, and also highlights the potential of these enzymes for efficient and sustainable chemical synthesis.

Guigen Li

Shengzhou Jin,[‡] Yao Tang,[†] Ting Xu,[‡] Yu Wang,[‡] Jia-Yin Wang,[α] Sai Zhang,[†] Qingkai Yuan,[†] Anis Ur Rahman,[†] Hao Liu,[†] and Guigen Li[*†‡]

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Professor Guigen Li was born in Jiangsu, China. He obtained his B.S. in 1984 at Jiangsu Normal University and M.S. at Nankai University under Prof. Zhenheng Gao's supervision. After that, he was recruited by Nanjing University as a faculty member and worked for three years. He moved to the United States in 1990 and earned his Ph.D. in 1995 from the University of Arizona under the guidance of Prof. Victor J. Hruby. He began his postdoctoral research with Prof. K.B. Sharpless at the Scripps Research Institute and played a crucial role in discovering Sharpless asymmetric aminohydroxylation reaction (a part of project of 2001 Nobel prize in chemistry). Currently, he is the Paul W. Horn Distinguished professor at Texas Tech University and a distinguished adjunct professor at Nanjing University. He has achieved nearly 400 publications with h-index of 65.

New Chirality and New Asymmetric Methodologies

New types of chirality, orientational and staircase chirality, have been established. The former consists of a tetrahedron center and a remotely anchored blocker, and the latter consists of symmetrical planes which are atropisomerically arranged. The asymmetric approaches to these two types of chirality will be presented. Meanwhile, new chiral aggregate-based tools – aggregation-induced asymmetric synthesis (AIAS) and asymmetric (AIAC) catalysis will be presented. These asymmetric tools have been proven to be successful in the asymmetric GAP synthesis of functionalized 2,3-dihydrobenzofurans and catalytic asymmetric dihydroxylation reaction (AD) of olefins. They are new additions to well-known methods of controlling chirality including the use of chiral auxiliaries, reagents, solvents, and catalysts documented in literature. In addition, AIAC is a new catalytic category between homogeneous and heterogeneous catalysis, which can reverse asymmetric control simply by changing co-solvent ratios without changing the chiral starting materials and catalysts.

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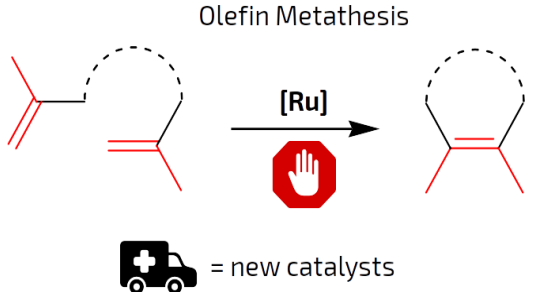
Karol Grela received his PhD degree from the Institute of Organic Chemistry, Polish Academy of Sciences, in 1998. As Alexader von Humboldt Scholar, he spent one year in the Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr, Germany, just in time to be present at the blooming of metathesis methodology in the laboratories of Professor Alois Fürstner. In 2008 he was promoted to Full Professor. Since 2008, he leads a research froup at the Biological and Chemical Research Centre of the Faculty of Chemistry, University of Warsaw. His synthetic research focuses on improving synthetic efficiency of organic reactions, green chemistry and catalysis. His work with ruthenium involves the development of new catalysts and conditions for olefin metathesis. He cooperated with a number of companies, inc. Boehringer-Ingelheim Inc., Nalco Inc., Evonik AG, Umicore AG, Polpharma SA, Apeiron Synthesis SA.

Ruthenium catalyzed formation of tetrasubstituted or crowded C–C double bonds—a chemical story in three acts

Ruthenium-catalyzed olefin metathesis reactions represent an attractive and powerful transformation for the formation of new carbon-carbon double bonds (1). This area is now quite familiar to most chemists as numerous air and moisture stable ruthenium (2) catalysts are available that enable a plethora of olefin metathesis reactions. However, formation of substituted and crowded double bonds still remains a challenge, making applications of this methodology difficult (3). This limitation can be solved by designing new, more active and stable catalysts. During the lecture three different very approaches to this problem will be presented (4-6).



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Scott J. Miller

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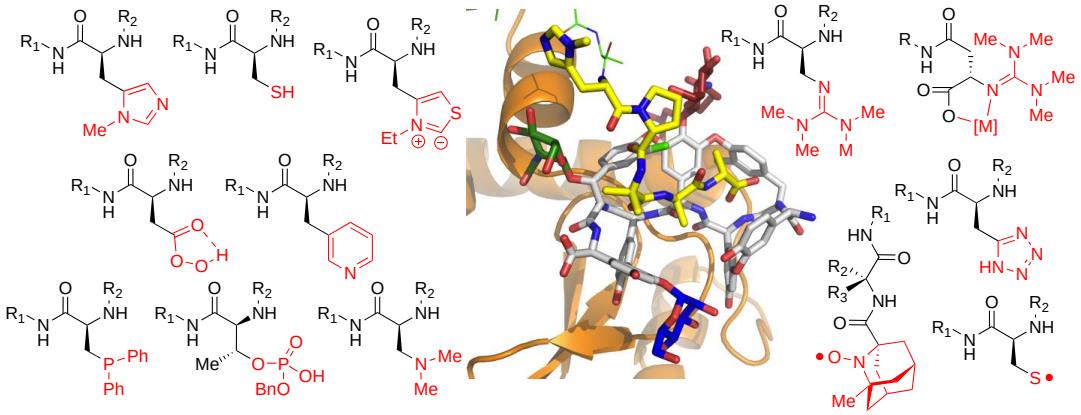
Scott J. Miller was born on December 11, 1966 in Buffalo, NY. He received his B.A. (1989), M.A. (1989) and Ph.D. (1994) from Harvard University, where he worked with David Evans as a National Science Foundation Predoctoral Fellow. Subsequently, he traveled to the California Institute of Technology where he was a National Science Foundation Postdoctoral Fellow with Robert Grubbs until 1996. For the following decade, he was a member of the faculty at Boston College, until joining the faculty at Yale University in 2006. In 2008, he was appointed as the Irénée du Pont Professor of Chemistry. Professor Miller's research program focuses on asymmetric catalysis. Several current interests are: (a) the selective functionalization of complex molecules, (b) catalytic reactions in conformationally complex and stereodynamic systems, (c) the exploration of analogies between synthetic catalysts and enzymes.

Searching for Selective Catalytic Reactions in Complex Molecular Environments

This lecture will describe recent developments resulting from our efforts to develop catalysts for asymmetric reactions, in particular for the preparation of densely functionalized, stereochemically complex structures. Over time, our foci have been on enantioselectivity, site-selectivity and chemoselectivity. In much of our current work, we are studying issues of enantioselectivity as a prelude to the extrapolation of catalysis concepts to more complex molecular settings where multiple issues are presented in a singular substrate. Complex natural products, for example, will be presented as quintessentially complex scaffolds for catalytic modification. Mechanistic paradigms, and their associated ambiguities – especially in light of catalyst or substrate conformational dynamics – will figure strongly in the lecture. Moreover, our focus on peptide-based catalysts has facilitated analogies to enzymes. Finally, several interesting collaborations – often unanticipated by us –will be discussed.



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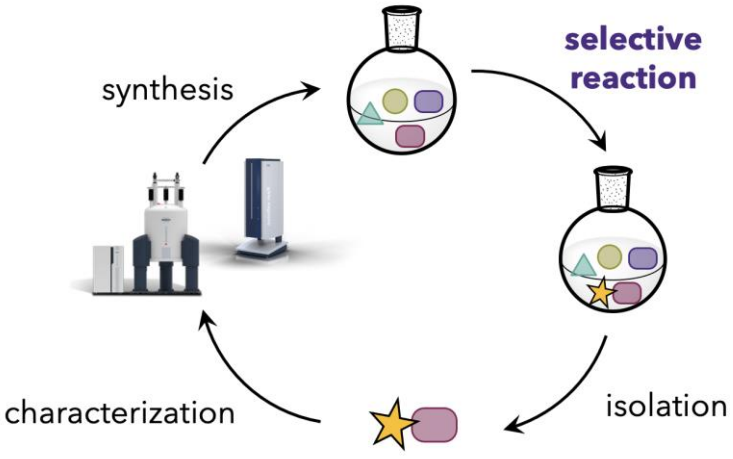
Julia's research goal is the development of strategies to control the synthesis and properties of polymeric materials with light. Her group's work has been recognized with the DOE Early Career Award, the Air Force Office of Scientific Research Young Investigator Program award, the Sloan Research Fellowship, and the ACS Award in Pure Chemistry. She obtained her BA at Columbia University in 2008, where she studied chemistry and creative writing, then pursued graduate studies at Princeton University under the supervision of Prof. Abigail Doyle. After completing her PhD in 2013, she was a postdoctoral fellow at MIT with Prof. Timothy Swager. She started her independent career at Northwestern's Department of Chemistry in 2016 and was appointed the Dow Chemical Company Associate Professor of Chemistry in 2023.

Light as a selection pressure for materials discovery

The evolving demands of the modern world call for new materials with advanced performance and minimal environmental footprint. As the structural complexity of these materials increases, the traditional iterative approach to synthesis, testing, and optimization becomes prohibitively time consuming and labor intensive. Here, I will present an abiotic approach to the discovery of new organic materials inspired by directed evolution. The key advance that makes this approach possible is the discovery of reaction mechanisms that link a stimulus (light) to the target (photophysical) properties. Based on this principle, we have discovered a photopolymerization to synthesize of π-conjugated polymers, as well as selective reactions for the functionalization of triplet sensitizers.



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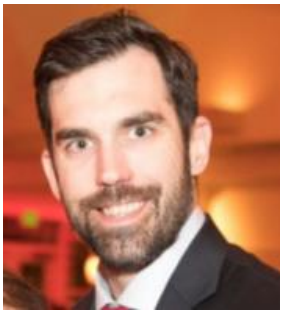
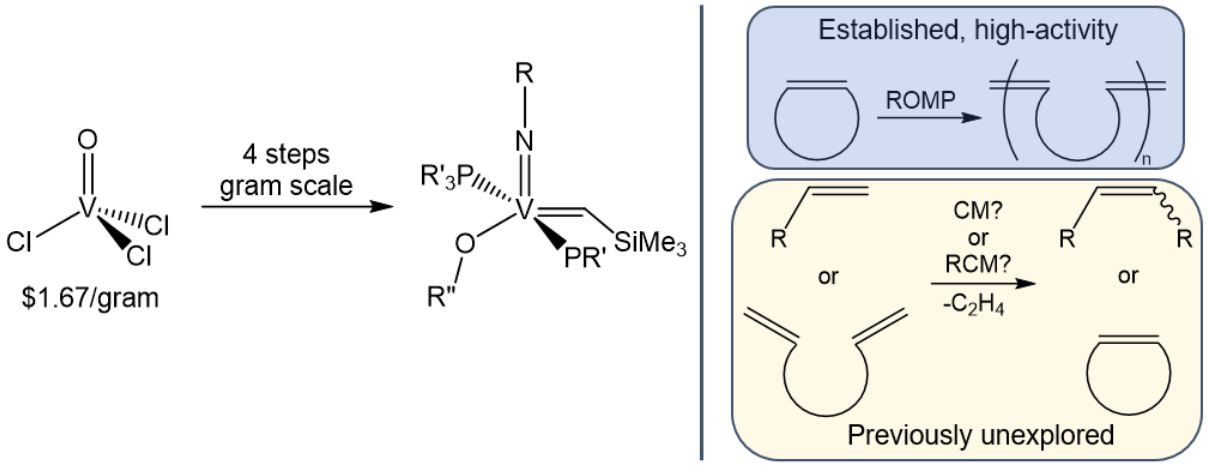


Wes was born and raised in Cape May, New Jersey. He attended Wake Forest University in Winston-Salem, North Carolina, where he received an Honors BS in Chemistry with a minor in Spanish. He attended the University of Maryland for graduate school, working under the direction of Prof. Larry Sita in the field of small-molecule activation, and then went on to postdoc at the National Institute of Standards and Technology in the Polymers and Complex Fluids group under the guidance of Dr. Kate Beers, where he developed methods for precision polyolefin synthesis. In 2018, Wes joined the faculty at the United States Naval Academy, where he holds the rank of Assistant Professor and conducts research with midshipmen on catalysis with Earth-abundant metals as well as the synthesis of binders for energetic materials.

Olefin Metathesis Using Earth-Abundant Vanadium

Olefin metathesis has proven critical in the synthesis of small- and macromolecules alike for decades. These reactions are typically mediated by ruthenium, molybdenum, and tungsten catalysts, with many new variations being reported regularly. The move beyond these select metals and the addition of catalysts based on less expensive, more Earth-abundant elements has proved challenging, however. Vanadium has been reported as a highly efficient initiator for ring-opening metathesis polymerization, but extension to other olefin metathesis reactions has been lacking. We report here the use of vanadium alkylidenes, which may be synthesized in gram quantities from inexpensive vanadium(V) oxychloride, to catalyze cross-metathesis reactions and key mechanistic insights into limitations that presently hinder high turn-over numbers.



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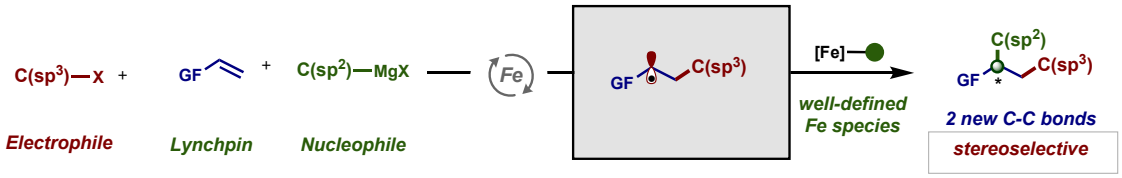
Osvaldo was born in Mexico and raised in Sacramento, California. He attended Sacramento City College from 2001 to 2006 then transferred to UCLA in 2006 where he worked as an undergraduate at the laboratories of Prof. Houk where his research focused on the use of quantum mechanical calculations to study organocatalysis. He obtained his B.S./M.S. in 2009 and completed his Ph.D. in 2012 (UC Davis) under the guidance of Prof. Tantillo. From 2012-2016 he worked as a postdoc with Prof. Kozlowski at the University of Pennsylvania where he used computational and experimental tools to study transition metal-catalyzed processes. In 2016 he started his independent position at the University of Maryland College Park as an Assistant Professor, and then promoted to Associate Professor in Summer 2021. In the Fall 2021, he moved to Texas A&M University where his research combined computational and experimental approaches to advance our understanding of iron- and nickel-catalyzed radical cross-couplings. In addition to research interests, Osvaldo is involved in a series of initiatives to increase diversity in STEM including serving as president of the Alliance for Diversity in Science and Engineering (ADSE) and organizer of the annual Young Researchers Conference (YRC) and Breaking Barriers Through Chemistry (BBTC).

Decoupled Fe-Catalyzed Radical Cross-Coupling Reactions

Despite advances in high-throughput screening methods leading to a surge in the discovery of catalytic reactions, our knowledge of the molecular-level interactions in the rate- and selectivity-determining steps of catalytic reactions, especially those involving highly unstable and reactive open-shell intermediates, is rudimentary. These knowledge gaps prevent control, suppression, or enhancement, of competing reaction channels that can drive development of unprecedented catalytic reactions. In this talk, I will focus on our use of high-level quantum mechanical calculations, rigorously calibrated against experimental data, to interrogate the mechanisms and to guide the development of new catalysts and reagents for currently sluggish or unselective reactions. In particular, I will focus on our use of combined experimental and computational tools to understand and develop new stereoselective iron-catalyzed decoupled radical cross-coupling reactions.



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Lara R. Malins

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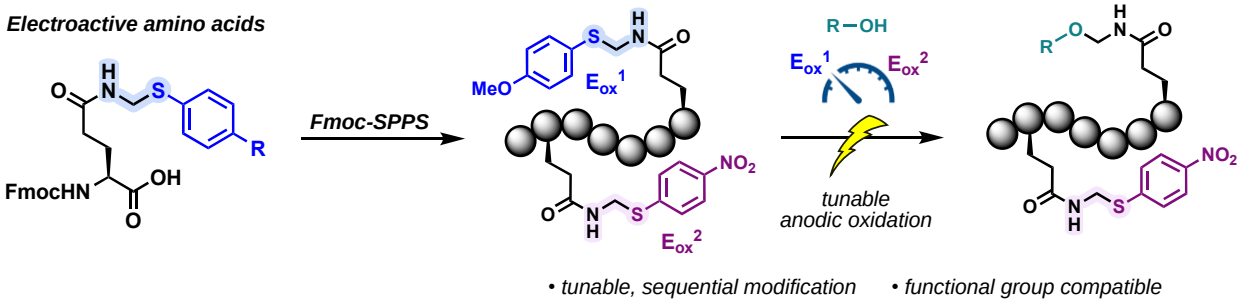
Lara was born in South Carolina and grew up in Pearl City, Hawaii. She completed her B. A. in chemistry at Boston University before relocating to the University of Sydney, Australia, to undertake her PhD with Prof. Richard Payne on the development of new methods for peptide ligation. In 2015, Lara joined the laboratory of Prof. Phil Baran at the Scripps Research Institute in La Jolla, supported by a National Institutes of Health postdoctoral fellowship. Her work focused on late-stage peptide modification chemistry, including macrocyclization and decarboxylative cross-coupling strategies. In late 2017, Lara began her independent career at the Australian National University where she is currently an Associate Professor. Lara's group works at the interface of organic synthesis and chemical biology, developing new methods for drug discovery, natural product synthesis, and late-stage peptide functionalization.

Electrochemically-Enabled Late-Stage Peptide Modifications

The use of electricity to drive chemical reactions is an appealing approach to sustainable synthesis.[1] Moreover, electrochemistry provides powerful opportunities for the precise control of chemical reactivity by enabling practitioners to "dial in" the potential or current at which a reaction is performed. Despite these appealing characteristics, there are remarkably few examples of tunable electrochemical peptide functionalizations.[2] This presentation will highlight our recent work on selective and iterative electrochemical peptide modification substrates.[3] Designer amino acid residues adorned with discrete "electroauxiliaries"—functional groups electronically-predisposed to anodic oxidation—are incorporated into peptides and exploited for iterative modifications to afford a library of high-value peptide *N,O*-acetals. The method is demonstrated on unprotected peptides and bioactive substrates and is applied in a novel approach to peptide macrocyclization. Electrochemical activation serves to unlock a new level of orthogonality in peptide synthesis, and the strategy has promising applications for the preparation of therapeutic peptide libraries.



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Roberto Gomes

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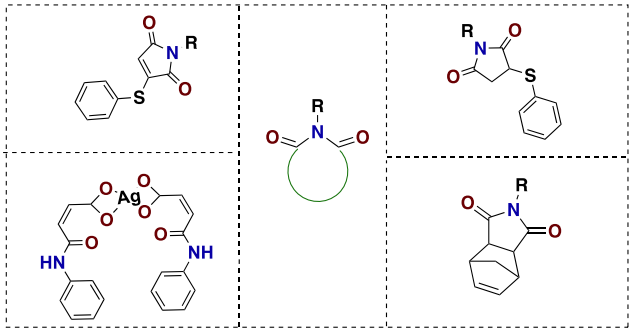
Roberto was born and raised in Brazil. He obtained his B.S. degree in Chemistry from the University Ibirapuera in 2004. He received his Ph.D. in the group of Prof. Paulo Olivato from the University of São Paulo, Brazil in 2011. Then, he was awarded CAPES Fellowship in Chemical Biology and Medicinal Chemistry at the Federal University of Mato Grosso do Sul (UFMS/Brazil) in 2012. He worked as an Associate Professor at the Institute of Chemistry at the Federal University of Grande Dourados (UFGD), Brazil (2014-2017) working on the synthesis of cyclic imides for biomedical application. In 2017 he joined the Nobel Prize awarded E. J. Corey's research group at Harvard University working on the asymmetric synthesis of a new set of rapid onset antidepressants. He also was an Adjunct Professor at the University of Massachusetts at Lowell (2019-2020) before he started his new position as an Assistant Professor of Pharmaceutical Sciences at the Department of Pharmaceutical Sciences at North Dakota State University.

Functionalization of Cyclic Imides for Biomedical Application

Nitrogen-based heterocyclic chemistry is a prominent and important class in organic chemistry and biomedical research, with significant research devoted to producing new compounds. 72% of the 200 best-selling drugs in 2022 contain at least one nitrogen-based heterocyclic group. Moreover, revenue of US$ 18.7 billion was generated in 2022 in the U.S. from medications containing cyclic imides, ranking Revlimid® (a 6-member cyclic imide medication used to treat multiple myeloma) as one of the top-5 best-selling drugs, reaching US$ 10,06 billion in profit in 2022. Despite their unique reactivity and structural features that render them attractive in medicinal chemistry, their limitations, encompassing stability issues, toxicity concerns, synthetic challenges, lack of selectivity, and biological instability, limit a more extensive application as pharmaceutical agents. To overcome this limitation, we have developed synthetic methodologies for new C-C, C-N, and C-S bond-forming techniques and strategies that diverge significantly from the state-of-the-art procedures used today.



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Baihua Ye

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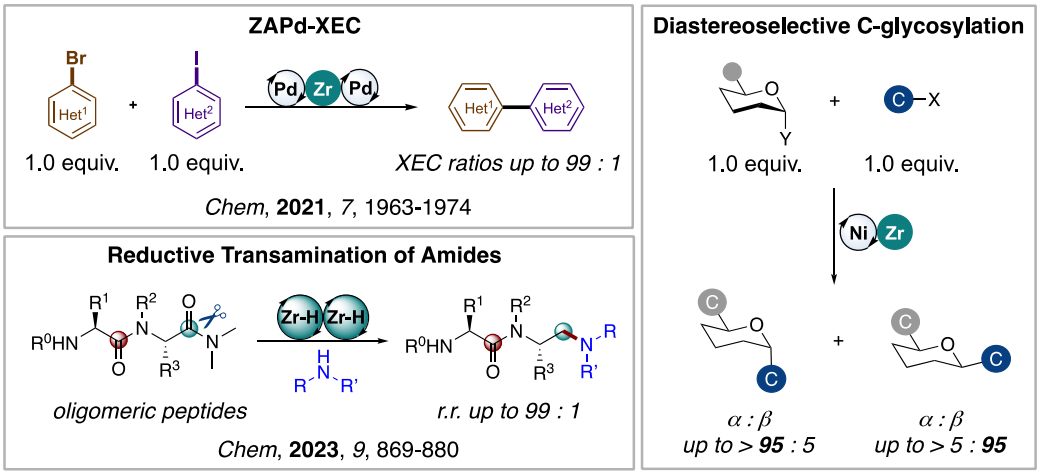
Baihua Ye obtained his bachelor's and master's degrees at Ecole Polytechnique Federale de Lausanne (EPFL) in Switzerland. His Ph.D. research, supervised by Prof. Nicolai Cramer at EPFL, focused on creating chiral Cp ligands for asymmetric Rh-catalyzed C-H functionalizations. He further advanced his career as a postdoctoral researcher under Prof. F. Dean Toste at UC Berkeley in the United States, where he specialized in photo-driven chiral anion phase transfer catalysis. In 2019, Ye commenced his independent career as an assistant professor of organic chemistry at ShanghaiTech University.

Tactics of Precision Synthesis with Harnessing Zirconocene

The exploration of sustainable and user-friendly zirconocene holds significant promise within the realm of organic synthesis. This presentation encapsulates our recent pivotal studies, concentrating on the precise assembly and subsequent modifications of biologically relevant oligomeric peptides, heterocycles and carbohydrates (Fig. 1). In our first endeavor, we successfully identified zirconaaziridine-mediated Pd-catalyzed cross-electrophile couplings (ZAPd-XEC), as a groundbreaking method for constructing unsymmetrical biaryl and heteroaromatic scaffolds *(1)*. Alternatively, zirconaaziridine can also act as a potent reductant enabling diastereoselective Ni-catalyzed C(sp^2)-glycosylation induced by the ligand's chirality *(2)*. Finally, a dual Zr-H catalysis will be introduced in which a platform for regioselective reductive transaminations of oligomeric peptides has been developed *(3)*. Overall, the remarkable achieved precision in controlling regio-, chemo-, diastereo-selectivities through the scope of our research underscores the immense potential of zirconocene in the synthesis of intricate and sophisticated molecules.



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(3) J.-T. Tang§, Y. Gan§, X. Li§, **B. Ye*** Chem, **2023**, *9*, 869-880. (§contributed equally)

Christian Malapit

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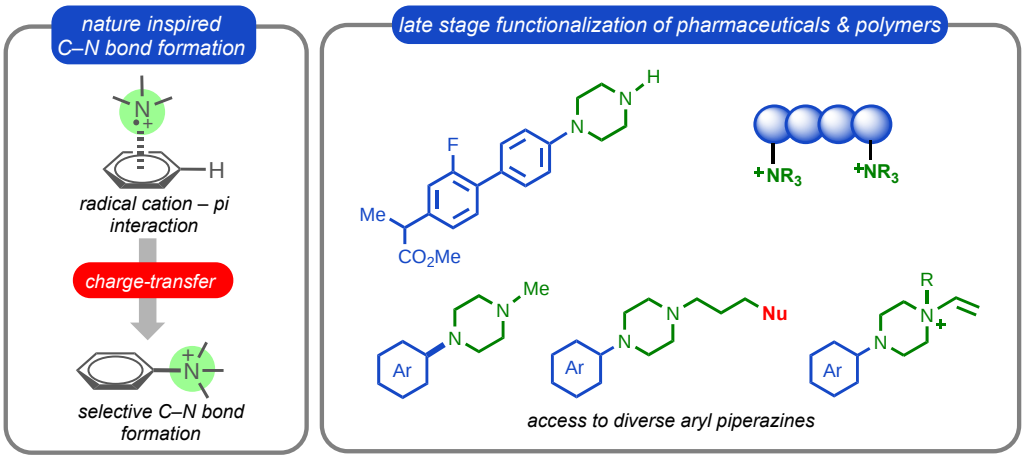
Christian was born and raised in the Philippines, where he obtained his BS and MS in Chemistry degrees. In 2016, Christian received his PhD in organic chemistry at the University of Connecticut with Prof. Amy Howell. His PhD work was recognized with a Connecticut Chemistry Research Award, the ACS Division of Organic Chemistry, and a Boehringer Ingelheim fellowship. Christian moved to the University of Michigan to conduct mechanistic organometallic chemistry for reaction discovery with Prof. Melanie Sanford. Recently, Christian received the NIH Pathway to Independence Investigator Award. In 2022, Christian started his tenure-track appointment as an assistant professor of chemistry at Northwestern University where his group works on electro-organic synthesis, organometallic catalysis, and organic-based redox-flow batteries.

Electrosynthesis for selective new reactions

Electrosynthesis has emerged as a versatile and powerful tool within organic chemistry, enabling the exploration and development of new organic reactions. In this presentation, I will showcase notable discoveries from the Malapit Lab, highlighting the innovative application of electrochemistry in the exploration of novel and transformative reactions. Among these groundbreaking findings are a site-selective C–H functionalization reaction and the utilization of organoboron reagents to generate diverse carbon-heteroatom products through radical intermediates. These reactions hold promise for the late-stage functionalization of numerous biologically active compounds, presenting exciting opportunities for drug development and synthesis.



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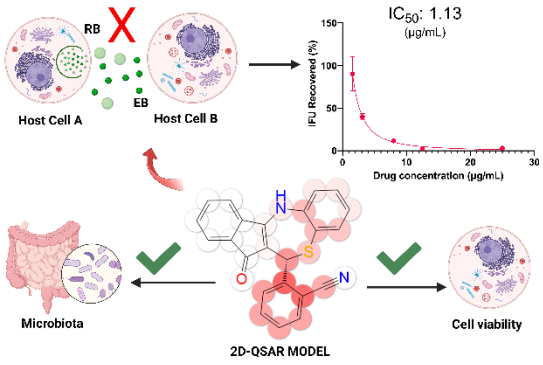
Martin Conda-Sheridan was born in Buenos Aires, Argentina. He received his Bachelor of Science in Chemistry from Brigham Young University (Utah, USA) and a Masters in Organometallic Chemistry from the University of Utah (USA). Then, he moved to West Lafayette, Indiana to pursue a Ph.D. in Medicinal Chemistry and Molecular Pharmacology under the direction of Mark Cushman (Purdue University). Upon graduation, he moved to Chicago to complete his Postdoctoral training in Materials Sciences at Northwestern University in the group of Sam Stupp. In 2015, he started his independent career in the Department of Pharmaceutical Sciences in the College of Pharmacy at the University of Nebraska Medical Center. His research group works at the interface of medicinal chemistry and material sciences. His main interests are the development of stimuli-responsive biomaterials and the synthesis of small molecules and nanostructures to treat bacterial infections and cancer.

Killing bacteria by modulating cylindrical proteases

Bacterial infections are slowly becoming a worldwide health crisis. In fact, the Infectious Diseases Society of America has listed bacterial infections as "1 of the 3 greatest threats to human health. Our research group seeks to develop new treatments against pathogenic infections by developing small heterocycles and nanoparticles. In this lecture, I will present our efforts to develop dysregulators of cylindrical proteases with the goal of eliminating Chlamydia Trachomatis (Ctr) infections. Ctr is the most prevalent sexually transmitted bacterial disease in the world. We will discuss the preparation of antichlamydial agents that can activate or inhibit the ClpXP system. I will discuss the *in vitro* activity and target identification of the molecules. I will describe their toxicity profile, selectivity and stability. In addition, I will describe how machine learning can be used to improve the activity of lead compounds.



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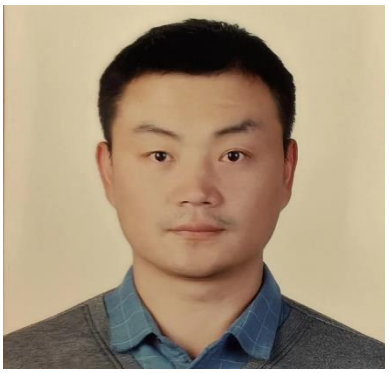
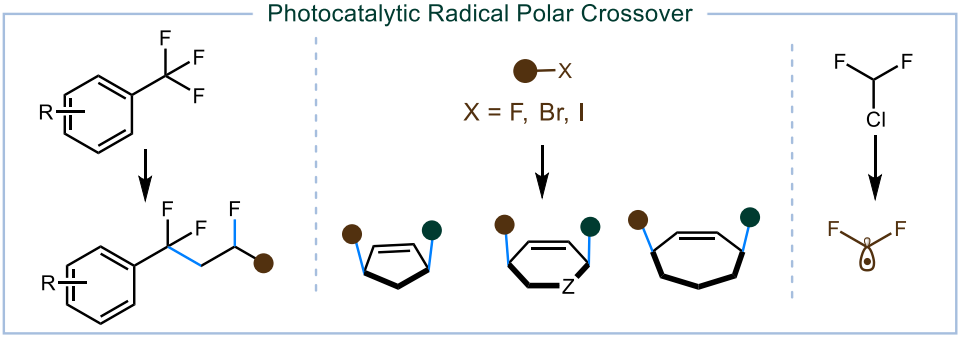


Zuxiao was born and raised in China, received a *Master of Science in Organic Chemistry* from SIOC under the supervision of Professor Guosheng Liu. In 2016, he obtained his *Ph.D.* at University of Florida under the supervision of Professor William R. Dolbier Jr. He then joined the Nagib group at the Ohio State University as a postdoctoral researcher. In 2021, he started his independent career at the Zhejiang Normal University. In September 2023 he moved to the Chemistry Department at University of Hawai'i at Mānoa. His research focuses on three directions, fluorine chemistry, radical chemistry, and asymmetric catalysis. The long-term goal is to develop novel catalytic system by harness both radical and polar reactivity to realize selective functionalization of inert chemical bonds initiated multicomponent reactions, thus to provide an efficient way to access biorelevant molecules, as well as a robust tool for late-stage functionalization of complex drug molecules.

Selective Halogen Functionalization in Multicomponent Reactions via Photocatalytic Radical Polar Crossover

Multicomponent reactions (MCRs) are indispensable tools in contemporary organic synthesis, facilitating the efficient assembly of intricate molecular architectures from diverse substrates. This work focuses on the integration of selective C-F and C-Cl bond functionalizations within MCRs, providing a flexible strategy for the precise modification of halogen-containing substrates. Notably, a photocatalytic formal selective C-F bond insertion into alkenes has been developed, demonstrating its efficacy in the late-stage functionalization of complex drug molecules. Additionally, employing hybrid palladium catalysis has enabled a general and modular 1,4-syn-addition of cyclic conjugated dienes with exceptional diastereoselectivity. This methodology offers a convenient and efficient approach to construct 1,4-cis-disubstituted cyclic frameworks, facilitating the assembly of bioactive molecules from readily available starting materials. Furthermore, the hybrid palladium catalysis has been extended to selective C-Cl bond cleavage, allowing for regioselective difluoromethylamination of 1,3-dienes using Freon-22, as well as controllable dechloronation of gem-dichloroalkanes.



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Christopher Newton

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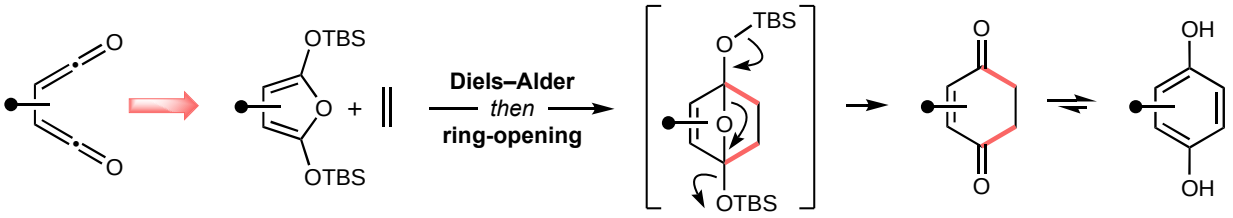
Chris was born and raised in New Zealand, obtaining a BSc (Hons) from Victoria University of Wellington. He conducted his PhD at the Australian National University under the supervision of Professor Michael Sherburn, focusing on the application of cross-conjugated hydrocarbons in total synthesis. Following graduation, Chris conducted postdoctoral studies in the group of Professor Nicolai Cramer (EPFL, Switzerland), working in the areas of enantioselective CH functionalization and biomimetic natural product synthesis. Chris returned to Australia as a DECRA Fellow at the University of Adelaide, before moving to UGA in early 2021 to start as an Assistant Professor.

Design and Application of New Pericyclic Strategies

The overarching theme of our research program concerns the development of new and general pericyclic strategies that enable efficient access to complex (poly)cyclic frameworks of biological importance. A hallmark of our approach is the design of atypical cycloaddition reaction partners that are at a high oxidation level (i.e., large degree of heteroatom incorporation and/or unsaturation) in order to confer unique reactivity, while also minimizing the need for redox manipulations post cycloaddition. Generally speaking, our approaches leverage fundamental structure and reactivity studies to inform the optimization of our proposed reaction partners in order to gain kinetic stability without sacrificing desired reactivity. Once we have developed a new methodology, our focus pivots toward applications in target-oriented synthesis. Various thematically linked projects within this context will be discussed, including our recently disclosed work concerning the development of bisketene equivalents as Diels–Alder dienes.



• detailed study of furan reactivity and stability • broad furan scope • broad dienophile scope (alkenes, alkynes, arynes)
• application in natural product synthesis • diene-transmissive reactivity for double Diels–Alder routes to polycyclic systems
• extension to pyrroles for the synthesis of *para*-iminoquinones

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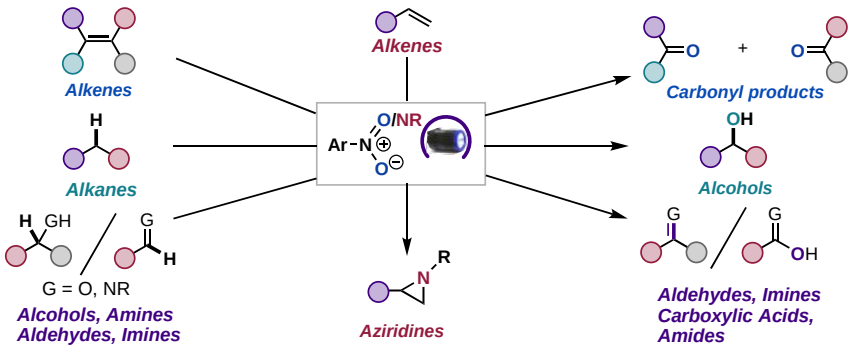
Marvin Parasram was born and raised in The Bronx, New York. He received his B.S. in Chemistry in 2010 from Stony Brook University. Later that year, he joined Prof. Vladimir Gevorgyan's group at the University of Illinois at Chicago for his Ph.D. studies, where he was involved in developing novel Pd-catalyzed synthetic methodologies. In 2017, he joined Prof. Abigail G. Doyle's Group at Princeton University as a National Institutes of Health Ruth L. Kirschstein NRSA Postdoctoral Scholar, where he worked on the development of Ni/Photoredox catalyzed methods. In the Fall of 2020, he began his independent career as an Assistant Professor of Chemistry at New York University.

Anaerobic Heteroatom Transfer Reactions Promoted by Photoexcited 1,3-Dipoles

Heteroatom units, such as carbonyls, C(sp^3)–OH and C(sp^3)–NH_2 bonds, are prevalent motifs in many medicinally important compounds. Methods to incorporate these important functional groups at the expense of hydrocarbons rely on the use of non-commercial heteroatom transfer agents, precious transition metals, and/or costly engineered enzymes. Also, these methods often require exogenous oxidants to promote the C–heteroatom bonding event, which greatly limits substrate scope. Our laboratory focuses on the employment of economical 1,3-dipoles as versatile reagents that can serve as the hydrocarbon activator and the heteroatom atom source for the heteroatom incorporation of aliphatic systems under benign visible-light irradiation. Our contributions involve the cleavage of alkenes leading to valuable carbonyl derivatives and the direct C–H oxidation of hydrocarbons via anaerobic oxygen-atom transfer from photoexcited nitroarenes. Using photoexcited azoxys, an anaerobic nitrogen atom transfer event can occur leading to the aziridination of alkenes. Mechanistic studies reveal that the 1,3-dipoles are the sole photo-absorbing species, which leads to the formation of diradical intermediates that are responsible for heteroatom transfer events.



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Yee Hwee LIM obtained her joint PhD/DPhil from The Scripps Research Institute, USA and University of Oxford, UK where she was trained in natural product total synthesis (Prof. KC Nicolaou) and fluorination radiochemistry (Prof V Gouverneur) respectively. After graduation, she joined A*STAR Institute of Chemical and Engineering Sciences (ICES) as a scientist. She rose through the ranks and in 2022, she was appointed the director of Chemical Biotechnology and Biocatalysis division at the Institute of Sustainability for Chemicals, Energy and Environment ($ISCE^2$), A*STAR. She is also an adjunct Associate Professor at the Synthetic Biology Translational Research Program, Yong Loo Lin School of Medicine (NUS) (2021-). She is passionate about advancing chemistry frontiers and harnessing Nature's catalytic powers to solve molecular challenges. Her team focuses on developing integrative technologies at the interface between chemistry, biology, informatics and engineering for sustainable chemical manufacturing.

Harnessing the gems from Nature & its application in fine chemicals biomanufacturing

Enzymes are power catalysts evolved by Nature to carry out specific transformation under benign conditions. Unlike chemical halogenation which typically requires harsh reagents and often leads to undesired polyhalogenated products, Nature incorporates halogens chemoselectively via a metal halide salts and halogenating enzymes under generally benign conditions. Similarly, in the field of alcohol oxidation, galactose oxidase (GOase) is one of the most established enzymes capable of this important chemical transformation under benign conditions. However, one of the key limitations of Nature's catalysts is their limited diversity (especially in the case of fluorinase) and substrate specificity. For example, the applicability of GOase towards more complex molecules such as those frequently found in the pharmaceutical, or agrochemical industries remains restricted. In this talk, efforts to expand on the scope and specificity of halogenases and GOases, and their applications in the manufacturing of complex molecules will be discussed.

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Igor Alabugin grew up in Siberia and earned his MSc and PhD degrees in chemistry from Lomonosov Moscow State University. After a postdoctoral study at UW-Madison, he joined faculty of the Florida State University (FSU) in 2000 where he is currently the Distinguished Research Professor. His professional efforts are focused on the discovery of new ways to control chemical structure and reactivity. His interests span development of new chemical transformations, design of light- and pH-activated anticancer drugs, construction of carbon-rich nanostructures, and establishing the roles of electron and hole upconversion in catalysis. Underlying much of this chemistry are contributions to a deeper understanding of stereoelectronic effects.

Accumulating energy to drive chemical reactions: from stereoelectronic frustration to electron upconversion

Molecules store energy and, as bonds are formed and broken, every chemical process can either store or release energy. This talk will discuss practical ways for incorporating this common knowledge into reaction design and in searching for new physical phenomena.

After introducing familiar textbook functionalities that accumulate more energy than an excited state [1,2], I will show how one can make formation of any reactive intermediate thermodynamically feasible [3,4] and how to control the flow of energy in chemical reactions by coupling unfavorable and favorable elementary steps.

In the final part, I will introduce the phenomenon of electron upconversion, a counterintuitive way to transform weak reductants into strong reductants in a thermodynamically favorable fashion [5]. Such processes enable electrocatalytic transformations where a single electron or hole can drive multiple catalytic cycles [6].

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László Kürti

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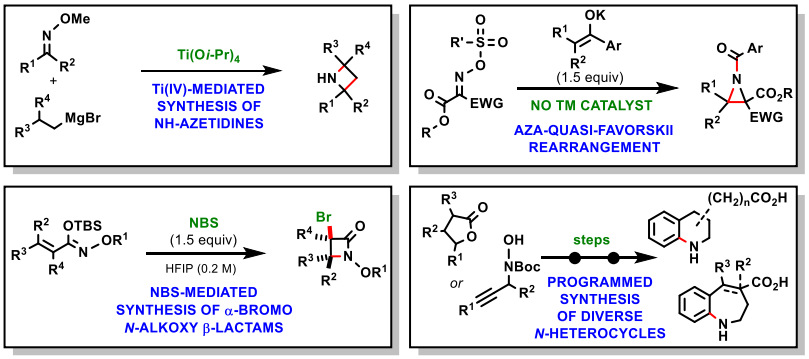
László was born and raised in Hungary. He received his Diploma from Lajos Kossuth University (now University of Debrecen) where he conducted research in the laboratory of Professor Sándor Antus. Subsequently he received his M.Sc. at the University of Missouri-Columbia, working with Professor Michael Harmata, and his Ph.D. degree (2006) in synthetic organic chemistry under the supervision of Professor Amos B. Smith III at the University of Pennsylvania. Between 2006-2010 László was a Postdoctoral Fellow in the group of Professor E.J. Corey at Harvard University. On September 1, 2010 László began his independent career as an Assistant Professor in the Department of Biochemistry at UT Southwestern Medical Center, Dallas, Texas, but on June 1, 2015 he joined the faculty at Rice University (Houston, Texas) as an Associate Professor in the Department of Chemistry. The Kürti group focuses on the development of powerful new methods for the expedient enantioselective assembly of highly functionalized biaryls, heterocycles and carbocycles.

Aminating Agents, C-H Amination & Nitrogen Heterocycles: New Directions

N-heterocycles are present in more than 80% of active pharmaceutical ingredients (APIs) and agrochemicals.[1] In addition, many naturally occurring *N*-containing compounds show significant pharmacological and physiological properties. Despite their apparent abundance and importance, general and efficient synthetic approaches remain challenging. Therefore, there is a continuous need for the development of novel syntheses of *N*-containing compounds. In this talk, I will cover some of the most recent directions my group has taken towards the synthesis of *N*-heterocycles: [1] Titanium-mediated synthesis of spirocyclic NH-azetidines[2]; [2] Unconventional approach to highly substituted aziridines: Aza-Quasi Favorskii reaction[3]; [3] Synthesis of *N*-activated α-bromo β-lactams from *N*-alkoxy silyl imino ethers and [4] Programmed synthesis of structurally diverse *N*-heterocycles: An intramolecular catalytic C-H amination approach.



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Marcos G. Suero

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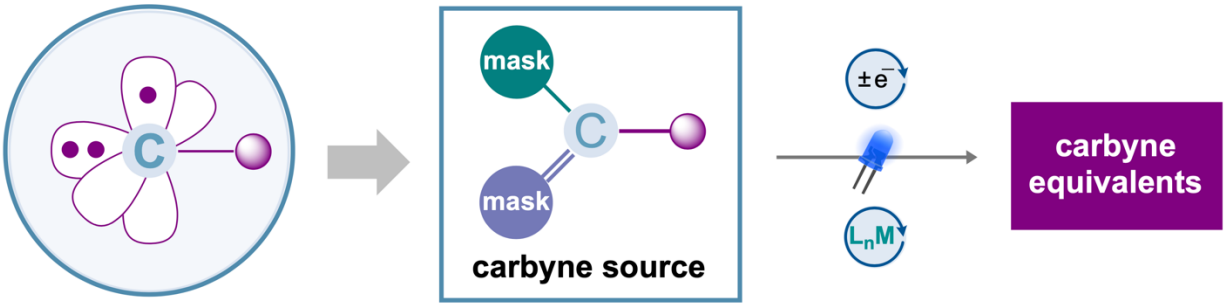
Marcos García Suero was born in Noreña (Asturias) in 1981. He was graduated in Chemistry from the Universidad de Oviedo in 2003 and introduced to organometallic chemistry in the laboratory of Prof. José Gimeno and Prof. Pilar Gamasa. In February 2009 he obtained his PhD degree in the Institute of Organometallic Chemistry Enrique Moles of the Universidad de Oviedo, where he worked under the direction of Prof. José Barluenga and Prof. Josefa Flórez on Fischer carbene chemistry. During the summer of 2005 he joined the laboratory of Prof. Andrew Myers at Harvard University working on the synthesis of novel tetracycline antibiotics as a PhD visiting student. In May 2010 he moved to the University of Cambridge to work with Professor Matthew Gaunt on copper(III) catalysis and methionine bioconjugation as a Postdoctoral Marie Curie Fellow and in October 2014 he started his independent research career at the Institute of Chemical Research of Catalonia (ICIQ) within the CELLEX-ICIQ starting career programme. In December 2023, he was apointed ICREA Research Professor.

New Carbyne Transfer in Organic Synthesis

The art of organic synthesis and reaction discovery relies on logic-guided thought processes that often involve hypovalent carbon reactive species and their corresponding stabilized equivalent forms. However, not all of the possible carbon reactive intermediates and their reactivity rules have attracted the same attention by the synthetic community. This is mainly because of the perception of the lack of synthetic utility and importantly, because of the challenges associated with controlling its extreme reactivity and lack of efficient sources.
In this lecture, I will show how the catalytic generation of conceptually-novel carbyne equivalents, enabled the discovery of new carbon reactivity towards C–H and C–C bonds. The metal or photocatalytic activation of tailored sources revealed new reactivity rules at carbon that have been under-appreciated, not only in the design and discovery of new chemical reactions, but also in their use to build molecular complexity through unexplored disconnection approaches and late-stage functionalization of medically relevant agents.



Franziska Schoenebeck

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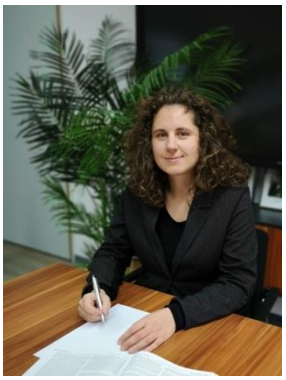
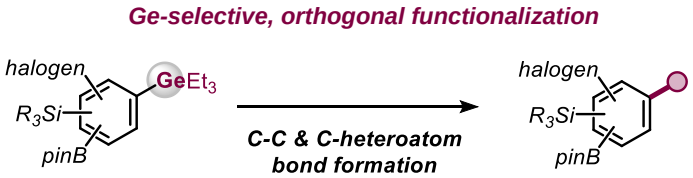


Franziska Schoenebeck has been a Full Professor and Chair at the Institute of Organic Chemistry at RWTH Aachen University since the summer of 2016. Professor Schoenebeck was born and raised in Berlin, Germany. From 2001-2004, she studied Chemistry at the TU Berlin and the University of Strathclyde in Glasgow, UK. She undertook her PhD in synthetic organic chemistry in Glasgow, UK. In 2008, she moved to California (UCLA) for a postdoc in computational chemistry. In 2010, she joined the faculty of the ETH Zürich to start her independent research program. Three years later, she was appointed Associate Professor at the Institute of Organic Chemistry at RWTH Aachen University and promoted to Full Professor in 2016. Her research has been recognized with several awards and lectureships, including the 2022 Tetrahedron Young Investigator Award, the 2020 Klung-Wilhelmy-Wissenschafts-Preis. She serves the chemical community in various roles, including as Associate Editor of JACS.

Recent Developments with Organogermanes



While organogermanes have historically been the least reactive functionality under Pd^0/Pd^{II} catalyzed cross coupling as compared to boronic acids/esters, silanes or alternative established coupling partners, recent developments in our laboratory unlocked these notoriously robust building blocks via alternative activation modes, making the organogermanes into the most reactive site of the molecule – capable of outcompeting other functional groups (such as boronic acids, esters and silanes) for both C–C and C–heteroatom bond formation. This presentation will highlight the recent advances in the field of organogermane chemistry both with respect to their synthesis and applications in synthetic and catalytic transformations.

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Petr Vachal

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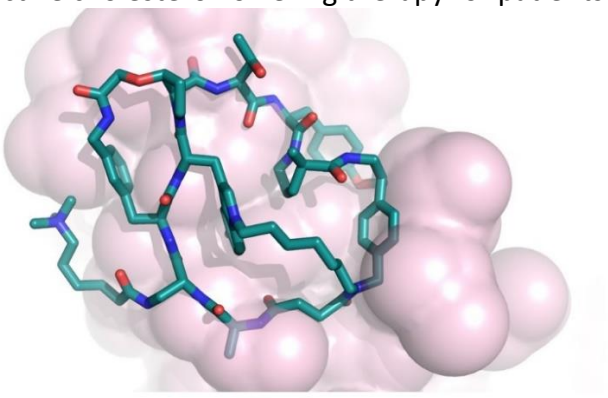
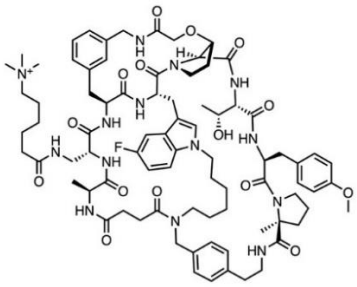
Petr Vachal is an accomplished drug hunter and executive manager with a track record of success for building diverse, high performing teams, providing strategic scientific leadership across therapeutically important areas, modalities and drug discovery-enabling technologies spanning from target & lead identification to clinical candidate qualification and clinical development. Under Petr's leadership, Merck drug discovery has seen dramatically increased efficiency and probability of success as the best response to the increasing complexity of chemical and biological targets. Petr currently serves as Head of Rahway Discovery Chemistry, Global Head of External Discovery & Sample Management. While his impact is evident across Merck global pipeline, teams directly under Petr's leadership delivered over 30 clinical candidates; more than ten of these are currently progressing through Ph1-3. Petr's track record includes the following assets reaching Ph3/pre-filing status with the FDA: taranabant (CB1 small molecule inverse agonist, obesity), anacetrapib (CETP small molecule inhibitor, dyslipidemia), enlicitide (PCSK9 peptide inhibitor, dyslipidemia).

Invention of MK-0616, an Orally Bioavailable Macrocyclic Peptide PCSK9 Inhibitor

Inhibition of PCSK9 (proprotein convertase subtilisin/kexin type 9) lowers plasma LDL (low density lipoprotein-cholesterol), which has been associated with improved cardiovascular outcomes. Macrocyclic peptides represent a novel approach to targeting large surface proteins, traditionally considered intractable by small-molecules, theoretically amenable to optimization for oral bioavailability. mRNA-display screening was used to identify lead chemical matter, which was then optimized by applying structure-based drug design enabled by invention of novel synthetic chemistries leading to the discovery of macrocyclic peptide MK-0616 with exquisite potency and selectivity for PCSK9. Phase 1 & 2 clinical trials demonstrated >93% reduction of unbound plasma PCSK9; in participants on statin therapy, multiple–oral-dose regimens provided a maximum 61% reduction of LDL from baseline after 14 days of once-daily oral dosing of 20 mg MK-0616. This work demonstrates a proof of concept for oral macrocyclic peptides in context of highly effective cholesterol lowering therapy for patients in need.





MK-0616
PCSK9 FRET Ki = 0.005 nM
21 mg QD; Phase 3

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L.-C. Campeau

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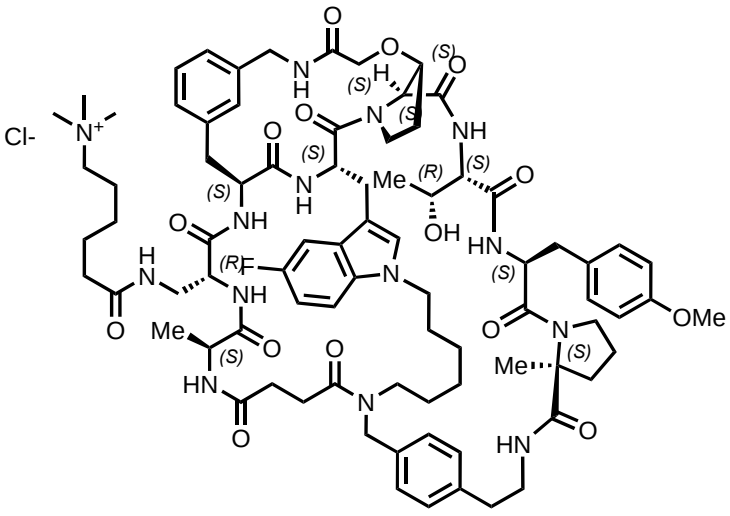
L.-C. Campeau obtained his Ph. D. degree in 2007 with the late Professor Keith Fagnou at the University of Ottawa in Canada. He first joined Merck Research Laboratories at Merck-Frosst in Montreal in 2007 making key contributions to the discovery of Doravirine (MK-1439) a next generation non-nucleoside reverse transcriptase inhibitor for the treatment of HIV. In 2010, he moved from Quebec to New Jersey, where he has served in roles of increasing responsibility. He co-led the early development team for Merck's oral PCSK9 inhibitor MK-0616, ushering this first macrocyclic peptide in Merck's history into phase 3 clinical trials. L.-C. is currently Associate Vice President and the Head of Small Molecule Process Research and Development. Over his tenure at Merck, L.-C. and his team have made important contributions to >40 clinical candidates and 7 commercial products to date. L.-C. was elected Fellow of the Royal Society of Canada in 2022.

Teaching and Old Dog New Tricks: Advances in Macrocyclic Peptide Synthesis

Orally bioavailable macrocyclic peptides have the potential to unlock a new paradigm in drug discovery, enabling monoclonal antibody-like potency and selectivity despite 1000X smaller molecular weight. Merck recently invented MK-0616 which has exquisite potency and selectivity for PCSK9 for the treatment of hypercholesteremia. To achieve this, extensive advances in synthetic methods and strategy were developed in order to enable discovery of a clinical candidate. Further process chemistry optimization was used to scale-up this lead-molecule, including novel biocatalytic methods to access key non-canonical amino acids. We believe this successful application of these synthetic chemistry advances pave the way for application to other important protein-protein interaction targets.



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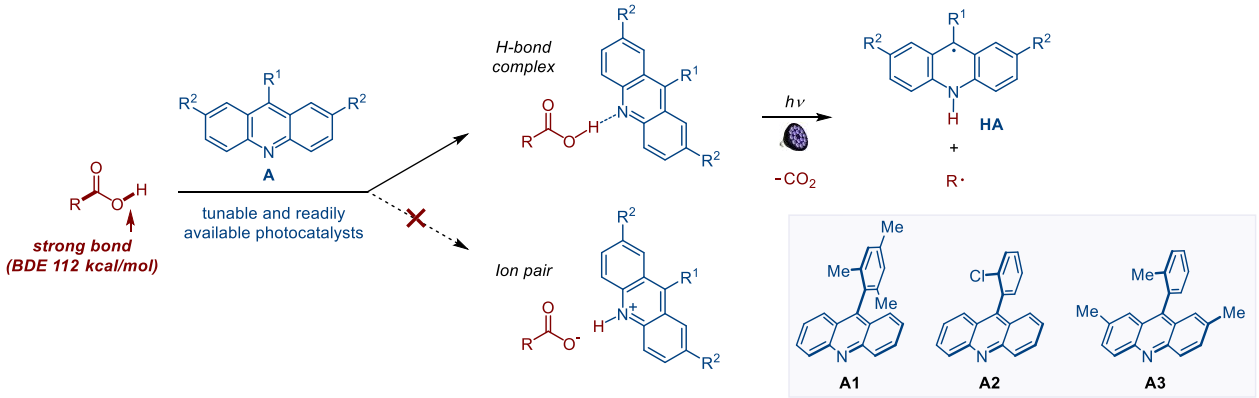
Oleg Larionov received his PhD degree from the University of Göttingen under the tutelage of Prof. Armin de Meijere. In 2010, after postdoctoral studies with Prof. Alois Fürstner at the Max-Planck-Institut für Kohlenforschung and Prof. E. J. Corey at Harvard University, he joined the faculty at the University of Texas at San Antonio, where he is now Professor and Robert A. Welch Distinguished University Chair in Chemistry. His research interests focus on the development of synthetic methods for the construction of carbon–carbon and carbon–heteroatom bonds, transition metal catalysis, organoboron chemistry, and organic photochemistry.

Acridine photocatalysis for efficient organic synthesis

Photocatalytic decarboxylative functionalizations present new avenues for the construction of carbon–carbon and carbon–heteroatom bonds from carboxylic acids that are readily available and abundant feedstocks. Acridine photocatalysis has emerged as a versatile synthetic tool that enables efficient conversion of carboxylic acids to functionalized products via decarboxylative strategies. Our recent work on the photocatalytic activity of acridines has resulted in the development of new catalytic reactions that allow for a direct decarboxylative conversion of carboxylic acids to a variety of functionalized organosulfur compounds without a prior activation of the carboxylic group. These developments highlight the efficiency and selectivity of acridine photocatalysis and point to other future applications of the photocatalytic system in organic synthesis.



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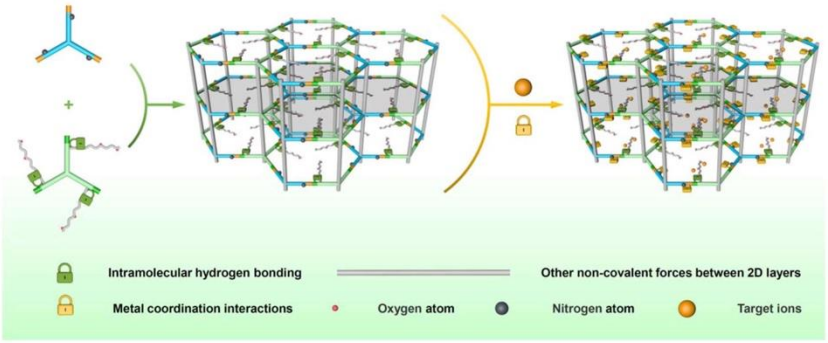
Dr. Yanli Zhao currently holds the Lee Soo Ying Professorship from Nanyang Technological University (NTU), Singapore. His group conducts research in an interdisciplinary area of synthetic chemistry, functional materials, and biomedical engineering with an emphasis on the design and synthesis of integrated systems for targeted diagnostics and therapeutics as well as for green energy and sustainable catalysis.

Integrating Supramolecular Interactions into Covalent Organic Frameworks for Catalytic Applications

Linkage chemistry is important for the synthesis of covalent organic frameworks (COFs), since it not only plays vital roles in the formation of COFs, but also has a significant impact on the properties of resulting materials.[1,2] We developed supramolecular interaction-integrated linkage engineering to fabricate 2D hydrazone-linked COFs for the coordination of diverse transition metal ions, and demonstrated that different coordination modes in 2D COFs have a significant influence on the properties of the resultant frameworks toward advanced catalysis.[3] After coordination with suitable metal ions (M), the resultant M/COFs exhibited the extended π-conjugation, improved crystallinity, enhanced stability and additional functionalities as compared to the parent COFs. In particular, the coordination mode in M/COFs endowed them with excellent catalytic activity and cyclic stability, outperforming amorphous counterparts.[4,5]



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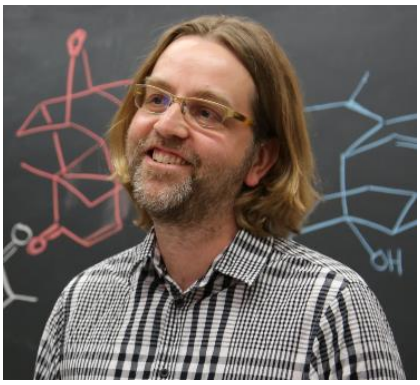
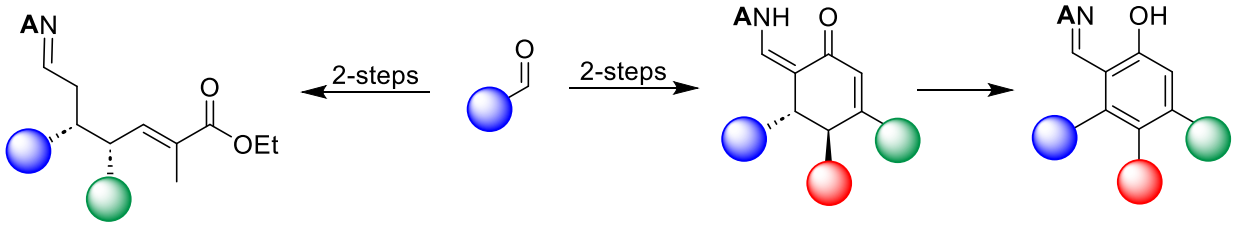


Jon was born and raised in the town of Akranes, Iceland. After receiving a BS in chemistry from the University of Iceland, Jon moved to Yale University where he joined the research group of Professor, John L. Wood and worked on the total synthesis of the natural products CP-225,917 CP-263,114 and new dearomatization reactions. Jon then moved to New York City to work in the laboratory of Professor Samuel J. Danishefsky at the Memorial Sloan-Kettering Cancer Center as a General Motors Cancer Research Scholar. While in the Danishefsky group, Jon completed the total syntheses of epothilone 490 and migrastatin. Jon moved to Ithaca in 2004 to start his independent career at Cornell University, where he launched a research program focused on natural products and the development of new reactions. In 2010 Jon and his group moved west to Tucson where he is a professor in the Department of Chemistry and Biochemistry at the University of Arizona.

Asymmetric Anionic-Amino Cope Adventures

In this seminar, I will discuss how earlier investigations led us into the dormant exciting area of asymmetric anionic-amino Cope chemistry, which we have been enjoying exploring in the last few years. As part of these efforts, we have addressed how to streamline synthesis and push the limits of this reaction platform sterically and electronically, which has revealed several new reactions. Examples of applications and futures plans will be presented.



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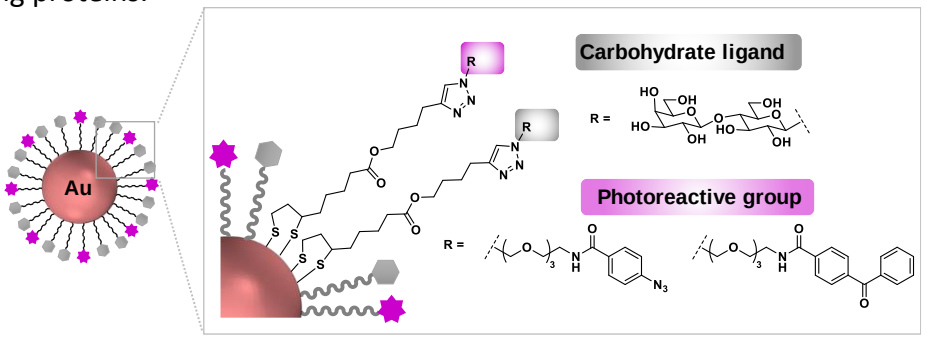
Kaori Sakurai grew up in Tokyo, Japan and graduated from the University of Tokyo with a B. Sci. degree in 1996. She received her Ph.D. in chemistry from Princeton University in 2003 under the guidance of Prof. Daniel Kahne. She undertook her postdoctoral studies in the research group of Prof. David R. Liu at Department of Chemistry and Chemical Biology, Harvard University. She started her independent research group at the Department of Biotechnology and Life Science, Tokyo University of Agriculture and Technology (TUAT) in 2006. Her research interest lies in the development and application of new chemical probes for exploring the target proteins and mechanisms of action of natural products and bioactive small molecules.

Multivalent Affinity Labeling Probes for Exploration of Carbohydrate-Binding Proteins

Identification of protein partners of carbohydrate ligands is crucial for understanding of their roles in various biological and pathological processes. However, the characterization or modulation of carbohydrate-binding proteins remains challenging due to their weak binding interaction to monomeric ligands. In this talk, I will discuss a new chemical probe-based approach toward elucidation of carbohydrate-protein interactions. We developed novel multivalent photoaffinity probes that display multiple molecules of a carbohydrate ligand and a photoreactive group on gold-nanoparticles in high density. We have also expanded the use of gold nanoparticles as probe scaffolds to more efficiently explore low-affinity carbohydrate-binding proteins by using electrophilic groups, which have higher labeling efficiency and lower selectivity compared to photoreactive groups. By functionalizing the electrophilic groups on the surface of gold-nanoparticles, we were able to tune their reactivity and selectively label low-affinity binding proteins.



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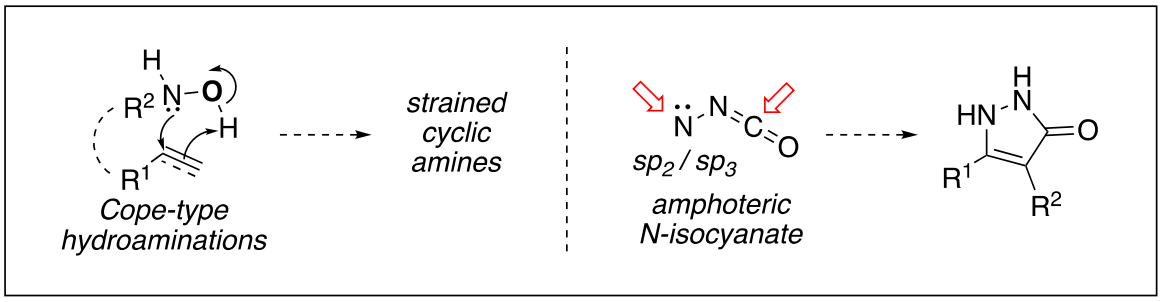
André Beauchemin obtained his BSc from Université Laval, his PhD from the Université de Montréal (supervisor: André B. Charette) and was a NSERC PDF at Harvard University (David A. Evans). In 2004, André started his academic career at the University of Ottawa. His group's research interests are focused on biologically active nitrogen-containing molecules, including the development of new amination reactions and new building blocks that can facilitate the synthesis of pharmaceuticals and agrochemicals. This work has been recognized by an AstraZeneca Award in Chemistry (2011), a University of Ottawa Research Chair (2012-) and the Boehringer Ingelheim Research Excellence award (2015). Among various service activities, he acted as Vice-Dean, Graduate Studies and Entrepreneurship at the Faculty of Science (2019-2022), and is now Vice-Provost, Graduate and Postdoctoral studies.

Strategies to Build Nitrogen Heterocycles

Most agrochemicals and pharmaceuticals contain nitrogen atoms in their structure, and heterocyclic systems are also common in bioactive molecules. Our group has long been interested in the development of reactions, strategies and building blocks to rapidly assemble nitrogen-containing molecules, including heterocycles. Often this involved using new reactions of hydroxylamine and hydrazine derivatives, reagents that continue to hold much untapped synthetic potential. In this presentation, advances allowing unprecedented Cope-type hydroamination reactivity will be presented.[1,2] Then, the potential of nitrogen-substituted isocyanates as reactive intermediates[3] and NNCO building blocks[4] will be highlighted in the development of a new route forming pyrazolones.



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Marcus A. Tius

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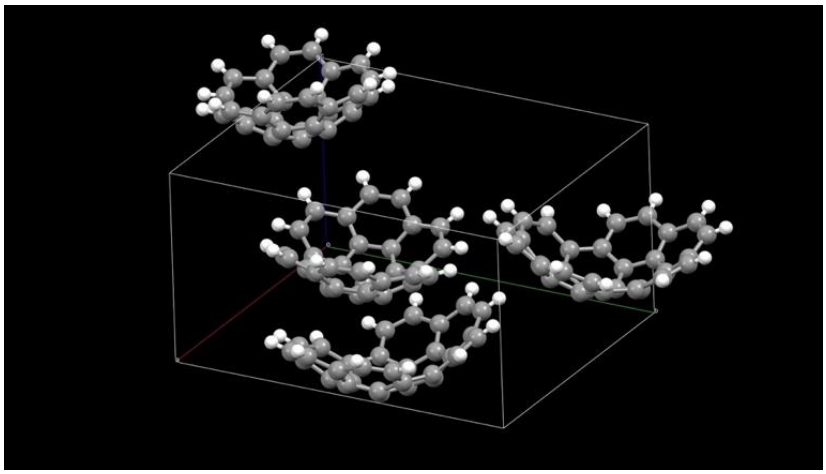
Marc Tius was born in 1953 in Izmir, Turkey. He moved to Greece when he was 5 years old and attended elementary school in Kavala, a town in Eastern Macedonia, and gymnasium in Thessaloniki. In 1971 he enrolled as an undergraduate at Dartmouth College in Hanover, New Hampshire, where he majored in Mathematics and Chemistry. His first research experience was in Professor Gordon Gribble's labs. In 1975 he moved to Cambridge and started graduate studies at Harvard in Professor E. J. Corey's group. For his thesis he completed the synthesis of aphidicolin, working with Larry Blaszczak first, and then with Jagabandhu Das. After a brief postdoc in the Corey group, he moved to Hawaii in August, 1980, where he has been ever since. He currently has a joint appointment in the Chemistry Department of the University of Hawaii, and at the University of Hawaii Cancer Center.

Escape From Flatland

What started out as an undesired side reaction that was observed during the execution of a total synthesis, after many years and after many twists in the road has led to an expeditious synthesis of semi-buckminsterfullerene, $C_{30}H_{12}$. The hope is that by developing this relatively short synthesis that does not require specialized reagents or equipment, curved polyaromatic hydrocarbons can be made accessible to non-specialists and purposed for the creation of novel catalysts and ligands.



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Chad Lewis

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Chad Lewis was born and raised in Alberta, Canada. He received his Bachelors of Science (Honors Chemistry) from the University of Alberta in 2003. He proceeded to receive his PhD in 2008 working with Prof. Scott Miller at Yale University. Chad followed up with postdoctoral studies in the Phil Baran group at The Scripps Research Institute and joined the faculty at Cornell University in 2015. Chad then proceeded to Pfizer process chemistry and worked on a number of projects including the commercial route development and supplies for a new API.

Synthetic Route Development of a Commercial Active Pharmaceutical Ingredient

The development of a commercial route of an active pharmaceutical agent using biocatalysis, a late-stage Lossen rearrangement, and a novel water-tolerable sulfonylating reagent is detailed.

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Oliver Thiel

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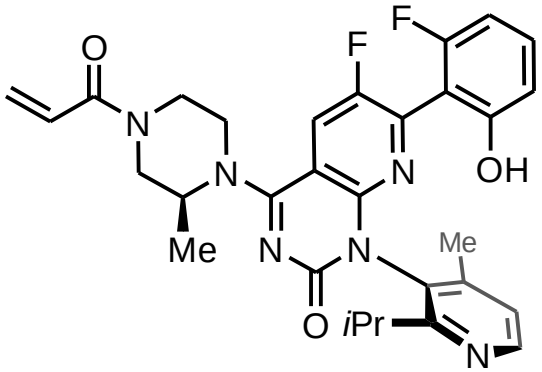
Oliver Thiel leads a group of chemists and engineers, working across the Amgen sites in Cambridge, MA and Thousand Oaks, CA, supporting the process development and commercialization of the Amgen small molecule portfolio. Oliver joined Amgen in 2003 and has held various positions in Process Development. His teams have been accountable for clinical and commercial process development, technology transfers and commercial support across synthetic and biologic modalities, supporting multiple commercial products and > 50 clinical development candidates. Prior to joining Amgen, Oliver was a postdoctoral fellow at Stanford University. He has a M.Sc. degree in chemistry from the Technical University Munich, and a Ph.D. from the Max-Planck-Institut für Kohlenforschung, Mülheim. He also holds an MBA degree from the Fernuniversität Hagen.

Development of a Commercial Manufacturing Process for LUMAKRAS™ (sotorasib)

Atropisomeric molecules have recently gained significant attention in pharmaceutical discovery research. Due to the increased complexity, atropisomeric active pharmaceutical ingredients (APIs) pose a significant challenge for the development of efficient, large-scale manufacturing processes. LUMAKRAS™ (sotorasib), an atropisomeric API, was the first $KRAS^{G12C}$ inhibitor to enter clinical trials and receive FDA accelerated approval. The Amgen process development team developed a chromatography-free preparation of sotorasib by leveraging high-throughput experimentation, kinetic analysis, and modeling. The final process enabled the preparation of an atropisomeric precursor to sotorasib with >99.95% enantiopurity on a multi-hundred-kilogram scale. Optimization of the downstream processing steps reduced impurity formation and improved manufacturing cycle times, which resulted in improved API quality and manufacturing efficiency. These efforts resulted in the rapid development of a manufacturing process that enabled commercialization of sotorasib at an industry-leading speed while improving environmental sustainability.



sotorasib (AMG 510)

Bill Morandi

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Professor Bill Morandi studied at ETH Zürich (2003–2008), receiving a BSc in Biology and a MSc in Chemical Biology. From 2008 to 2012, he pursued his PhD in organic synthesis at the same institution in the labs of Professor Erick M. Carreira. Afterwards, he moved to the California Institute of Technology (Pasadena, CA) for a postdoctoral stay with Professor Robert H. Grubbs. From 2014 to 2018, he was an independent Max Planck Research Group Leader at the Max-Planck-Institut für Kohlenforschung (Mülheim, Germany), before subsequently returning to ETH Zürich as a Professor in 2018. He is currently Full Professor of Synthetic Organic Chemistry and heads the Institute of Organic Chemistry (Laboratorium für Organische Chemie) at ETH Zürich.

Recent Adventures in Catalysis and Beyond

In this presentation, recent developments in synthetic methodology from our group will be discussed. First, progress in the area of molecular editing, including single nitrogen atom insertion and oxo-walk reactions will be presented. New developments in the area of shuttle catalysis, including applications to feedstock and waste valorization, will also be briefly discussed. This will be complemented by a discussion on further methods recently developed in our group, as well as accompanying mechanistic studies.

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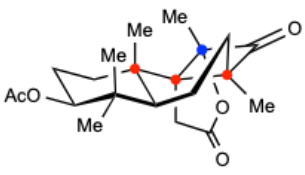
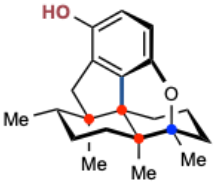
Zhen Yang obtained his B. Sc and M. Sc degrees in 1982 and 1986, respectively, from the Shenyang College of Pharmacy and his Ph.D. degree in 1992 from The Chinese University of Hong Kong under the supervision of Professor Henry N. C. Wong. He carried out postdoctoral research on natural product synthesis with K. C. Nicolaou at The Scripps Research Institute in La Jolla, CA, USA and joined its faculty in 1995. In 1998, he moved to the Institute of Chemistry and Cell Biology at Harvard Medical School as an institute fellow before returning to China as a professor at Peking University in 2001. He currently has served as the Executive Vice Chancellor of Peking University of Shenzhen Graduate School and the Editor-in-Chief of Tetrahedron Letters. His group actively pursues the total syntheses of bioactive natural products and chemical biology research.

Application of Norrish Yang Photocyclization to the Total Synthesis of Complex Natural Product

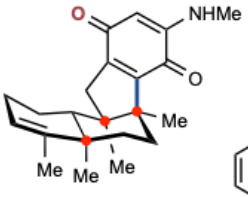
In recent years, photochemical transformation[1] have drawn great attention due to the reaction can provide a concise and unique way to construct the complex natural product scaffolds from relatively simple building blocks in a single step. Light-promoted reactions involve electronically excited states upon absorption of photons, which produces transient reactive intermediates and significantly alters the reactivity of a chemical compound. The input of energy provided by light offers a means to produce strained and unique scaffolds that cannot be assembled using thermal protocols. In this context, our group recently has focused on the total synthesis of natural product with vicinal quaternary stereogenic centers. In this presentation, we present our recent efforts towards the regio- and stereo-selective total synthesis of natural products (+)-cyclobutastellettolide B,[2] dysiherbol A, and dysifragilone A, as well as phainanoids by using Norrish-Yang photocyclization as a key step.



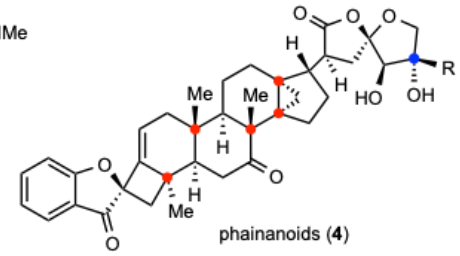
cyclobutastellettolides B (**1**)
(*JACS*, **2021**,*143*, 18287)



dysiherbol A (**2**)



dysideanone B (**3**)



phainanoids (**4**)

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Zhi-Xiang Yu

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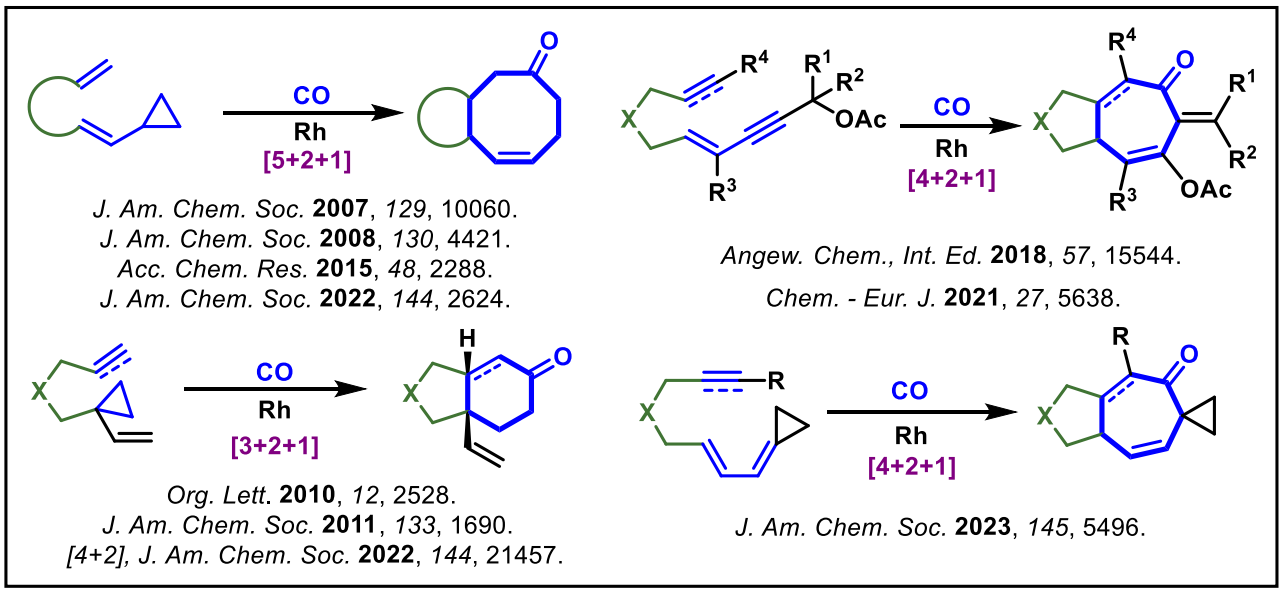
Zhi-Xiang Yu obtained his B.S. from Wuhan University in 1991 and his M.S. from Peking University in 1997. Later in 2001 he obtained his Ph.D. from Hong Kong University of Science & Technology.

Development and Application of Metal-Catalyzed Cycloadditions

My group is interested in developing ring formation reactions and applying these reactions to the synthesis of natural products and pharmaceuticals. The scheme below shows some of these ring formation reactions (catalyzed by Rh complexes), which will be introduced in this talk.



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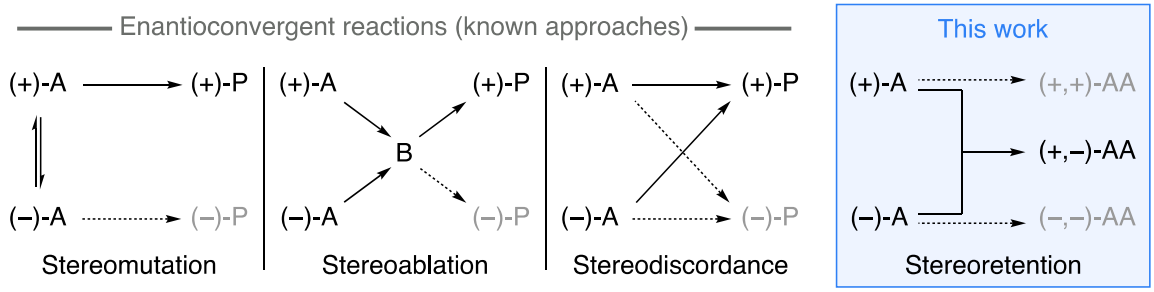
Andy was born and raised in Doncaster, South Yorkshire, UK. He completed his undergraduate studies at the University of Oxford, St John's College (2002–2006, Hons 1st Class) and subsequently obtained a DPhil at the University of Oxford working under the supervision of Prof. Sir Jack Baldwin FRS and Prof. Rob Adlington (2006–2010). Andy then moved to Australia to spend two years (2010–2011) as a postdoctoral research fellow with Prof. Mick Sherburn at the Australian National University (ANU) in Canberra. In 2012, Andy began an Australian Research Council DECRA Fellowship at the ANU before moving back to the UK in 2013 for an academic position at the University of Edinburgh, where he is now full Professor.

Rethinking Enantioconvergent Reactions

Enantioconvergent reactions are preeminent in contemporary asymmetric synthesis as they convert both enantiomers of a racemic starting material into a single enantioenriched product, thus avoiding the maximum 50% yield associated with resolutions. All currently known enantioconvergent processes necessitate the loss or partial-loss of the racemic substrate's stereochemical information, thus limiting the potential substrate scope to molecules that contain labile stereogenic units. I will present an alternative approach to enantioconvergent reactions that can proceed with full retention of the racemic substrate's configuration. This uniquely stereo-economic approach is possible if the two enantiomers of a racemic starting material are joined together to form one enantiomer of a non-*meso* product. Experimental validation of this concept is presented using two distinct strategies; (1) a direct unsymmetrical coupling approach and (2) a multi-component approach, which exhibits statistical-amplification of enantiopurity. Thus, the established dogma that enantioconvergent reactions require substrates that contain labile stereogenic units is shown to be incorrect.



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Jeremy A. May

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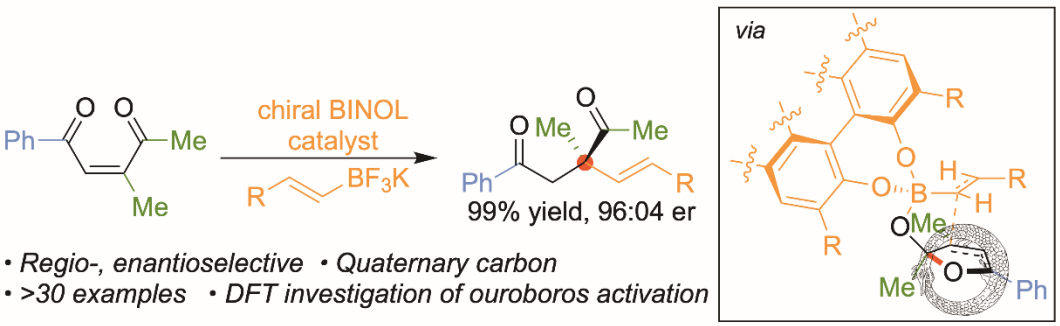
Professor Jeremy A. May (left) grew up in Montana, then graduated *cum laude* from the University of Utah with a B.S. in chemistry. He pursued a PhD in organic synthesis under the guidance of Professor Brian M. Stoltz at the California Institute of Technology and received his doctoral degree in 2006. Subsequently, he completed a Ruth Kirschstein NIH postdoctoral fellowship with Professor Samuel J. Danishefsky at the Memorial Sloan Kettering Cancer Center. He began as an Assistant Professor at the University of Houston in 2009, and was promoted to Associate Professor with tenure in 2015. He is now full professor and Associate Dean for Graduate Studies there. His research encompasses natural product synthesis, medicinal chemistry, organometallic catalysis, complex ligand design, and the development of novel synthetic transformations.

Electrophilic Deboronation in Synthesis

The Carbon-Boron bond has many advantages for synthesis, including nucleophilic activation, positional selectivity for substitution, mild reaction conditions, and functional group tolerance. These advantages are especially evident in metal free electrophilic deboronative substitution reactions with carbon-based electrophiles. This approach has enabled many complex target syntheses that are highly efficient and has enabled acyclic quaternary carbon formation via a novel catalytic ouroboros transition state.



• *Regio-, enantioselective* • *Quaternary carbon*
• *>30 examples* • *DFT investigation of ouroboros activation*

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POSTER ABSTRACTS

&

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Photocatalytic Hydrofluoroalkylation of Alkenes with Carboxylic Acids

Kang-Jie Bian,† Yen-Chu Lu,† David Nemoto Jr, Shih-Chieh Kao, Xiao-Wei Chen and Julian G. West*

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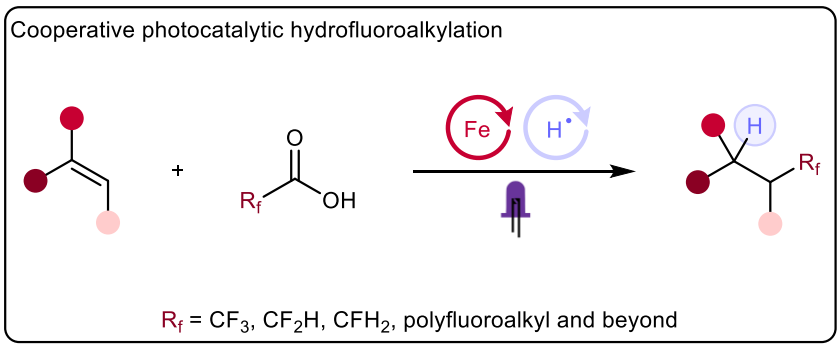
Kangjie (Harry) Bian earned his B.S. in chemistry in 2017 from Huaqiao University under the mentorship of Qiu-Ling Song and M.S. in 2020 from University of Science and Technology of China under the guidance of Xi-Sheng Wang investigating remote functionalization of inert C-H bonds. Outside of lab, he likes to watch movies, listen to dream-pop and shoe-gaze music, and read young adult novels. He can also make really good spaghetti!

Abstract:

Incorporation of fluoroalkyl motifs in pharmaceuticals can enhance the therapeutic profiles of the parent molecules. The hydrofluoroalkylation of alkenes has emerged as a promising route to diverse fluoroalkylated compounds; however, current methods require superstoichiometric oxidants, expensive/oxidative fluoroalkylating reagents and precious metals, and often exhibit limited scope, making a universal protocol that addresses these limitations highly desirable. Here we report the hydrofluoroalkylation of alkenes with cheap, abundant and available fluoroalkyl carboxylic acids as the sole reagents. Hydrotrifluoro-, difluoro-, monofluoro- and perfluoroalkylation are all demonstrated, with broad scope, mild conditions (redox neutral) and potential for late-stage modification of bioactive molecules. Critical to success is overcoming the exceedingly high redox potential of feedstock fluoroalkyl carboxylic acids such as trifluoroacetic acid by leveraging cooperative earth-abundant, inexpensive iron and redox-active thiol catalysis, enabling these reagents to be directly used as hydroperfluoroalkylation donors without pre-activation. Preliminary mechanistic studies support the radical nature of this cooperative process.



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Asymmetric Catalytic Friedel–Crafts Reactions of Unactivated Arenes

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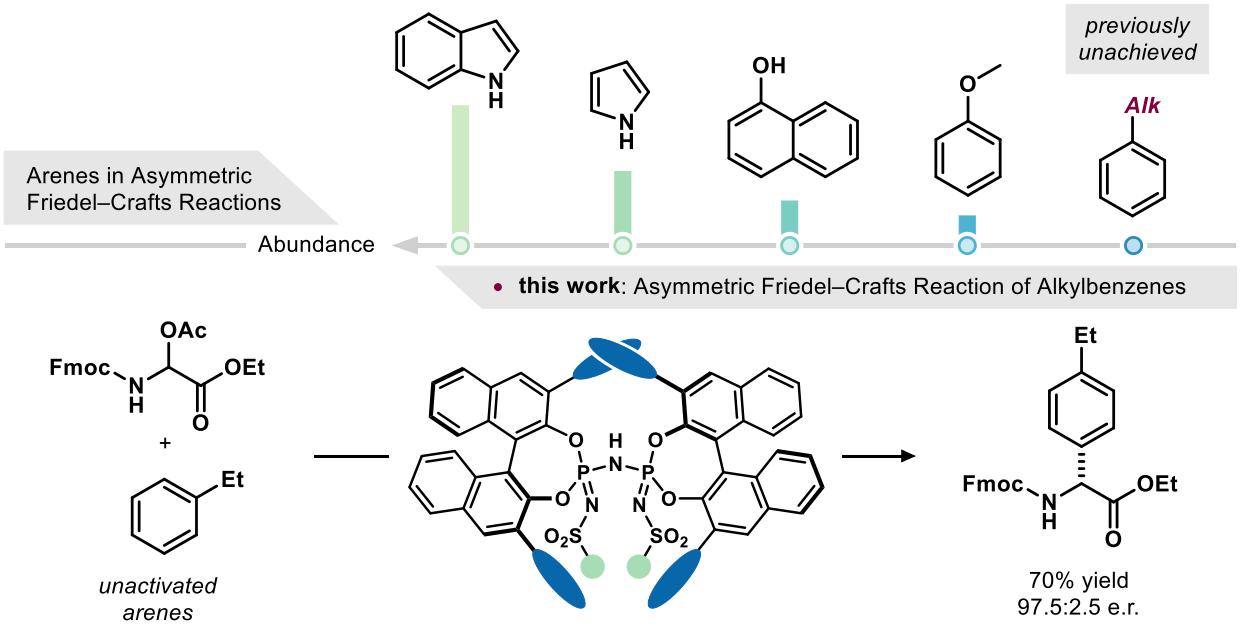
Sebastian Brunen was born in Munich, Germany, and grew up in Marburg. He obtained his B.Sc. and M.Sc. degrees in chemistry at the Philipps-Universität Marburg. For his master thesis, he joined the Meggers research group to work on the development of novel iridium catalysts and their application in enantioselective synthesis. Fueled by these intriguing insights into the field of asymmetric catalysis, he then joined the research group of Prof. Benjamin List in 2020 for his graduate studies. His research is focused on the development of selective Friedel–Crafts transformations of unactivated arenes using strong and confined Brønsted acid catalysts.

Abstract:

The Friedel–Crafts reaction is a crucial tool for the functionalization of arenes.[1] Despite longstanding research, however, this transformation still faces challenges. Among others, the Friedel–Crafts reaction is intrinsically limited by the nucleophilicity of the aromatic substrate which is especially apparent in asymmetric versions thereof. To overcome this fundamental limitation, we report the asymmetric Friedel–Crafts reaction of purely hydrocarbon arenes with *N*,*O*-acetals to give enantioenriched arylglycine derivates.[2] Mechanistic studies were subsequently performed to shed light on relevant intermediates within the catalytic cycle.



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Dedicated Purification Platform and Solutions

Rick Chang

Beijing Orienda Instruments Co., Ltd.
E-mail: bc@orienda.com

Rick Chang, Business Development of Orienda Instruments. Drawing upon a profound understanding of the application process, Orienda is dedicated to enhancing user experience and continuously advancing automation capabilities, aiming to reach the ranks of world-class scientific instruments.

Abstract:

Orienda offers a range of products, including the Brix and Meta preparative chromatography platforms. These platforms have been instrumental in providing users with advanced mass spectrometry systems, automated cyclic sample loading, customizable multidimensional chromatography, and other high-value solutions. Depending on your specific requirements, you can choose between high-pressure or medium-pressure preparation options.

Additionally, Orienda supplies reliable high-pressure and medium-pressure liquid chromatography infusion pumps, UV/visible light detectors, automatic distillate collectors with collection valves, chromatography workstations, and other products. These products find extensive applications in liquid chromatography, ion chromatography, preparative liquid chromatography, as well as the medicine and chemical industry's production and manufacturing domains.

Alkyl Arylation of Alkenes via Decarboxylative Smiles-Truce Rearrangement

Xiao-Wei Chen[a], Kang-Jie Bian[a], Shih-Chieh Kao[a], Shijin Yu[a], Julian G. West[a]

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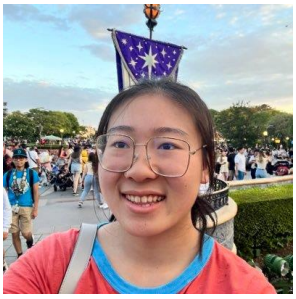
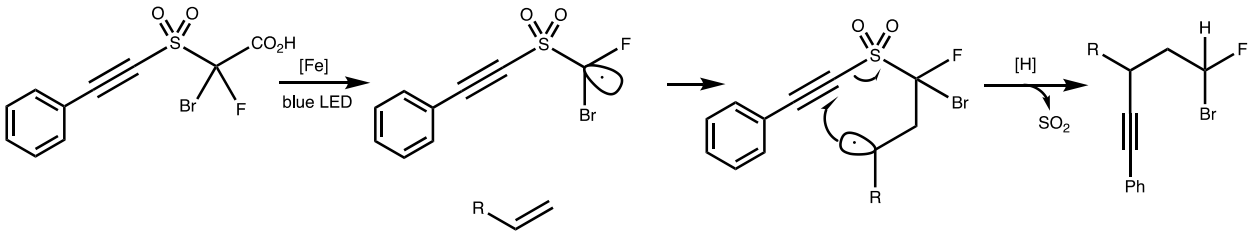


Xiaowei Chen was born and raised in Shanghai, China. She is a 4th year undergraduate student at Rice University looking for graduate studies in Chemistry. In the West lab, she works on photocatalytic iron-mediated decarboxylations and alkene functionalizations. During the previous summer, Xiaowei undertook an internship with Professor Keary Engle at Scripps Research, where she worked on developing a nickel-catalyzed alkene alkylalkenylation using alkenyl SOMOphiles.

Abstract:

Rearrangement reactions enable the controlled cleavage and reconstruction of chemical bonds, facilitating the incorporation of valuable functional groups into targeted molecules. While radical-mediated rearrangements have shown great promise in difunctionalizing activated olefins, the scope has been limited to olefins with proximal substituents that stabilize radical intermediates. Recently, a docking-migration strategy has been disclosed for radical functionalization of unactivated olefins. By using a dual-function reagent tethered to a traceless linker SO_2, this strategy enables the intramolecular migration of a radical acceptor. Notably, sulfone-based dual-function reagents inverts the polarity-match reaction mode between alkene substrates and nucleophilic radicals. In the docking-migration reactions, the polarity of sulfonyl-decorated alkyl radical is inverted to electrophilic, thus allowing its addition to aliphatic alkenes. Leveraging the docking-migration strategy and iron's LMCT reactivity towards carboxylate group, we proposed an iron-catalyzed radical Smiles-Truce rearrangement mechanism.



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Nitroarene Reduction Using in situ Generated Boron Triiodide

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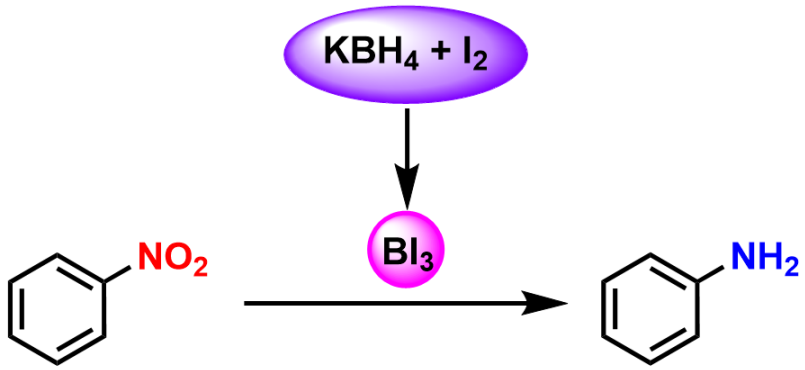
Andrej Ćorković was born in Hamburg, Germany, and moved to northern Illinois in 1999. He received his B.A. in Chemistry and a concentration in European Studies from Grinnell College in 2018. At Grinnell, he worked with Professor Erick Leggans where he synthesized Teixobactin analogues. After graduation, he worked as a medical scribe in an ER for 2 years before committing to the University of Iowa and joining Professor Florence Williams' group in 2020. At Iowa, Andrej has researched borylnitrenes, halogen exchange of aryl trifluoromethyl compounds, and the reduction of nitroarenes using boron triiodide (BI_3).

Abstract:

Anilines are ubiquitous among medicinal and agrochemical substances. Industrially, anilines are often formed from nitroarenes using palladium-catalyzed hydrogenations and iron-mediated reductions.[1] Recently, there has been growing interest in transition-metal-free boron-mediated reductions of aryl nitro compounds with diboron complexes like $B_2(OH)_4$ and B_2pin_2.[2] Recently, we found that we can reduce nitroarenes from benchtop-stable potassium borohydride and iodine, alleviating shortcomings of previous methods. The borohydride and iodine are used to pregenerate BI_3 which effectively reduces nitroarenes to anilines.[3] Thus, we describe a method of reducing a range of nitroarenes in ambient conditions with in situ generated BI_3.[4]



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Pseudo Rings as a Novel Conformational Control Element in Peptide Macrocycles

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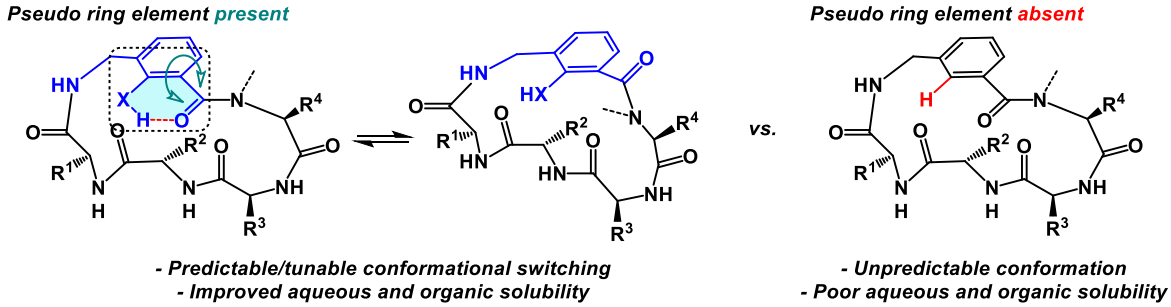
Matthew was born and raised in the city of Newmarket, ON, Canada. He received both his B.Sc. and M.Sc. from the University of Waterloo. He completed his master's thesis under the supervision of Professor Scott Taylor. His research was focused on the solid-phase total synthesis of complex Z-dehydrotryptophan-bearing cyclic peptides. Matthew joined the Yudin group in the Fall of 2021 with interests in reaction discovery as well as the study of peptide-based macrocycles.

Abstract:

Heterocycles have played a pivotal role in the discovery of bioactive small-molecules. Emerging modalities such as macrocycles, peptides, unnatural oligonucleotides, and others have adopted some of the findings made in small-molecule chemistry. One particular small-molecule control element – pseudo rings, comprising of an intramolecular hydrogen bond in place of covalent linkages – has not been applied to control and modulate the structures of complex macrocycles. This work examines the unique structural features of pseudo ring containing peptide macrocycles. This study offers a methodology to examine conformational equilibria in peptidomimetic macrocycles through computational and spectroscopic techniques. We have shown an ability to control the peptidic system such that specific hydrogen bond donors and acceptors of the pseudo ring system are either embedded within the peptide's core or exposed to the solvent. This is particularly important for the purposes of peptide passive permeability and peptide aqueous/organic solubility as well as for specific binding of cyclic peptides in enzyme active site binding pockets.

This work: pseudo ring-containing peptides



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Recent Development in the Organocatalytic House-Meinwald Rearrangement

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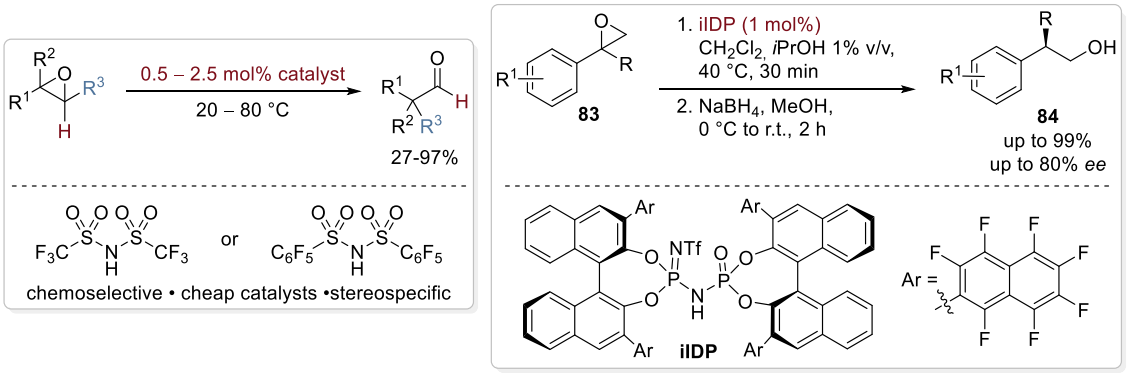
Friedemann Dreßler grew up in a small village in Hesse, Germany. He studied Chemistry at the Justus Liebig University in Gießen and joined the Sanofi Fraunhofer Center for Natural Product Research for his Bachelor thesis, focusing on the asymmetric synthesis of pyridazine carboylic acid derivatives. Subsequently, he continued his Master studies in Gießen and joined the Schreiner Group for his Master thesis, working on Lewis-Acid catalyzed epoxide rearrangements. In 2019, he began his PhD in the Schreiner group, where he is currently working on the organocatalytic House-Meinwald Rearrangement.

Abstract:
Epoxides are versatile intermediates in modern organic synthesis, offering numerous opportunities for synthetic modifications, including reduction, epoxide opening, and rearrangement reactions. Our focus is on the epoxide rearrangement, also known as House-Meinwald rearrangement. The goal is to establish an organocatalytic and chemoselective rearrangement of trisubstituted epoxides. Through the screening of various sulfonic acids and sulfonimides, we observed that both the acidity and the nature of the Brønsted acid significantly influence the selectivity of the reaction. Furthermore, we demonstrated the stereospecific nature of the rearrangement using an enantioenriched epoxide. Now, our focus is on the asymmetric House-Meinwald rearrangement of 2,2-disubstituted epoxides, with the goal of achieving an enantioselective H-shift. We have screened various IDP-derived catalysts and again observed the strong impact of their acidity on yield and enantioselectivity. The resulting epoxides can be used as intermediates for a new enantioselective route in the synthesis of various drugs, including ibuprofen, ketoprofen, and naproxen.



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Progress Towards the Total Synthesis of Pyrroloiminoquinone Marine Natural Products

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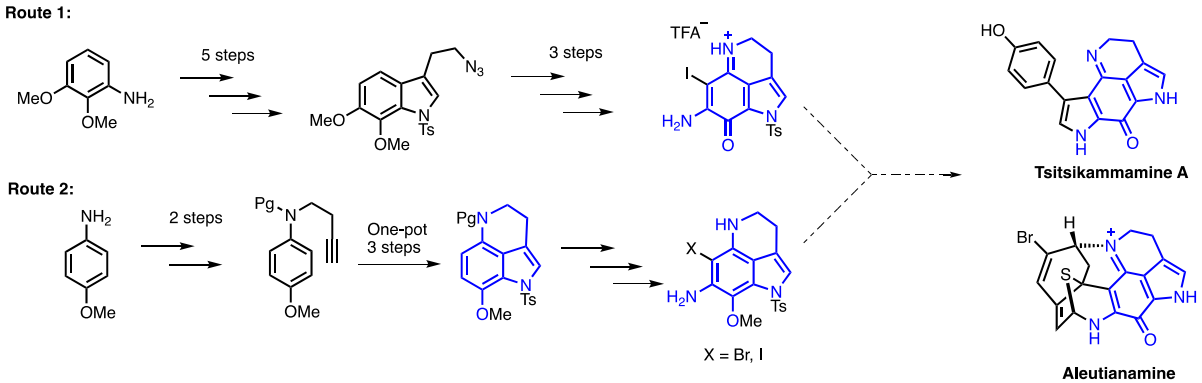
Sam Flipse is from San Antonio, Texas. He received his B.S. in Biochemistry from Arizona State University in the fall of 2017. He joined the Tius Lab at the University of Hawaii at Manoa in 2018 originally as a master's student before moving into the PhD program. His research efforts have since focused on asymmetric organocatalysis, analog synthesis for SAR analysis, and most recently the total synthesis of pharmaceutically active marine natural products.

Abstract:

The *Latrunculia* sponges, found off the coast of the Aleutian Islands, provide access to a variety of pyrroloiminoquinone natural products which have shown promise as drug candidates; however, the difficulty of collection and isolation presents supply issues. One such compound, aleutianamine, shows potent and selective cytotoxicity against pancreatic cancer cell lines (PANC-1).[1] This work describes current attempts towards the total synthesis of aleutianamine. Initial efforts (Route 1) focused on the construction of the pyrroloiminoquinone core with subsequent functionalization. The reactivity of this substructure led to issues of stability and scalability, which necessitated a different approach. Route 2 establishes the tricyclic core by a dearomatizing intramolecular [3 + 2] annulation. This approach improves step economy, scalability, and allows access to the reduced and protected tricyclic core, eliminating issues of stability. This route provides an attractive option for further functionalization to access aleutianamine and tsitsikammamine A.



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Vitamin B_{12} Photocatalysis: A Tunable System for Epoxide Reactivity

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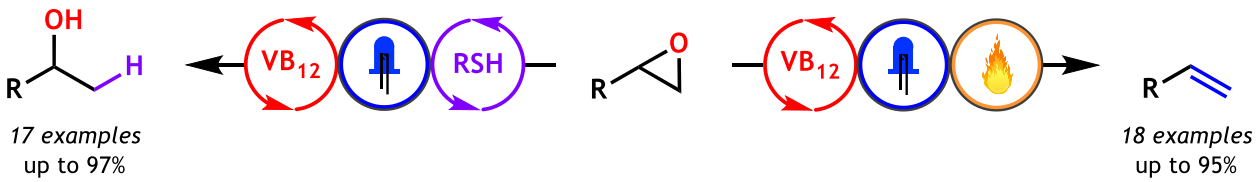
Brian grew up in the suburbs of Philadelphia, Pennsylvania. He did his undergraduate studies at Penn State University where he obtained his B.S. in Chemistry. He spent two years working in the Zhang Research Group where he synthesized molecular-rotor fluorophores towards the development of a fluorogenic toolkit for the detection of protein aggregation. In the Fall of 2021, Brian began his graduate research in the West Lab at Rice University where he does synthetic methodology with a focus on radical chemistry and Vitamin B_{12} catalysis.

Abstract:
Synthetic chemists need better tools for the production of important compounds, from agrochemicals to medicines and therapeutics. Crucial to the development of such tools is the efficient and sustainable use of Earth-abundant elements. To this end, Vitamin B_{12} presents an intriguing avenue for exploration for several reasons. Vitamin B_{12} is a naturally occurring, widely available cobalt complex enabling synergistic access to both ionic and radical reactivity that has allowed nature and chemists alike to achieve many synthetically challenging transformations. Here we describe our development of a tunable system of light-induced Vitamin B_{12} catalysis to enable mild hydrogenative epoxide ring opening as well as efficient and bio-inspired epoxide deoxygenation. These reactions function in wet solvent, employ radical chemistry, and proceed with moderate to excellent yields. Together, these methodologies showcase the compelling versatility of Vitamin B_{12} as a catalyst, with minor alterations to reaction conditions leading to vastly different epoxide reactivity.



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Towards regioselective ring opening of aryl-thiomaleimides

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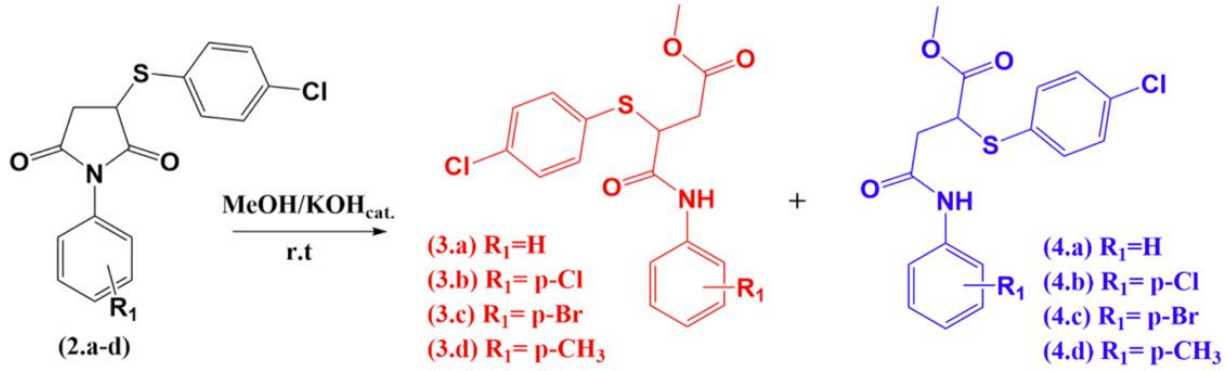
Gabriela Gomes grew up in São Paulo, Brazil. She is pursuing her undergraduate studies in Biochemistry at the Department of Chemistry and Biochemistry at the North Dakota State University. She is a sophomore student. Her research interests are in development of hard-to-synthesize small molecules for biomedical use. Since the Fall of 2021, she started her research studies at North Dakota State University in the Gomes lab, where she is developing new methodologies for regioselective malemide ring opening. In 2022, she was awarded a NSF-INBRE scholarship to support her research studies.

Abstract:

Derivatives of N-aryl maleamic acids showed a high degree of cytotoxicity, including fungicidal and bactericidal activity. These molecules have considerable reactivity in some structure sites of their structure that facilitate structural changes in their compositions. Given the ease of structural modification in aryl maleamic acid derivatives and the possibility of producing molecules that also present biological activity, this work aimed to synthesize esters from *N*-aryl-thiomaleimide derivatives, using them as material for subsequent alkaline regioselective methanolysis.



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Highly Reactive Lithium Metal Dendrites for the Synthesis of (Trimethylsilyl)methyllithium

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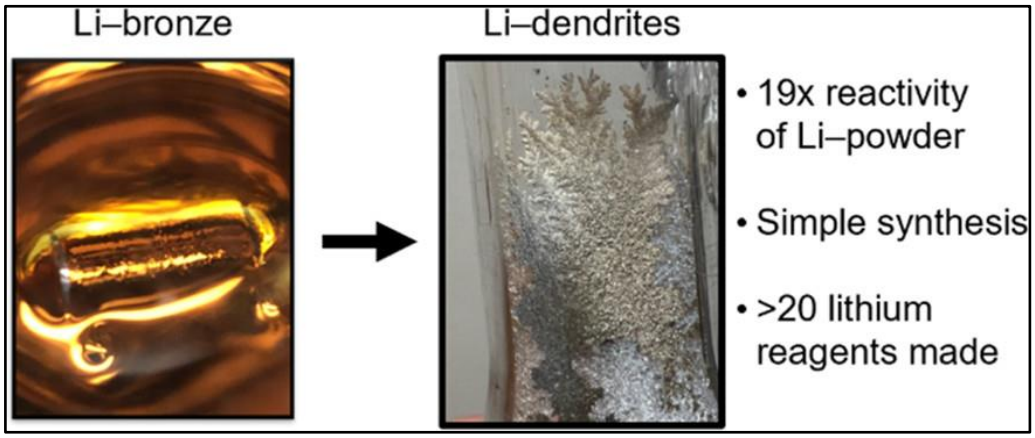
Raquel Gonzalez was born and raised in Sacramento, CA. She is a current sophomore undergraduate at Texas A & M University where she works under the tutelage of Prof. Andy Thomas. Raquel's research is focused on the synthesis of organolithiums using highly reactive lithium metal dendrites.

Abstract:
In the preparation of organolithium reagents, the use of highly activated lithium metal surfaces is essential. Our group has presented a new approach to synthesize lithium with surface areas up to 100 times greater than conventional Li-dispersion. Our method involves the use of liquid ammonia (NH_3) to clean the lithium surface, resulting in the controlled dendritic growth of lithium structures along the flask wall. Herein, we outline the procedure for applying 5 grams of Li-dendrites for the synthesis of TMS(CH_2)Li, highlighting the potential impact of our method on organometallic chemistry.



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O-Vinyl and *O*-Cyclopropyl Hydroxylamines as Versatile Reagents for the Synthesis of Nitrogen Heterocycles

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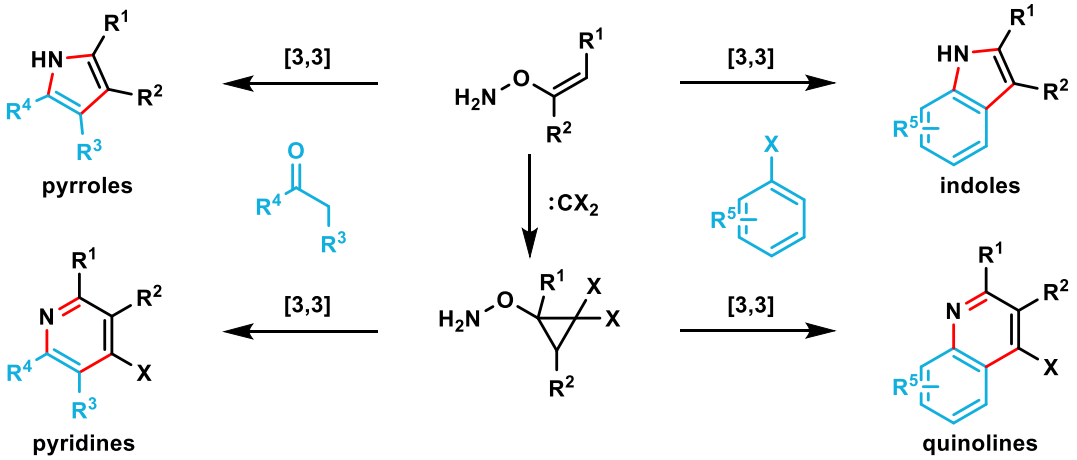
Zach Grimm grew up in Lorena, TX. He did his undergraduate studies at Southwestern University where he obtained his B.Sc. in Chemistry. During his time at Southwestern University, he worked in the Gesinski group developing new gold-catalyzed syntheses of heterocyclic rings. In the Fall of 2020, he began his graduate studies at Rice University in the Kürti lab, where he is currently working on new reactions for the synthesis of nitrogen-containing heterocycles.

Abstract:

Hydroxylamines have been used extensively for the preparation of many heterocyclic moieties over the years. Many researchers have identified valuable rearrangement reactions of hydroxylamines such as in the Bartoli indole synthesis, which utilizes an *N*-aryl *O*-vinyl hydroxylamine intermediate that undergoes a [3,3]-sigmatropic rearrangement and results in 7-substituted indoles.[1] In addition, the Kürti lab has previously demonstrated that *O*-cyclopropyl hydroxylamines participate in [3,3]-rearrangements as well.[2] Notably, 59% of unique small-molecule FDA approved drugs contain a nitrogen heterocycle.[3] Given the importance of nitrogen heterocycles and the proven effectiveness of hydroxylamines for the synthesis of these moieties, it is worthwhile to develop robust methods for the synthesis and application of *O*-vinyl and *O*-cyclopropyl hydroxylamines. Described herein is our work towards the scalable synthesis of *O*-vinyl and *O*-cyclopropyl hydroxylamines and their utility towards the synthesis of highly substituted nitrogen heterocycles.



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Investigation of Metastable Polymorph Formation by Atomic-resolution Transmission Electron Microscopy

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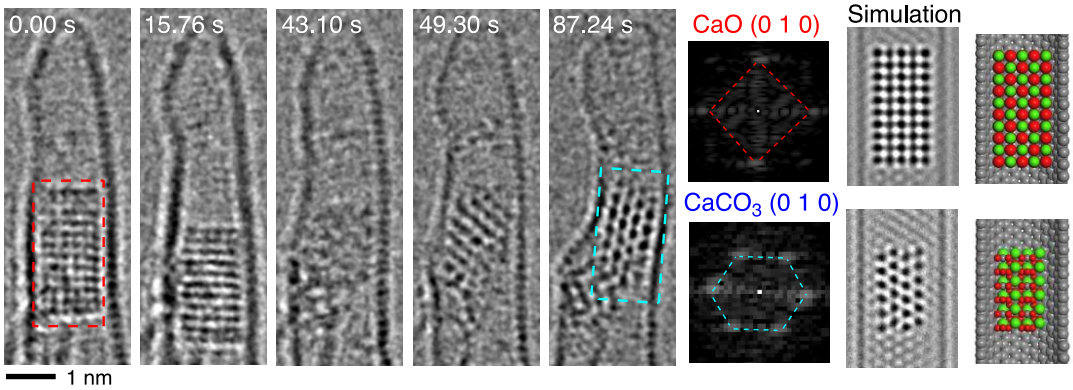
Miyuki Hanazawa grew up in Tokyo, Japan. She completed her undergraduate studies in Chemistry and Education, and obtained teaching licenses for kindergarten, elementary, junior high, and high school at Tokyo Gakugei University. During her final thesis at Tokyo Gakugei University, she worked on the analysis of separation and extraction mechanism of metal species in solvent extraction method with ODS silica. In April 2021, she began her graduate studies at the University of Tokyo in the Nakamura lab, where she is currently working on direct observation and exploration of reaction mechanisms at atomic-resolution by time-resolved transmission electron microscopy.

Abstract:

The mechanism of crystal polymorph selection and its control have attracted much interest because material property and pharmaceutical quality are strongly related to crystal polymorphism. However, polymorphism in the early stage of structure formation has not been well studied due to the lack of experimental methods and have been made to control them by changing conditions based on empirical rules. In this study, using calcium carbonate ($CaCO_3$) with three polymorphs[1] as a model system, we directly observed the structure formation process by chemical reactions and investigated the polymorph selection. Calcium oxide (CaO) and a carbon dioxide source were encapsulated in conical CNTs.[2] Under TEM observation, the lattice structure of CaO (0 s) transforms via a nonperiodic structure (43.10 s) into $CaCO_3$ aragonite crystal, a metastable phase at room temperature and pressure (87.24 s). In this presentation, the transient structure and reaction mechanism will be discussed.



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Alkene Difunctionalization with *N*-Halogen-*O*-Sulfonylhydroxylamine Derivatives

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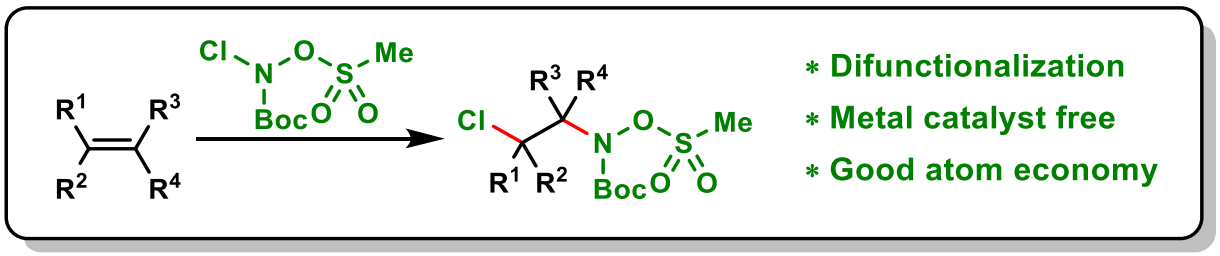
Daniel Joaquin was born and raised in El Salvador. He obtained his bachelor's degree in chemistry from Brigham Young University-Idaho (2017), followed by his Ph.D. in organic chemistry from Brigham Young University-Utah (2022) under the direction of Prof. Steven Castle, where his research focused on the total synthesis of anticancer natural products as well as the stabilization of helical peptides using dehydroamino acids. After graduating, Dr. Joaquin became a postdoctoral associate in the research group of Prof. László Kürti at Rice University, where he currently works on the development of novel olefin difunctionalization methods using versatile hydroxylamine derivatives.

Abstract:
Amines and their derivatives are present in the majority of drug molecules and many natural products, but currently only few amination methods can be used for intricate fragment couplings and for the late-stage functionalization of complex molecules. Described herein is a method to transform olefins into novel electrophilic aminating agents with previously inaccessible structural complexity using *N*-halogenated-*N*-acyl-*O*-alkyl/arylsulfonyl hydroxylamine as the difunctionalization reagent. These multifunctional hydroxylamines can then be exploited in a variety of complexity-building transformations, such as in intramolecular and/or intermolecular aliphatic and aromatic C-H amination reactions, direct and stereospecific olefin aziridinations, as well as complex cycloadditions.



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Photochemical Strategies for C-N Bond Formation – the Merger of Visible-Light-Induced-Homolysis (VLIH) and Radical-Ligand-Transfer (RLT) Catalysis to Enable Olefin Diazidation and Decarboxylative Azidation

Shih-Chieh Kao[a,§], Kang-Jie Bian[a,§], David T. Nemoto, Jr.[a], Xiaowei Chen[a], Ying Chen[b], Angel A. Marti[b], and Julian G. West*[, a]

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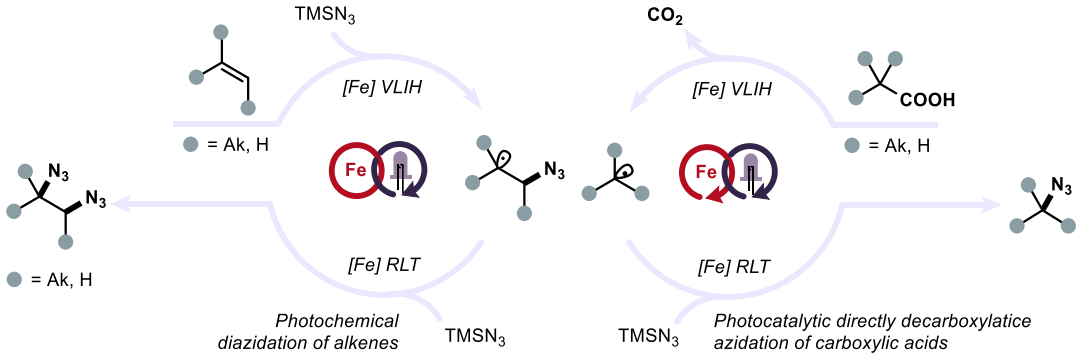
Shih-Chieh Kao was raised in Taiwan and completed his undergraduate studies at Tamkang University, earning a B.Sc. in Chemistry and Biochemistry. During his senior year, he conducted research in the Hsieh group, focusing on synthesizing novel bio-mimetic iron hydrogenase for hydrogen generation. He pursued his master's degree at National Yang Ming Chiao Tung University, working on organic transformations using continuous flow techniques in the Ryu and Wu lab, where he obtained his master's degree. Since the Spring of 2021, he has been undertaking his graduate studies at Rice University in the West lab, where his current focus lies in alkene hydrofunctionalization and difunctionalization."

Abstract:

Approaches for C-N bond formation are crucial due to the prevalence of nitrogen atoms in pharmaceuticals and natural products. Organic azides are key precursors for diverse nitrogen-containing structures, including amines and triazoles, making azide installation an important strategy for C–N bond formation. This report presents two innovative azide formation processes: photochemical olefin diazidation and direct decarboxylative azidation, combining visible-light-induced-homolysis (VLIH) and radical-ligand-transfer (RLT). Using inexpensive iron nitrate as both a radical translator and terminator, these methods efficiently convert various olefins and carboxylic acids into organic azides under mild conditions with broad functional group tolerance. By utilizing the nitrate counteranion as a terminal oxidant, they eliminate the need for costly and reactive oxidants, simplifying reaction protocols and ensuring scalability. Initial mechanistic studies suggest a radical mechanism for the iron-mediated ligand-transfer process and highlight the nitrate counteranion's role as an internal oxidant for iron catalyst turnover.



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Machine Learning-Guided Development of Trialkylphosphine Ni(I) Dimers and Applications in Site-Selective Catalysis

Teresa M. Karl[a], Samir Bouayad-Gervais[a,§], Julian A. Hueffel[a,§], Theresa Sperger[a], Sebastian Wellig[a], Sherif J. Kaldas[a], Uladzislava Dabranskaya[a], Jas S. Ward[b], Kari Rissanen[b], Graham J. Tizzard[c], and Franziska Schoenebeck[*,a]

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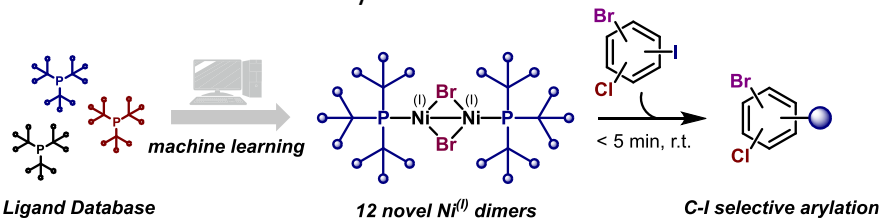
Teresa Karl studied chemistry at RWTH Aachen University. During her master's degree she joined Prof. John A. Murphy's group at the University of Strathclyde in Glasgow for the investigation of transition-metal free cross coupling reactions promoted by organic super electron donors. For her master's thesis, she worked on the late-stage heteroarylation of (hetero)aryl sulfonium salts under the supervision of Prof. Tobias Ritter at the Max-Planck-Institut für Kohlenforschung. In February 2021, Teresa joined the Schoenebeck group to pursue her doctoral studies and is currently working in the field of Ni-catalysis.

Abstract:

Although being highly impactful in the area of Pd-catalysis,[1] bulky trialkylphosphines have found limited application in the realm of Nickel catalysis due to inhibited COD displacement from commonly employed Ni(0) precursors such as $Ni(COD)_2$.[2] However, Ni(I) dimers – in analogy to Palladium[3] – might offer a promising route to trialkylphosphine-ligated Ni(0). As there is currently no rationale available on the factors that dictate Ni-speciation and it is also unknown how the phosphine ligand impacts this speciation, we employed assumption-based machine learning to identify suitable ligands.[4] Consistent with clustering results we synthesized numerous trialkylphosphine-derived bromine-bridged Ni(I) dimers containing ligands of which the majority has never been used in Ni-catalysis. Moreover, we explored their potential in catalysis and showcase the iodo-selective arylation in polyhalogenated arenes in less than 5 min at r.t. using only 0.2 mol% catalyst loading. Such reactivity and selectivity are unprecedented for alternative mononuclear or dinuclear Ni and Pd catalysts.



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Catalyst-Free Difunctionalization of Alkenes with Halogenated Hydroxylamine Derivatives: New synthetic Route toward Complex *N*-Heterocycles

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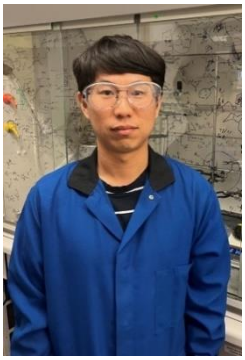
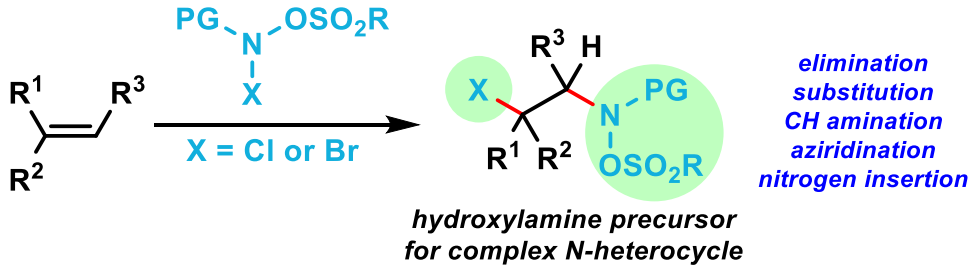


Young Do grew up in Cheonan, South Korea. He received his B.Sc. in Applied Chemical Engineering from KOREATECH, South Korea in 2014. Later received his M.Sc. in Medical Sciences from Jeonbuk National University, South Korea in 2016 under the supervision of Dr. Hee-Kwon Kim. From 2017 to 2020, he worked on radiofluorination method developments in the laboratory of Dr. Joong-Hyun Chun at Yonsei University. In the Fall of 2020, he began his graduate studies at Rice University in the Kürti lab, where he is currently working on the development of an alkene difunctionalization methodology with halogenated hydroxylamine derivatives.

Abstract:
N-Alkyl *O*-activated hydroxylamines are powerful reagents that can form C–N bonds to produce secondary anilines or *N*-alkyl aziridines. Few strategies including the Mitsunobu reaction have been employed to prepare *N*-alkyl *O*-activated hydroxylamines. In this work, *N*-alkyl *O*-activated hydroxylamines are prepared through the difunctionalization of alkenes using *N*-halogen *O*-activated hydroxylamines. Both activated and unactivated alkenes were successfully transformed to their corresponding difunctionalized products containing the halogen and the *O*-activated hydroxylamine moiety. Moreover, further functionalization of the prepared *N*-alkyl *O*-activated hydroxylamines reveals their synthetic potential to access complex nitrogen-heterocycles.



Catalyst & additive-free / difunctionalization / mild conditions / high atom economy

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Design and Synthesis of Novel Pegylated Viologens for Applications in Aqueous Organic Redox Flow Battery (AORFB)

Calvine Lai, Alizée Debiais, Thomas Boulanger, Louis Hamlet, Dominic Rochefort and Hélène Lebel

Université de Montréal, Département de Chimie, Montréal, Québec, Canada

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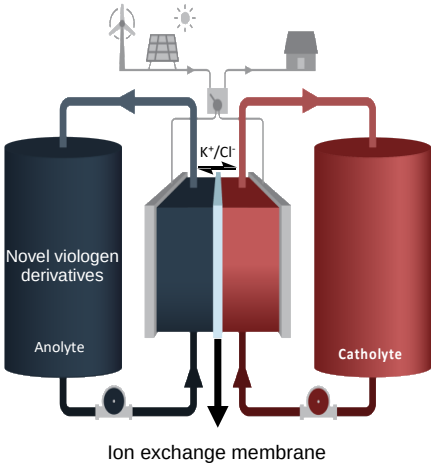
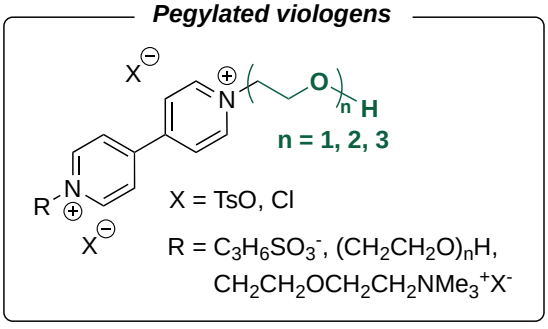
Calvine Lai earned a Master's degree in Chemistry from École Nationale Supérieure de Chimie de Lille (ENSCL) in France. She went on to pursue her doctoral studies at the Université de Montréal, where she worked under the supervision of Prof. Hélène Lebel on the development of nitrene transfer reactions with iron complexes. In 2022, she joined Prof. Hélène Lebel and Prof. Dominic Rochefort as a research associate focusing on the synthesis of organic electrolytes for aqueous organic redox flow batteries.

Abstract:

Aqueous organic redox flow batteries (AORFBs) are emerging systems for large-scale renewable energy storage. These systems store electricity by harnessing the electrochemical reactions of organic molecules in an aqueous solvent, offering better safety and renewability than traditional RFBs such as vanadium or Zn–Br_2 RFBs. Nevertheless, creating highly water-soluble molecules with good physical properties and long-term cycling stability remains challenging. We synthetized various pegylated viologens, with different chain lengths, counterions and symmetries and analyzed their physical and electrochemical characteristics, such as solubility, viscosity, redox potential, and reaction rate. Remarkably, PEG2-BPy-PEG2 $2Cl^-$ manifested excellent chemical stability and cycling performance with a very good daily capacity retention of 0.3% for 1 M solution over 12 days, showing the relevance of PEGylation in the design of electroactive molecules in AORFBs.





✓*Synthesis on 150 mmol scale* ✓*High solubility in water (up to 2.7 M)* ✓*Excellent cycling performance*

Lignin as a Source of Chemical Feedstocks: Structural Analysis of Boron Trihalide Mediated Low-Crosslinked Lignin from Sawdust

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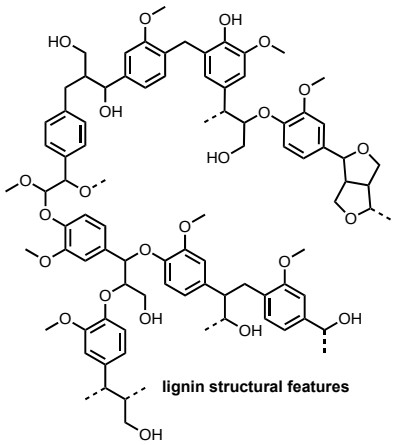
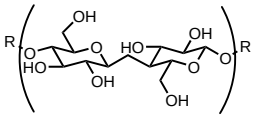
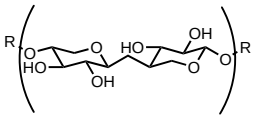
Theodora obtained her B.S. in chemistry and minor in mathematics at the University of Missouri-Columbia and is now pursuing her PhD a at The University of Iowa under the guidance of Professor Florence Williams, where her research involves using boron Lewis acids to facilitate regioselective and chemoselective cleavage of strong C–O bonds. While waiting for her reactions to go to completion, Theodora enjoys baking sweets and then eating them all at once, running, and reading (for business and pleasure).

Abstract:

Lignocellulose is the structural component of all plant cell walls. As a result, the three components of lignocellulose– lignin, cellulose, and hemicellulose– are the most abundant biopolymers on the planet, and therefore an important resource for sustainable aromatic feedstocks (currently derived from petroleum sources).[1] The Williams Lab has discovered a method of using boron Lewis acids to selectively cleave ether bonds by using an equimolar mixture of BBr_3 and BCl_3.[2] Upon subjecting our lignocellulose sample to this reaction, the polysaccharide components were efficiently extracted out, leaving a low-condensed lignin-rich solid without subjecting the lignin sample to high temperatures, oxidants, or concentrated Brønsted acids, all of which are problematic agents in lignin condensation which in turn mitigates depolymerization to access aromatic monomers.[3] Herein, we describe the development of our polysaccharide extraction method and compare the degree of condensation of our lignin to that of two distinct types of extraction procedures.[4]







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Direct Formation and Site-Selective Elaboration of Methionine Sulfoximine in Polypeptides

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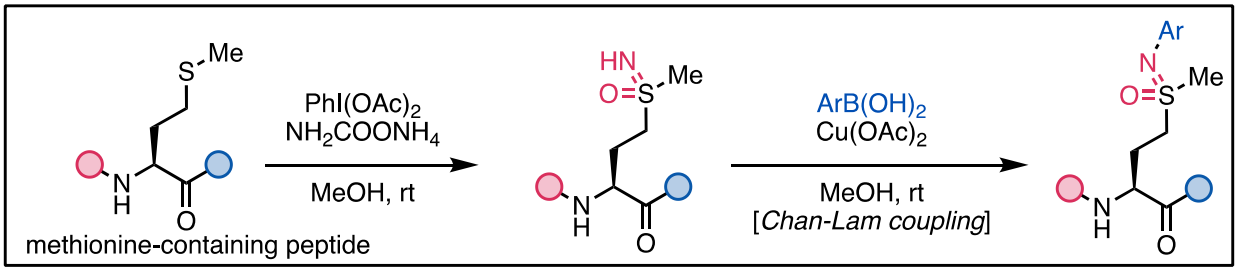
Alex grew up in the small, rural town of Ponca City, Oklahoma. He attended high school at the Oklahoma School of Science and Mathematics, where he was first exposed to the world of organic chemistry. He is currently studying chemistry as an undergraduate at Rice University and performing research in the Ball lab. Alex's research interests center around utilizing "iodonitrene" reactivity for selective peptide modification and the modular construction of nitrogen-containing aliphatic scaffolds. After graduating from Rice, Alex plans on obtaining a PhD in organic chemistry.

Abstract:

Post-translational modification of peptides and proteins has become a highly studied area with important applications to chemical biology, medicinal chemistry, and many other fields.[1] Methionine contains a unique thioether group that can be exploited through various reactions for selective modification. However, the bulk of reported methionine modifications rely on simple alkylation of its thioether with alkyl halides, epoxides, etc.[2], while modifications based on sulfur redox chemistry[3] have been largely unexplored. Inspired by reports of methionine sulfoximine (MSO) as an irreversible inhibitor of glutamine synthetase, we report the formation of MSO residues in complex peptides using $PhI(OAc)_2$ and NH_2COONH_4.[4] The sulfoximine is subsequently shown to be a competent bioorthogonal reactive handle in a Chan-Lam coupling with aryl boronic acids. Additionally, several MSO-containing peptides have been shown to be even more potent inhibitors of glutamine synthetase than free MSO.



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Concise Total Synthesis of Phaeocaulisin A

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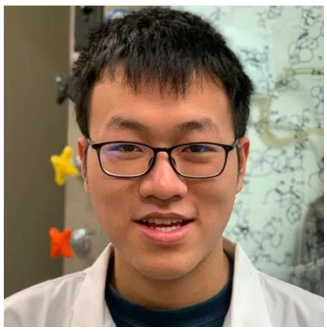
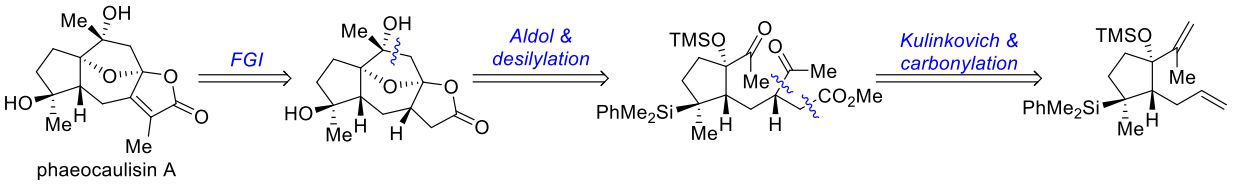


Chang Liu grew up in Wuhan, China. He received his B.S. in 2019 from Peking University, where he worked in Zhen Yang research group. In the fall of 2019, he began his graduate study at Purdue University in the Dai lab and has since worked on total synthesis of natural products. In 2022, the Dai lab including Chang moved to Emory University.

Abstract:

Phaeocaulisin A, first isolated from *Curcuma phaeocaulis* in 2013, is a sesquiterpene possessing a guainane-type skeleton with a unique acetal oxygen bridge. It shows promising inhibitory activity against NO production (IC_{50} = 1.5 μM) without significant cytotoxicity. [1] In 2022, Procter group reported the first total synthesis of (−)-phaeocaulisin A, the enantiomer of the naturally occuring one, in 17 steps (LLS). [2] We here present the total synthesis of phaeocaulisin A via a concise route (10 steps in total). Key features of this synthesis include an intermolecular Kulinkovich reaction, a newly developed palladium-catalyzed cyclopropanol ring-opening carbonylation, and a 7-membered-ring-forming Aldol reaction. We were also able to apply our carbonylation methodology in the preparation of various γ-keto esters.



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The Design and Synthesis of Novel Chiral 2,2'-Bipyridine Ligands

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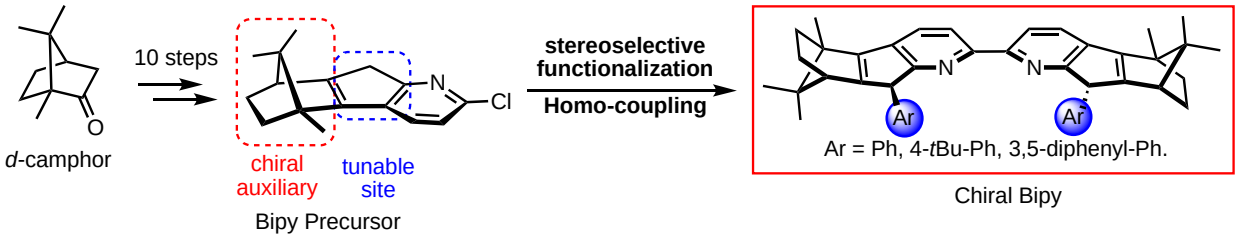
Chaolun Liu earned his B.S. in chemistry from Nankai University (Tianjin, China). He then pursued his graduate studies at the University of Hawai'i at Manoa, joining Prof. Marcus Tius' group. During his Master's program, Chaolun focused on developing a novel methodology for the preparation of (*Z*)-trifluoromethyl-trisubstituted alkenes. He continued his Ph.D. study with Prof. Tius and working on the design and synthesis of chiral bipyridine ligands.

Abstract:

The 2,2'-bipyridine ligand is one of the most commonly used ligands in coordination chemistry.[1] The development of new chiral bipyridine ligands is of great importance in synthetic chemistry.[2] The design and synthesis of a series of novel tunable camphor-derived chiral 2,2'-bipyridine ligands will be discussed.[3]



- **No Chiral Resolution**
- **Tunable at a Late Stage**
- **α-Aryl-Substituted Chiral Bipyridines**

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Radical Chlorination of Enediones Containing 4-aminoantipyrine Scaffold

Rafaela Santos Cunha Medeiros,[a,§] Ingridhy O. M. F. da Silveira,[a,§] Gabriela Gomes,[a,] Roberto Gomes[a]

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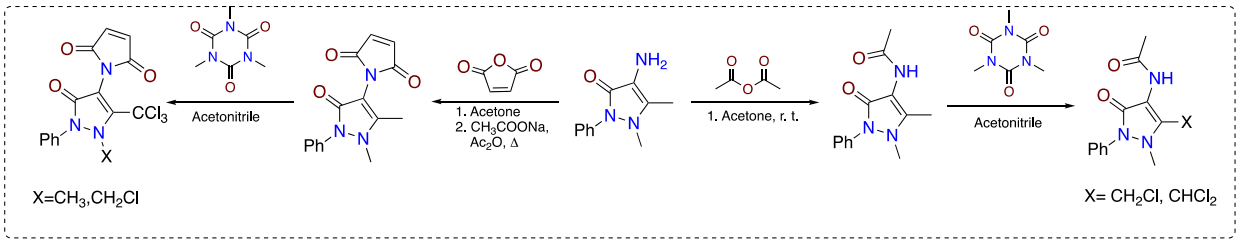
Rafa Medeiros grew up in Natal, Brazil. She has a Master of Public Health degree with emphasis in Infectious Diseases and is pursuing her doctoral degree in Cellular and Molecular Biology at the North Dakota State University. Her research interests include investigating hard-to-synthesize small molecules for biomedical use in Pancreatic ductal adenocarcinoma (PDAC), with hopes to discover novel therapeutics for this disease. She is starting her 3rd year in the PhD program this spring, where she plans to investigate in vitro and in vivo dynamics of several small molecules and further increase her knowledge in PDAC and its treatment options.

Abstract:

The compound 4-aminoantipyrine has been used as starting material in several syntheses, where modifications occur mainly in the amine group, substituent of the pyrazolone ring. Structures derived from 4-AAP coupled to the 1,4-dioxobutenyl group are compounds found with potential for future non-steroidal anti-inflammatory drugs. Encouraged by this biomedical potential, this research proposed to prepare of new chlorinated derivatives of 4-AAP using radical synthetic methods. To initiate transformations in the structure of 4-AAP, protection of the amine function was carried out, adding maleimide and acetylation protecting groups. The chlorination processes used on 4-AAP-protected substrates were tested at different temperatures using trichloro-isocyanuric acid as a source of chloride radicals. The temperature and ratio between trichloroisocyanuric acid and 4-AAP directly influenced the amount of radical substitutions in the production of mono, di, tri and tetrachlorinated products.



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Exploration of the reactivity of dinuclear metal complexes

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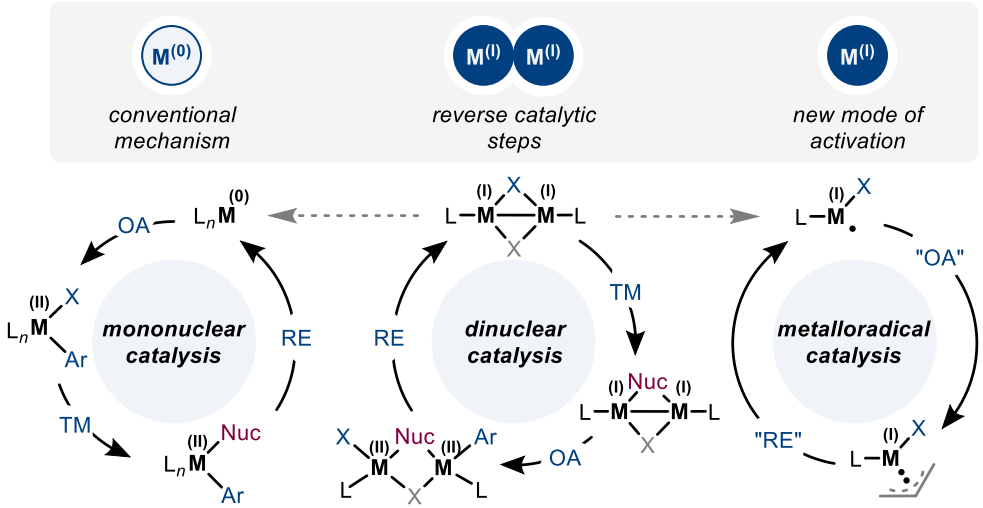
Email: marvin.mendel@rwth-aachen.de

Marvin is a PhD student at RWTH Aachen University in the Schoenebeck group and currently exploring the application of dinuclear M(I)-M(I) scaffolds as diverse (pre)catalysts in mononuclear, dinuclear and metalloradical catalysis. He grew up in Wangen im Allgäu, a small German town on the border to Austria and Switzerland, and a stunning view of the Alps. Marvin received his B. Sc. at Ulm University with Prof. G. Maas working on enantioselective cyclopropanation. He then joined RWTH Aachen University where he completed his M. Sc. in the group of Prof. F. Schoenebeck and subsequently started his PhD studies in May 2019.

Abstract:
Homogeneous metal catalysis has revolutionized modern organic synthesis. Traditionally, the vast majority of reported methods have focused on closed-shell two-electron processes involving mononuclear species, e.g. Pd(0)/Pd(II) cycles, while processes involving dimeric metal complexes in rather unusual oxidation states like Pd(I) have – by comparison – received much less attention.[1] This poster will discuss dinuclear as well as odd oxidation state metal catalysis to address important challenges in synthesis with particular emphasis on selectivity, mildness and speed.[2] Examples of privileged reactivity of the M(I) species will be showcased also and range from fully predictable, sequential functionalization of poly(pseudo)halogenated arenes to modular and iterative synthesis to vinylcyclopropanes and more.



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Stereoselective (NMP) in Iron-Catalyzed Multicomponent Cross-Coupling Reactions Enabled by Chiral Auxiliaries

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[b]Department of Chemistry, University of Rochester, United States.
[c]Inorganic Chemistry Laboratory, Department of Chemistry, University of Oxford, United Kingdom.

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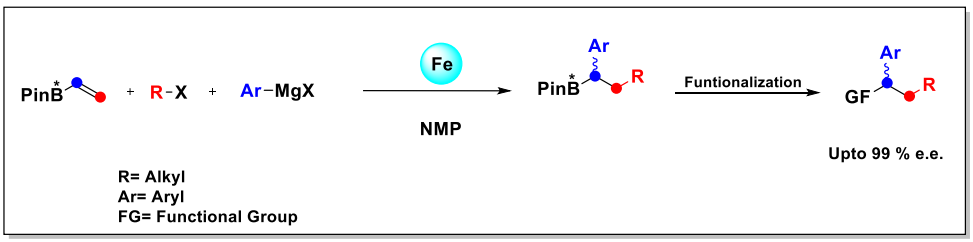
Poulami was born in West Bengal, India and was raised in Ukhra, a small town in West Bengal. She completed her Bachelor of Science (Chemistry) from Jadavpur University in 2020 and then completed her master's from IIT Guwahati in 2022 where she worked in transition metal free synthesis of aryl thioethers via ipso nucleophilic substitution reaction under the supervision of Prof. Bhubaneswar Mandal. In fall 2022, she joined Dr. Gutierrez's group where she is working on synthesis of multicomponent iron-catalyzed cross coupling reaction. She is also interested in working on applications of density functional theory to understand the reaction mechanism of organometallic and organic reactions as well.

Abstract:
Transition metal-catalyzed enantioselective cross-coupling reactions have emerged as a tool for the construction of chiral molecules. Moreover, the dicarbofunctionalization of olefins has been a hot topic for many synthetic chemists because it facilitates the editing of biologically important molecules. Nevertheless, due to the scarcity and toxicity of novel transition metals, earth-abundant and cost-effective iron catalysis has emerged as an attractive strategy for applications in the dicarbofunctionalization of olefins, especially in enantioconvergent cross-coupling reactions. In addition, although multicomponent reactions are widely employed in stereoselective synthesis, enantioselective iron-catalyzed multicomponent reactions are challenging because of the lack of in-depth mechanistic studies. Herein, I will describe our efforts to develop a highly enantioselective iron-catalyzed multicomponent dicarbofunctionalization reaction facilitated by the judicious choice of chiral auxiliary and N-methyl pyrrolidone (NMP). Also, I will explain the preliminary mechanistic studies and elucidate the origin of enantioselectivity and the role of NMP in this cross-coupling reaction.



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Studies Towards the Total Synthesis of *Ganoderma* Meroterpenoids

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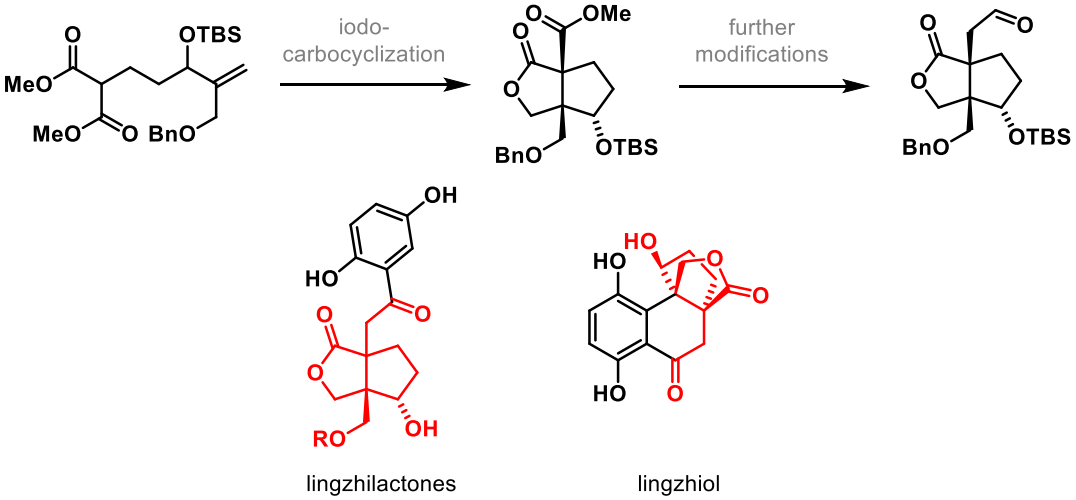
Nicolas Müller was born and raised in Oberkirch, a small village in southern Germany. He then moved to Munich to study Chemistry at the Ludwig–Maximilians University. For his Bachelor thesis he joined the group of Prof. Trauner to work on the total synthesis aplydactone, a sesquiterpenoid natural product. In 2018, he joined Prof. Sarpong´s group at the University of California in Berkeley for his Master thesis, working on the synthesis of the xishacorene natural products. Since 2021, he is a PhD student in the group of Prof. Magauer at the University of Innsbruck (Austria).

Abstract:

Ganoderma meroterpenoids are biologically active natural products, isolated from a wood decay fungus from the family *Ganodermataceae*. Structurally, these meroterpenoids contain a 1,2,4-trisubstituted benzene ring and a polyunsaturated terpenoid core structure. Owing to their structural complexity and their interesting biologically properties, meroterpenoids from the Ganoderma genus are attractive targets for total synthesis. Our synthetic strategy towards these natural products relied on a powerful diastereoselective iodocarbocyclization to form the terpenoid skeleton. With this general entry to the *Ganoderma* meroterpenoids, several members of this class could be accessed.



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Sequential Electrochemical/Photochemical Synthesis of Triazolopyrazines

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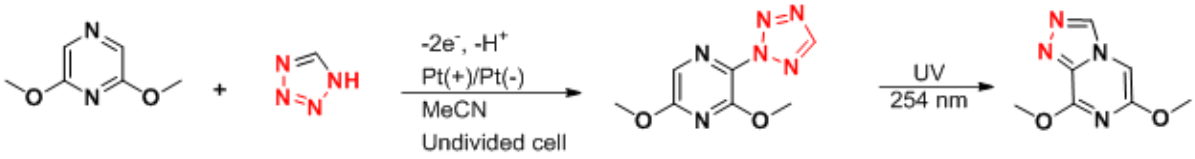
Email: dpiercey@purdue.edu

Dr. Davin Piercey received his PhD from the Ludwig Maximilian University of Munich in Germany in 2013 under the direction of Prof. Dr. Thomas M. Klapötke and his postdoctoral research at Los Alamos National Laboratory in New Mexico under Dr. David E Chavez. Since 2018 he has been faculty at Purdue University directing his research group on the synthesis of new energetic materials. He has published over 60 peer-reviewed papers and holds 5 patents and provisional patents. He has been devoted to the synthesis of new energetic materials for over 15 years. His research encompasses all areas of energetic materials synthesis from the development of new N-N bond forming reactions to the targeted synthesis of energetic compounds of desired properties.

Abstract:

1,2,4-triazolo-[4,3-a]pyrazine molecules were prepared via a two-step electrochemical, photochemical process. First, a 5-substituted tetrazole is electrochemically coupled to 2,6-dimethoxypyrazine to yield 1,5- and 2,5- disubstituted tetrazoles. Subsequent photochemical excitation of the 2,5-disubstituted tetrazole species using a dual-wavelength (254 nm and 265 nm) ultraviolet lamp releases nitrogen gas and a short-lived nitrilimine intermediate. Rapid cyclization of the nitrilimine intermediate yields a 1,2,4-triazolo-[4,3-a]pyrazine backbone. Materials produced were identified using chemical analytical techniques and computationally studied for potential application as an insensitive energetic material.



Polyene Cyclizations as a Powerful Tool for the Total Synthesis of Indole Sesquiterpenoid Alkaloids

Tobias Pinkert,[a] Immanuel Plangger,[a] Klaus Wurst,[b] and Thomas Magauer[a,*]

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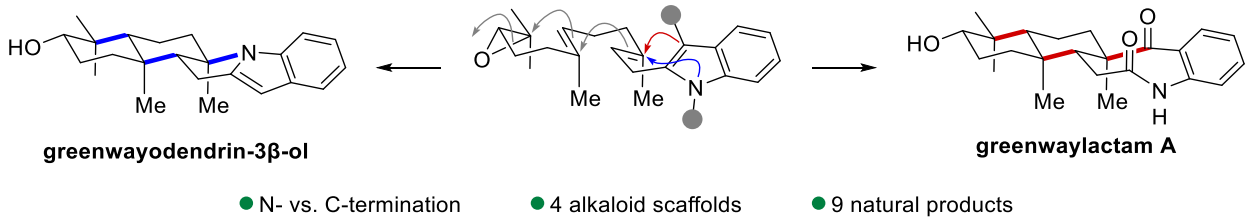
[b]Institute of General, Inorganic and Theoretical Chemistry, University of Innsbruck, Innrain 80–82, 6020 Innsbruck, Austria.

Email: tobias.pinkert@uibk.ac.at

Tobias Pinkert grew up in Menden, a small city in North Rhine-Westphalia, Germany. He studied Chemistry at the University of Münster including a six-month research stay in the group of Tom Maimone at the University of California, Berkeley, working on natural product synthesis. He then joined the group of Frank Glorius for his master and doctoral studies, where he developed novel methods in C–H activation and photochemistry. Currently, he is a postdoctoral researcher in the group of Thomas Magauer at the University of Innsbruck. His research there focuses on natural product synthesis.

Abstract:

Polyene cyclizations display a powerful strategy for the construction of polycyclic scaffolds in a single synthetic step.[1] Despite significant progress in the last decades, most examples feature carbon or oxygen terminating groups. We developed a bioinspired indole N-terminated tricyclization,[2] which enabled the divergent synthesis of greenwayodendrines and polysin. Variation of the cyclization precursor allowed to switch the termination mode from indole N to C3. In this case, subsequent Witkop oxidation converted the cyclopentene-fused indole into an eight-membered benzolactam moiety giving access to the greenwaylactam family of natural products.



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Bifunctional Iminophosphorane Catalyzed Amide Enolization for Enantioselective Cyclohexadienone Desymmetrization

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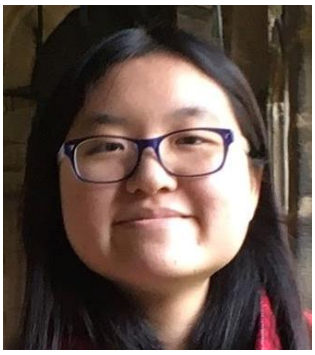
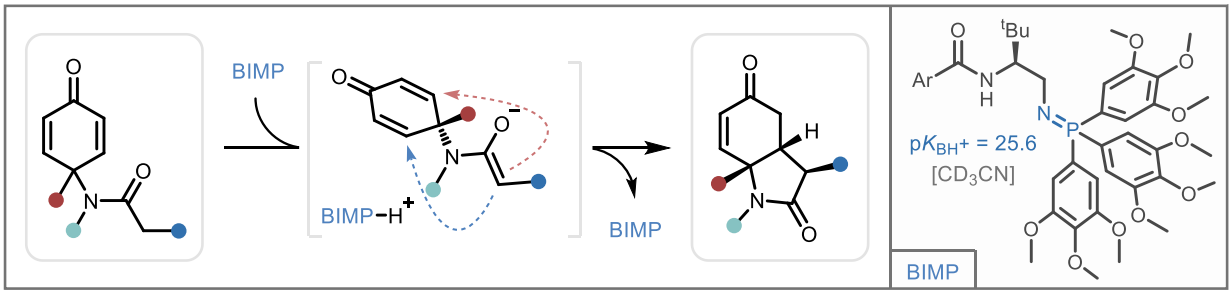


Charmaine Poh grew up in Singapore, moving to the UK in 2015 for her undergraduate studies at Imperial College London, graduating with a BSc in 2018. After a year working on peptide synthesis at A*STAR in Singapore, she joined the Dixon group at the University of Oxford for her graduate studies, where she is currently working on asymmetric organocatalysis with bifunctional iminophsophorane superbase catalysts. She is currently in her final year in the Synthesis for Biology and Medicine Centre for Doctoral Training (SBM CDT) on a scholarship funded by A*STAR Singapore.

Abstract:

We describe the organocatalytic enolization of 2-arylacetamides, followed by an enantioselective intramolecular conjugate addition to tethered 2,5-cyclohexadienones, yielding 3D fused N-heterocycles. The transformation represents the first nucleophilic activation of carboxamides via α-C–H deprotonation in a metal-free, catalytic, and enantioselective reaction, and can be achieved by employing a bifunctional iminophosphorane (BIMP) superbase catalyst.

With an amide-based BIMP catalyst, we have achieved the formation of enantioenriched 3D fused N-heterocycles using amide-tethered cyclohexadienones in high yields, diastereomeric and enantiomeric ratios of up to 99:1. We have expanded the substrate scope with variations at 4 different positions on the substrate, with 20 examples. With a gram-scale synthesis of a substrate, we have also performed a series of transformations on this product to demonstrate its synthetic utility.



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Visible-light-induced Enantioselective Radical Cross-Coupling of Alkyl-Zr

Songlin Bai[a], Yadong Gao[a], Chao Yang[a], Xiangbing Qi*[a]

[a]National Institute of Biological Sciences, Beijing

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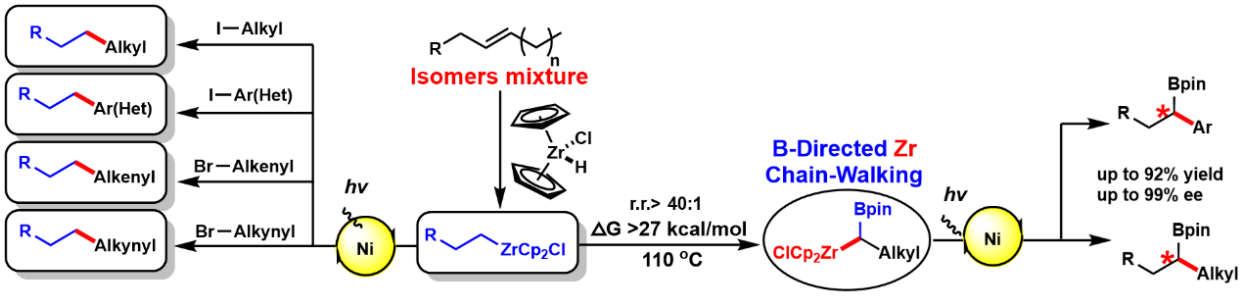
Dr. Qi obtained his PhD in Chemistry and Biochemistry from UT Southwestern Medical Center, Dallas in 2009. After postdoctoral training at the University of Illinois Urbana-Champaign and medicinal chemistry research at UT Southwestern Medical Center, Dr. Qi joined the National Institute of Biological Science (NIBS), Beijing in 2013 and currently is the associate PI and the Director of Chemistry Center. His research program mainly focuses on the interface of synthetic chemistry, chemical biology and medicinal chemistry.

Abstract:

Cross-coupling involving sp3-hybridized carbon nucleophiles has become one of the most powerful methods for the synthesis of C(sp3)-enriched three-dimensional (3D) structures, which are essential scaffolds for pharmaceuticals, agrochemicals, and functional materials. Although sp2-hybridized organometallic compounds are widely employed in cross-couplings, sp3-hybridized organometallic coupling partners are less developed. We recently developed a visible-light-induced single nickel-catalyzed C(sp3)–C(sp3), C(sp3)–C(sp2), and C(sp3)–C(sp) cross-coupling reactions using alkylzirconocenes. In addition, a zirconocene-based alkyl organometallic reagent is rarely applied in asymmetric transformations due to the conventional sterically hindered two-electron transmetalation of alkylzirconocene. We discovered a mechanistically distinct single-electron transmetalation-based asymmetric strategy to synthesize chiral borane compounds, which are highly valuable and versatile building blocks in chemical synthesis. The alkyl radical generated from alkylzirconocene via photolytic homolysis has been demonstrated for the first time in an enantioselective cross-coupling and is expected to enable new opportunities for the use of alkylzirconocene in asymmetric synthesis.



Visible-Light-Induced Cross-coupling of Alkyl-Zr

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Asymmetric Total Synthesis of Tetrodotoxin and 9-epiTetrodotoxin

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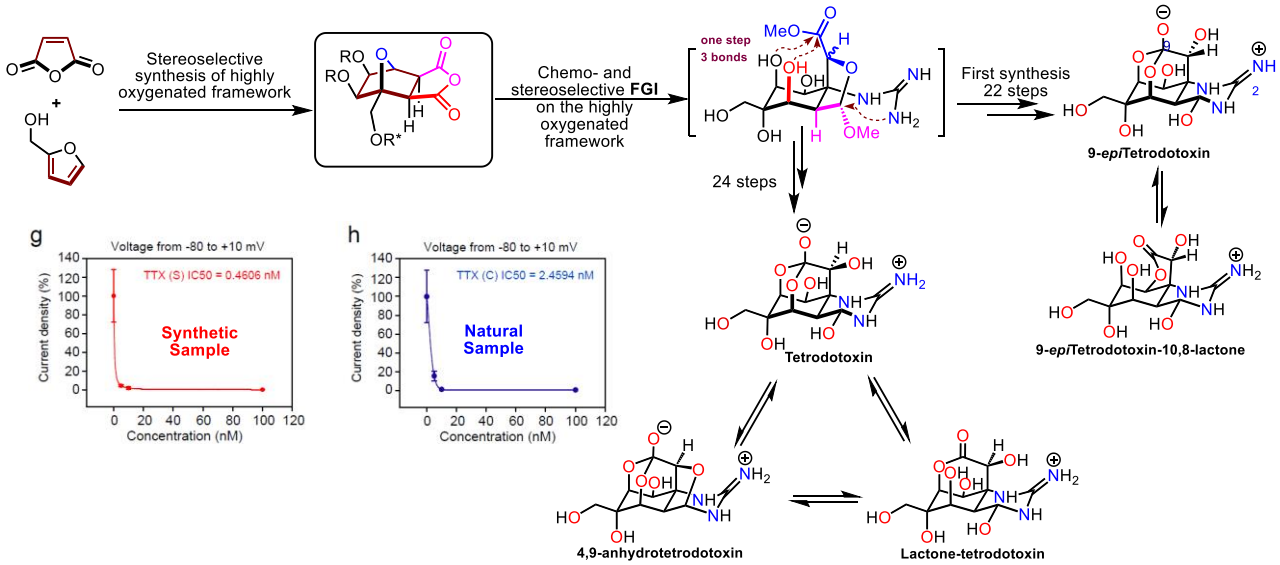
Dr. Qi obtained his PhD in Chemistry and Biochemistry from UT Southwestern Medical Center, Dallas in 2009. After postdoctoral training at the University of Illinois Urbana-Champaign and medicinal chemistry research at UT Southwestern Medical Center, Dr. Qi joined the National Institute of Biological Science (NIBS), Beijing in 2013 and currently is the associate PI and the Director of Chemistry Center. His research program mainly focuses on the interface of synthetic chemistry, chemical biology and medicinal chemistry.

Abstract:

As a specific blocker of voltage-gated sodium channels, Tetrodotoxin (TTX) has exhibited remarkable anesthesia and analgesic effects in clinical and represents one of the promising non-opioid medications on pain-relief(or non-opioid pain medications). However, due to a lack of sufficient materials supply for clinical development, tremendous efforts have been devoted to the chemical synthesis of TTX. The fascinating dioxa-adamantane structure with an unprecedented ortho acid and a cyclic guanidinium hemiaminal enables TTX to be attractive while challenging synthetic target. In this poster, I will present the efficient and practical synthesis of TTX wherein the highly heteroatoms-substituted and pseudo-symmetric carbocyclic skeleton was assembled via a stereoselective Diels-Alder reaction and a symmetry-broken strategy. Controllable functional group interconversions were condensely enforced during the stereoselective installation of heteroatoms on the critical chiral centers and guaranteed a scalable total synthesis.



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[1] Peihao Chen, Jing Wang, Yan Wang, Xiangbing Qi*, DOI:10.26434/chemrxiv-2023-76wll-v2

Regioselective Fluoroalkylarylation of Enamides Enabled by an Iron-Catalyzed Multicomponent Radical Cross-Coupling Strategy

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[§]These authors contributed equally to this work

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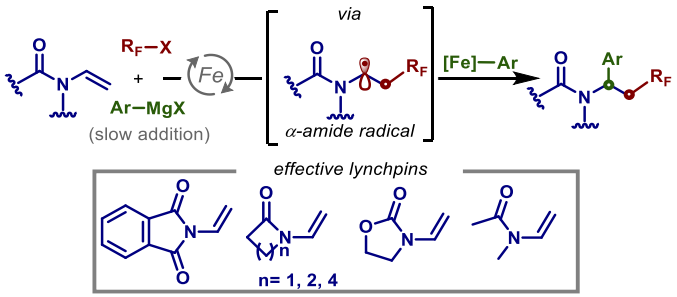
Dr. Ángel Rentería-Gómez was born and raised in Guanajuato, México. He did his bachelor's in chemistry, pharmacy, and biology at Guanajuato University. He pursued doctoral studies in Prof. María del Rocio Gámez-Montaño group at the same university. His doctoral work focused on isocyanide-based multicomponent reaction (I-MCR) and mechanistic studies using DFT with the co-advisory of Prof. Jose Oscar Carlos Jimenez-Halla. In his final year of doctoral studies, Dr. Rentería completed a research internship under the guidance of Professor Jieping Zhu at EPFL-LSPN (École Polytechnique Fédérale de Lausanne-Laboratory of Synthesis and Natural Products) in Lausanne, Switzerland. During this time, he focused on developing MCR methodologies and using iron as a catalyst for the azidation of benzylic positions. He obtained his PhD in May 2019 (Honor: "summa cumme laude"). As a Fulbright-García Robles scholar and later as a postdoctoral research associate, he joined Dr. Gutierrez's team in January 2021, where he currently works on computational research and iron-catalyzed cross-coupling reactions.

Abstract:

Fluoroalkylated compounds are important entities in agrochemicals, pharmaceuticals, and materials. The catalytic dicarbofunctionalization of alkenes represents a powerful strategy for rapidly constructing and diversifying compounds. In this vein, multicomponent cross-coupling reactions (MC-CCR) can provide an efficient synthetic route to build molecular complexity. This work reports the first iron-catalyzed three-component fluoroalkylarylation of enamides via selective formation and trapping of α-amide radicals under mild conditions and fast reaction times. The reaction tolerates a variety of commercially available aryl Grignard reagents and fluoroalkyl halides. Finally, using a removable phthalimido group provides an efficient strategy to prepare highly valuable γ-difluoroalkylated amines.[1]



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Diastereoselective Synthesis of α–Bromo *N*–Alkoxy β–Lactams from α,β-Unsaturated Silyl Imino Ethers

Agustin M. Rodriguez Treviño,[a] Sanjay Pandiri,[a] Pierre Loch-Temzelides,[a] Justin K. Kirkland,[b] Michael T. Davenport, [b] Ulises Aguinaga,[c] Muhammed Yousufuddin,[c] Daniel Ess,[b] László Kürti*[a]

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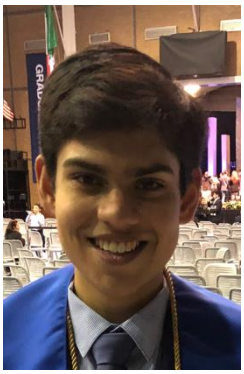
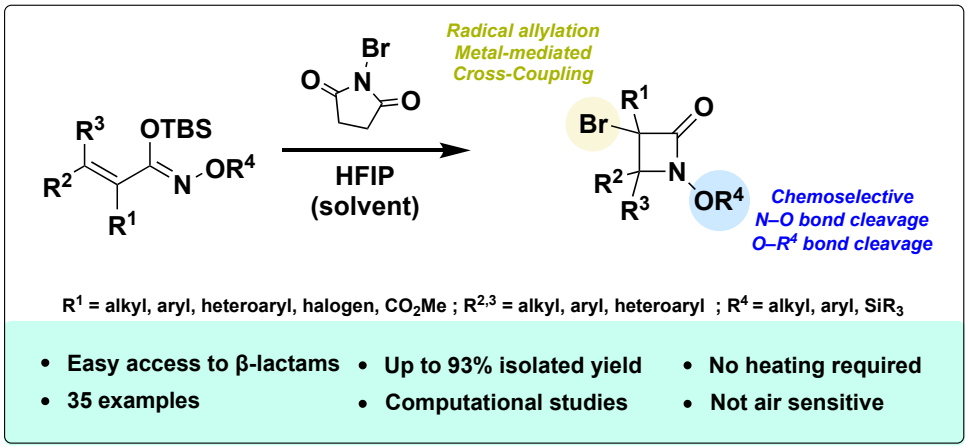


Agustin Rodriguez grew up in Monterrey, Nuevo León, México. He did his undergraduate studies in Tecnológico de Monterrey (ITESM) where he obtained his B.Sc. in Nanotechnology and Chemical Sciences Engineering. His senior year he worked in CINVESTAV-Mexico in Dr. Eusebio Juaristi's group developing new mechanoenzimatic methods for the kinetic resolution of pharmaceutically active compounds. Since the Fall of 2020, he began his graduate studies at Rice University in the Kürti lab, where he has worked on the development of green transfer hydrogenation reactions and currently on new methods for the synthesis of highly strained nitrogen heterocycles. contact: amr23@rice.edu

Abstract:

The synthesis of the β–lactam motif containing both C–Br and N–O bonds as synthetic handles remains challenging. Described herein is a novel diastereoselective NBS–mediated cyclization of α,β–unsaturated silyl imino ethers to afford α–bromo *N*–alkoxy β–lactams. The reaction gives convenient access to a wide range of monocyclic, spirocyclic and fused β–lactams in moderate to good yields. The synthetic handles have been demonstrated to be useful for the further functionalization of the β–lactam core.



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Catalytic Asymmetric Pictet-Spengler Reactions toward Tetrahydroisoquinolines

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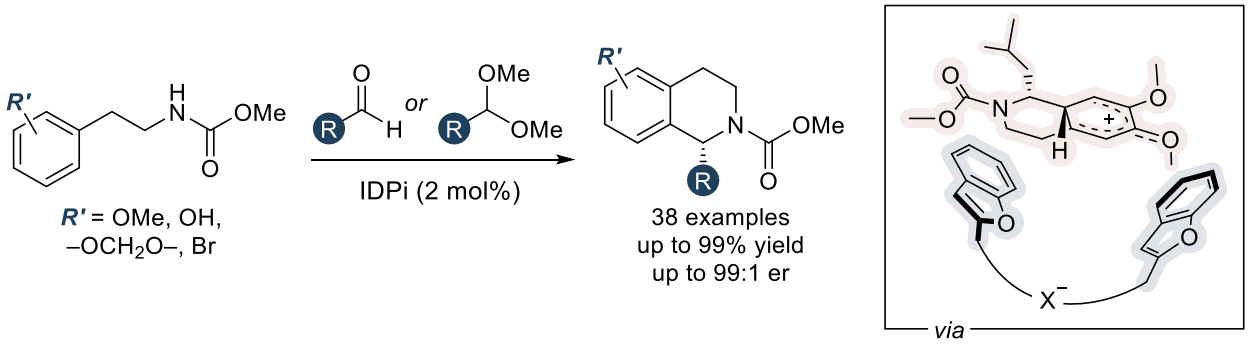
Manuel was born in Hannover, Germany, where he also pursued is Bachelors and Masters Education with a focus on medicinal and natural product chemistry. During a stay in the Trost group at Stanford University for his Master's thesis, Manuel decided to develop his career in the field of asymmetric catalysis. He moved to Mülheim an der Ruhr, to pursue a PhD with Benjamin List and completed his graduate studies in September 2023. His research focuses on the design and application of novel Brønsted acid organocatalysts for the asymmetric synthesis of naturally occurring alkaloids.

Abstract:

Electron-rich heteroaromatic imidodiphosphorimidates (IDPis) catalyze the asymmetric Pictet-Spengler reaction[1,2] of *N*-carbamoyl-β-arylethylamines with high stereochemical precision.[3] This particular class of catalysts furthermore provides a vital rate enhancement compared to related Brønsted acids. We present studies on the underlying reaction kinetics to shed light on the specific origins of rate acceleration. Based on the experimental evidence, we propose that cation-π interactions[4,5] allow for enthalpic stabilization of cationic intermediates and transition states by way of attractive electrostatic forces offered by the electron-rich π-surfaces in the chiral counteranion.[6] Our deepened understanding of the reaction mechanism allowed us to develop an improved reaction protocol for accessing 1-aryl tetrahydroisoquinolines from aromatic dimethyl acetals, a substrate class that was thus far unattainable in catalytic asymmetric Pictet-Spengler reactions.



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Total Syntheses of (-)-Scabrolide A and Yonarolide

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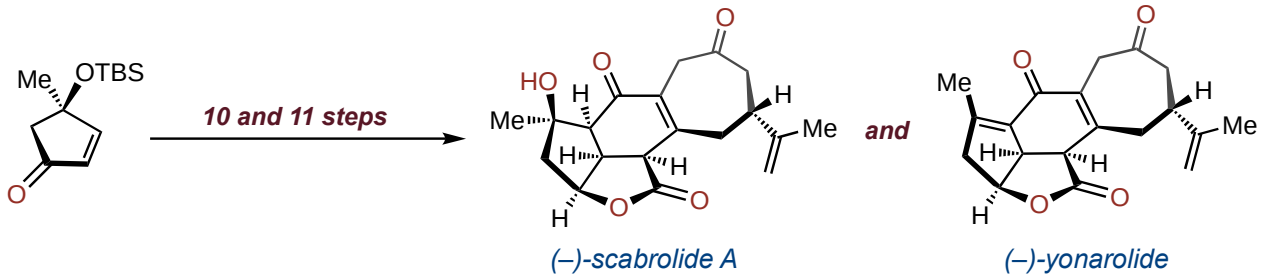
Roberto Serrano grew up in Hialeah, Miami, Florida. He obtained his B.Sc. in Chemistry at the University of Florida under the guidance of Professor Alexander Grenning. During this time, he performed studies on the reductive Cope rearrangement for the synthesis of complex terpenoid scaffolds. Since the Fall of 2020, he began his graduate studies at the University of Illinois, Urbana-Champaign in the Sarlah lab. He is currently engaged in the total synthesis of complex natural products.

Abstract:

The concise total syntheses of oxidized norcembranoid terpenoids (−)-scabrolide A and (−)-yonarolide have been accomplished in 10 and 11 steps, respectively. The carbocyclic skeleton was efficiently constructed from two chiral-pool-derived fragments, including a [5,5]-bicyclic lactone accessed through a powerful Ni-catalyzed pentannulation of functionalized cyclopentenone with methylenecyclopropane and subsequent fragmentation. Additional features included a Liebeskind–Srogl coupling, induction of a cyclization/elimination cascade by a zinc-amido base, and installation of a sensitive enedione motif by late-stage γ-oxidation.



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Enigmatic Enzymatic Natural Product Dimerization

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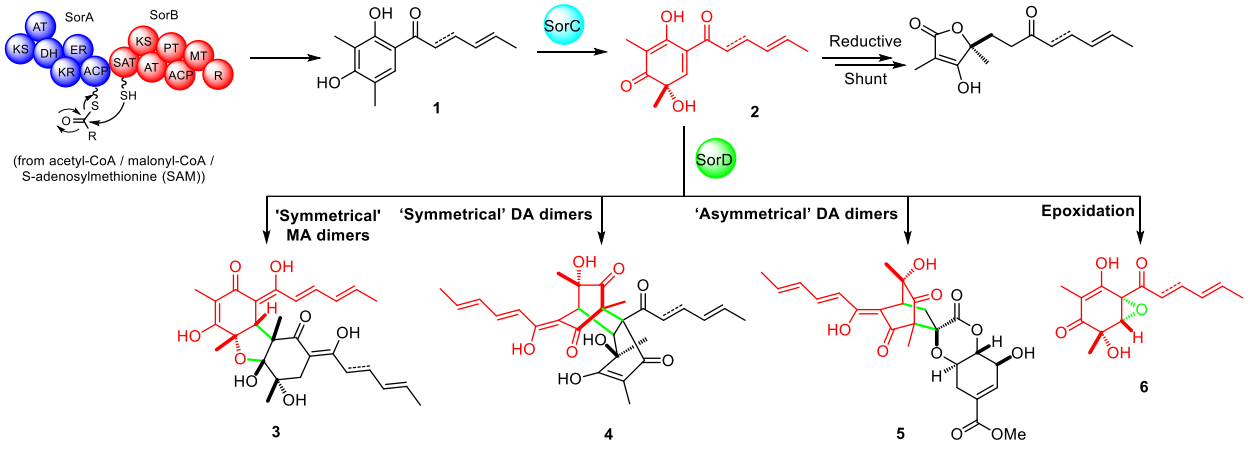
Elizabeth Skellam grew up near Liverpool, United Kingdom (U.K.). She obtained an MChem in Chemistry from Swansea University (U.K.), a PhD from the University of Bristol (U.K.), and an MBA from the University of North Carolina Wilmington (UNCW; U.S.A.). She did postdocs at UNCW and Leibniz University Germany. She began her independent career at University of North Texas (UNT; U.S.A.) in Fall 2020 where she investigates natural product biosynthesis in fungi.

Abstract:

Natural products from plants and microorganisms have revolutionized human medicine with one third of FDA-approved drugs being derived from natural sources [1]. Over 600 dimeric natural products are known and dimerization is thought to be Nature's strategy to rapidly increase chemical complexity, structural diversity, and induce a more significant biological response in their target compared to the monomeric equivalent [2]. We recently discovered the first example of flavin-dependent monooxygenase (FMO; SorD) capable of *catalyzing intermolecular [4+2] dimerization* during our investigating into bisorbicillinoid biosynthesis [3,4]. Here we are utilizing theoretical and experimental investigations to investigate FMO dimerases from fungi.



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Preparation of Spirocyclic Vinylic Carbonates from Allylic Alcohols

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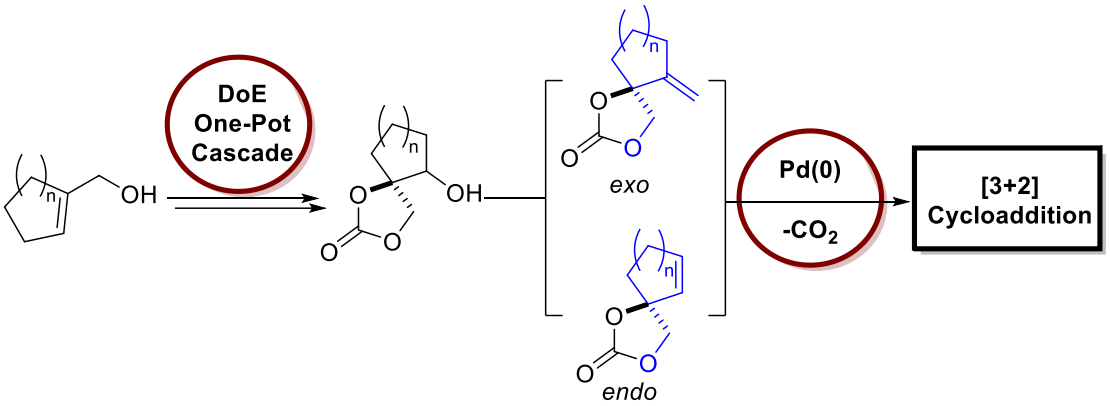
Christopher Topp grew up in the 'Goethe-city' Wetzlar, Hesse, Germany. He did his studies at the Justus-Liebig University Giessen where he obtained his B.Sc. and M.Sc. in chemistry under the guidance of Prof. Peter R. Schreiner, developing photoswitchable organocatalysts for regioselective acylation reactions. In 2019 he began his doctoral studies at the Justus-Liebig University Giessen, also in the group of Prof. Schreiner, where he continued his work on photoswitchable catalysis, as well as developing new spirocyclic carbonates for Pd-catalyzed decarboxylative formal cycloaddition reactions.

Abstract:

We present the synthesis of *exo*- and *endo*- spiro-vinyl ethylene carbonates (*s*-VECs), starting from various cyclic allylic alcohols. The one-pot cascade reaction to the spirocyclic scaffold was optimized using a Design of Experiments approach. The introduction of spiro-vinyl ethylene carbonates broadens the scope of Pd-catalyzed decarboxylative formal cycloaddition reactions and provides an easy synthetic entry into spirocyclic scaffolds of various ring sizes.



● DoE optimized, cheap construction of spirocycles ● Spirocyclic VECs ● Transferable spirocycles without olefin migration

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Photoinduced Decarboxylative Hydroxylation of Carboxylic Acids

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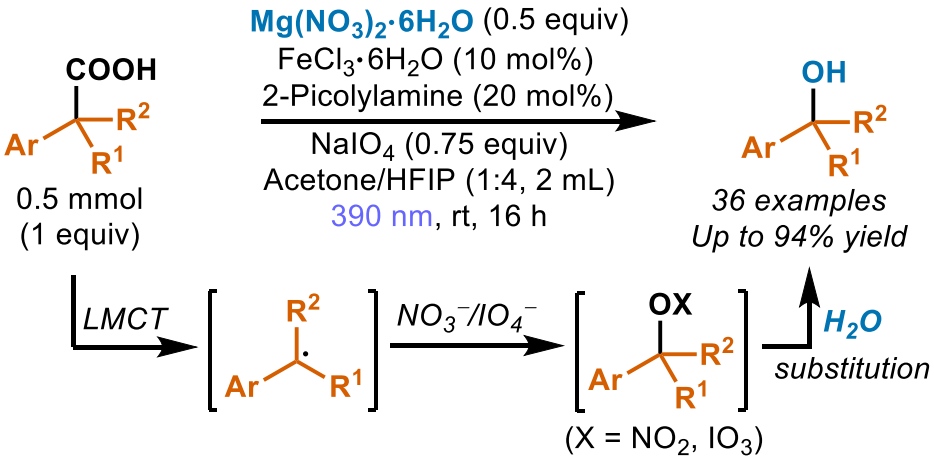
Hai grew up in the central highlands of Vietnam. He graduated from Ho Chi Minh City University of Science in 2014 with a B.Sc. in Chemistry. In 2017, he began his graduate studies with Professor Levi M. Stanley at Iowa State University. There he developed enantioselective hydrofunctionalization and arylative substitution reactions using nickel catalysts. He received his Ph.D. in 2022 and then joined Professor Julian G. West group at Rice University as a postdoctoral research associate. His current research focus is to develop new strategies for decarboxylative functionalization of carboxylic acids using iron catalysts.

Abstract:

Photoinduced decarboxylative hydroxylation is a promising method to access alcohol products under remarkably mild reaction conditions. Previous decarboxylative hydroxylation methods rely on a stepwise O_2 oxidation/$NaBH_4$ reduction sequence, or the use of an expensive Ru photocatalyst and organic hypervalent iodine oxidant, limiting the functional group compatibility and sustainability of these reactions. Here we present these challenges can be overcome using iron photocatalysis to drive decarboxylative hydroxylation of carboxylic acids in a single step using mild, sustainable reagents. Simply irradiating an inexpensive, air- and moisture-stable $FeCl_3{\cdot}6H_2O$ catalyst in the presence of $Mg(NO_3)_2{\cdot}6H_2O$ and $NaIO_4$ as a terminal oxidant allows various carboxylic acids to be converted to corresponding alcohols directly with broad functional group tolerance. Mechanistic studies are consistent with decarboxylation enabled by a ligand-to-metal charge transfer (LMCT) process, and the radical intermediate is initially trapped by NO_3^- and/or IO_4^- anions, followed by H_2O nucleophilic substitution to deliver the alcohol product.



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Enantioselective Electrochemical Cobalt-Catalyzed C–H Activation

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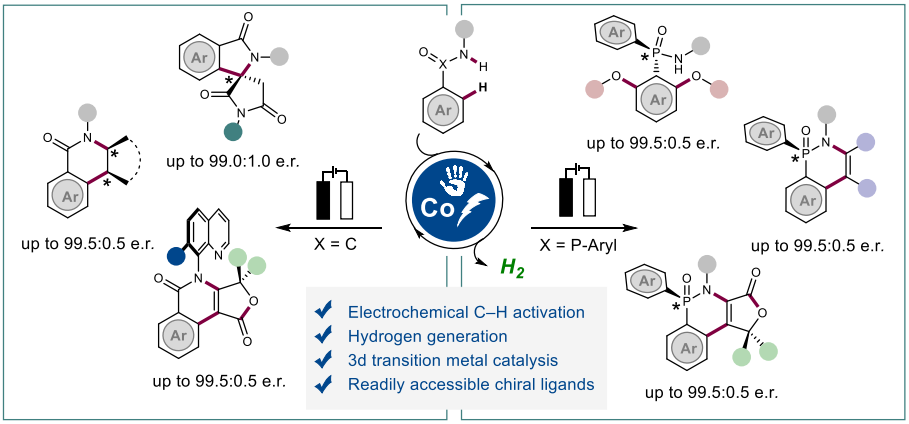
Tristan von Münchow was born in 1996, in Bayreuth, Germany. He received his bachelor's degree (B.Sc.) in Chemical and Environmental Engineering from TH Lübeck, Germany, and master's degree (M.Sc.) in Chemistry from Georg-August-Universität Göttingen, Germany. Since 2021 he is a Ph.D. student at the same university under the supervision of Prof. Lutz Ackermann. In 2022, he received the Kekulé-fellowship from the Fonds der Chemischen Industrie (FCI). His research interest is the enantioselective catalytic C–H bond activation through earth-abundant 3d transition metals.

Abstract:

In recent years, the merging of electrosynthesis with enantioselective C–H activation has evolved as a powerful and sustainable technique that enables the important hydrogen evolution reaction (HER) being paired to the synthesis of chiral valuable molecules. [1] This approach allows to perform oxidative transformations without the use of sacrificial stoichiometric oxidants. Further advantages in terms of sustainability and resource economy result from the use of catalysts based on earth-abundant transition metals instead of expensive 4d and 5d transition metals. [2] However, enantioselective electrochemical C–H activation through 3d transition metal catalysis represents a challenge and remained unexplored until very recently.

Herein, we describe strategies for enantioselective cobaltaelectro-catalyzed C–H activations that allow the synthesis of versatile chiral molecules. [3] Thus, the developed electrooxidative cobalt catalysis provides access to highly enantioenriched *C*-stereogenic, *P*-stereogenic as well as atropoisomeric molecules – key structural motifs in drugs and crop protection agents.



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Towards the Chemoenzymatic Total Synthesis of Nargenicin A1

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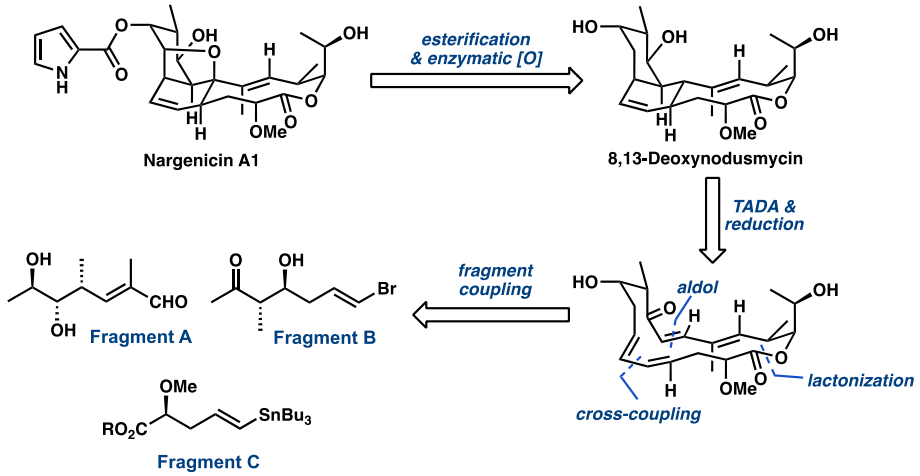
Nour grew up in Cairo, Egypt. In 2012, she immigrated to Toronto, Canada with her family. She earned her B.Sc. and M.Sc. from York University working under the supervision of Professor Arturo Orellana where she utilized palladium-catalysis for the lateral functionalization of alkylpyridines. She began her doctoral journey in the Renata group in the fall of 2020, where she now works on the total synthesis of the nargenicins leveraging the power of enzymes to develop an efficient route for the preparation of this family of antibiotics.

Abstract:

With rising antimicrobial resistance, there is now a dire need for antibiotics with new mechanism of action. The nargenicins are a family of structurally unique polyketide macrolides that exhibit narrow-range antimicrobial activity against *Staphylococcus aureus* and its methicillin resistant strains. They possess an intricate architecture, sharing a unique oxa-bridged *cis*-decalin core. Although total syntheses of three members of the family have been achieved previously, an efficient and scalable route to nargenicin A1 remains outstanding. We aim to simplify the preparation of nargenicin A1 by targeting a late-stage enzymatic oxidation to install the ether-bridge utilizing the dioxygenase native to its biosynthetic pathway. To access the requisite 8,13-deoxynodusmycin, we adopt a biomimetic transannular Diels-Alder cyclization to set the stereochemistry across the *cis*-decalin scaffold in one step. To date, the desired macrolide precursor has been enantioselectively prepared using contemporary polyketide chemistry and the key Diels-Alder cyclization has been successfully performed in 53-90% yield, setting the stage for the completion of our synthesis. We anticipate other family members and analogs could be accessed using this convergent and modular approach.



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Orienda Extremely Laconic Flash System (ELF)

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Sean Xue, Sales Manager of Orienda Instruments. Founded on December 8, 2017, Orienda specializes in automating liquid chromatography and fluid delivery/control systems, offering comprehensive solutions for various preparation, detection, and sample pretreatment requirements. Over the years, it has developed a wide range of innovative automation equipment and solutions, establishing a strong reputation in the industry. As a high-tech enterprise, Orienda excels in the research and development, design, manufacturing, and sales services of professional instruments and equipment.

Abstract:

Orienda instruments introduced the newly launched Extremely Laconic Flash (ELF) system at the venue. This system has transformed the traditional perception of previous equipment, which was seen as bulky, heavy, and expensive. By employing dual syringe pumps and an LED UV detector for continuous liquid delivery, the system's footprint has been reduced to just 2/3 the size of a standard letter paper. The instrument is equipped with various user-friendly automation features, including automatic flow rate control, automatic gradient generation, dynamic slope adaptation, and remote monitoring via Bluetooth connectivity, making it incredibly easy to use. Moreover, the system offers reserved slots that enable control over rotary valves, solenoid valves, peristaltic pumps, temperature regulation, analog signal input, and more. With these extensions, the device can serve as an integration platform for a wide range of automated equipment or reactors.

Tactics of Precision Synthesis with Harnessing Zirconocene

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Baihua Ye obtained his bachelor's and master's degrees at Ecole Polytechnique Federale de Lausanne (EPFL) in Switzerland. His Ph.D. research, supervised by Prof. Nicolai Cramer at EPFL, focused on creating chiral Cp ligands for asymmetric Rh-catalyzed C-H functionalizations. He further advanced his career as a postdoctoral researcher under Prof. F. Dean Toste at UC Berkeley in the United States, where he specialized in photo-driven chiral anion phase transfer catalysis. In 2019, Ye commenced his independent career as an assistant professor of organic chemistry at ShanghaiTech University.

Abstract:

The exploration of sustainable and user-friendly zirconocene in organic synthesis holds significant promise within the realm of medicinal chemistry. This presentation encapsulates two recent pivotal studies, concentrating on the precise assembly and subsequent modifications of biologically relevant heterocycles and oligomeric peptides ***(Fig. 1)***. In our first endeavor, we successfully identified zirconaaziridine-mediated Pd-catalyzed cross-electrophile couplings (ZAPd-XEC) as a groundbreaking method for constructing unsymmetrical biaryl and heteroaromatic scaffolds. Notably, the degree of cross-selectivity, reaching up to 99%, is intricately governed by the relative rate of oxidative addition of Pd(0) as the sole catalyst into the carbon-halide bonds *(1)*. Subsequently, we introduce a dual Zr-H catalysis, establishing a platform for regioselective reductive transaminations of oligomeric peptides *(2)*. The remarkable precision in controlling regioselectivities during the functionalization of amide motifs, coupled with excellent compatibility with various functional groups, underscores the immense potential of this approach in the synthesis of intricate and sophisticated molecules.

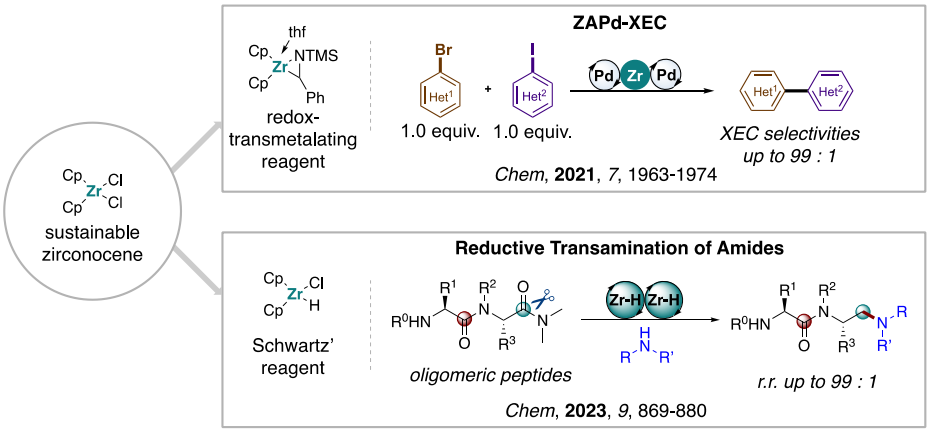

Figure 1: exploration of zirconocene in organic homogeneous catalysis.

References:

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(2) J.-T. Tang[§], Y. Gan[§], X. Li[§], **B. Ye*** Chem, **2023**, *9*, 869-880. ([§]contributed equally)

Oxidative Nitrogen Insertion into Silyl Enol Ethers

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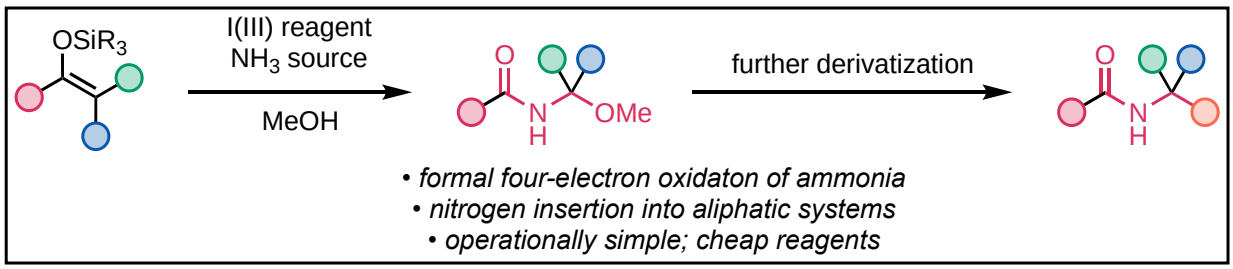
Born in New York City, Simon is a current junior at Rice University who has worked in the Kürti group since June 2022. His current research focuses on nitrogen insertion into silyl enol ethers. After graduating college, Simon plans on pursuing a PhD in organic chemistry.

For Alex's bio, see "Direct Formation and Site-Selective Elaboration of Methionine Sulfoximine in Polypeptides".

Abstract:
Nitrogen is one of the most important and common heteroatoms found in complex natural products, as well as pharmaceuticals and agrochemicals. Therefore, selective and mild methods for incorporating nitrogen into organic compounds are of great interest. Previous reports have utilized the combination of an iodine(III) reagent and an ammonia surrogate for the insertion of nitrogens into various aromatic scaffolds, such as indoles, pyrroles, and indenes.[1-3] However, nitrogen insertion into aliphatic systems still remains a challenge. Herein, we report our recent discovery of a novel oxidative nitrogen insertion into silyl enol ethers. Our method performs a formal 4-electron oxidation of ammonia, cleaving the C=C of the silyl enol ether in the process, to give a *N*-acyl-*N*,*O*-acetal. These products are versatile synthetic intermediates for further derivatization. The mechanism of this transformation will also be discussed.



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1,4-*syn*-Addition of Cyclic 1,3-Dienes *via* Hybrid Palladium Catalysis

Yan Liang,[a‡] Tiancen Bian,[a‡] Komal Yadav,[b] Qixin Zhou,[a] Liejin Zhou,[a] Rui Sun[b] and Zuxiao Zhang[b]

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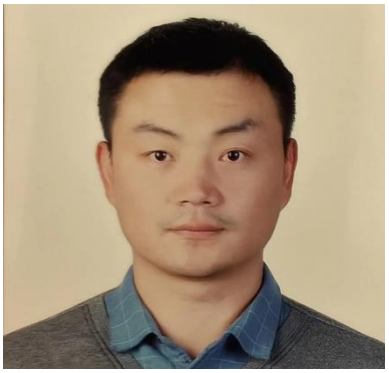
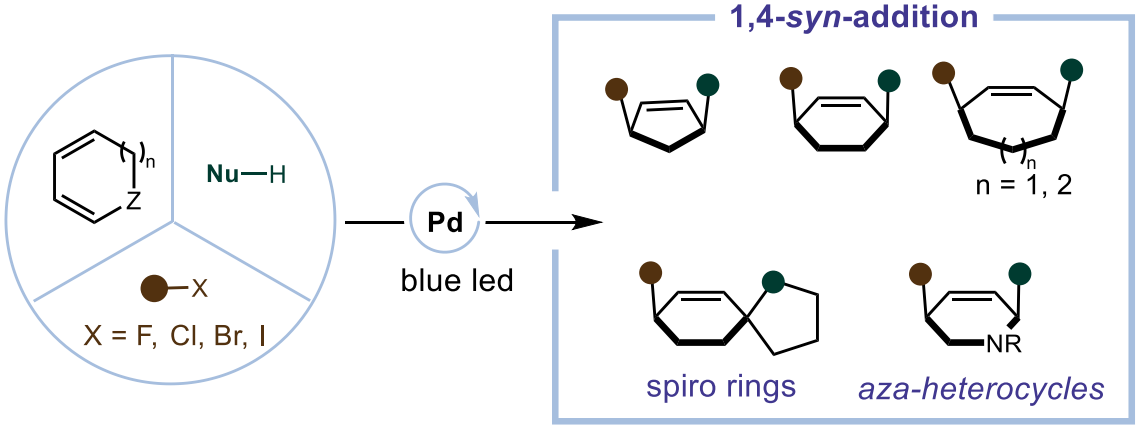


Zuxiao was born and raised in China, received a *Master of Science in Organic Chemistry* from SIOC under the supervision of Professor Guosheng Liu. In 2016, he obtained his *Ph.D.* at University of Florida under the supervision of Professor William R. Dolbier Jr. He then joined the Nagib group at the Ohio State University as a postdoctoral researcher. In 2021, he started his independent career at the Zhejiang Normal University. In September 2023 he moved to the Chemistry Department at University of Hawai'i at Mānoa.

Abstract:
1,4-*cis*-disubstituted cyclic compounds play a pivotal role in pharmaceutical development, offering enhanced potency and bioavailability. However, their stereoselective and modular synthesis remains a long-standing challenge. Here, we report an innovative strategy for accessing these structures via mild conditions employing cyclic 1,3-dienes/alkyl(aryl)halides and amines. This procedure exhibits a wide substrate scope that tolerates various functional groups. The utility of this method is demonstrated in the efficient synthesis of a TRPV6 inhibitor, CFTR modulator and other bioactive molecules. Combined experimental and computational studies suggest that the hybrid palladium-catalyzed radical-polar crossover mechanism is crucial for achieving the exceptional 1,4-syn-addition selectivity (dr > 20:1).



References

[1] Li, Y.; Li, Y.; Shi, H.; Wei, H.; Li, H.; Funes-Ardoiz, I.; Yin, G. *Science*. **2022,** 376, 749-753.
[2] (a) Huang, H.-M.; Bellotti, P.; Glorius, F.; *Chem. Soc. Rev.*, **2020**, *49*, 6186-6197. (b) Lu, F.-D.; He, G.-F.; Lu, L.-Q.; Xiao, W.-J. *Green. Chem.* **2021**, *23*, 5379–5393. (c) Wang, P.-Z.; Xiao, W.-J.; Chen, J.-R.; *Chin. J. Catal.* **2022**, *43*, 548–557.

Synthesis of Therapeutic Species in Living Systems for Cancer Treatment

Yanli Zhao[a]

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Dr. Yanli Zhao currently holds the Lee Soo Ying Professorship from Nanyang Technological University (NTU), Singapore. His group conducts research in an interdisciplinary area of chemistry, functional materials, and biomedical engineering with an emphasis on the design and synthesis of integrated systems for targeted diagnostics and therapeutics as well as for green energy and sustainable catalysis.

Abstract:

Living systems are abundant with a wide variety of polymerizations, e.g., the biological polymerization of monosaccharides, amino acids, nucleotides, and fatty acids, to constitute the elementary components, confer essential functionalities, and modulate the biological process. Achieving artificial synthesis in living systems still encounters certain problems, including the requirement of high concentration of monomers, the existence of complicated intracorporal interferences, and the demand for extra external stimulations. In our work, a nanocompartment-confined strategy, providing a confined and secluded environment for monomer enrichment and isolation, is developed to achieve high polymerization efficiency, reduce the interference from the external environment, and realize broad-spectrum polymerizations in living systems. With the interference of fresh cell supernatant, the activity of polymerization rate is maintained in the nanocompartment-directed group. Moreover, the product of an endogenous oxidative polymerization can harvest light to produce heat to ablate the tumor cells and activate effective photoacoustic imaging-guided photothermal immunotherapy.[1] In addition, we have also carried out the preparation of functional materials using bacteria support.[2]

References:

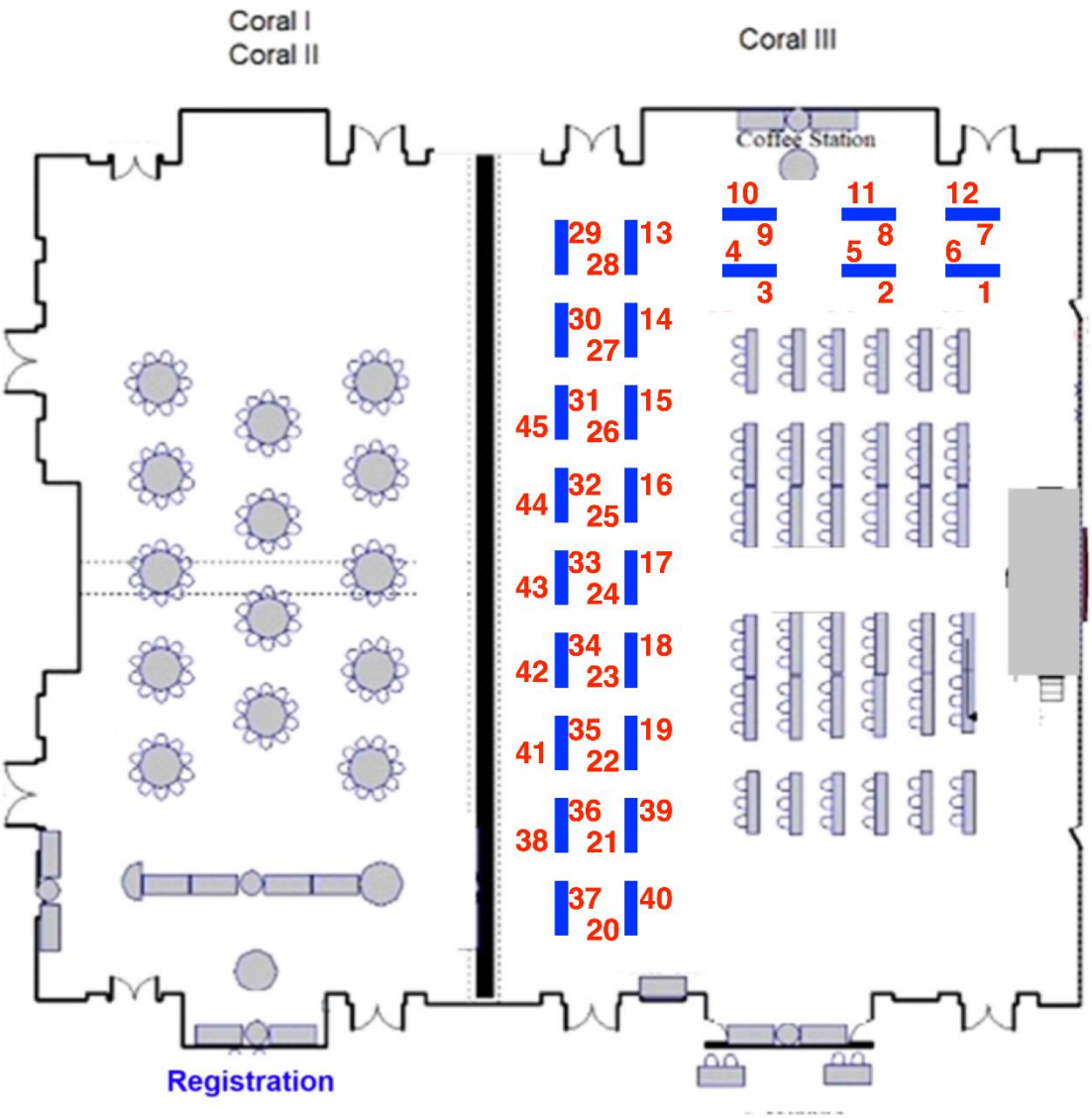
[10 Chen, Y.; Zuo, M.; Chen, Y.; Yu, P.; Chen, X.; Zhang, X.; Yuan, W.; Wu, Y.; Zhu, W.; Zhao, Y. L. Nat. Commun. **2023**, 14, 5229.

[2] Wang, D.; Liu, J.; Wang, C.; Zhang, W.; Yang, G.; Chen, Y.; Zhang, X.; Wu, Y.; Gu, L.; Chen, H.; Yuan, W.; Chen, X.; Liu, G.; Gao, B.; Chen, Q.; Zhao, Y. L. Nat. Commun. **2023**, 14, 2943.

ASSIGNMENT OF POSTER BOARD NUMBERS

Name of Poster Presenter Last name, First Name	Affiliation	Poster Board #
1. **Bian, Kangjie (Harry)**	Rice University (**Student**, USA)	1
2. **Brunen, Sebastian**	Max Planck, Mulheim (**Student**, Germany)	2
3. **Chang, Rick**	Beijing Orienda Instruments, Co. (**Exhibitor**, China)	39
4. **Chen, Xiaowei**	Rice University (**Undergrad**, USA)	4
5. **Ćorković, Andrej**	University of Iowa (**Student**, USA)	5
6. **Diamandas, Matthew**	University of Toronto (**Student**, Canada)	6
7. **Dressler, Friedemann (Friedhelm)**	Justus-Liebig-University Giessen (**Student**, Germany)	7
8. **Flipse, Samuel**	University of Hawaii @ Manoa (**Student**, USA)	8
9. **Funk, Brian**	Rice University (**Student**, USA)	9
10. **Gomes, Gabriela**	North Dakota State University (**Undergrad**, USA)	10
11. **Gonzalez, Raquel**	Texas A&M University (**Undergrad**, USA)	11
12. **Grimm, Zachary**	Rice University (**Student**, USA)	12
13. **Hanazawa, Miyuki**	University of Tokyo (**Student**, Japan)	13
14. **Joaquin, Daniel**	Rice University (**Postdoc**, USA)	14
15. **Kao, (Jay) Shih-Chieh**	Rice University (**Student**, USA)	15
16. **Karl, Teresa Maria**	RWTH Aachen (**Student**, Germany)	16
17. **Kwon, Young-Do**	Rice University (**Student**, USA)	17
18. **Lai, Calvine**	Université de Montréal (**Postdoc**, Canada)	18
19. **Leventis, Theodora**	University of Iowa (**Student**, USA)	19
20. **Lin, Alex**	Rice University (**Undergrad**, USA)	20
21. **Liu, Chang**	Emory University (**Student**, USA)	21
22. **Liu, Chaolun**	University of Hawaii @ Manoa (**Student**, USA)	45
23. **Medeiros, Rafaela**	North Dakota State University (**Student**, USA)	22
24. **Mendel, Marvin**	RWTH Aachen (**Student**, Germany)	23
25. **Mukherjee, Poulami**	Texas A&M University (**Student**, USA)	24
26. **Müller, Nicolas**	Leopold-Franzens-University of Innsbruck (**Student**, Austria)	25
27. **Piercey, Davin**	Purdue University (**Faculty**, USA)	26
28. **Pinkert, Tobias**	Leopold-Franzens-University of Innsbruck (**Postdoc**, Austria)	27
29. **Poh, Charmaine (Ying)**	Oxford University (**Student**, UK)	28
30. **Qi, Xiangbing (Ben)**	National Institute of Biological Sciences (**Faculty**, China)	29
31. **Qi, Xiangbing (Ben)**	National Institute of Biological Sciences (**Faculty**, China)	30
32. **Renteria-Gomez, Angel**	Texas A&M University (**Postdoc**, USA)	31
33. **Rodriguez, Agustin**	Rice University (**Student**, USA)	32
34. **Scharf, Manuel**	Max-Planck-Institut (**Student**, Germany)	33
35. **Serrano, Roberto**	University of Illinois Urbana-Champaign (**Student**, USA)	34
36. **Skellam, Elizabeth**	University of North Texas (**Faculty**, USA)	35
37. **Topp, Christopher**	Justus-Liebig-University Giessen (**Student**, Germany)	36
38. **Tran, Hai**	Rice University (**Postdoc**, USA)	37
39. **von Münchow, Tristan**	Georg-August-Universität Göttingen (**Student**, Germany)	38
40. **Wasfy, Nour**	Rice University (**Student**, USA)	3
41. **Xue, Sean**	Beijing Orienda Instruments, Co. (**Exhibitor**, China)	40
42. **Ye, Baihua**	Shangai Tech University (**Faculty**, China)	41
43. **Yellen, Simon**	Rice University (**Undergrad**, USA)	42
44. **Zhang, Zuxiao**	University of Hawaii at Manoa (**Faculty**, USA)	43
45. **Zhao, Yanli**	Nanyang Technological University (**Faculty**, Singapore)	44

LAYOUT OF POSTER ASSIGNMENTS



LIST OF ALL WIPOS 2023 PARTICIPANTS IN ALPHABETICAL ORDER

LIST OF ALL WIPOS 2023 PARTICIPANTS

Name of Participant	Affiliation of Participant	Designa-tion	Poster Brd #
1. **Alabugin, Igor**	Florida State University (**Faculty**, USA)	**Speaker**	
2. **Aubé, Jeffrey**	UNC Chapel Hill (**Faculty**, USA)	**Speaker**	
3. **Ball, Zachary T**	Rice University (**Faculty**, USA)	**Speaker**	
4. **Beauchemin, André**	University of Ottawa (**Faculty**, Canada)	**Speaker**	
5. **Bian, Kangjie (Harry)**	Rice University (**Student**, USA)		**1**
6. **Blakey, Simon**	Emory University (**Faculty**, USA)	**Speaker**	
7. **Brunen, Sebastian**	Max Planck, Mulheim (**Student**, Germany)		**2**
8. **Campeau, L.-C.**	Merck (**Industry**, USA)	**Speaker**	
9. **Chang, Rick**	Beijing Orienda Instruments, Co. (**Exhibitor**, China)		**39**
10. **Chen, Xiaowei**	Rice University (**Undergrad**, USA)		**4**
11. **Chirik, Paul**	Princeton University (**Faculty**, USA)	**Speaker**	
12. **Conda-Sheridan, Martin**	University of Nebraska – Medical Center, Omaha (**Faculty**, USA)	**Speaker**	
13. **Ćorković, Andrej**	University of Iowa (**Student**, USA)		**5**
14. **Cornwall, Richard**	BYU-Hawaii (**Faculty**, USA)	**Participant**	
15. **Diamandas, Matthew**	University of Toronto (**Student**, Canada)		**6**
16. **Dressler, Friedemann (Friedhelm)**	Justus-Liebig-University Giessen (**Student**, Germany)		**7**
17. **Farrell, Wesley**	US Naval Academy (**Faculty**, USA)	**Speaker**	
18. **Flipse, Samuel**	University of Hawaii @ Manoa (**Student**, USA)		**8**
19. **Funk, Brian**	Rice University (**Student**, USA)		**9**
20. **Gomes, Gabriela**	North Dakota State University (**Undergrad**, USA)		**10**
21. **Gomes, Roberto**	N. Dakota State Univ. (**Faculty**, USA)	**Speaker**	
22. **Gonzalez, Raquel**	Texas A&M University (**Undergrad**, USA)		**11**
23. **Grela, Karol**	Inst. of Org. Chem., Polish Acad. of Sci. (**Faculty**, Poland)	**Speaker**	
24. **Grimm, Zachary**	Rice University (**Student**, USA)		**12**
25. **Gutierrez, Osvaldo**	Texas A&M (**Faculty**, USA)	**Speaker**	
26. **Hanazawa, Miyuki**	University of Tokyo (**Student**, Japan)		**13**
27. **Hong, Cindy**	Merck (**Industry**, USA)	**Speaker**	
28. **Inoue, Masayuki**	University of Tokyo (**Faculty**, Japan)	**Speaker**	
29. **Joaquin, Daniel**	Rice University (**Postdoc**, USA)		**14**
30. **Kalow, Julia**	Northwestern University (**Faculty**, USA)	**Speaker**	
31. **Kao, (Jay) Shih-Chieh**	Rice University (**Student**, USA)		**15**
32. **Karl, Teresa Maria**	RWTH Aachen (**Student**, Germany)		**16**
33. **Kürti, László**	Rice University (**Faculty**, USA)	**Host Speaker**	
34. **Kwon, Young-Do**	Rice University (**Student**, USA)		**17**
35. **Lai, Calvine**	Université de Montréal (**Postdoc**, Canada)		**18**
36. **Larionov, Oleg**	UT San Antonio (**Faculty**, USA)	**Speaker**	
37. **Lawrence, Andrew L.**	The University of Edinburgh (**Faculty**, UK)	**Speaker**	
38. **Lebel, Hélène**	University of Montreal (**Faculty**, Canada)	**Speaker**	
39. **Leventis, Theodora**	University of Iowa (**Student**, USA)		**19**
40. **Lewis, Chad**	K36 Therapeutics (**Industry**, USA)	**Speaker**	
41. **Li, Guigen**	Texas Tech University (**Faculty**, USA)	**Speaker**	
42. **Lim, Yee Hwee**	A*STAR (**Faculty**, Singapore)	**Speaker**	

Name of Participant	Affiliation of Participant	Designa-tion	Poster Brd #
43. **Lin, Alex**	Rice University (Undergrad, USA)		20
44. **Liu, Chang**	Emory University (Student, USA)		21
45. **Liu, Chaolun**	University of Hawaii @ Manoa (Student, USA)		45
46. **Malapit, Christian**	Northwestern University (Faculty, USA)	Speaker	
47. **Malins, Lara**	Australian Nat. University (Faculty, Australia)	Speaker	
48. **Martinez, Jenny**	New York University (Faculty, USA)	Participant	
49. **Maryanoff, Bruce**	The Scripps Research Institute (Faculty, USA)	Participant	
50. **Maryanoff, Cynthia**	Baruch S. Blumberg Institute (Faculty, USA)	Participant	
51. **May, Jeremy**	U of Houston (Faculty, USA)	Speaker	
52. **McKenna, Grace**	Loxo Oncology (Industry, USA)	Participant	
53. **Medeiros, Rafaela**	North Dakota State University (Student, USA)		22
54. **Mendel, Marvin**	RWTH Aachen (Student, Germany)		23
55. **Miller, Scott**	Yale University (Faculty, USA)	Plenary Speaker	
56. **Morandi, Bill**	ETH Zurich (Faculty, Switzerland)	Speaker	
57. **Mukherjee, Poulami**	Texas A&M University (Student, USA)		24
58. **Müller, Nicolas**	L.-Franzens-Univ. of Innsbruck (Student, Austria)		25
59. **Newton, Christopher**	University of Georgia (Faculty, USA)	Speaker	
60. **Njardarson, Jon**	University of Arizona (Faculty, USA)	Speaker	
61. **Odegard, Jan**	Director @ The Ion Houston/Rice University (USA)	Participant	
62. **Parasram, Marvin**	New York University (Faculty, USA)	Speaker	
63. **Piercey, Davin**	Purdue University (Faculty, USA)		26
64. **Pinkert, Tobias**	L.-Franzens-Univ. of Innsbruck (Postdoc, Austria)		27
65. **Poh, Charmaine (Ying)**	Oxford University (Student, UK)		28
66. **Qi, Xiangbing (Ben)**	National Inst. of Biol. Sciences (Faculty, China)		29 & 30
67. **Renteria-Gomez, Angel**	Texas A&M University (Postdoc, USA)		31
68. **Rodriguez, Agustin**	Rice University (Student, USA)		32
69. **Sakurai, Kaori**	Tokyo U. of Agri. & Technol. (Faculty, Japan)	Speaker	
70. **Scharf, Manuel**	Max-Planck-Institut (Student, Germany)		33
71. **Schoenebeck, Franziska**	RWTH Aachen (Faculty, Germany)	Speaker	
72. **Serrano, Roberto**	Univ. of Illinois Urbana-Champaign (Student, USA)		34
73. **Skellam, Elizabeth**	University of North Texas (Faculty, USA)		35
74. **Suero, Marcos G.**	ICIQ (Faculty, Spain)	Speaker	
75. **Thiel, Oliver R.**	AVP of Process Chem., Amgen (Industry, USA)	Speaker	
76. **Tius, Marcus**	University of Hawaii at Manoa (Faculty, USA)	Speaker	
77. **Topp, Christopher**	Justus-Liebig-Univ. Giessen (Student, Germany)		36
78. **Tran, Hai**	Rice University (Postdoc, USA)		37
79. **Vacek, Abby**	Rice University (USA)	Host	
80. **Vachal, Petr**	AVP of Chemistry, Merck (Industry, USA)	Speaker	
81. **von Münchow, Tristan**	Georg-August-Univ. Göttingen (Student, Germany)		38
82. **Wasfy, Nour**	Rice University (Student, USA)		3
83. **Xue, Sean**	Beijing Orienda Instruments, Co. (Exhibitor, China)		40
84. **Yang, Zhen**	Peking U. Shenzen Grad. Sch. (Faculty, China)	Speaker	
85. **Ye, Baihua**	Shanghai Tech University (Faculty, China)	Speaker	41
86. **Yellen, Simon**	Rice University (Undergrad, USA)		42
87. **Yu, Zhi-Xiang**	Peking University (Faculty, China)	Speaker	
88. **Zhang, Xumu**	SUSTech (Faculty, Shenzen, China)	Speaker	
89. **Zhang, Zuxiao**	University of Hawaii at Manoa (Faculty, USA)	Speaker	43
90. **Zhao, Yanli**	Nanyang Tech. University (Faculty, Singapore)	Speaker	44

WIPOS 2023 – NOTES

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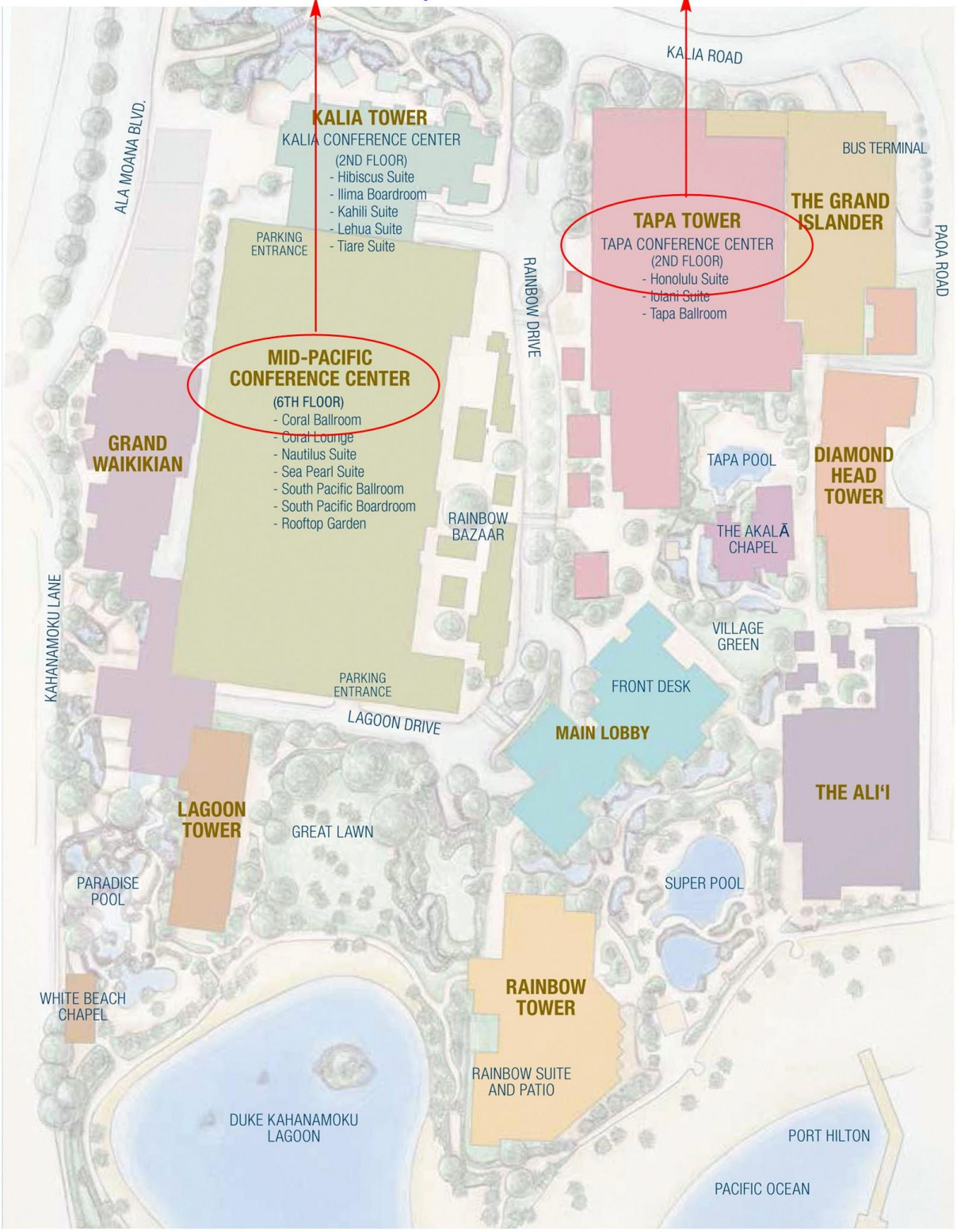
WIPOS 2023 – NOTES

HILTON HAWAIIAN VILLAGE PROPERTY MAP

VENUE of WIPOS 2023
Coral III Ballroom
Monday-Thursday, Dec 18-21, 2023
7:30 AM - 3:30 PM Daily

WELCOME RECEPTION
Honolulu Suites
SUNDAY, December 17, 2023
4 PM - 7 PM

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