

January 20, 2024 8:30 AM - 12:30 PM Student Union Grand Ballroom

ubrp.arizona.edu



35TH ANNUAL UNDERGRADUATE BIOLOGY RESEARCH PROGRAM CONFERENCE

January 20, 2024 | Student Union Grand Ballroom | 1303 E. University Blvd.

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EVENT AGENDA

8:30am BREAKFAST (food available until 10:00am)

• Enjoy breakfast and preview posters

8:45 – 9:45am KEYNOTE ADDRESS

- Welcome & Acknowledgements by Jennifer Cubeta, UBRP Director
- Introduction of Keynote Speaker by Prof. Carol Bender
- Keynote Address: Navigating a Career in Biotech Through Experimentation and Connection by Denise Krawitz, PhD, UBRP/BRAVO! Alumna and Principal Consultant at CMC Paradigms
- Conference Logistics

9:45 – 10:00am BREAK

- Preview posters and enjoy breakfast
- 50-50 raffle tickets available for purchase

10:00am – 12:00pm STUDENT POSTER SESSIONS

- Odd-numbered posters present from 10:00 11:00am
- Even-numbered posters present from 11:00am 12:00pm
- 50-50 raffle tickets available for purchase

12:00 – 12:15pm RECOGNITION, AWARDS, AND CLOSING REMARKS

- Recognition of Student Poster Presenters
- Recognition of Graduating Seniors, Ambassador Officers, & Pen Pals
- Recognition of Outstanding Mentor Award Nominees
- Presentation of Outstanding Graduate Student Mentor Award
- Presentation of Outstanding Faculty Mentor Award
- Door Prizes & Announcement of Raffle Winner

WELCOME



Dear Guests:

Welcome to the 35th Annual Undergraduate Biology Research Program (UBRP) Conference! On this special day, we celebrate the accomplishments of our students, recognize our mentors and volunteers, and enjoy a day of community as we explore a myriad of biological topics in the spirit of learning.

This year, there are 105 student presenters from programs coordinated by the Undergraduate Biology Research Program Office, including UBRP, Beckman Scholars, Biology Research Abroad: Vistas Open!, Data Sciences Academy (DSA), Environmental Health Sciences — Research for Indigenous Student Engagement (EHS-RISE), Environmental Health Sciences — Transformative Research Undergraduate Experience (EHS-TRUE), and the Partnership for Native American Cancer Prevention (NACP), in addition to student presenters from the Maximizing Access to Research Careers Program (MARC), visiting NACP students from Northern Arizona University, and additional University of Arizona undergraduate researchers. Today, our guests will have the opportunity to learn about a wide diversity of biological research topics from these amazing students!

I hope you enjoy connecting with our students about their research today, and that you find yourself refreshed with a deep appreciation for the world of biology, as well as for the students and mentors which make up our wonderful research community.

Enjoy the Conference!

Jennifer Cubeta, M.Ed.

UBRP Director

THANK YOU!

UBRP is made possible by the financial support of University of Arizona contributors, grant awards, and donors. We thank the following for their generous support:

At the University of Arizona:

- Office of the Provost (Ronald Marx, Interim Provost)
- Office of Research, Innovation, & Impact (Elliot Cheu, Interim Senior Vice President for Research)
- BIO5 Institute (Jennifer Barton, Director)
- College of Science (Carmala Garzione, Dean)
- College of Medicine (Michael Abecassis, Dean)
- College of Agriculture & Life Sciences (Shane Burgess, Dean)
- Data Sciences Academy (Joe Watkins, Director)
- R. Ken Coit College of Pharmacy (Rick Schnellmann, Dean)
- Arizona Institute for Resilience (Kevin Bonine, Director of Education Initiatives and Maria Sohn Hasman, Program Coordinator of RISE Internship Program)

Granting Agencies:

- American Society for Pharmacology & Experimental Therapeutics (ASPET) for the ASPET Summer Research Fellowship Program
- Arnold and Mabel Beckman Foundation for the Beckman Scholars Program
- National Institute of Environmental Health Sciences for the Environmental Health Sciences – Research for Indigenous Student Engagement (EHS-RISE) and the Environmental Health Sciences - Transformative Research Undergraduate Experience (EHS-TRUE) Programs
- National Cancer Institute for the Partnership for Native American Cancer Prevention

<u>Thank you to our UBRP Advisory Board Members and colleagues, who are champions for our program</u>: John Szivek (Chair), Carol Bender (Emerita), Nathan Ellis, Susan Kaleita (College of Science Development) Teri Suzuki, Samantha Szuter, Doug Wellington, and Ken Wertman.

Thank you to our wonderful UBRP donors!

American Online Giving Foundation • Dr. Craig Aspinwall & Ms. Catherine Aspinwall • Dr. Jordan Barrows • Dr. David Bellows & Dr. Alison Bailin • Prof. Carol Bender • Dr. John Biebelhausen & Ms. Amanda Biebelhausen • Ms. Elizabeth Bondy • Dr. Amitava Bose & Ms. Barbara Bose • Dr. Dustin Boyer • Dr. Margaret Briehl & Dr. Dennis Ray • Dr. Gail Burd & Dr. John Hildebrand • Dr. Xuemei Cai & Dr. Phillip Gray • Ms. Elizabeth Camus • Dr. Susheela Carroll • Ms. Roxie Catts • Compris Vineyard • Dr. Rita Cook & Dr. Robert Cook (Nokes-Cook UBRP Endowment) • Mrs. Jennifer Cubeta • Mr. Richard Edelman & Mrs. Sharon J. Vogelsang • Dr. John Enemark & Ms. Mary Enemark • Dr. Zhen Fan • Dr. Mark Fernandez (in honor of Carol Bender) • Dr. Jeffrey Frelinger • Dr. Paul Gause & Ms. Amy Gause • Dr. Vijay

Gokhale • Dr. Marilyn Halonen • Ms. Emma Harrell • Mr. Bosun Hau & Dr. Anne Chung (Bosun Hau and Anne Chung UBRP Endowment) • Dr. James Hazzard and Mrs. Norma Hazzard (in honor of Anne Collins Walker, and in memory of Drs. Terry Meyer & Michael A. Cusanovich) • Ms. Xi He & Mr. Heng Yuan • Dr. A. Teresa Isaias • Dr. John Jewett and Dr. Trianna Oglivie • Dr. David Johnson • Ms. Susan Kaleita and Mr. John Moeller • Ms. July Kelley • Dr. Paul Klekotka & Mrs. Kimberly Klekotka • Dr. Christina Kochel • Dr. Michael Kuhns • Mr. Michael Lee (in memory of Emily Korff) • Mr. Jeffrey LoCascio & Mrs. Danielle LoCascio • Mr. Oleg Lysyj & Dr. Teri Suzuki (Natalie Lysyj UBRP Endowment) • Dr. Thomas Malan & Ms. Carole Malan • Mr. Brian Massey and Dr. Megan O'Meara • Mrs. Sharon Matlock & Mr. Peter Matlock • Mr. Juan Mena-Gonzalez & Ms. Maura Mena • Ms. Verma Miera • Ms. Amanda Moon • Dr. Michael Nelson & Ms. Kristin Nelson • Pfizer – Matching Gifts • Regeneron Pharmaceuticals, Inc. – Matching Gifts • Dr. Daryn Stover • Mr. Benjamin Super & Mrs. Jill Liberman-Super • Dr. Anne Suzuki & Mr. Scott Creasman (in honor of Dr. Teri C. Suzuki) • Dr. John Szivek & Ms. Sally Szivek • Ms. Samantha Szuter • Ms. Decemna Tang • Dr. Ronald Teed • Dr. Kenneth Teter • Dr. Allison Titcomb • Anna Trieller • Mr. Dale Vernon • Dr. Ilya Vilinsky • Mr. Dana Weant & Dr. Melanie De Boer • Mr. Doug Wellington & Ms. Andrea Wellington (Andrea Jeffers Wellington Fellowship) • Dr. Jessica Yingling & Mr. Christopher Mahoney • Dr. Benjamin Zaepfel

TODAY'S ACTIVITIES IN DETAIL

8:45 – 9:45am | WELCOME AND KEYNOTE ADDRESS



Navigating a Career in Biotech Through Experimentation and Connection

by Denise Krawitz, PhD UBRP/BRAVO! Alumna and Principal Consultant at CMC Paradigms

Introduction of Keynote Speaker
by Prof. Carol Bender
Professor Emerita, Department of Molecular & Cellular Biology
Former Director of UBRP and BRAVO!

Denise Krawitz is a Principal Consultant at CMC Paradigms with over 20 years of experience in the biotechnology industry. She is a proud UBRP and BRAVO alum from (too) many years ago and is excited to come back to see how the UBRP has thrived and meet current students. After U of A, Denise got her PhD in Molecular and Cell Biology from UC Berkeley and then moved into the study of Chemistry and Manufacturing Controls (CMC) for protein-based therapeutics in the biotech industry. Denise spent several years working at different biotech companies in CA, including Genetech/Roche, BioMarin Pharmaceuticals, and Ambrx. Her background in studying protein chaperones in the Vierling lab as an undergraduate was foundational for her work in graduate school as well as industry.

As a consultant, Denise spends most of her time working with small and virtual biotechnology companies helping them design and produce proteins to benefit patients with different types of cancers, immunological disorders, neurological disease, genetic deficiencies, and anything else that can be solved by creative academic and industrial scientists. She helps these companies move potential therapeutic proteins from a research laboratory into a larger scale development environment to enable clinical trials in humans. The challenges with protein chemistry, cellular engineering, ensuring patient safety and navigating the regulatory environment, while managing investors, tight timelines, and the knowledge that patients are in need, sometimes desperate need, is immensely motivating and has been challenging, rewarding, and very exciting. While working as a consultant has been a steep learning curve, it is also a great way to do good science, help people, and importantly, have fun.

Denise currently lives with her family and 3 dogs in Marin County in the San Francisco Bay Area.

10:00am – 12:00pm | STUDENT POSTER SESSIONS

Our students are excited to share their research with you! We invite our visitors to be curious and to ask questions such as "Can you walk me through your poster? What are future directions for your project? What excites you about doing research? What is the 'take home' message from your project?"

Student presenters are listed in the **Topical Guide to UBRP Conference Posters**, in alphabetical order by last name within each topic. Full abstracts are available on the UBRP Conference webpage at https://ubrp.arizona.edu/conference/35th-annual-conference.

To give our students a chance to see each other's work:

- Odd-numbered posters will be presented from 10:00 11:00am.
- Even-numbered posters will be presented from 11:00 12:00pm.

12:00pm - 12:30pm | RECOGNITION & AWARDS

CONGRATUATIONS TO OUR GRADUATING SENIORS!

Congratulations to UBRP seniors who will be graduating in 2024! To celebrate all they have accomplished through our program, seniors will receive a teal UBRP graduation cord in March. Seniors, we wish you all the best for the future and look forward to receiving updates about your post-graduation positions and accomplishments. Make sure to update your profile on LinkedIn and join our UBRP group at https://www.linkedin.com/groups/3762234/

UBRP AMBASSADORS

UBRP Ambassadors are charged with the responsibility of helping to create community among undergraduate researchers by organizing social activities, providing feedback to program staff, and representing UBRP in speaking to on- and off-campus groups. We thank our 2023-2024 UBRP Ambassador officers for their service:

Ariel Cheng, President
Gavin Arnold, Vice President
Hannah Vu, Secretary
Kaitlyn Lai, Volunteer Coordinator
Cat Jezerc, Social Media
Jackie Larson, Pen Pals Coordinator

UBRP PEN PALS

This outreach program, originally created by UBRP participant Misha Pangasa in 2008-2009, connects UBRPers with students at Mansfeld Middle School, where they correspond regularly with seventh grade students and serve as role models to provide young students with perspectives on science and college. Thank you to this year's volunteers!

Jackie Larson

Pen Pals Coordinator

Anil Kalra

Sixth Grade Teacher, Mansfeld Middle School

OUTSTANDING MENTOR AWARDS

Each year, we celebrate UArizona's supportive culture for undergraduate research and the outstanding mentorship UBRP students enjoy by granting the Outstanding UBRP Graduate Student, Postdoctoral Fellow, or Research Specialist Mentor Award and the Outstanding UBRP Faculty Mentor Award. Candidates are nominated by current UBRP students and UBRP alumni. A committee composed of UBRP students and alumni reviews the nominees and selects the finalists.

Nominees for the 2023-24 UBRP Outstanding Mentor Awards:

Joe Adams

Nominated by Tom Pham

David Baltrus

Nominated by Ariel Heinrich

Mark Beilstein

Nominated by Nada Elnady

Ross Buchan

Nominated by Nick Mortimore

Jenna Honan

Nominated by Jackie Larson

Grace Lee

Nominated by Veronica Hode

Edita Navratilova

Nominated by Veronica Hode

Catherine Vasquez

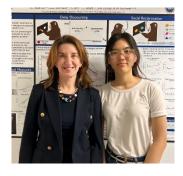
Nominated by Andrew Kim



2023-2024 UBRP Outstanding Graduate Student Mentor Jeaho Lim

Graduate Student, Genetics

Nominated by Natalie Rawlings



2023-2024 UBRP Outstanding Faculty Mentor Katalin Gothard

Professor, Physiology Nominated by Sun Woo Kim

We thank all of our mentors for training and educating our students!

2023-24 PROGRAMS, PARTICIPANTS, AND FACULTY MENTORS

The programs housed within the Undergraduate Biology Research Program (UBRP) are designed to teach students science by involving them in biologically related research. Students are paid for their time doing research where they develop an understanding of the scientific method and receive a realistic view of research. They also participate in professional development workshops, scientific seminars, and supplementary activities to acquire the tools necessary to be successful in post-graduate studies should they choose careers related to biology or biomedical research, and they join the community of scholars.

UNDERGRADUATE BIOLOGY RESEARCH PROGRAM (UBRP)

Funding for UBRP students is provided by private donors, the UArizona Office of the Provost, Office of Research, Innovation, & Impact, BIO5 Institute, the Arizona Institute for Resilience (RISE Internship Program), and the Colleges of Medicine, Science, Agriculture and Life Sciences, and Pharmacy. The UBRP Office is administratively supported by the Department of Molecular and Cellular Biology.

<u>Student</u>	Mentor(s)
Yuchen (Ella) Ai	Sally Dickinson
Mustafa Allababidi	Nima Toosizadeh
Angelo Antenor	George Sutphin
Gavin Arnold	Robin Polt & Ying-Hui Chou
Shreya Balasubramanian	Tally Largent-Milnes
Lindsey Bell	David Moore
Olivia Bertuca	Judith Brown
Remington Bliss	Brian McKay
Alessandro Bolus	Bentley Fane
Sean Chen	Michael Brown
Ariel Cheng	Jana U'Ren
Sai Anwita Chintala	Ralph Fregosi
Deanna Clinch	Christopher Banek
Caroline Coppinger	Gregory Thatcher
Michael Davis	Lee Ryan
Angela Ding	Frank Duca
Nada Elnady	Mark Beilstein
Michael Foster	Jon Njardarson
Madison Gackle	Paul Langlais
Aditi Ghosh	Martha Bhattacharya
Parker Guss	Ying-Hui Chou
Aunita Hakimi	Ross Buchan
Alexander Hames	Rui Xiong
Mathew Hanna	Mark Beilstein
Ariel Heinrich	David Baltrus
Jacob Herbert	Eugene Chang
Kate Hilbert	Samantha Harris
Ciara Himes	David Baltrus

Student Mentor(s) Veronica Hode Edita Navratilova **Emily Jamboretz** Felicia Goodrum Catherine Jezerc Ying-Hui Chou Mira Kaibara Jennifer Teske Jean-Marc Fellous & Alexandra Keen Jessica Andrews-Hanna **Bradley Khanthaphixay** Jeong-Yeol Yoon Andrew Kim Jil Tardiff Kaitlyn Lai Ying-Hui Chou Katalin Gothard Ryan Le Sarah Lind Paulo Pires Gamaliel Luna Martha Bhattacharya Matt Lyons Rayna Gonzales Sophia Marcinowski Ross Buchan Nikki Martin Salma Patel Esha Mathur Julie Armin Jasmine Meredith Lalitha Madhavan Jesus Mota Jr. Torsten Falk **Ananth Nair** Donata Vercelli Ronald Palmenberg Michael Taylor & Matt Cordes Milin Patel Salma Patel Adithi Peedoly Rebecca Schomer Darya Pershina Jeong-Yeol Yoon Ranon Plett Frank Duca Ibrahim Ramadan **Eugene Chang** Anna Ramsook John Jewett Asia Richardson Jon Njardarson Violet Rowland Lisa Nagy Elissa Schiff Mary Alt Misty Shah Salma Patel Sanjana Shahreen Nancy Horton Susan Sharpe Martha Bhattacharya Mia Sponseller **Carol Barnes** Ines Studer Xinxin Ding Jeanne Pemberton Madeleine Tibayan **Ethan Tonthat** Nancy Horton Ivan Vanek Elena Plante Anisha Venigalla Benjamin Renguist Patrick Viboolmate **Emmanuel Katsanis** Hannah Vu Haijiang Cai Maddox West Melville Wohlgemuth Lillian Wu Yitshak Zohar

Anthony Bosco

Meiven Yang

<u>Student</u>

Mentor(s)

Suetmui Yu Forrest Zepezauer Charles Zhang Ningning Zhao
Renee Duckworth & Andrew Capaldi
Ross Buchan

Additional students from UBRP research groups presenting today:

<u>Student</u>	<u>Mentor</u>
Erin Choi	Jennifer Teske
Harvey Harvey	Lisa Nagy
Cassidy Johnson	Haijiang Cai
Tyler Reese	Anna Dornhaus
Garret Wilson	Joanna Masel

AMERICAN SOCIETY FOR PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS SUMMER UNDERGRADUATE RESEARCH FELLOWSHIP (ASPET SURF)

The ASPET SURF Fellowship, funded by a grant from the American Society for Pharmacology and Experimental Therapeutics, supports five undergraduate students per year to conduct research under the mentorship of UArizona faculty who are members of ASPET. The program's goal is to introduce undergraduate students to pharmacology research using authentic, mentored research experiences to heighten student interest in careers in research and related health care disciplines.

<u>Student</u>	<u>Mentor</u>
Emma Gevelhoff	John Streicher
Joseph Mancuso	John Streicher
Nguyen (Tom) Pham	Abhijit Date
Aruna Sreenivasan	Frank Porreca
Alyssa Welborn	John Streicher

THE BECKMAN SCHOLARS PROGRAM

The Beckman Scholars Program is designed to help stimulate, encourage and support research activities by exceptionally talented undergraduate students at U.S. universities and colleges. The Beckman Scholarship at the University of Arizona provides funding for students to conduct in-depth research with one of 11 stellar research mentors in UArizona's College of Science.

Funding for this program is provided by the Arnold and Mabel Beckman Foundation.

<u>Student</u>	<u>Mentor</u>
Olivia Fernflores	Ryan Gutenkunst
Nicholas Mortimore	Ross Buchan
Douglas Swango	Pascale Charest
Bryce Wilson	Andrew Paek

BIOLOGY RESEARCH ABROAD: VISTAS OPEN! (BRAVO!)

The BRAVO! Program supports University of Arizona undergraduates in gaining a global perspective through summer research experiences abroad. BRAVO! enhances participants' scientific and professional skills and encourages the development of international collaborative relationships, through independent and immersive experiences as participants live and conduct research in a foreign country.

Funding for BRAVO! is provided by private donors.

<u>Student</u>	International Mentor	UArizona Mentor
Ryan Bowser	Michael Gotthardt	Carol Gregorio
Germany	Max-Delbrück-Centrum für Molekulare Medizin	
Alexis Henderson	Clark Dickerson	Kristen Renner
Canada	University of Waterloo	
Sun Woo Kim	Pier Francesco Ferrari,	Katalin Gothard
France	ICS - Marc Jeannerod	
Shinhye (Chloe) Park	Lilach Sheiner	Anita Koshy
Scotland	University of Glasgow	

DATA SCIENCES ACADEMY (DSA)

DSA is an initiative to mobilize researchers across disciplinary boundaries who share a passion for data science, to deepen partnerships with both industry and government agencies, and to challenge students at all degree levels to explore new, innovative domains of expertise, to ensure the nexus between research and education is captured. Support for DSA's summer research positions is provided by the Office of the Provost.

<u>Student</u>	<u>Mentor</u>
Chiragdeep Chatur	Joanna Masel
Victoria Garza	Carol Barnes
David Jurkowitz	Travis Wheeler
Isaac Kailat	Michael Taylor
KyeongHee Kim	Kevin Lin
Ella Marshall	Lee Ryan
Natalie Rawlings	Andrew Capaldi
Kiran Smelser	Michael Hammer
Jackson Taylor	Zhongguo Xiong
Lynette Valenzuela	Jennifer Barton

ENVIRONMENTAL HEALTH SCIENCES - RESEARCH FOR INDIGENOUS STUDENT ENGAGEMENT (EHS-RISE)

EHS-RISE, funded by the National Institute of Environmental Health Sciences grant #1-R25-ES34923-01 (Qing-Yu Zhang, Principal Investigator), is an introductory, full-time, and residential summer research

program which aims to increase the representation of Native Americans in the STEM workforce, while supporting students' cultural identity.

<u>Student</u>	<u>Mentor</u>
RueShunda Jim	Joseph Hoover
Taylor Massey	Zelieann Craig

ENVIRONMENTAL HEALTH SCIENCES TRANSFORMATIVE RESEARCH UNDERGRADUATE EXPERIENCE (EHS-TRUE)

EHS-TRUE, funded by the National Institute of Environmental Health Sciences grant #1-R25-ES025494 (Yin Chen, Principal Investigator), provides students from underrepresented backgrounds with two years of paid training and research experience in an environmental health sciences research laboratory. The goal of EHS-TRUE is to enhance the competitiveness of our undergraduates for post-baccalaureate education in the environmental health sciences.

<u>Student</u>	<u>Mentor</u>
Jacqueline Larson	Paloma Beamer
Vivianna Metzler	Zelieann Craig
Venesa Romero	Yin Chen
Melisa Smith	Yin Chen

PARTNERSHIP FOR NATIVE AMERICAN CANCER PREVENTION (NACP)

The Partnership for Native American Cancer Prevention (NACP) is a collaboration between Northern Arizona University and the University of Arizona's Cancer Center. The mission of the NACP is to alleviate the unequal burden of cancer among Native Americans of the Southwest through research, training and community outreach programs in collaboration with the communities they serve. The Training Core of NACP at the University of Arizona is led by Dr. Jennifer Bea, and funding for NACP is provided by the National Cancer Institute Grant #2U54CA143924.

<u>Student</u>	<u>Mentor</u>
Tanjia Clarkson	Yitshak Zohar
Leyla Cordova	Jianqin Lu
Allan Paxson	Anne Cress
Will Roman	Jeong-Yeol Yoon
Halie Tewa	Heidi Brown

Additional NACP students from Northern Arizona University presenting today:

<u>Student</u>	<u>Mentor</u>
Feather Eagleman	Naomi Lee
Marinca Faimau	Naomi Lee

We are also excited for student presenters from the Maximizing Access to Research Careers (MARC) program to be presenting their posters today!

MAXIMIZING ACCESS TO RESEARCH CAREERS

The MARC Program is a unique research, mentoring, financial and academic opportunity for undergraduates belonging to a group considered underrepresented in biomedical research and who have the interest and potential to pursue a PhD or combined PhD (e.g. MD/PhD) degree. The program is a two-year program intended for the last two years of a student's enrollment at the University of Arizona.

Mentor(s)
Joyce Schroeder
Elizabeth Hutchinson
Arthur Riegel & Scott Killgore
Dongkyun Kang
John Jewett
Elizabeth Hutchinson
Lalitha Madhavan