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THE UNIVERSITY OF ARIZONA



## Happy Holidays

Reflecting on 2024 and embracing the possibilities of 2025



### Dear BIO5 Community,

At the BIO5 Institute, our mission to enhance lives and drive meaningful change is more than a vision—it's a shared commitment. Whether it's fostering the next generation of scientists through impactful programs like the KEYS Research Internship Program, developing solutions to pressing global challenges or advancing Arizona as a leader in bioscience innovation, the work we do together matters.

This year has been a testament to the power of collaboration and innovation, even amidst the various challenges we've had to face. **The resilience and dedication of the BIO5 community have continued to drive advancements in bioscience**

**research and make a lasting impact on our society.**

In this newsletter, we reflect on the milestones and stories that defined 2024. From groundbreaking discoveries to inspiring partnerships, we've compiled a list of the Top 10 stories showcasing BIO5 researchers and the breadth and depth of their work. These stories highlight the scientific strides we've made and the heart and passion of the people who make them possible.

Thank you for being part of this journey. Your engagement and support are critical to our success, and I'm inspired to share the incredible progress we've made this year. Together, we're shaping a future defined by discovery, collaboration, and hope.

Warm wishes for a wonderful holiday season and a bright New Year,

**Jennifer Kehlet Barton, PhD**

Director, BIO5 Institute

Distinguished Professor, Thomas R. Brown - Biomedical Engineering



The banner features a dark blue background with white and red text. At the top, 'SCIENCE TALKS' is in large white letters, with 'PODCAST' below it. A white microphone icon is to the right. Below this, 'special episode' is written in a red script font. Underneath, 'REFLECTIONS AND HORIZONS AT BIO5' is in white. A circular portrait of Jennifer Barton is on the left. To its right, 'FEATURING JENNIFER BARTON' is written in white. At the bottom right are the University of Arizona and BIO5 Institute logos.

**Science Talks: Horizons and reflections at BIO5**

BIO5 director Jennifer Barton reflects the mission of BIO5, shares her top moments of 2024, and reveals some exciting developments for 2025.

[LISTEN NOW](#)

## Top 10 Stories

### What a year for research!

University of Arizona officials project to reach the milestone of **exceeding \$1 billion in research activity in fiscal year 2024**. At the BIO5 Institute, we are thrilled to contribute to this incredible work across our hundreds of researchers from 19 colleges and 84 departments.

*See our Top 10 stories from 2024.*



### Applying VR and AI to find a faster way to test for TBI

Using a seed grant with BIO5 member **Gustavo de Oliveira Almeida** in the U of A Health Sciences SensorLab, BIO5 member **William D.S. Killgore** and his team are developing a small, portable tool to quickly diagnose military personnel with traumatic brain injury (TBI) in the field.

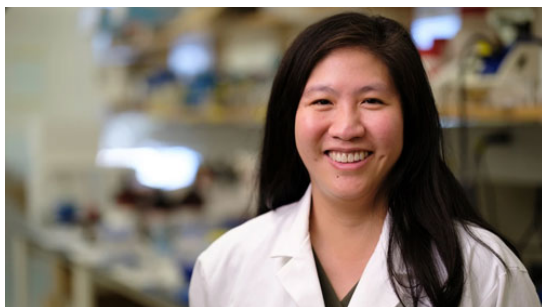
[Read more](#)



### BIO5 Institute's Kelle Hyland honored as 2024 AZBio Bioscience Educator of the Year

An integral part of the BIO5 Institute's KEYS Research Internship program for the past 8 years, **Kelle Hyland** is recognized for her extraordinary leadership and dedication by the Arizona Bioindustry Association.

[Read more](#)



## Researchers take power and efficiency of biological sensing to record level

BIO5 member **Judith Su** leads research on the development of a new biological sensing method that can detect substances at the zeptomolar level—an astonishingly miniscule amount—that can be immediately applicable for drug testing and potentially lead to portable sensors.

[Read more](#)



## Advancing Alzheimer's research and taking knowledge home

To encourage interest in neuroscience among Native American students and fill gaps in Alzheimer's disease research, BIO5 members **Kathleen Rodgers** and **Roberta Diaz Brinton** have developed the Undergraduate Ready for Burgeoning Research for American Indian Neuroscientists (UBRAIN) program.

[Read more](#)



## Peer in the labs, microscopes, and computers of our 2024 high school interns

Under the mentorship of over 50 University of Arizona researchers and their labs, KEYS interns



## Researcher awarded \$3 million grant to develop new therapy for lung diseases in premature babies

BIO5 member **Vlad Kalinichenko** received a \$3 million grant from the



contributed to ongoing research in cancer biology, neurodegenerative and cardiac diseases, biomedical engineering, environmental and insect science, and physics.

[Read more](#)

National Heart, Lung and Blood Institute to explore new drugs, signaling mechanisms and targeted drug delivery systems with the goal of treating serious neonatal lung diseases.

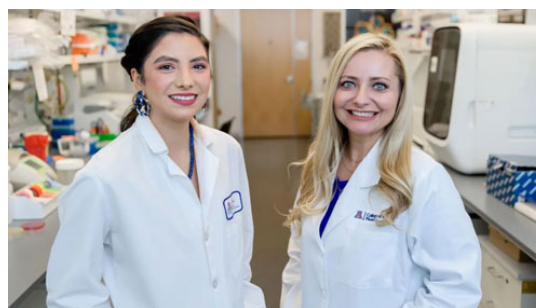
[Read more](#)



### Pursuit of a Valley fever vaccine passes significant milestone

BIO5 members **John Galgiani**, **Marc Orbach**, and **Lisa Shubitz** took a giant step forward in creating the world's first vaccine against fungal infection as new National Institutes of Health funding advances a human vaccine candidate for Valley fever (formally known as coccidioidomycosis or cocci).

[Read more](#)



### Collaborative teamwork untangles complex web of chronic pelvic pain and endometriosis

A pilot study co-led by 2023 BIO5 Postdoctoral Fellow **Nicole Jimenez** under the mentorship of BIO5 member **Melissa Herbst-Kralovetz** brings together a diverse team to lay the groundwork for linking the microbiome to poorly understood gynecologic conditions.

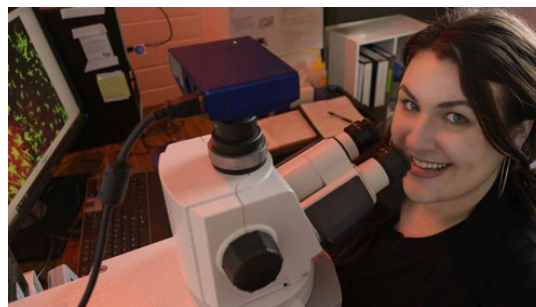
[Read more](#)



## Innovative chemical strategy targets mosquito larvae gut to combat spread of deadly diseases

BIO5 members **Michael Riehle**, **John Jewett**, and their team made a new advance in mosquito control with a minimal ecological footprint by designing chemical compounds targeting mosquito larvae without harming other aquatic animals.

[Read more](#)



## Study identifies potential new drug for Parkinson's-related cognitive decline, dementia

BIO5 member **Lalitha Madhavan** leads a team, including BIO5 member **Robin Polt**, that found a tiny protein appearing to have a protective effect on brain cells, which could lead to treatments for the cognitive symptoms of Parkinson's disease.

[Read more](#)

## Year In Review

### IMPROVING HEALTH

**\$157.1M**

NEW GRANTS/GIFTS  
FROM TRIF INVESTMENTS

**\$480K+**

SEED AND EQUIPMENT  
GRANTS AWARDED FOR  
EARLY-STAGE  
RESEARCH PROJECTS

**11**

PILOT/SEED  
GRANTS  
AWARDED  
FOR RESEARCH

### ENGAGING STUDENTS

**1500+**

STUDENTS  
IMPACTED BY BIO5

**746**

ARIZONA HIGH  
SCHOOL STUDENTS HAVE  
COMPLETED THE KEYS  
RESEARCH INTERNSHIP

**FY24**

*Thank you*

FOR YOUR CONTINUED SUPPORT OF BIO5!

### IMPACTING ARIZONA

**109**

INVENTION  
DISCLOSURES

**1**

START-UP  
COMPANY

**196**

U.S.  
PATENTS  
FILED

**34**

PATENTS  
ISSUED

**100**

STUDENT AND  
COMMUNITY  
EVENTS  
HOSTED/ATTENDED

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### **Land Acknowledgment**

*We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service.*