# Table of Contents

**Evaluating Greenhouse Gas Emissions From Soil Application of Anaerobic Organic Digestate Compared With Conventional Manure**
Guadalupe Abonce & Sharon Zhao ................................................................. 9

**Fear of Cancer Recurrence Among Black and White Mothers**
Rechael Acheampong & Katelynn Bergman .................................................. 17

**Ethnic Differences In Perceptions of Mental Illness: Examining Intergroup Relations**
Alexandra Aringer ............................................................................................. 25

**The Power of Words: How Are Depression Symptoms and Labile Self-Esteem Related to Word Use?**
Tiffany Gomez .................................................................................................. 33

**The Effect of Shame and Guilt On Students Writing Habits**
Daniel Gutierrez .................................................................................................. 41

**Analysis of Pulmonary Complement Protein Expression Following Organic Dust Exposure**
Sarah Ibrahim .................................................................................................... 49

**The Benefits of Trait Mindfulness and Flow During a Period of Stressful Preparation**
Janine Medina ..................................................................................................... 57

**Role of Perceived Support From Parents and On- and Off-Campus Friends In First- and Non-First-Generation College Students’ Life Satisfaction**
Dagoberto Partida ............................................................................................. 65

**Blazing Beetles: The Effect of Temperature on the Locomotion of a Namib Dune Beetle**
Jonathan Philips .................................................................................................. 73

**Shakespeare’s Violent Women: A Feminist Analysis of Lady Macbeth**
Camila Reyes ....................................................................................................... 81

**Development of Quantitative Förster Resonance Energy Transfer (Qfret) Based High Throughput (Hts) Screening For Pd-1/Pd-L1 Immune-Checkpoint Assay**
Amanda Xaypraseuth ........................................................................................ 87

**Voicing Lyrical Dance: (Re)Considering Lyrical Dance and Dance Hierarchy**
Julia Zumaya ....................................................................................................... 95
So far, 2020 has provided an intense study in deviation. As a research university, we made rapid adjustments when COVID-19 swept through the country, disrupting normal operations, upsetting our plans and work in progress. Yet, this year has also given us a lesson in rigor and adaptability. Despite the challenges, our students, faculty, and research teams worked to move forward. And when we couldn’t, we learned from that. In other words, no matter where we turned, we strengthened our skills as researchers. Even in a pandemic, we seized opportunities to bring new learning to light.

You will see in this 14th volume of the UC Riverside Undergraduate Research Journal that our students are delivering truly remarkable work. The published papers this year span the disciplines of Psychology, Biomedical Sciences, Bioengineering, Environmental Sciences, English, Dance, and Ecology. One paper examines how feelings of shame and guilt impact procrastination. Another studies our respiratory system’s response to toxins in organic dust.

Timeless and timely—these examples are but two highlights from this year’s journal reminding us that our scholarly pursuits are critical at any time but especially now as we turn to science for help against a viral enemy. At UCR we are stewards of transformation; we create knowledge through student-centered research endeavors, providing the next generation with skills to address tomorrow’s challenges.

To all of the students who contributed to this year’s Journal, congratulations on your impressive work. I also offer my heartfelt gratitude to the faculty mentors and staff members whose dedication, guidance, and perseverance made these projects possible. All of your efforts inspire pride in our university and hope for the future.

Sincerely,
Kim A. Wilcox
Chancellor

The Fourteenth Annual UC Riverside Undergraduate Research Journal features some of the very best faculty-mentored undergraduate research and scholarship from America’s fastest rising university. The Undergraduate Research Journal adds to the university’s impressive 66-year legacy of high-impact research, which fully integrates with the undergraduate student engagement experience.

In many ways, UC Riverside represents the university of tomorrow. Our inclusive culture, world-renowned faculty, and rigorous and future-focused environment produces young researchers who are prepared to tackle the dynamic challenges that face not only California’s Inland Empire, but the world at large. The students whose work is presented in the journal are enriching the environmental, economic, social, and cultural future of California, the nation, and the world.

Congratulations to each of the scholars featured in this journal as this is the culmination of a lengthy process of discovery filled with excitement, frustration, and anticipation. Thank you to our students, faculty, and staff who made the publication of the Undergraduate Research Journal possible. In particular, I would like to acknowledge the Student Editorial Board for leading the peer-review process, the Faculty Advisory Board for its consultation and advice, and Gladis Herrera-Berkowitz for her role in bringing this journal to fruition.

I hope you enjoy and are enriched by the discoveries revealed in this year’s Undergraduate Research Journal.

Wishing you all the best,
Jennifer Brown, Ph.D.
Vice Provost and Dean of Undergraduate Education

From the Administration
It is with great pleasure that we present UC Riverside's 14th Edition of the Undergraduate Research Journal. It has been an honor to work alongside talented individuals across disciplines and backgrounds, all of whom have contributed to the success of the Journal. Congratulations to the authors, Student Editorial Board, and Faculty Advisory Board — your diligence, dedication, and efforts towards the editing process have ensured the quality and success of the Journal. The research presented in this Journal represents the creative culture and academic achievements of the UCR student body and contributes to the legacy of excellence within UCR’s undergraduate research. We are proud and extremely humbled to have been part of an outstanding team that has made this year’s Journal a success.

Sincerely,
Phuong-Anh Do & Catherine Seo, Co-Editors-in-Chief
Since UCR’s Undergraduate Research Journal started, it has published over 150 scholarly articles across many fields. These papers represent the commitment of our undergraduate students to performing independent research as part of their undergraduate experience. The Undergraduate Research Journal thus fills a critical need. More often than not, undergraduate research forms part of a larger work with many contributors, which can mean a dilution of the student’s contributions as well as a longer time between completing the work and publication. With the Undergraduate Research Journal, our students can publish their work and get first-author credit. They can publish before the end of the academic year, and gain the experience of seeing their manuscript go through a peer-review and publication process just like a standard research journal. When the paper becomes a part of a student’s professional experience, it contributes to their record of scholarly achievement. The Journal submission and review process is run by undergraduates who form the Student Editorial Board, working with members of the Faculty Advisory Board. The preparation of this issue has been especially challenging because students and faculty have been able to meet only virtually. We owe a debt of gratitude to the students for their professionalism and dedication for the review and preparation of the articles in this issue. We are also grateful for the participation of the members of the Faculty Advisory Board in guiding the reviewers. If you are interested in publishing your undergraduate research at UCR, consider submission to our next issue!

Prof. Morris F. Maduro
Chair of the Undergraduate Research Journal
Faculty Advisory Board
Professor of Biology

EXECUTIVE COMMITTEE FOR UNDERGRADUATE RESEARCH

Dr. Alicia Arrizon
Associate Dean for Student Academic Affairs, College of Humanities, Arts, and Social Sciences

Dr. Jennifer Brown
Vice Provost and Dean, Undergraduate Education, Committee Chair

Dr. Anil B. Deolaika
Dean, School of Public Policy

Dr. Thomas Dickson
Associate Provost, Undergraduate Education

Dr. Thomas Kramer
Associate Dean of the Undergraduate Program, School of Business

Dr. Connie Nugent
Divisional Dean for Student Academic Affairs, College of Natural and Agricultural Sciences

Dr. Marko Princevac
Associate Dean for Student Academic Affairs, Marlan and Rosemary Bourns College of Engineering

Dr. Louie Rodriguez
Associate Dean for Undergraduate Education, School of Education

EDITORIAL TEAM

Phuong-Anh Do
Co-Editor-in-Chief

Catherine Seo
Co-Editor-in-Chief

Gladis Herrera-Berkowitz
Director, Student Engagement

Jennifer Kavetsky
Writing Support Specialists, Academic Resource Center

Jay Farago-Spencer
Student Engagement Student Workers

FACULTY ADVISORY BOARD

Ilana Bennett
Psychology

John Briggs
University Writing Program

Monica Carson
Biomedical Sciences

Elizabeth Davis
Psychology

Andrea Denny-Brown
English

Jonathan Eacott
History

Howard Friedman
Psychology

William Grover
Bioengineering

Erica Heinrich
Biomedical Sciences

Xiaoping Hu
Bioengineering

Isgouhi Kaloshian
Nematology

Matthew King
Religious Studies

Morris Maduro
Biology

Joshua Morgan
Bioengineering

Leonard Mueller
Chemistry

Misaki Natsuaki
Psychology

Vorris Nunley
English

Nicole Rafferty
Evolution, Ecology, and Organismal Biology

Wendy Saltzman
Biology

James Tobias
English

Ruoxue Yan
Chemical & Environmental Engineering

Weiwei Zhang
Psychology
THE PATH OF LEAST RESISTANCE

Located near Page, Arizona, this crescent-shaped meander is better known as Horseshoe Bend. As I approached this spectacle, the Type A in me gave up the fight for constant control of the situation and succumbed to the grandeur of the scene. I pondered and took a long stare at what was in front of me when I remembered how this greatness was created — like how I would navigate my life moving forward — by following the path of least resistance.