



# BioSci at 60

**UC Irvine** Charlie Dunlop  
School of Biological Sciences



DEAN'S REPORT 2025



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# BIOSCI AT 60

For six decades, the Charlie Dunlop School of Biological Sciences has advanced discovery, inspired generations of students and strengthened UC Irvine's role as a world-class research institution. What began as an ambitious vision in an open field has grown into a vibrant academic community shaping science, medicine and society. As we mark BioSci's 60th anniversary, we reflect on the moments, people and ideas that built our foundation — and the momentum carrying us forward. The stories ahead highlight how our commitment to innovation, education and public impact continues to define who we are and what we strive to achieve.



## MIND

Our nimble and complex minds power our lives, safeguarding our knowledge, experiences and recollections. Keeping our minds sound throughout our lives has become an important consideration for us all.

## BODY

The mind thrives in tandem with the body. For most of us, better physical health makes better brain health more likely and helps us flourish, no matter our age.

## WORLD

The health of our minds and bodies depends on the planet's air, water, soil, flora and fauna. If the well-being of the world around us declines, so will our individual health and the collective destiny of humanity.



# DEAN'S MESSAGE



Dear Colleagues and Friends,

This year marks a momentous milestone as we celebrate UC Irvine's 60th anniversary. As one of the seven founding schools when our campus opened its doors in 1965, the School of Biological Sciences has been integral to UCI's remarkable journey from a vision in an orange grove to one of the world's premier research universities.

Over these six decades, we have conferred more than 40,000 degrees, each representing a student whose life was transformed through education and discovery. Our graduates have gone on to become clinicians, researchers, educators, entrepreneurs and leaders across diverse fields, carrying forward the spirit of innovation that defines our school.

I would be remiss not to acknowledge that higher education faces unprecedented challenges today. Yet in these times, we must remember that our universities remain one of America's greatest strengths — a beacon that draws the world's brightest minds and continues to be the envy of nations everywhere. We would do well as a nation to recall the words of our first president, George Washington, who said "There is nothing which can better deserve your patronage than the promotion of science and literature. Knowledge is in every country the surest basis of public happiness."

His words ring as true today as they did at our nation's founding. That vision — of knowledge as the foundation of prosperity and progress — remains at the heart of what we do.

As a public research university, UC Irvine exemplifies the California promise — providing world-class education and groundbreaking research that serves our communities and drives innovation across the globe. The work we do here matters, not just for California, but for the world.

This year also marks the triumphant conclusion of UCI's Brilliant Future campaign, and what a successful campaign it was! I am deeply grateful to all who contributed to this historic effort. Every gift, regardless of size, has played a vital role in advancing our mission and supporting our students, faculty and research. I am especially thrilled to recognize Charlie Dunlop, whose visionary generosity has forever changed our trajectory — our school now proudly bears his name. This extraordinary investment reflects not only his unwavering belief in our mission but his dedication to empowering the next generation of scientific leaders who will shape our world.

The Dunlop School has also received landmark gifts that will advance two critical frontiers in brain health. The \$58 million gift establishing the

Noel Drury, MD Institute for Translational Depression Discoveries represents an audacious pledge to transforming mental health care.

This newly created institute will accelerate our efforts to bring hope and healing to millions suffering from depression and related conditions, bridging the critical gap between laboratory discoveries and real-world treatments. Moreover, the generous \$50 million gift honoring Ann Quilter to UCI MIND will propel our cutting-edge research in Alzheimer's disease and related dementias, bringing us closer to breakthroughs that will ease the burden on families facing these devastating conditions. Together, these gifts represent an unparalleled commitment to addressing two of humanity's most pressing challenges.

I am profoundly grateful to Lester and Vani Ng for establishing the endowed Dean's Chair, which honors their parents, Dr. Lionel and Fay Ng. I am especially humbled to serve as its inaugural holder. This meaningful recognition not only acknowledges the vital role of academic leadership but also celebrates the legacy of Dr. Lionel and Fay Ng, whose values of education and service continue to inspire us. It is a responsibility I carry with sincere dedication to ensuring visionary leadership for future generations.



## DEAN'S MESSAGE CONTINUED

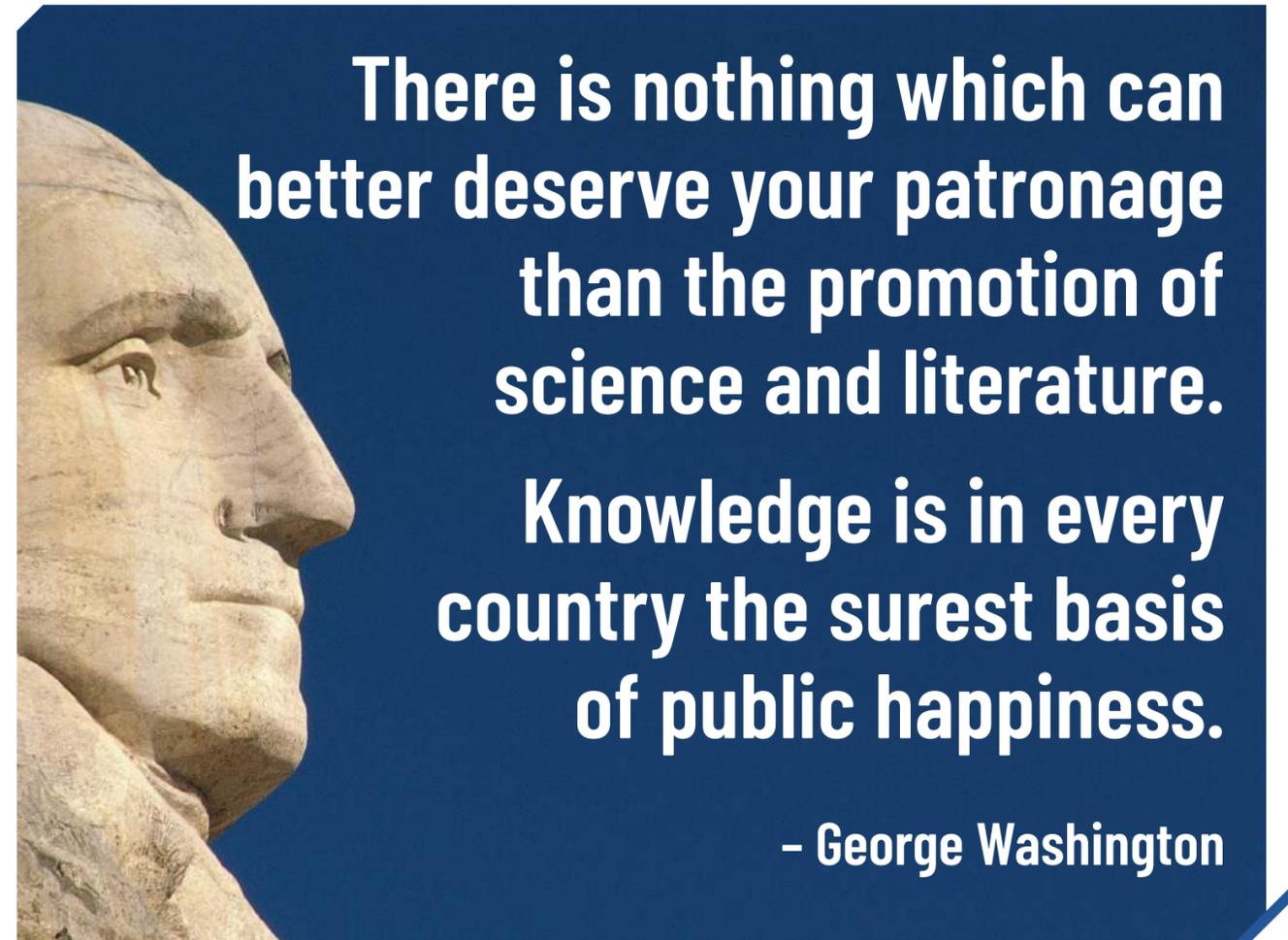
As I reflect on 60 years of excellence and look toward the future, I am filled with profound gratitude and boundless optimism. I have been extraordinarily fortunate to serve as dean during both our 50th and now our 60th anniversaries — a rare privilege that has allowed me to witness firsthand the remarkable evolution of our school and the exceptional minds who continue to push the boundaries of biological discovery. The momentum we've built, the partnerships we've forged, and the talent we've assembled position us not just to meet the challenges ahead, but to lead the way in solving critical problems facing humanity.

From unlocking the mysteries of the brain to conquering cancer and disease throughout the body, from understanding the complexities of our ecosystems to training the next generation of scientific pioneers — our best days are not behind us, they are ahead of us. Our future has never looked brighter, and I could not be more excited about the journey that lies before us.

Sincerely,

*Frank LaFerla*

Frank LaFerla, PhD  
Dr. Lionel and Fay Ng Dean and  
Distinguished Professor



**There is nothing which can  
better deserve your patronage  
than the promotion of  
science and literature.**

**Knowledge is in every  
country the surest basis  
of public happiness.**

**– George Washington**

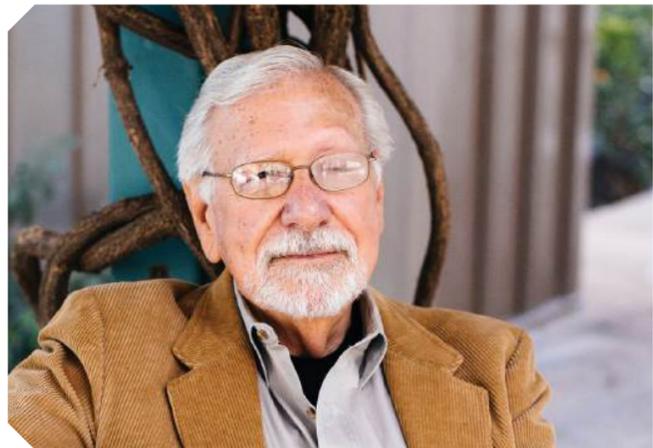
# ENCODING A LEGACY: REFLECTING ON MEMORIES OF UC IRVINE'S FIRST DAYS

Before the city of Irvine was founded, before a single classroom had opened its doors and long before the name UC Irvine carried any weight in the academic world, a young neurobiologist took a gamble on a bold idea. That man was James L. McGaugh, who would become not only a founding faculty member of the University of California, Irvine, but one of the essential architects of the university itself.

In 1964, the UC system was expanding, and Edward Steinhaus — a quiet visionary from UC Berkeley — was determined to build something new: a School of Biological Sciences that would reject the traditional taxonomy-based structure of zoology, botany and bacteriology in favor of one based on levels of analysis. Psychobiology, organismic biology, molecular and cell biology, and population and environmental biology would form the foundation. “It was the first school of Biological Sciences to do that,” McGaugh recalled, “and now throughout the country, that’s the way it is.”

At the time, McGaugh was freshly settled at the University of Oregon with a promising career and a newly built home. But then came a call from Steinhaus himself, founding dean of the School of Biological Sciences. “He spun his vision of the school for me. And it sounded like it was more than reasonable,” McGaugh said. The allure? He was being invited to create and chair what would be the first academic department in the world devoted entirely to the scientific study of the brain. The department, initially named Psychobiology, was later renamed Neurobiology and Behavior — a reflection of both its evolving scope and lasting impact.

Still, the decision meant giving up a tenured position at a respected university to move to a place that didn’t yet exist.



What ultimately convinced him to take the leap was the name. “One of the main reasons I came was the name,” he explained. “It was the University of California. And I’m a product of UC Berkeley, and I know it to be one of the world’s finest universities. So why not come to one of the world’s finest universities starting all over again?”

McGaugh accepted, arriving at a place that was less a campus and more a cow pasture. The future UC Irvine was at the time little more than the Irvine Ranch, a sprawl of undeveloped land bordered by barbed wire. There were no roads, no trees, no city. His lab and office were in small buildings hastily erected at the corner of Jamboree and what is now Campus Drive. “Friends of mine would come and they’d look and say, ‘You came to this from the University of Oregon?’”

And yet, McGaugh never looked back. The promise of building something meaningful was too compelling. “That first year was like summer camp,” he said. “It was like being a kid in a candy store.”

Life on campus could be surreal. In the early fall, McGaugh and his colleagues would stand on the balcony of what is now Steinhaus Hall, looking southwest. From that vantage point, they could see actual cowboys — wide-brimmed hats, horses and all — herding cattle down from the hills. “They’d bring the cattle down and put them on trucks and take them away,” McGaugh recalled. That part of the ranch, not far from where the Science Library now stands, was still very much alive in the early days.

It wasn’t just the School of Biological Sciences McGaugh helped shape; it was the campus itself. One of only a few non-administrative faculty on-site that first year, he helped make decisions that would influence UC Irvine for decades: whether the campus would follow a quarter or semester system, whether to allow fraternities or sororities (they voted no), and even what to name the streets and dormitories. “We named every street,” he said. “Circle View became Peltason. I voted for quarter system because I’d been on both quarter and semester, and I like quarter better ... that’s what we did the first year.”

Perhaps the most consequential decision of McGaugh’s early career came during a pivotal moment of administrative wrangling. When the Dean of Social Sciences tried to absorb the Psychobiology department, which would have made its focus psychology over biology, Steinhaus threatened to resign. “He said, ‘Here’s my response ... and if you move the department, then I’m going back to Berkeley.’” McGaugh would have left, too. “It was Steinhaus who saved the department. He created it and saved it.”

When Dean Steinhaus went on sabbatical, he asked McGaugh to serve as acting dean in his absence. What was expected to be a temporary assignment quickly turned into something more permanent

when Steinhaus tragically passed away during his leave. McGaugh remained in the role longer than anticipated, helping guide the school through a period of transition until Howard Schneiderman — an accomplished biologist who would later play a key role in the development of genetically modified foods — was appointed dean. McGaugh then returned to his department, where his heart had always been. “I didn’t want to do that position at that point in my career, so I was happy to return to the department.”

But his leadership days were far from over. McGaugh would go on to serve as Vice Chancellor of Academic Affairs, then as Executive Vice Chancellor of the entire campus. Even then, he remained closely connected to his roots in the School of Biological Sciences, returning multiple times to chair the department he helped create.

Under McGaugh’s leadership, and thanks to the department’s novel focus, UC Irvine became a magnet for top students and researchers in neuroscience and behavior. “We were the only department of this kind in the world ... we attracted high-quality people from all over,” he said. “Our international recognition grew very quickly.” The reputation was earned not just through novelty but by excellence.

In the early 1980s, McGaugh also founded the Center for the Neurobiology of Learning and Memory, a hub that became central to UC Irvine’s continued influence in brain research. “I led it for about 20 years,” he said. “We were able to hire great faculty who have since gone on to play prominent roles in the school.”

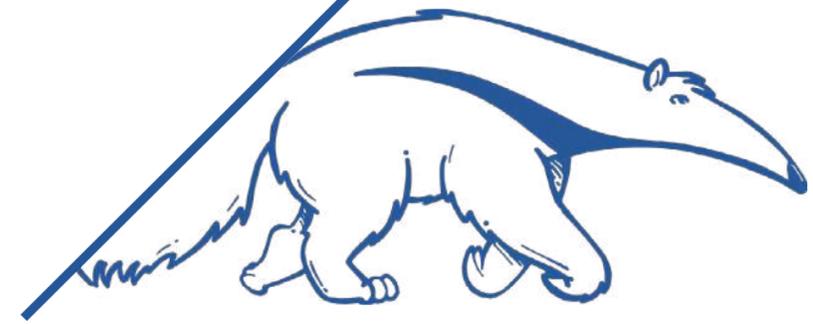
McGaugh is not prideful. Instead, he describes his feelings as satisfaction. “I’m immensely satisfied that we created a novel school and department of lasting significance.” He still marvels at the fact that UC Irvine, now a global research powerhouse, was once accessible only by helicopter. “There was no 405 or 5. I flew to LAX, got a helicopter, and landed at a heliport on the corner of Pacific Coast Highway and Jamboree because they didn’t have roads.”

Today, McGaugh’s fingerprints are all over campus, from the naming of streets to the structure of its academic programs. More than just a foundational faculty member, he was a builder of institutions and a steward of Steinhaus’ vision.

In telling his story, Distinguished Professor Emeritus James McGaugh tells the story of UC Irvine. It is one of high-stakes decisions made in temporary buildings, unexpected challenges and a shared belief in the potential of a new institution. From modest beginnings, the university — and what is now the Charlie Dunlop School of Biological Sciences — grew into something lasting and influential, thanks to the efforts of those who helped build it from the ground up.

# WHY UC IRVINE CHOSE THE ANTEATER — AND WHY IT STILL FITS 60 YEARS LATER

The anteater didn't just become UC Irvine's mascot by chance — it was chosen through a deliberate act of creativity and independence that set the tone for the university's future. In 1965, as UC Irvine prepared to welcome its first students, the campus community faced a symbolic decision: what kind of mascot would represent this new institution? The options included familiar collegiate symbols such as Eagles, Seahawks and Unicorns, but students had something different in mind. On November 30, 1965, they voted decisively for the anteater, making a choice that was both unexpected and forward-thinking. That vote defined the young university's character: bold, unconventional and unafraid to stand apart.



The selection of the anteater quickly became a rallying point for campus identity. The accompanying cheer, "Zot!" — borrowed from the B.C. comic strip, where it represented the sound of an anteater striking — became the heartbeat of student culture. It was heard at athletic events, printed in newsletters and embraced by students as a symbol of unity and humor. Over time, "Zot!" evolved from a quirky inside reference into an enduring expression of pride. Today, the anteater's influence can be seen everywhere: on campus signage, apparel, social media and even the university's communications channels. It has transcended its origins to become one of the most distinctive mascots in higher education — instantly recognizable and inseparable from UCI's identity.

Behind the mascot's appeal lies the biology of its real-life counterpart, the giant anteater (*Myrmecophaga tridactyla*). Native to Central and South America, this striking animal can measure up to seven feet from its long snout to the tip of its sweeping tail. Its distinctive features — a narrow head, dense fur and curved foreclaws — are not simply for show; they are the product of evolutionary precision. The giant anteater's survival depends on specialization. It feeds almost exclusively on ants and termites, consuming tens of thousands each day. Lacking teeth, it uses a tongue that can extend more than two feet and flick rapidly in and out of its mouth — over 150 times a minute — to collect its prey. Sticky saliva coats the tongue, allowing the anteater to capture insects with remarkable efficiency, while its foreclaws tear open nests with careful strength.

Its internal biology is equally adapted to this unique lifestyle. The giant anteater's stomach functions like a grinding chamber, breaking down insects through muscular contractions and small bits of sand or soil ingested along with its prey. It maintains a lower metabolic rate and a body temperature around 91°F, several degrees cooler than most mammals, enabling it to conserve energy in habitats where food is widely dispersed. Each adaptation tells a story of quiet efficiency — an organism shaped to succeed through persistence rather than speed or aggression.

Despite its resilience, the giant anteater now faces serious ecological challenges. Classified as vulnerable, it is threatened by habitat loss from deforestation, grassland fires and vehicle collisions as human development expands into its range. Conservation groups in South America are working to preserve its habitats and reduce these risks, recognizing the anteater's ecological importance and the fragility of its remaining populations.

As UC Irvine celebrates its 60th anniversary, the anteater remains more than a symbol — it is a reflection of the university's enduring values. The decision made by students in 1965 was not simply about choosing an animal; it was about defining an attitude. The anteater embodies independence, curiosity and adaptability — traits that continue to characterize UC Irvine's approach to research, education and innovation. Just as the giant anteater thrives through precision and perseverance, UCI has built a legacy on thoughtful experimentation and intellectual courage. Sixty years later, the anteater still represents what the university has always aspired to be: distinct, resilient and unafraid to chart its own course. **Zot Zot Zot!**

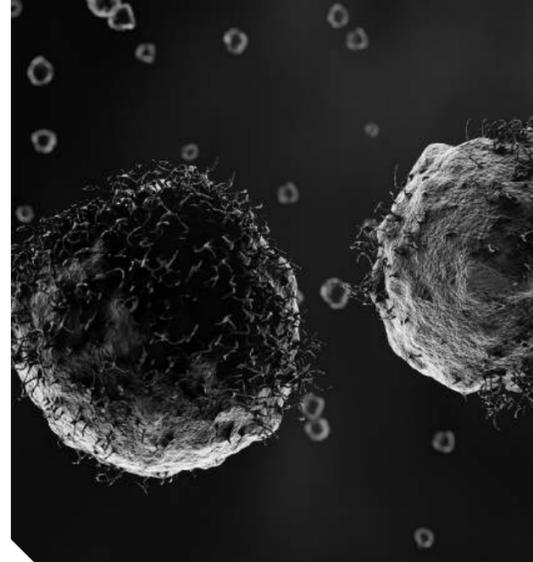


Biology advances our understanding of the mind, protects the body, and sustains the world we share.



# FROM DNA TO DISCOVERY: 60 YEARS OF MOLECULAR SCIENCE

– Professor David Fruman, Chair



**In the early 1960s, as scientists worldwide were unlocking the secrets of DNA and how genetic information works, a new department was taking shape at the newly founded University of California, Irvine. The Department of Molecular Biology & Biochemistry emerged during this exciting era of biological discovery, focused on understanding how molecules like DNA, RNA and proteins control the behavior of cells. Over six decades, the department has become a powerhouse in translating these molecular discoveries into solutions for real-world health problems, including cancer, infectious diseases, immune disorders and brain diseases.**

## Seeing Life's Building Blocks

In its early years, the department pioneered ways to see and understand life's most fundamental processes. Researchers used powerful microscopes to capture the first detailed images of how DNA copies itself and how genetic information gets converted into the proteins that do the work in our cells. These groundbreaking images helped bring the molecular revolution in biology into sharp focus.

## Building 3D Maps of Life's Machines

As technology advanced, department scientists became known for creating detailed 3D models of the protein machines that maintain cell health and that malfunction in disease. They mapped the structures of enzymes that help our bodies process medications and molecules that control blood flow and immune responses. One researcher captured the first complete picture of an antibody — the Y-shaped proteins our immune system uses to fight infections — and even partnered with NASA to experiment with growing protein crystals in space. Others have made major advances in understanding how proteins misfold in

diseases like Alzheimer's, work that continues to guide the global search for treatments.

Today's researchers are decoding ancient biological machines used by soil bacteria to capture nitrogen from the air — work that could lead to more energy-efficient agriculture and new ways of converting greenhouse gases into clean fuels.

## Fighting Viruses and Disease-Carrying Insects

Viruses have been a central focus since the department's founding. Early researchers discovered how viruses hijack our cells during infection, laying the groundwork for antiviral drugs now used to treat HIV and hepatitis C. Others made key discoveries about herpes viruses and proposed bold new theories about how viruses may have shaped the evolution of complex life.

In one of UC Irvine's most globally impactful research programs, scientists have spent over three decades developing genetically engineered mosquitoes that cannot transmit diseases like malaria, dengue and Zika. This work, which uses cutting-edge gene-editing tools, is now influencing global public health policy.

## Exploring the Hidden World of Microbes

Today's researchers continue exploring the microscopic world in new ways. Scientists are leading a new generation of microbiome research, focusing on viruses that infect bacteria and developing potential therapies that could fight infections without traditional antibiotics. Others use structural biology to understand how harmful bacteria invade and survive inside the human body.

## Unlocking Immune System Secrets

The immune system has long captivated department scientists. In the 1970s and '80s, researchers discovered key immune molecules that helped pave the way for therapies like Humira and Enbrel, now widely used to treat autoimmune diseases. Current research on the complement system — a part of our immune response — has deepened understanding of its roles in both brain health and disease, including Alzheimer's. In the growing field of neuroimmunology, faculty are revealing how the immune system interacts with the brain — sometimes helping, sometimes causing harm.



## Leading the Fight Against Cancer

The department has played a major role in UC Irvine's leadership in cancer research. Scientists helped found what is now the Chao Family Comprehensive Cancer Center. Current research advances cancer drug development through work on cell signaling, explores how cancer cells rewire their metabolism and investigates how diet and chemical interventions could fight tumors. Researchers have developed advanced methods for growing human blood vessels in the lab and created "organ-on-chip" platforms that mimic real tumors, giving scientists powerful tools to test cancer therapies in realistic human tissue environments.

## Training the Next Generation

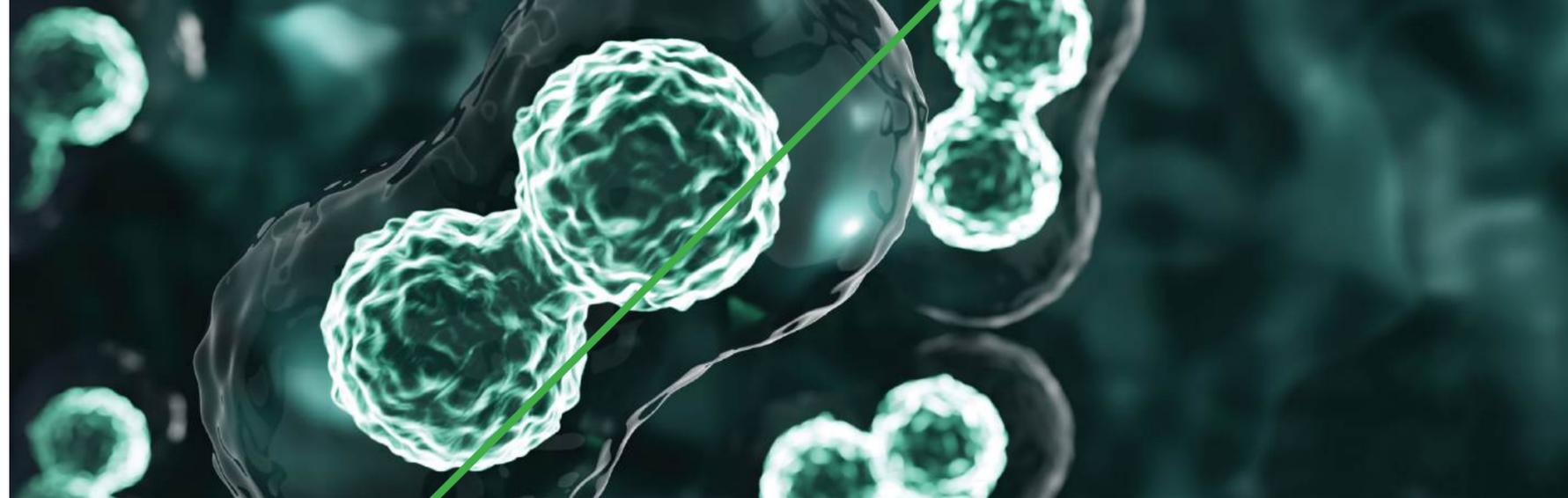
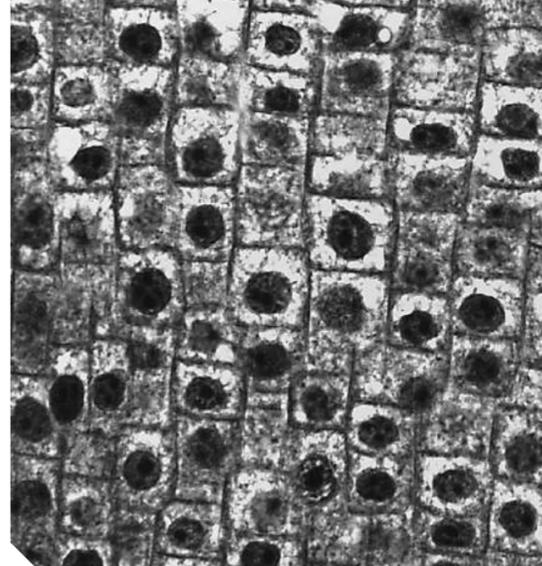
Throughout its history, the department has remained committed to excellence in both research and teaching. Faculty members are global leaders in structural biology, microbiology, immunology, cancer biology, and bioengineering. Just as importantly, they serve as mentors who help shape generations of scientists, physicians and innovators.

## Looking Ahead

**From decoding DNA to designing therapies, from mapping molecular machines to modifying disease-carrying insects, the department has helped shape the modern age of biology. Its discoveries push the boundaries of knowledge in molecular sciences, touching lives in ways that are both profound and practical. As part of the Charlie Dunlop School of Biological Sciences, the Department of Molecular Biology & Biochemistry remains a vibrant and visionary force — advancing human health one molecule at a time.**

# BUILDING LIFE: SIX DECADES OF CELLULAR DISCOVERY

– Professor Kavita Arora, Chair



The Department of Developmental & Cell Biology traces its origins to Organismic Biology, which was among the inaugural departments founded when UC Irvine was established in 1965. Over the decades, it has grown to become a pillar of biological sciences research on campus, producing groundbreaking discoveries that deepen our understanding of how cells work, how living things develop from a single cell into complex organisms and what goes wrong in diseases.

## Revolutionary Times and Visionary Leadership

The department emerged during an era of groundbreaking advances in molecular biology and discoveries that were dissolving the traditional boundaries between biological disciplines. The newly established campus offered an ideal setting for pioneering research initiatives under inspirational leadership that simultaneously guided both the department's formation and the broader School of Biological Sciences. This unique dual leadership allowed for building a robust institutional framework, attracting outstanding faculty members and cultivating the collaborative research environment that continues to define the department's character today.

The pioneering faculty explored fundamental questions about how organisms grow and develop from a single cell to a complex adult. Their groundbreaking work led to the discovery of genes linked to growth abnormalities and cancer in humans. By studying simple animals like *Hydra* and fruit flies, researchers revealed fundamental principles of development, including how organisms regenerate lost parts and how body patterns are established. Early faculty also laid crucial groundwork for stem cell research at UC Irvine, placing the university years ahead in what would become one of the most influential fields in biomedical science.

## Decades of Discovery and Innovation

Over the ensuing decades, faculty have continued to make impactful contributions to science and human health. Today, research in the department uses sophisticated new technologies to study problems at the sub-cellular, cellular and whole-organism levels, revealing the molecular mechanisms that drive cellular function and guide organismal development.

## Understanding How Life Repairs Itself

Groundbreaking work in regeneration has revealed how animals can regrow limbs, how pancreatic cells that produce insulin can be restored and how injured neurons can be repaired. Research in skin biology is uncovering fundamental insights into wound healing, how skin protects us from environmental challenges and identifying potential cures for baldness.

## Tracking Cells on the Move

Studies on how cells migrate have illuminated how complex cellular movements shape developing animals, including how problems in these processes contribute to birth defects. This work helps us understand everything from how our faces form during development to how cancer cells spread through the body.



## Decoding Cellular Communication

The department's expertise in genetics and how genes are controlled has shed light on how cells interpret and respond to complex signaling environments — essentially how cells "talk" to each other and coordinate their activities. Sophisticated algorithms developed by our faculty have allowed the prediction of how gene networks direct cells to differentiate into specialized cell types.

## From Normal Function to Disease

Cell biology research focused on how cells control their growth and metabolism has led to insights into how normal biological processes become disrupted in cancer, parasitic infections and inherited diseases such as Cornelia de Lange syndrome, Huntington's disease and craniofacial disorders. Pioneering studies on obesogens have helped explain how environmental chemicals contribute to the global obesity epidemic.

Collectively, this work has enabled the identification of new therapeutic targets and treatment strategies.

## Breaking Down Scientific Barriers

A key strength of the department is its commitment to collaborative science that spans different fields, enabling breakthrough discoveries that wouldn't be possible within traditional academic boundaries. Recent work has applied computational and mathematical modeling approaches to predict biological outcomes during development and cancer, providing new insights into how cells respond to genetic and environmental challenges.

## Training Tomorrow's Scientists

The department has played a crucial role in advancing biology education. It pioneered the use of innovative teaching strategies, including active learning and peer instruction, to improve how undergraduate students engage with and learn biology. These innovations have positioned the department as a leader in undergraduate biology education both on campus and nationally.

The graduate program has been remarkably successful as well, producing 150 PhDs in the last 25 years alone. Alumni have gone on to distinguished careers in academia, the biotech industry, as teachers, patent lawyers and physician-scientists.

## Looking Forward: The Next Chapter

As the Dunlop School of Biological Sciences enters its seventh decade, the department is well-positioned to continue making important contributions to science and biomedical research. Today the department comprises 30 faculty members, including seven fellows of the American Association for the Advancement of Science, with others receiving prestigious national awards.

Recent faculty recruitments in cutting-edge areas such as expansion microscopy, stem cell biology, genomic regulatory strategies and tissue regeneration position researchers to tackle questions of cellular behavior at unprecedented scale and resolution.

Together, these achievements ensure UC Irvine's continued leadership in developmental and cell biology research and science education — promising transformative discoveries that will deepen our understanding of life and improve human health for decades to come.

# NEUROBIOLOGY AND BEHAVIOR: THE BIRTH OF BRAIN SCIENCE AT UC IRVINE

– Professor Marcelo Wood, Chair

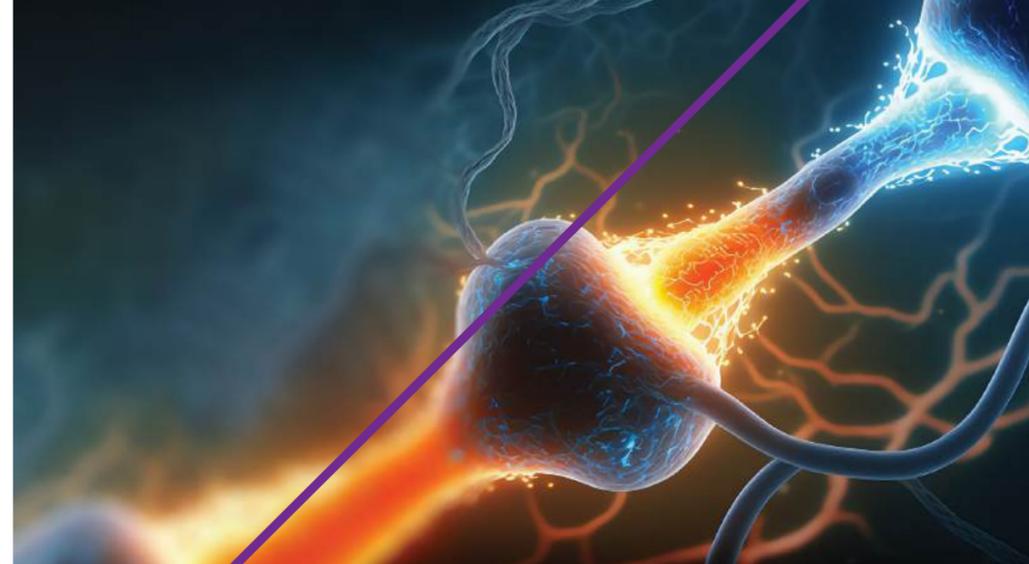
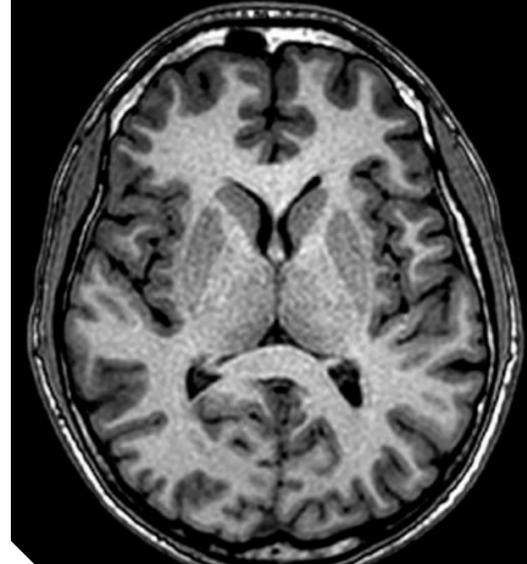
When the University of California, Irvine was founded in the 1960s, the field of neuroscience was just beginning to emerge as a distinct area of study. At the heart of UC Irvine's early investment in understanding the brain was the creation of the Department of Psychobiology – what we now know as the Department of Neurobiology & Behavior – in 1964. Today, the department is a cornerstone of the Charlie Dunlop School of Biological Sciences, with a 60-year legacy of discovery that has transformed how we understand the brain and behavior.

## Pioneering the Science of Memory

The department's founding leadership by Professor James McGaugh was instrumental in establishing the science of learning and memory. This groundbreaking research revealed how emotional experiences become lasting memories, fundamentally reshaping our understanding of how the brain works. In 1982, the department established the Center for the Neurobiology of Learning and Memory — the first research center in the world devoted to understanding how memory functions. UC Irvine's early commitment to brain science positioned it at the leading edge of a field that would soon explode with discovery, just as scientists around the world were beginning to unite under the newly formed Society for Neuroscience.

## Unlocking the Mysteries of Learning and Memory

Over the decades, faculty have continued to lead in the science of learning and memory. Researchers uncovered how changes in brain connections, called synaptic plasticity, underlie our ability to learn new things. Others have explored how memory is shaped by biological sex differences, sleep patterns, spatial navigation and even how memories change over time. These discoveries have provided crucial insights into both normal brain function and what goes wrong in memory disorders.



## Tackling Brain Diseases and Aging

Another area where the department has made pioneering and field-changing contributions is in studying neurodegenerative diseases. Faculty helped uncover the biological foundations of Alzheimer's and Huntington's diseases, developed some of the most widely used laboratory models for studying dementia and launched unique studies of aging in people over 90 years old. These discoveries are now expanding into promising new territory, from understanding the role of immune cells in the brain to developing stem-cell-based approaches to therapy.

Current researchers are using cutting-edge tools to understand how genes and cells shape brain health and disease, while others are helping translate that knowledge into clinical research that may ultimately improve treatment for patients.

## How Does the Brain Translate Information from the World as We Experience It?

Numerous faculty in the department over the decades have led the exploration of trying to understand how the brain converts information we experience via the sensory systems of sight, sound, olfaction and more. These discoveries have had profound impacts on understanding human disorders associated with vision loss and deafness but also converting these discoveries into novel therapeutic approaches.

## Understanding Addiction and Brain Reward Systems

The department has also become a leader in the neuroscience of addiction. Early studies examining the impact of methamphetamine on the brain have evolved into comprehensive investigations of how substances like nicotine and cannabis affect brain reward systems. This research has important implications for developing better treatments and prevention strategies for substance use disorders.

## Embracing New Technologies

From the department's earliest days, faculty have embraced emerging technologies to open new windows into the brain. Research has helped define how we use brain imaging, gene sequencing, stem cell tools and computational analysis to tackle questions once thought unanswerable. Whether studying how brain structure/function evolved across species, how infants learn to hear or how stroke reshapes the brain,

scientists are united by a drive to push the field forward using the most advanced methods available.

## Training the Next Generation

As with all departments in the school, education has always been central to Neurobiology & Behavior's mission. Undergraduate majors in Neurobiology and Human Biology — once small programs — have exploded in size and popularity. These programs not only offer rigorous scientific training but also connect students to research opportunities that can spark lifelong careers in science and medicine.

At the graduate level, faculty have played a leading role in shaping neuroscience education across campus, helping develop foundational coursework and professional development programs that prepare students for careers in academia, medicine, industry and beyond.

## A Culture of Collaboration

What truly defines a department in the Charlie Dunlop School of Biological Sciences is its collaborative culture. Faculty, staff and students alike are united by a deep sense of collegiality and a shared commitment to advancing scientific knowledge. This spirit is reflected in the many leadership roles department members hold across the university and in their ability to support and mentor the next generation of scientists.

## Looking to the Future

Looking ahead, the potential for discovery is enormous. From novel brain imaging techniques and stem cell technologies to computational neuroscience and artificial intelligence, today's tools allow researchers to ask questions that were unthinkable just a generation ago. As neuroscience continues to evolve, so too will the department's focus. One particularly promising area lies in social neuroscience — understanding how brains interact with one another — a question that could have profound implications for understanding human behavior and relationships.

## A Legacy of Impact

Sixty years after its founding, the Department of Neurobiology & Behavior remains one of the most influential forces in neuroscience. Faculty have shaped the field, students have become leaders and discoveries continue to ripple across science and medicine. As part of the Charlie Dunlop School of Biological Sciences, the department stands as a powerful example of how a university department can change the world — not just through what it discovers, but through the people it inspires and the knowledge it creates for the benefit of humanity.

# ECOLOGY & EVOLUTIONARY BIOLOGY AT UC IRVINE: UNDERSTANDING THE RULES OF LIFE

- Professor Travis Huxman, Chair

From the sagebrush-covered hills surrounding our campus, to the depths of the Pacific Ocean, and across all corners of the globe, UC Irvine's Ecology & Evolutionary Biology department has been unraveling the fundamental forces shaping the intricate web of life for nearly six decades. Our founding faculty members laid the groundwork for how the life sciences now study nature. They investigated everything from population growth and diseases spread to species evolution and energy flow through ecosystems. Following UCI's example, the nation's leading research universities subsequently established Ecology & Evolutionary Biology units in their schools and colleges.

## A Focus on Biodiversity

From the very beginning in 1965, our faculty and students took a different approach. Instead of studying one type of animal or plant, they explicitly contemplated the big picture — how everything in nature is connected and related. They studied biology as a system, where the relatedness of species, their interdependence, and their relationship with environment all play important roles in how life works.

This approach uncovered general rules of life. We now understand that making sense of biology comes from an evolutionary perspective, with ecology providing the environmental context in which evolution unfolds. One can see this approach in what society required of science to understand the emergence of COVID — two keys to understanding the pandemic were the evolutionary responses of the virus to novel hosts and settings and the spatial and temporal patterns of virus abundance associated with transmission.

## Integrated, Interdisciplinary, and Multiscalar

Our department organized itself around big questions rather than taxonomic specializations like "bird experts" or "tree specialists." As such, our faculty have long been interdisciplinary scholars, bringing together combinations of approaches from fields like anatomy, physiology, molecular biology, genomics, and biochemistry into their individual research programs. This allowed our faculty to make advances in diverse issues. And we still are a faculty composed of diverse skill sets and backgrounds, allowing us to act as a hub on campus bringing researchers together in ways that lead to breakthroughs. Faculty in Ecology & Evolutionary Biology have led recent initiatives in Exercise Science, Microbiomes, Sustainability, and Oceans.

Our researchers continue this tradition by studying life at every scale, from tiny microbes in the soil to entire forests, and from individual genes to whole ecosystems. Living in Southern California also gives us a unique advantage. We're surrounded by incredible diversity, from the ocean to coastal wetlands to mountains and deserts. We collaborate with geologists, oceanographers, atmospheric chemists, and public health scientists. And we partner with local communities who care about how these special places work, how they impact human health, and how they affect society.

## Bringing Modern Tools to Grand Challenges

Today's technology has revolutionized how we study nature. Our scientists use thermal cameras to track animals and understand their physiology, DNA sequencing to understand population dynamics, remote sensing to measure the activities of whole-ecosystems, and computer models to predict future ecological states. These tools help us answer questions that seemed impossible just decades ago.

We have also learned that evolution and ecology work together in fascinating ways. For example, climate change does not just threaten species; it can actually accelerate or change how they evolve. Our faculty have been leaders in understanding these connections.

## Science In, and For the Real-World

Our research goes far beyond the laboratory. Faculty use networks of field stations throughout California and carry out work in partnership with the decision-makers in society that use our knowledge. Enhancing science communication is a shared goal of the faculty and we use our leadership positions in such organizations as the Newkirk Center for Science and Society, to connect scientific discoveries to real-world solutions.

## Continuing the Legacy

Our retired faculty helped put UC Irvine on the map, pioneering the use of DNA to trace evolutionary family trees, advancing our understanding of how plants evolve, helping create the field of environmental physiology, and inspiring thousands of students to love and protect California's natural areas.

## Looking Forward

Our department studies life not just to understand how it works, but to protect it and apply our discoveries to solve pressing global challenges. Our impact reaches from Southern California's coastal tidelands to biodiversity hotspots around the world, and even to understanding the microbes that live in our own bodies.

Ecology and evolutionary biology is fundamentally about connections — linking the smallest molecules to entire ecosystems, connecting the past to the future, and bridging science with society. As we celebrate 60 years of discovery, we are excited about the breakthroughs still to come and the next generation of scientists we are training to tackle tomorrow's challenges.

Our current faculty continue this tradition of groundbreaking research, working on:

- > Restoring damaged ecosystems in our changing climate
- > Understanding how fungi and microbes help ecosystems bounce back from disturbances
- > Partnering with communities to help them adapt to climate change
- > Exploring how fish feeding habits reveal evolutionary secrets that help with conservation
- > Studying butterfly vision to inspire new technologies
- > Investigating how food webs drive the health of entire ecosystems



“  
The work we  
do here matters,  
not just for  
California, but  
for the world.  
– Dean Frank LaFerla  
”



# BIOSCI AMBASSADORS: CHAMPIONING THE FUTURE OF SCIENCE

The Dunlop BioSci Ambassadors (BSA) program is a vibrant and growing community of alumni, supporters and friends who are deeply committed to advancing the mission of the Charlie Dunlop School of Biological Sciences. The program was created to foster meaningful engagement between BioSci and its benefactors, bringing together individuals who share a passion for scientific discovery, education and community impact.

The BioSci Ambassadors are catalysts for the School's success — forging powerful connections, opening doors to extraordinary collaborations and championing BioSci's innovative story across diverse industries and networks. Members enjoy VIP access to exclusive events and experiences that connect them directly with faculty, students and leadership, creating opportunities for insight, mentorship and philanthropy to intersect.

The program also hosts dynamic networking mixers and alumni engagement events throughout the year, creating vibrant spaces for Ambassadors to forge connections with recent graduates and fellow members. Beyond traditional gatherings, Dunlop BioSci Ambassadors gain exclusive access to one-of-a-kind experiences with Dean Frank LaFerla and distinguished faculty, such as birdwatching expeditions at the San Joaquin Marsh where expert faculty naturalists lead participants through thriving wetlands, blending community, cutting-edge ecological science and the awe-inspiring beauty of nature.

As BioSci commemorates 60 years of scientific excellence, the BioSci Ambassadors continue to play a pivotal role in shaping its future; building bridges between academia, industry and philanthropy to drive innovation and inspire future generations of scientific leaders. We invite you to become a Dunlop BioSci Ambassador and be part of something extraordinary.

Scan here to learn more:





# INVESTING IN TOMORROW'S LEADERS

**At the Dunlop School of Biological Sciences, we believe every student has the potential to change the world. From day one, we invest in their success – academically, professionally and personally. Through dedicated advising, intentional programs and opportunities to build impactful connections, we empower students to discover their unique path and transform their potential into impact.**



Beyond marquee events, the Dunlop School promotes student achievement every day through initiatives that build academic confidence and community. A team of professional advisors provides individualized guidance that goes well beyond course planning, connecting undergraduates to resources and experiences that align with their goals. **The Excellence in Academic Student Engagement (EASE) program** brings together select first-year students, helping them develop effective study strategies and a sense of belonging from the start. Building on this foundation, the school recently launched **Learning Communities** that now include all 1,000 incoming freshmen — creating peer networks that encourage collaboration, study and friendship. **The International Student Program (ISP)** extends this support globally, providing tailored academic advising, mentoring and social activities for biological sciences majors from around the world. ISP fosters a warm, welcoming community for students far from home and helps them thrive both academically and personally.

Complementing these efforts are programs and courses that connect academic preparation with real-world application. **Bio 3A and Bio 3B** help students explore a wide



range of professional paths through guest speakers from health and non-health fields, while **Bio 2A and Bio 190** serve as “welcome to college” seminars for freshmen and transfer students, respectively. Regular **Health Professions Workshops** and social events further strengthen the sense of connection that defines the BioSci experience.

**Donuts with the Dean** brings students, faculty and leadership together quarterly for an informal afternoon of conversation and community. Over donuts, undergraduate attendees hear from distinguished speakers — typically accomplished alumni and industry leaders — who share the real stories behind their success. These are not rehearsed presentations; they're honest discussions about challenges faced, lessons learned and pivotal moments that shaped their careers. The relaxed atmosphere encourages students to ask questions, seek advice and forge professional relationships. It's where mentorship and inspiration meet — and where students discover that the path forward is rarely a straight line. These conversations remind them that they are not alone in facing uncertainty and that the Dunlop School's support extends well beyond the classroom.



**The Annual Graduate Banquet** stands as one of our most prestigious gatherings, bringing together faculty, students and generous benefactors to celebrate the exceptional achievements of our graduate scholars. This formal evening honors outstanding contributions to research, teaching and service. Named awards, made possible by the philanthropic vision of our supporters, recognize graduate students who have demonstrated excellence in their fields. The banquet provides a meaningful opportunity for benefactors to witness firsthand the impact of their investment, for faculty to celebrate their mentees' accomplishments and for graduate students to be recognized among their peers for the rigorous work that often goes unseen. It's an evening that underscores the vital role graduate students play in advancing the school's mission and honors the partnerships that make their success possible.

**BioSci Career Conversations** is our newest initiative designed to bridge the gap between academic preparation and professional opportunity. These dynamic events bring biotech professionals and senior executives directly to students through engaging industry panels and one-on-one discussions. Participants gain insider perspectives on diverse career trajectories — often discovering

paths and possibilities they hadn't previously considered — while building valuable connections with leaders who can open doors to internships, research collaborations and future employment. Beyond individual benefit, these events cultivate partnerships between the school and leading biotech companies, creating pipelines for talent recruitment, collaborative research and industry-informed curriculum development.



By facilitating these direct connections, we ensure our students don't just enter the workforce — they enter it with confidence, clarity and a network of professionals invested in their success.

**The GPS-STEM program** is a comprehensive professional development initiative designed to support graduate students and postdoctoral scholars in the Schools of Biological Sciences, Physical Sciences, Engineering and Medicine. Focused on bridging academic training with career readiness, GPS-STEM offers targeted

workshops, mentorship, industry engagement and skill-building opportunities that prepare participants for a broad range of careers within and beyond academia. By fostering a supportive and resource-rich environment, the program empowers students and scholars to explore diverse professional pathways, strengthen their leadership abilities and achieve lasting success in the STEM workforce.

Collectively, these initiatives reflect the Dunlop School's unwavering commitment to student success — a commitment that extends far beyond the classroom and continues throughout each student's journey from their first day as students to accomplished professionals. Through advising, mentoring and programs that foster connection and career readiness, the school provides every student with the guidance, resources and inspiration to reach their goals and make significant contributions to the scientific community and beyond.

# BIOSCI'S DIAMOND ANNIVERSARY: CELEBRATING 60 YEARS OF IMPACT AND INNOVATION

**This November, the Dunlop School commemorated a remarkable milestone – its 60-year anniversary. Nearly 400 alumni, faculty, students, staff and community partners gathered for an inspiring afternoon program that celebrated the school's bold beginnings and spotlighted the promise of its next chapter. As Dean Frank LaFerla remarked from the outset, the message was unmistakable: this was not just a victory lap, but a launchpad for the transformative future to come.**



Dean LaFerla and Chancellor Howard Gillman opened the program with powerful reflections on how BioSci has shaped UCI's identity since its earliest days. As one of UCI's founding faculty, Distinguished Professor Emeritus James L. McGaugh took the audience back to the university's origins, recounting the defining moments and decisions that cultivated its collaborative and ambitious spirit.

The program continued with dynamic lightning talks from Professors Arthur Lander, Jennifer Martiny, Andrea Tenner and Diego Pizzagalli, who highlighted emerging breakthroughs across systems biology, microbiome science, immunotherapies and mental health. Their presentations captured the innovative momentum propelling the Dunlop School into its next era of discovery.

That evening, an invitation-only dinner assembled a select circle of faculty, emeriti faculty, alumni, benefactors and campus leaders to envision BioSci's next chapter. Dean LaFerla opened with brief remarks on the school's mission and public impact. Provost Hal Stern and Vice Chancellor for Advancement and Alumni Relations Brian Hervey underscored this momentum, highlighting BioSci's storied legacy and recent fundraising successes.

The school's namesake, Charlie Dunlop, delivered a stirring reflection on his landmark \$50 million naming gift and his unwavering belief in BioSci's mission. The room erupted with excitement at the announcement of two major new gifts — one from Dr. Tamera Hatfield and Greg Heintz, and another from Dr. Sana and Safura Khan — fueling the school's ambitious future. A dynamic panel led by Associate Dean Christopher Hughes featuring Dean's Leadership Council members Zachary Antovich, John Gerace, Dr. Tamera Hatfield and Dr. Sana Khan, and BioSci faculty Professors Katrine Whiteson and Craig Stark, then explored the frontiers of education and innovation, and how strategic partnerships are accelerating the translation of pioneering ideas into real-world impact.

A unifying framework threaded through the day: MIND | BODY | WORLD. The principle is simple yet visionary — a healthy mind depends on a healthy body, which in turn depends on a healthy world. This holistic philosophy keeps BioSci focused on what matters most: people and impact. Whether advancing brain health, disease prevention, climate resilience or community well-being, the Dunlop School's work is driven by a tangible benefit to society.



As the celebration concluded, the anniversary had achieved its purpose: honoring a distinguished history, affirming present excellence and igniting momentum for the future. BioSci's path forward centers on three bold priorities — promoting student success, deepening community partnerships and accelerating research that elevates lives throughout Orange County and the world. As the Dunlop School enters its seventh decade, the charge is clear: move discoveries to real-world solutions faster, remain accountable to the public good and let tangible impact be the defining measure of success.



# THE YEAR IN PICTURES



< Dean LaFerla holding an anteater while on a recent trip to Ecuador.

# SCHOOL LEADERSHIP AND STAFF

FROM LEFT:

**Frank M. LaFerla, PhD**  
Dr. Lionel and Fay Ng Dean

**Karina Cramer, PhD**  
Associate Dean of  
Academic Personnel

**Christopher C. W. Hughes, PhD**  
Associate Dean of Research  
and Innovation



FROM LEFT:

**Raju Metherate, PhD**  
Associate Dean of  
Undergraduate Education

**Craig Walsh, PhD**  
Associate Dean of  
Graduate Education

**Benedicte Shipley**  
Senior Assistant Dean



FROM LEFT:

**Hazel Carpenter**  
Executive Director  
of Development

**Ethan Perez**  
Director of Marketing  
and Communications

**Randy Bautista, PhD**  
Strategic Initiatives Lead



FROM LEFT:

**Madison Bellan**  
Director of Development

**Lauren Morales**  
Senior Events Specialist

**Lisa Grigaitis**  
Executive Assistant  
to the Dean



# DEPARTMENT LEADERSHIP

## NEUROBIOLOGY & BEHAVIOR

FROM LEFT:

**Marcelo Wood, PhD**  
Chair

**Kim Green, PhD**  
Vice Chair

**Tina Dominguez**  
Department Administrator



## DEVELOPMENTAL & CELL BIOLOGY

FROM LEFT:

**Kavita Arora, PhD**  
Chair

**Lee Bardwell, PhD**  
Vice Chair

**Andrea Wiley**  
Department Administrator



## MOLECULAR BIOLOGY & BIOCHEMISTRY

FROM LEFT:

**David Fruman, PhD**  
Chair

**Melissa Lodoen, PhD**  
Vice Chair

**Bessy Varela**  
Department Administrator



## ECOLOGY & EVOLUTIONARY BIOLOGY

FROM LEFT:

**Travis Huxman, PhD**  
Chair

**Matthew McHenry, PhD**  
Vice Chair

**Cascade Sorte, PhD**  
Vice Chair



# 2024-2025 NEW FACULTY



## Haleh Alimohamadi, PhD

Assistant Professor, *Molecular Biology & Biochemistry*

My research focuses on the biophysics and biochemistry of living systems across molecular, mesoscale, and cellular levels. I develop multiscale theoretical models, high-throughput experimental approaches, and physics-guided AI frameworks to uncover the fundamental principles governing biological organization, from low-level protein machinery to high-level cellular functionalities. By mapping protein feature space to molecular function and to emergent cellular morphology and dynamics, my work aims to identify the integrated mechanisms linking the molecular environment to cellular behavior. These insights provide a foundation for developing predictive and programmable therapeutic strategies capable of advancing modern biomedicine.



## Seungsoo Kim, PhD

Assistant Professor, *Developmental & Cell Biology*

Professor Seungsoo Kim's research focuses on how transcription factors (TFs) control cell states. Our goals are 1) to shed light on the fundamental mechanisms underlying TF specificity and function, 2) to gain a mechanistic perspective on the complex landscape of cell states, and 3) to ultimately leverage this understanding to precisely manipulate cell states for regenerative medicine and to improve the diagnosis and treatment of diseases. To address these goals, we use novel high-throughput screens to test many TF perturbations together with in-depth epigenomic characterization of targeted perturbations and computational analysis of a variety of mammalian stem cell and cancer cell models.



## Piotr Konieczny, PhD

Assistant Professor, *Developmental & Cell Biology*

Konieczny's lab studies how epithelial barrier tissues, such as the skin and lung, sense and respond to environmental cues to maintain health and prevent disease. The lab employs interdisciplinary approaches from stem cell, endothelial, immune, and cancer biology to investigate how cellular networks coordinate tissue repair and inflammation. Using advanced imaging, genetic models, and single-cell technologies, the lab aims to define mechanisms that restore barrier integrity after injury and uncover why these processes fail in cancer and chronic inflammatory conditions. Their goal is to identify therapeutic strategies to prevent or correct maladaptive repair.



## Diego Pizzagalli, PhD

Distinguished Professor, *Neurobiology & Behavior*

Distinguished Professor Diego Pizzagalli's research aims to uncover the psychological, environmental and neurobiological mechanisms underlying mood disorders, with a focus on major depression. His work integrates behavioral testing, electrophysiology, neuroimaging, pharmacology and preclinical models to examine three key features of depression: anhedonia (loss of pleasure), increased stress sensitivity, and executive function deficits. Through this multifaceted approach, he seeks to advance understanding of depression's core processes and identify novel targets for prevention and treatment, bridging basic science and clinical applications to improve outcomes for individuals with mood disorders.



## Katherine Xue, PhD

Assistant Professor, *Molecular Biology & Biochemistry*

Each of us is home to trillions of microbes, and the interactions between these microbes play key roles in shaping human health. The Xue lab studies how microbes interact and evolve in complex communities like the human gut microbiome. The lab combines experimental and computational techniques to characterize ecological and evolutionary dynamics in the gut microbiome and to investigate how specific microbial interactions give rise to community-scale dynamics. The lab's long-term goal is to uncover principles to guide the design of more effective microbiome therapeutics.

# 2025 FACULTY RETIREMENTS



## Jorge Busciglio, PhD

Professor  
*Neurobiology & Behavior*



## Charles Glabe, PhD

Distinguished Professor  
*Molecular Biology & Biochemistry*



## Katumi Sumikawa, PhD

Professor  
*Neurobiology & Behavior*



## Andrea Tenner, PhD

Distinguished Professor  
*Molecular Biology & Biochemistry*  
Professor  
*Neurobiology & Behavior*

# DUNLOP SCHOOL AWARDS AND HONORS

## Fellow of the American Society of Biomechanics

American Society of Biomechanics  
2025  
Monica Daley, PhD

## Kavli Fellow

National Academy of Sciences  
2025  
Nir Drayman, PhD

## Hellman Fellowship Award

The Society of Hellman Fellowship  
2025  
Evgeny Kvon, PhD

## CAREER Award

National Science Foundation  
2025  
Tobin Hammer, PhD

## Elected Member

American Academy of Arts & Sciences  
2025  
Jennifer Martiny, PhD

## Kenneth T. Whitby Award

American Association for Aerosol Research  
2025  
Celia Faiola, PhD

## Early Career Investigator Award

The Endocrine Society  
2025  
Dequina Nicholas, PhD

## Excellence in Pedagogical Development Award

UC Irvine Division of Teaching Excellence and Innovation (DTEI), Office of Vice Provost for Teaching & Learning, Council on Teaching, Learning & Student Experience  
2025  
Ana Elisa Garcia Vedrenne, PhD

## Appointed Chair of the University of California Natural Reserve System Oversight Committee

UC Office of the President  
2024  
Kailen Mooney, PhD

## President

Society for Research on Nicotine and Tobacco (SRNT)  
2025  
Christie Fowler, PhD

## Guze Endowed Lecture

Department of Psychiatry, Washington University  
2025  
Diego A. Pizzagalli, PhD

## CINP AsCNP Brain Health Clinical Research Award

International College of Neuropsychopharmacology  
2025  
Diego A. Pizzagalli, PhD

## Visiting Fellowship

New College, University of Oxford  
2025  
Diego A. Pizzagalli, PhD

## Gerald L. Klerman Senior Investigator Award

Depression and Bipolar Support Alliance  
2024  
Diego A. Pizzagalli, PhD

## Christensen Fellowships

St. Catherine's College, University of Oxford  
2024  
Diego A. Pizzagalli, PhD

## Rising Star Award

National Alzheimer's Coordinating Center  
2025  
Xiaoyu Shi, PhD

## Tom Angell Fellowship Award (faculty)

UCI Graduate Division & Office of Inclusive Excellence  
2025  
Katherine Thompson-Peer, PhD

## Committee Spotlight Award

UCI Womxn's Center for Success  
2025  
Katherine Thompson-Peer, PhD

## Innovator Grant Award

Rose Hills Foundation  
2025  
Katherine Thompson-Peer, PhD

# IN MEMORIAM



## Donald E. Fosket, PhD

Professor Emeritus of Developmental & Cell Biology, Donald E. Fosket passed away on December 12, 2024. Having grown up in California, he developed a lifelong fascination with plants at an early age. He earned his PhD in plant biology from the University of Idaho in 1965. At the University of California, Irvine, Professor Fosket's research focused on plant development and the cytoskeleton, contributing to a deeper understanding of how cells organize and function in higher plants. Even after his retirement, he continued consulting in agricultural biotechnology and remained engaged in advancing plant science. His dedication to teaching, mentorship and discovery left a lasting impact on the Department of Developmental & Cell Biology and the broader UCI community.



## Hans R. Bode, PhD

Professor Emeritus of Developmental & Cell Biology, Hans R. Bode passed away on May 18, 2025. He earned his PhD in Biology from Yale University in 1966. Professor Bode was internationally recognized for his pioneering research on pattern formation and regeneration in *Hydra*, work that shed light on the molecular and evolutionary foundations of developmental biology. He served as chair of the department in the mid-1990s and played a pivotal role in shaping a supportive and collaborative culture. During his career at the University of California, Irvine, he was a devoted mentor and collaborator who inspired generations of scientists through his curiosity, rigor and generosity. Professor Bode's legacy continues through the discoveries he made and the many students and colleagues he guided throughout his career.

# THE YEAR IN PICTURES



# THE NEXT 60 YEARS OF LIFE SCIENCE: A FUTURE TAKING SHAPE AT UC IRVINE

If the past 60 years of biology have taught us anything, it's that life is more intricate, dynamic and capable of change than we ever imagined. Scientists once believed that brain cells couldn't regenerate, that our genes were fixed at birth and that most microbes posed a threat to human health.

But over time, those views have evolved. New discoveries didn't just overturn old assumptions — they added depth, nuance and possibility. That's how science works: each generation builds upon the last, refining the picture, correcting the course and opening new paths forward. In doing so, researchers have launched entire fields — from regenerative medicine to microbiome science — that are now defining the future of human and planetary health.

At the Charlie Dunlop School of Biological Sciences, researchers are pushing those possibilities even further. What they're learning today is laying the foundation for the breakthroughs of tomorrow — discoveries that could reshape how we treat disease, care for the planet and understand what it means to be alive.

Here's a glimpse of what the next 60 years might hold.

## Medicine That Predicts, Not Just Reacts

For most of modern history, medicine has been reactive. You get sick, and then you get care. But science is rapidly moving toward a model that anticipates illness — catching it early or preventing it altogether.

Imagine a future where a single blood test could detect cancer years before symptoms arise. Where subtle shifts in your biology could be tracked over time and used to tailor prevention plans specific to your needs. These ideas aren't speculative — they're under development in labs right now.

Researchers at the Dunlop School are exploring how cells make decisions: how they grow, divide, age and sometimes go off course. These cellular insights are key to understanding diseases like cancer, diabetes and neurodegeneration. When we know how disease begins, we can act before it takes hold.

And when intervention is needed, it will be more precise. We're learning how to direct immune cells to fight tumors more effectively, how to use gene editing tools to fix faulty instructions inside cells and how to guide the body to repair itself from within. These aren't abstract goals — they're already being tested in models that point toward a more personalized, adaptable form of care.

## The Next Frontier in Mental Health

Mental health care has often struggled to keep pace with advances in other areas of medicine. But that's changing — rapidly.

At UC Irvine, neuroscientists are uncovering how experiences shape the brain, how memory forms, how sleep repairs us and how trauma imprints itself biologically. This work is revealing the hidden patterns behind anxiety, depression and addiction — and helping to explain why different people respond so differently to the same treatments.

In the decades to come, it's likely we'll see interventions that are faster, longer-lasting and more finely tuned

to individual brain activity. Therapies might be guided not just by what you say you feel, but by what your brain shows us it needs. And just as importantly, we'll understand how to build resilience — how to strengthen the biological systems that support well-being before they begin to erode.

This future doesn't eliminate struggle, but it makes healing more possible, and more precise.

## Learning to Regrow and Repair

Nature already provides countless examples of resilience. Some animals can regrow limbs, repair spinal cords or even regenerate parts of their hearts. The question now is: can we do something similar?

Researchers at the Dunlop School are studying how regenerative processes unfold at the molecular level. What signals tell a cell to divide, differentiate or rebuild? What makes some cells repair tissue, while others scar it?

The answers could help us regrow nerve fibers after injury, restore insulin production in the pancreas or repair skin and muscle after trauma. Long term, it's not impossible to imagine transplanting lab-grown organs — or better yet, helping the body heal its own damaged ones.

The science is early. But it is real. And the potential it holds is quietly transformative.

## Harnessing Tiny Life to Solve Big Problems

The future of medicine, agriculture and climate resilience may depend on some of the smallest organisms on Earth. Microbes — bacteria, viruses, fungi and other microscopic life forms — are being studied not just as pathogens, but as partners in human and planetary health.

For much of modern science, microbes were primarily studied in the context of disease. But as tools and understanding improved, their essential roles in digestion, immunity, environmental balance and even mental health have come into view — shifting the story from threat to partnership.

That shift is opening up extraordinary new possibilities. Imagine a world where targeted microbes could help treat depression, boost immunity or even slow the progression of neurological disease. Where drought-resistant crops grow thanks to beneficial bacteria that help roots thrive in poor soil. Where we clean polluted waterways not by removing contaminants but by enlisting microbes that naturally break them down.

In the next 60 years, researchers at the Dunlop School and around the world are poised to unlock this microbial potential. As our understanding of microbial ecosystems deepens, we may be able to design entire communities of microbes to live inside the body or the environment — working quietly, continuously and precisely to support life.

## The Climate, the Biosphere and Us

As the planet warms, ecosystems shift. Species migrate. Disease patterns evolve. These changes don't happen in isolation — they affect food security, water quality, mental health and global stability.

But biology is giving us tools not just to adapt, but to help. Scientists at the Dunlop School are studying how biodiversity supports ecosystem resilience, how coral reefs recover from bleaching, how microbes affect soil carbon storage and how climate stressors influence brain development.

Over the next 60 years, we may learn how to restore habitats with surgical precision, protect endangered species through guided evolution or prevent the spread of pathogens before they become pandemics. Environmental biology isn't just about nature "out there" — it's about protecting the systems that make life possible everywhere, including in our own communities.

## When Disciplines Blur, Breakthroughs Follow

One of the most powerful forces in science today is convergence. Fields that once operated in isolation — genetics, neuroscience, computer science, mathematics — are now deeply intertwined.

At UC Irvine, researchers are combining high-resolution imaging, machine learning, bioinformatics and molecular biology to uncover patterns too complex for the human eye to see. They're creating models that simulate development, disease and healing in ways that can predict outcomes before they happen.

As these tools evolve, we'll be able to test hypotheses through computer simulations before moving to the lab, accelerating timelines and reducing cost. Discovery will become faster, smarter and more collaborative.

## Hope, Grounded in Curiosity

The future isn't shaped by certainty — it's shaped by imagination, followed by method. It takes time. It takes talent. And it takes people who are willing to ask difficult questions, even when the answers are far from obvious.

The next 60 years of life science will not solve every problem. But they will, almost certainly, change how we live, how we heal and how we care for the planet and each other.

At the Charlie Dunlop School of Biological Sciences, that journey is already underway.

# 2025 DUNLOP SCHOOL FACTS AND STATS



**4,416**

Undergraduate Students

**384**

Graduate Students

**33%**

First-generation students

**64%**



Female

**29%**

From Underrepresented Backgrounds

**23%**

From Underrepresented Backgrounds

**61%**



Female

## FALL 2025 ENROLLMENTS BY THE NUMBERS

Degrees Conferred   
Academic Year 2024-2025

**903**

Bachelor's Degrees

**84**

Graduate Degrees

**71**

Masters

**13**

Doctorates

**987**

Total Degrees

**#6**

UCI ranked No. 6 in the nation among public universities on *Forbes' America's Top Colleges List*

## Faculty Diversity

38% – Female

14% – From Underrepresented Backgrounds

**#4**

UC Irvine ranked fourth-best-value public college in 2025 by the *Princeton Review*

## Cumulative Totals - 1965 to 2025

44,000 – total degrees conferred

40,000 – estimated BioSci alumni to date

*Totals differ because many alumni earned multiple degrees.*

## Extramural Awards / Sponsored Projects

■ Fiscal Year 2024 – \$87.3 Million

■ Fiscal Year 2025 – \$63.4 Million

### 2025 Dean's Report Dean

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“ Innovation is the key indicator of a society’s future. ”  
 – Charlie Dunlop



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School of Biological Sciences



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