

### Message from the Vice Dean for Research



Welcome to the spring quarter edition of the SOMOR Newsletter. After a wild winter (certainly a big change from my previous life in San Diego), I'm sure we are all looking forward to the milder weather ahead.

In this edition we look at some of the exceptional research from the Department of Surgery, which ranges from breakthroughs in post-operative pain treatment and therapy, to *in utero* treatment for spina bifida.

The School of Medicine continues to amass research accomplishments and new initiatives. For example, the first few months of 2023 have already brought us exciting new projects, such as the launch of the UC Davis Institute for Psychedelics and Neurotherapeutics (IPN) in collaboration with UC Davis College of Letters and Sciences. The Institute will advance basic knowledge about the mechanisms of action of psychedelics and translate that knowledge into safe and effective treatments for psychiatric and neurological diseases. IPN's activities were recently kicked off with a full day symposium at the MIND Institute that gathered national experts as well as a highly engaged in-person and virtual audience.

The HEAL HER (Heart, BrEast and BrAin HeaLth Equity Research) Program is now over a year into its work focused on heart health, breast cancer and Alzheimer's disease in women. The four project teams have been sharing their progress in the Team Research Forum, held jointly with the campus Office of Research. The next update will be on May 12, with the team from the "Greater Sacramento Women's Brain Health Program" (GROW), led by Rachel Whitmer, presenting

on their accomplishments. I strongly encourage you to attend this and other Team Research Forum events, which are a great opportunity to keep abreast of cross-campus research work. You can find registration information for the Team Research Forum on our website here: [SOMOR Event Calendar](#).

Looking forward, we are excited to watch the literal growth of the Aggie Square project. Coming up on one year since construction began, the Life Sciences/Technology/Engineering (LSTE) East Building is now decking its 6th level. This building will house School of Medicine researchers and educational facilities, industry partners, incubator space, and a vivarium, amongst other functions. We have established three major themes for our first wave of tenants – Neurosciences, a Cancer Hub, and the Center for Surgical Bioengineering, as well as overarching enabling technologies and research related to musculoskeletal conditions. After all these years of planning, it is satisfying to see the physical manifestation of this innovative project. Check out the construction updates [here](#).

Finally, we continue to focus on incentivizing Team Science as well as cross-campus collaborations. Both our Cultivating Team Science program and a new pilot program launched jointly with the School of Veterinary Medicine drew robust applicant pools. Look for news on the selected recipients for both programs in an upcoming SOMOR newsletter. In the meantime, here's to a great spring!

#### Kim E. Barrett, Ph.D.

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### New ways to connect to the School of Medicine Office of Research!



The School of Medicine Office of Research has added an event calendar to our webpage. [Check it out](#) and subscribe to get notified on School of Medicine events such as symposia, training and conferences.

We also have a LinkedIn page, dedicated to highlighting feature events and stories. Follow us on LinkedIn [here](#).

# Recognition



[Helen C. Kales](#), chair of the [Department of Psychiatry and Behavioral Sciences](#), is one of 26 international experts named to the Lancet Commission on dementia prevention, intervention and care. The commission has released two influential reports highlighting the growing body of scientific evidence that identifies modifiable risk factors for the disease. This is the third time Kales, a geriatric psychiatrist and an expert in caring for people with dementia, has been named to the prestigious commission.



UC Davis pediatric endocrinologist [Nicole Glaser](#) has received the Senior Researcher Award from the [Pediatric Endocrine Society \(PES\)](#). This national honor is awarded to a senior investigator whose innovative and cutting-edge clinical, basic or translational research has significantly advanced the field of pediatric endocrinology and earned the nominee international recognition in the field. Winners are chosen from throughout North America. Glaser has conducted seminal studies into diabetic ketoacidosis and other areas of investigation into diabetes and pediatric endocrinology.



Congratulations to Stem Cell Program Director [Jan Nolta](#) on the 2023 International Society for Cell and Gene Therapy (ISCT) Career Achievement Award in Cell and Gene Therapy! This award is the International Society for Cell and Gene Therapy's highest honor and recognizes exceptional contributions and achievements within the cell and gene therapy field. With a career spanning more than 30 years, Dr. Nolta continues to inspire students, peers and the global cell and gene therapy community to advance innovation and clinical translation.

# Upcoming Event

## 2023 UC Davis Research Expo

The annual UC Davis Research Expo is a one-day event that showcases the latest research-related insights, resources, opportunities and tools to help you advance your research. Held on Tuesday, May 16, the event will include exhibits, presentations, workshops and opportunities to network with potential collaborators. The Distinguished Speaker in Research and Innovation at this event will be Donald Ingber, Founding Director of the Wyss Institute for Biologically Inspired Engineering at Harvard University and Judah Folkman Professor of Vascular Biology at Harvard Medical School and the Vascular Biology Program at Boston Children's Hospital. We welcome you to enjoy the full event or attend portions that are of particular interest. If you are involved in research, you will not want to miss this event! Register [here](#).

We highly encourage all School of Medicine research programs and cores to showcase your work, resources and opportunities at this year's expo. You can reserve your group's table at: <https://ResearchExpo2023.eventbrite.com>

# 2023

# RESEARCH EXPO

Connecting researchers with insight, opportunities  
and resources to succeed

# Get to know SOMOR

## Evaluation Unit

The Evaluation Unit collaborates with UC Davis Health centers, training programs, and researchers to design and implement evaluation plans, support grant writing, and disseminate evaluation findings. The unit officially became part of the School of Medicine Office of Research in 2019, but it has served the program evaluation needs of the UC Davis Health research community since 2006.

An important part of the mission of the School of Medicine Office of Research Evaluation unit is to provide evaluation support for principal investigators, researchers, students and staff at UC Davis Health. In the last year, the team has expanded the support provided to the UC Davis Health community through monthly data visualization drop-ins, which offer an opportunity for researchers and staff to improve data presentation, data accessibility and data literacy.



Data visualization is the practice of presenting information in a visual form, such as a map, chart, graph or even text. Data visualization principles focus on minimizing clutter, making intentional color and design choices, and identifying an overarching story to the data. Improving the presentation of data is not just for aesthetics. Research shows that for many people the brain is programmed for visualization. Specifically, well-designed visuals lead to faster processing by audiences, improved clarity, more directed attention on important points and increased engagement with the data.

The data visualization drop-ins, which are offered monthly on Zoom, have two goals: 1) to host an easily accessible venue to learn and teach data visualization methods, and 2) to create a learning community to provide and receive feedback on active data visualization projects. The drop-in focuses on understanding the combination of science, art, and best practices of data visualization.

Past drop-ins have included guest speakers on topics such as how to work with different programming languages, how to improve data literacy and equity, and how departments are approaching their own data presentation techniques. A recent session focused on finding resources for inclusive graphics, using icons and other elements of different body types/genders/abilities. The group has also discussed the meaning of colors in different cultures and how to avoid inadvertent signaling of emotion using color.

## Data Visualization Drop-Ins

If you are interested in attending the data visualization drop-in, please contact Melissa Sullivan (msullivan@ucdavis.edu) for additional information and the Zoom link.

## Evaluation Unit

<https://health.ucdavis.edu/medresearch/evaluation/evaluation-team.html>

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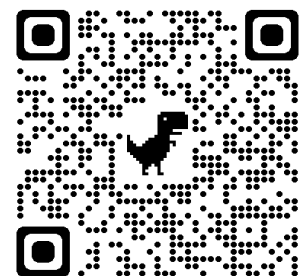
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With four research divisions, 43 PIs, 71 research staffers and a vigorous resident research program, UC Davis School of Medicine Department of Surgery is on the cutting edge of medical research. Led by internationally renowned fetal and neonatal surgeon, Chair [Diana Farmer](#), the department continually seeks to optimize patient care and outcomes via research led by expert professors and experienced research staff. The Department of Surgery conducts medical research in both clinical and laboratory settings in all of its divisions. It also collaborates with other divisions, departments and institutions within UC Davis Health and beyond to develop novel ideas in research that impact patient outcomes, teaching and clinical care.

Research is made possible by the efforts of surgeons, Ph.D. scientists, and their associated staff as well as contributions from government grants and private investments. As part of a teaching hospital, the faculty hold numerous research grants from both federal and non-federal sources. Investigative endeavors give medical students, surgery residents and post-doctorate investigators the opportunity to gain valuable research experience while working with their clinical mentors.

Farmer's current studies include [cutting edge work on therapies for spina bifida \(SB\)](#), the most common cause of lifelong childhood paralysis. Patients require life-long treatment as they navigate paralysis, cognitive disabilities, musculoskeletal deformities, and bowel and bladder dysfunction. This project is part of her work with the co-director of the [Center for Surgical Bioengineering \(CSB\)](#), [Aijun Wang](#). The CSB team produces interdisciplinary, groundbreaking research. It draws on up-to-date technologies (such as stem cell engineering) to tackle some of the largest challenges.

*cont. on p. 5*



### Recent Clinical Research in the Surgery Department

Professor [Mohamed Ali](#) is chief of the [Foregut, Metabolic and General Surgery Division](#). His current study, "Studying Metabolic Responses to Bariatric Surgery," is an investigation of inflammation as a contributor to obesity and the medical problems associated with it. Associate Professor [Victoria Lyo](#) is conducting research to understand mechanisms that could explain how women and men respond differently to bariatric surgery.

[General thoracic](#) surgeon [Lisa Brown](#), clinical director of the Comprehensive Lung Cancer Screening program, is conducting two studies on pain management after lung surgery. One project is on getting feedback on the pain management experiences and expectations of patients before and after lung surgery. This study also seeks to understand the perspective of the patients' primary caregivers as they help the patients prepare for and recover from surgery. Brown also is leading a study to identify factors associated with pain and continued opioid use after lung surgery. This study will seek to characterize patient-reported outcomes.

Professor of [trauma surgery](#), [Christine Cocanour](#) is also studying post-operative pain management. Her study is on the effectiveness of applying continuous, intravenous administration of magnesium sulfate to ICU patients. Magnesium sulfate has proven to be successful in managing pain before and after surgery. This drug has primarily been used for pain control in patients undergoing surgery. Using magnesium may decrease the need for narcotics for pain control.

[Professor Soman Sen](#), from the Division of [Burn Surgery](#), is leading two multicenter clinical trials comparing early physical therapy to standard therapy in burn patients, STAT and MOREFUN. STAT stands for Standard Therapy Plus Active Therapy to Improve Mobility, Long-Term Activity, and Quality of Life for Severely Burn-Injured Patients After Skin Graft Surgery for adults. MOREFUN is for the Progressive MObility EnduRance StrEngth and FUNction Program to Improve the Health and Well-Being of Burn Injured Children. Associate Professor [Kathleen Romanowski](#) is working on a study on personalized ablative laser therapy for effective scar reduction.

[Associate Professor Clifford Pereira](#), from the Division of [Plastic Surgery](#), runs a research laboratory that focuses on peripheral nerve injury and reconstruction. His research involves the use of novel tissue engineering technology, stem cells and bioactive molecules to improve nerve regeneration. Pereira also leads AppTITUD-PS, an initiative to increase diversity in the field of plastic surgery.

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Wang is one of the department's four vice chairs for research, along with [Rachael Callcut](#), [Tina Palmieri](#) and [Sean Adams](#). Each of the vice chairs oversees an extensive portfolio of research projects in their respective areas ranging from basic science to clinical trials to innovation, including machine learning.

Adams has multiple ongoing basic science research projects, [including a recently-published study on how c-section birth impacts the gut microbiome of offspring, compared to natural birth](#). He is also leading a study on how intestinal bacteria regulate the body's metabolism, which may lead to the prevention and treatment of diabetes, obesity and inflammation.

Vice Chair for Clinical Sciences  
Rachael Callcut is also chief of the Trauma/Acute Care Surgery division and a leader in School of Medicine research. She has been serving as Chief Research Informatics Officer and recently been appointed Associate Dean of Data Science and Innovation. [Callcut is PI on a study on platelet behavior after treatment of Peripheral Arterial Disease](#), especially for patients who experience antiplatelet resistance.

Callcut is also PI on [a study on Acute Respiratory Distress Syndrome \(ARDS\)](#), a type of lung injury that makes it hard to breathe and get enough oxygen.

This clinical trial is looking at the effectiveness of an experimental early treatment for improving survival after ARDS. She is also leading a study on how inflammation can impact how patients do following trauma surgery.

Vice Chair for Clinical Trials  
Tina Palmieri, chief of burn surgery, has multiple new and ongoing projects, including large multi-center efforts. This includes a [pivotal study to assess the safety and effectiveness of a new method of treating severe burns](#); an international study, TIER Effect, in conjunction with the Emergency Department, that evaluates the implementation of a new type of first aid for burns; and [NATIENS](#), a phase III randomized study on optimal management of Stevens-Johnson Syndrome, a rare but serious skin reaction to certain medications.

Palmieri is also PI on a study to assess biomarkers that may be related to clinical outcomes in patients with complex Traumatic Brain Injury (TBI) associated with burns and trauma. She also leads an investigation, with Shriners' Hospital for Children, on genomic-based precision dosing of opioids for pediatric burn patients. Under Department of Defense funding, Palmieri is leading a team to develop and examine the safety and dosing of a long-acting lyophilized nanoparticle anesthetic tilapia dressing (NPD) that would be suitable for use on

burn-injured service members on the battlefield. [Dr. Palmieri led a team of researchers to develop NPD](#), which consists of lidocaine bonded to a nanoparticle on dried tilapia skin.

The department is a global leader in precision animal modeling and several faculty have additional appointments within the UC Davis Department of Veterinary Medicine. Associate Professor [Bethany Cummings](#), is among these. She is currently leading a research team exploring a new angle on pancreatic islet function associated with type 2 diabetes.

Another interdisciplinary endeavor is [Center of Alimentary and Metabolic Science](#) (CAMS). CAMS brings laboratory and clinical scientists "under one roof" to study the underlying factors that shape metabolic health. Executive Director Mohamed Ali and Directors Adams and Cummings form the CAMS leadership, along with fellow surgical faculty [Hazem Shamseddeen](#) and Victoria Lyo.

For more detailed information about recent Surgery Department studies and publications, check out the department's 2022 annual report, [here](#).

## Featured Center: UC Davis Transplant Center

The [UC Davis Transplant Center](#) consists of an interdisciplinary team of surgeons, nephrologists, cardiologists and psychiatrists and serves as a resource hub for patients and potential transplant donors. The Center faculty conduct research into improving outcomes and technology for organ transplantation and other surgeries. Recent studies by Center-affiliated faculty include the following publications and clinical trials:

Assistant Professor of Surgery [Naeem Goussous](#) was first author on two recent studies looking at improvement of transplantation outcomes, looking at both [timing of procedures](#) and [process of transporting organs](#). In 2022, Assistant Professor [Junichiro Sageshima](#) published an overview on the outcomes of patients who, for various reasons, require [multiple kidney retransplantations](#). In January 2023, he also co-authored a study on treating focal segmental glomerulosclerosis (FSGS), a disease in which scar tissue develops on the parts of the kidneys that filter waste from the blood.

Transplant Center affiliate [Bob Kiaii](#) and his colleagues authored [several studies](#) on [minimally invasive cardiovascular surgeries](#). Kiaii currently is conducting a clinical trial on a device designed to access the heart via a minimally invasive procedure to decrease mitral regurgitation.

Assistant Professor [Ling-Xin Chen](#) is currently conducting a clinical trial studying the side effects of two FDA-approved medications for preventing kidney transplant rejection.

## April is Donate Life Month

[National Donate Life Month](#) was established by Donate Life America and its partnering organizations in 2003. Observed in April each year, National Donate Life Month helps raise awareness about donation, encourage Americans to register as organ, eye and tissue donors and to honor those that have saved lives through the gift of donation. Donated organs, eyes and tissues that are not recovered for transplant may be used for medical research and education if the donor authorizes it. Non-transplantable organs, eyes and tissues help save and heal lives by allowing researchers to find new ways to treat disease.

UC Davis established its [Body Donation Program](#) (BDP) in 1968 to create a philanthropic opportunity for donors to assist the medical school with the appropriate quality and quantity of anatomical materials necessary for the medical school curriculum. The BDP receives donations from the Northern California community. Donations are unsolicited and donors hear of the program mainly through word of mouth. Many donors are alumni of UC Davis, relatives or friends of students or alumni, have University of California (UC) affiliated physicians or are familiar with the research and academic reputations of the medical center and university. To date, the program has received about 3,000 donors. Currently, there are about 8,000 living people in the community registered as donors. The mission of the BDP includes gratitude to the donors and their families, respect for all cultures and beliefs, and the program's duty to serve public education within our community.

Yearly increase in donations has enabled the Body Donation Program to supply teaching materials not only to the medical and undergraduate classes of UC Davis. It has also helped the programs of many area colleges and universities who rely on this program to fulfill the needs of their curriculum. The increase has also supported research at UC Davis, other UC campuses, non-UC researchers and occasionally privately-funded research institutions.

For more information on the Body Donation Program, contact Aron Davis at [ardavis@ucdavis.edu](mailto:ardavis@ucdavis.edu).

## Quick facts about the UC Davis Body Donation Program

- Supplies stem cells and other tissues and organs (kidneys, eyes, brains) for multiple research studies here at UC Davis.
- Works with Alzheimer's Disease Center/MIND Institute donor families for dual registration so that a donor can be fully utilized for our programs here.
- Works with Sierra Donor services to train donation technicians and funeral service personnel on how to recover materials and then prepare the remains for viewing/funeral services.
- Provides materials for a host of departments within the School of Medicine, the hospital and the CSU and community colleges in California, Oregon and Washington.
- Supplies industry partners, such as Sutter Health, for device research and training.

## Research in the News

- [New mouse study reveals a key process in how the brain forms memories](#)
- [International study on Duchenne Muscular Dystrophy provides foundation for future research](#)
- [Medical students display innovative research at Poster Day](#)
- [UC Davis study uncovers age-related brain differences in autistic individuals](#)
- [Center for Healthcare Policy and Research rolls out new weight loss and wellness initiative](#)
- [How does wildfire smoke impact pregnancy and children](#)
- [Lipoprotein\(a\): A less understood but critical risk factor for heart disease](#)

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