

UC Davis School of Medicine achieves another record year in NIH funding

The 2022 Blue Ridge rankings have been released, making official the School of Medicine’s record-breaking year of National Institutes of Health (NIH) funding. The [Blue Ridge Institute of Medical Research](#) annually publishes this ranking of institutions, departments, and investigators based on NIH funding.

In 2022, UC Davis School of Medicine secured its highest-ever level of NIH funding at more than \$201 million, an increase of about \$7 million over the previous year. This achievement translates to an overall Blue Ridge ranking of 32 out of 143 US medical schools, up from 33 last year. This marks the second year in a row that UC Davis moved up in the rankings. Nine School of Medicine departments ranked in the top 20 nationally in their respective fields. ([Read more.](#))

The School of Medicine Departments ranked in the top 20 by funding this year are:

- | | |
|---------------------------------------|--|
| Public Health Sciences (#6) | Psychiatry and Behavioral Science (#15) |
| Urologic Surgery (#10) | Physical Medicine and Rehabilitation (#16) |
| Neurology (#11) | Cell Biology and Human Anatomy (#17) |
| Dermatology (#14) | Pharmacology (#20) |
| Physiology and Membrane Biology (#14) | |

Congratulations to all the amazing investigators who contributed to our success!

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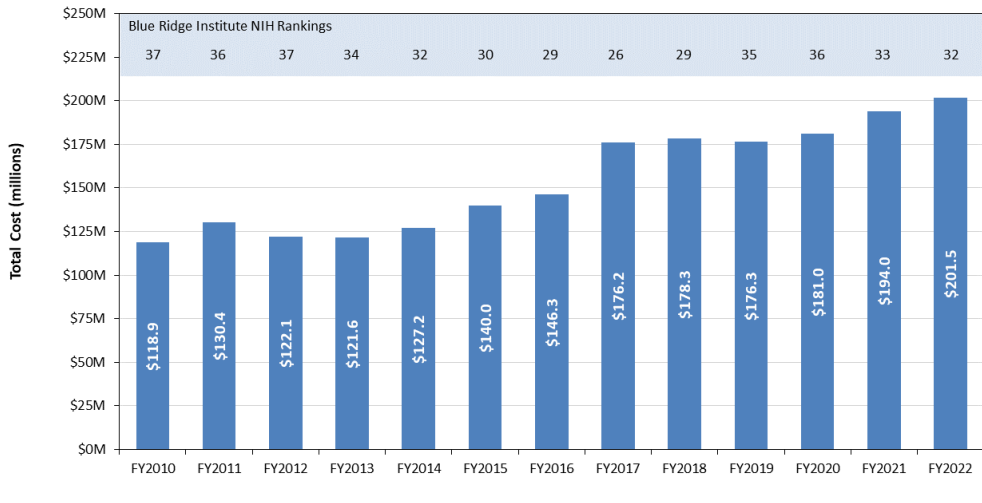
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School of Medicine extramural funding and Blue Ridge Institute NIH ranking



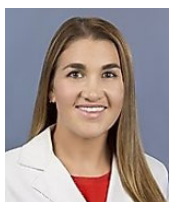
March is Multiple Sclerosis Awareness Month

Throughout March, you may see orange ribbons adorned with a butterfly symbol. Orange is the official color for Multiple Sclerosis (MS) awareness, and the butterfly represents the shape commonly seen on a magnetic resonance imaging (MRI) scan of a brain of a person with MS.

Impactful Publications



Fereydoun Hormozdiari, associate professor in the department of biochemistry and molecular medicine, has co-authored a study published in *Nature Methods*, "[SVDSS: structural variation discovery in hard-to-call genomic regions using sample-specific strings from accurate long reads.](#)" Structural variants (SVs) account for a large amount of sequence variability across genomes and play an important role in human diversity and susceptibility to disease, but their discovery is made difficult by redundancies and duplications in the genome. This article describes new technologies that show notable improvements in the ability to discover SVs in repetitive regions of the genome.



[In a study published in JAMA Network Open](#), a team of researchers analyzed more than two dozen residency programs across the country that employ strategies to boost diversity, equity and inclusion (DEI). The team then compiled their findings to share widely with Graduate Medical Education (GME) programs seeking to diversify the physician workforce. UC Davis co-authors of this study include Stephany Sanchez, associate professor of internal medicine, Tonya Fancher, associate dean for workforce innovation and education quality improvement, Arra Jane Soriano, workforce programs manager; Marjorie Westervelt, former director of the assessment, evaluation, and scholarship unit and Maya London, a second-year medical student. [Read more.](#)



David E. Olson, associate professor of chemistry, biochemistry and molecular medicine and director of the Institute for Psychedelics and Neurotherapeutics at UC Davis, is senior author of a paper published Feb. 17 in *Science*. In this [study](#), researchers at the University of California, Davis show that engaging serotonin 2A receptors inside neurons promotes growth of new connections but engaging the same receptor on the surface of nerve cells does not. The findings will help guide efforts to discover new drugs for depression, PTSD and other disorders. [Read more.](#)

Recognition

Clinical Research Forum Top Ten Award



Craig McDonald, Chair of Physical Medicine and Rehabilitation, and his team will be honored with a [2023 Top Ten Clinical Research Achievement Award](#). The award is presented by the Clinical Research Forum. It is in recognition of McDonald's remarkable work developing a stem cell therapy to treat the most severe patients with Duchenne muscular dystrophy (DMD). The rare genetic disorder causes muscle loss and physical impairment in young people and leads to premature death. McDonald is the national principal investigator leading HOPE-2, a multicenter double-blind randomized trial.

UC Davis Health Vice Dean for Research Kim E. Barrett nominated McDonald for this award. "We were delighted to nominate Dr. McDonald for this recognition and so pleased to learn of his selection as a Top 10 Clinical Research awardee," said Barrett,

distinguished professor of physiology and membrane biology at UC Davis. "His work has critical implications for treating patients with Duchenne muscular dystrophy and is a great example of the caliber of research done at UC Davis Health."

This is the second year in a row that a UC Davis School of Medicine researcher has been recognized by Clinical Research Forum as a top ten researcher. A ceremony for the awardees will be held on April 17. [Read more.](#)

Global Affairs Awards

Congratulations to the following faculty who were awarded 2022-2023 UC Davis Global Affairs research awards:

Seed Grants for International Activities

Public Health Sciences, Kristen Aiemjoy, *Pediatric Scrub Typhus in Nepal: a new research collaboration with Kanti Children's Hospital.*

Grants for Advancing UN Sustainable Development Goals

Internal Medicine, Jennifer Lane and Michael Wilkes, *Place-Based, One Health Experiential Education: A Platform for Inspiring Action in Tackling Complex Global Challenges to Achieve SDGs.*

Feature

Featured Research: UC Davis Department of Neurology



With over \$34 million in NIH funding in fiscal year 2021-2022, the Department of Neurology was the top-funded UC Davis School of Medicine department and one of the main drivers of the medical school's increase in national research ranking last year. Neuroscientific research covers a wide range of topics and diseases, from rare autoimmune disorders such as Myasthenia gravis and Lambert-Eaton to more commonly known conditions like multiple sclerosis, epilepsy, stroke and Alzheimer's disease. This year, the department's research again played a critical role in the school of medicine's record-breaking NIH funding, and ranks 11th among neurology departments nationally.

UC Davis is well known for the breadth and range of its Alzheimer's research. Director of the Alzheimer's Disease Research Center and Professor of Neurology, Charles DeCarli, the top-funded researcher for UC Davis School of Medicine in FY 2022, has several recently funded projects, including an investigation into whether some Latino ancestry groups have a significantly higher risk of dementia disorders (e.g., Alzheimer's disease) compared to other Latino groups. The results could fine-tune our understanding of the contribution of genetic and socio-economic factors to Alzheimer's disease and other dementias. Another of DeCarli's projects, the Neuroimaging Initiative, is a longitudinal multicenter study designed to develop clinical, imaging, genetic, and biochemical biomarkers for the early detection and tracking of Alzheimer's disease.

Neuroscientific research can be especially challenging, given how difficult disorders of the nervous system are to study. The Neurology Department's researchers are well placed to rise to this challenge and have demonstrated it with their new and ongoing investigations. This includes work by UC Davis Comprehensive Epilepsy Program director Jack Lin, whose projects include studying the coordination between the different regions of the brain in support of working memory, memory consolidation and attention. He is principal investigator for UC Davis on the long-term project, "Attention, Orientation and the Human Prefrontal Cortex," which has been continuously funded since 1985.

Myasthenia gravis (MG) is an autoimmune disease that causes production of antibodies that attack the connection between nerve and muscle, leading to muscle weakness. For this rare condition, UC Davis has some of the nation's preeminent researchers, including professor emeritus Robert Fairclough. Fairclough is principal investigator of one of seven research projects awarded NIH funding in November 2022 for pilot projects developing early stage, groundbreaking neuro-technologies. [This project](#) seeks to simplify and improve accuracy in diagnosing myasthenia gravis so that appropriate treatments can be determined more quickly.

UC Davis neuroscientists take part in national and international clinical trials that offer potentially effective therapies to current patients, as well as hope for future ones. For example, they have helped bring new drugs to patients suffering epilepsy, Huntington's disease, and Alzheimer's disease, to name just a few. In 2022, Kwan Ng, Associate Professor and director of the Comprehensive Stroke Center, was

Recent Neuro Research at UC Davis

Amy Brooks-Kayal, Professor and Chair

Brooks-Kayal is using a mouse model to investigate the role of signal pathway regulation in sculpting the dynamic responses of the genome to brain injuries that make one more susceptible to seizures. This has the promise of identifying potential disease-modifying therapies.

Kyle Fink, Professor

Fink is developing disease modifying activity for a CRISPR-based epigenome editing approach to reactivate the healthy copy of CDKL5 from the inactive X chromosome in females with CDKL5 Deficiency Disorder, a rare disease causing early life epileptic seizures.

Oanh Meyer, Professor

Meyer's study explores the impact of residential segregation on baseline cognitive scores versus cognitive trajectories among Latinos and non-Hispanic Whites. This contributes to the literature on the nuanced findings of racially/ethnically clustered neighborhoods.

Vicki Wheelock, Professor

Wheelock's HDClarity project involves the collection of a high-quality sample of cerebrospinal fluid (CSF) for evaluation of biomarkers and pathways that will enable the development of novel treatments for Huntington's Disease (HD). She then hopes to generate a high-quality plasma sample collection matching the CSF collections, which will be used to evaluate biomarkers and pathways of relevance to HD research and development.

March is Multiple Sclerosis Awareness Month

Multiple sclerosis (MS) is an unpredictable neurological disease that can affect people of all ages. Symptoms usually include impaired muscle control, weakness, and/or vision problems, and they can range from mild to debilitating. Symptoms can also be intermittent, chronic, or slowly progressive. Because of this variability, MS can be difficult to diagnose correctly.

The UC Davis Department of Neurology provides expert diagnosis and treatment for patients with MS. The faculty also conduct both basic research and clinical research studies for MS that are aimed at developing new treatments.

Current MS Research at UC Davis

Professor David Richman was awarded a grant by the Muscular Dystrophy Association to study improved treatment for autoimmune disorders, including MS and MG, that uses engineered immune cells (T cells) to target just the malfunctioning portion of the immune system. Current treatments target the entire system.

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awarded funding for a Phase 2 trial for the experimental drug TB006 in patients with acute ischemic stroke. TB006 targets a protein involved in brain inflammation, a process associated with Alzheimer's disease. Also in 2022, associate professor Temitayo Oyegbile-Chidi was awarded funding for a study of seizure medication Cenobamate in treating children with focal seizures.

David Johnson is the recent recipient of a \$2.3 million grant from the California Institute of Regenerative Medicine (CIRM) to study the impact of a health information program for minority communities. The Good Life program provides accessible health information programming tailored to match the specific interests of these communities. While The Good Life focuses on locality of programming to create a sense of virtual inclusiveness, which makes it well attended, the efficacy of The Good Life to implement meaningful healthy lifestyle changes is not known. This study will observe the results of live exercise and diet classes.

The Department of Neurology is committed to departmental and collaborative research with state-of-the-art facilities on Davis and Sacramento campuses. The department also collaborates with faculty from other schools and with the Veterans Affairs Northern California Health Care System (VA). In addition to department faculty, there are neuroscience faculty in the basic medical sciences, UC Davis School of Veterinary Medicine, UC Davis College of Agricultural and Environmental Sciences and UC Davis College of Letters and Sciences. Truly vigorous and collaborative work is done across multiple disciplines over this diverse and exciting area of scientific inquiry.

UC Davis Spine Center

Neurologists are among the specialists who contribute to the success of the UC Davis Spine Center, the most active spinal cord injury clinical trial program in California, if not the nation. As part of the region's only academic medical center, the spine center offers patients of all ages access to dedicated physicians who are actively involved in the latest spine research and clinical trials, and to new and investigational diagnostics and treatments.

Kee Kim, chief of spinal neurosurgery and co-director of the center, explains, "Our work wouldn't be possible without the dedicated team of residents, fellows, advanced practice providers, clinical research coordinators, and spine colleagues. We work together to make significant contributions to improve the lives of our injured and paralyzed patients. It wouldn't be possible without our team effort."

[Kim is leading a randomized study](#) testing a new treatment to regenerate the spinal cord. Researchers hope it will lead to improvement in spinal cord function.

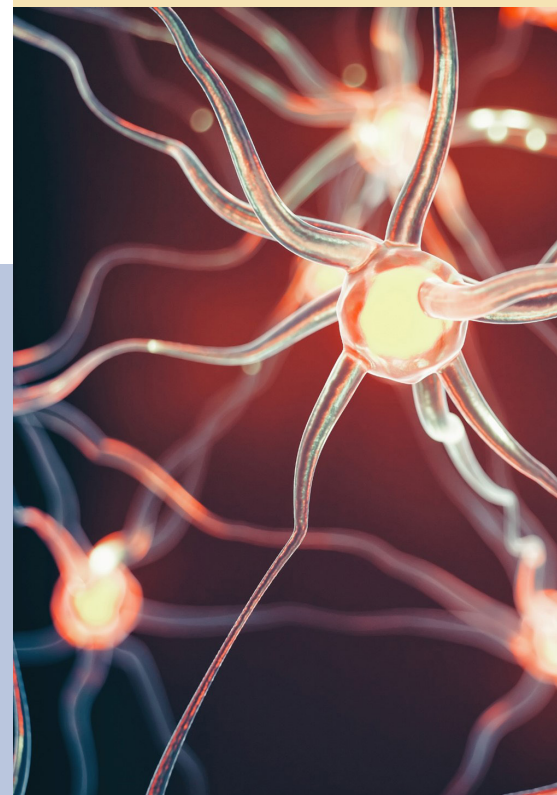
Recent Neuro Research at UC Davis

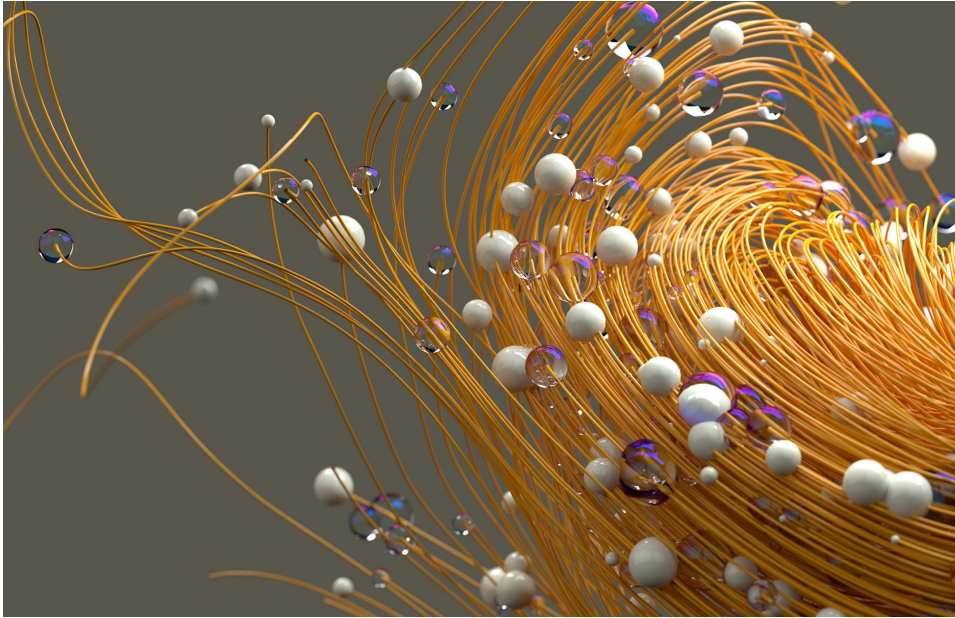
Fuzheng Guo, Associate Professor

Guo has been awarded several new NIH grants focused on central nervous glial cell development and disorders. Glial cells provide physical and chemical support to neurons and maintain their environment. One of his current lab projects is studying central nervous system glial cell development and regeneration, to shed light on the neurobiological basis of developmental abnormalities in patients with human anophthalmia / microphthalmia (birth defect of the eye).

David Pleasure, Professor and Vice Chair for Research

Pleasure's current research on Canavan disease is tackling a central nervous system genetic disease of infancy and childhood. Canavan disease is characterized by early onset brain vacuolar degeneration and delayed brain neuron depletion for which there are currently no effective therapies. Pleasure's team is attempting to reverse pre-existing degeneration and prevent progressive neuron loss in a well characterized mouse Canavan disease model.





National Center for Metabolic Phenotyping of Mouse Models of Obesity and Diabetes (MPMOD)

The UC Davis Health Department of Surgery has received \$3.75 million to launch a high-profile center where researchers can study metabolic disorders using mouse models. The goal is to learn more about the same diseases in humans. The new funding will advance this research. It will allow researchers to measure the impacts of diabetes, obesity, and other related metabolic disorders on laboratory mice that have been manipulated to model metabolic diseases in humans.

UC Davis Health researchers will collaborate with four university centers across the nation in this effort. The others include the University of Michigan, Vanderbilt University, Yale University and Augusta University.

Also included in the funding is support for a pilot program called MPMOD Vibrant. This initiative seeks to provide resources, training and advice to early career scientists. A major focus will be on studies at institutions that serve faculty and trainees historically underrepresented in biomedical research. [Read more.](#)

The Institute for Psychedelics and Neurotherapeutics

UC Davis has launched a new institute to advance basic knowledge about the mechanisms of psychedelics and translate it into safe and effective treatments for diseases such as depression, post-traumatic stress disorder, addiction, Alzheimer's disease and Parkinson's disease, among others. The Institute for Psychedelics and Neurotherapeutics will bring together scientists across a range of disciplines and partner with the pharmaceutical industry to ensure that key discoveries lead to new medicines for patients.

"Psychedelics have a unique ability to produce long-lasting changes in the brain that are relevant to treating numerous conditions," said David E. Olson, associate professor in the Department of Chemistry and the Department of Biochemistry and Molecular Medicine at UC Davis. "If we can harness those beneficial properties while engineering molecules that are safer and more scalable, we can help a lot of people." [Read more.](#)

The institute is organizing the Psychedelic Summit, to be held on March 23, 2023. [Registration information.](#)

Research in the News

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