

The Discovery Science Research Fund

A UC Davis Initiative to Catalyze the Next Generation of Science

Introduction

As one of the top 20 public research universities in the nation, and one of the fastest growing in terms of research funding in the UC system over the last two decades, UC Davis has consistently grown its strengths in world-class, interdisciplinary research and discovery. Leveraging its diverse faculty expertise, UC Davis is known for its collaborative environment that spurs innovations in learning and science by discoveries that take shape at the frontiers and intersections of academic disciplines. This distinctive approach, supported by unprecedented research resources, has resulted in national foundations and government agencies recognizing UC Davis as a powerhouse in discovery science.

In 2013 UC Davis decided to invest over \$10.9 million into 13 new, globally competitive, large-scale interdisciplinary research efforts. Called the Research Investments in Sciences and Engineering (RISE) program, this initiative brought together scientists and researchers from over 50 different disciplines to work together on basic research problems that create transformative knowledge and technologies focused on solving major societal problems that transcend state, national, and global boundaries.

Our initial investment is a success, resulting in some very exciting scientific progress and generation of significant levels of extramural funding. Eleven projects have secured follow-on funding from federal and state agencies and the program is already producing a 10:1 return on our initial investment with just under one year to run. It is from this experience that we are confident in the vision for a Basic Research Fund in Physical and Biological Sciences proposed by the Science Philanthropy Alliance. Early stage investments in fundamental, curiosity-driven research are critical to opening up entirely new fields of scientific endeavor, sustaining US leadership in scientific research, and helping to advance progress in solving some of the biggest scientific challenges of our time.

BRAIN-STIM: THE UC DAVIS GRAND CHALLENGE INITIATIVE IN BRAIN SCIENCE

UC Davis established the UC Davis BRAIN Consortium to stimulate collaborative and innovative research focused on achieving the goals of the Obama BRAIN initiative. A major component of the effort is to provide funding designed to promote new and creative strategies that leverage the breadth and depth of scientific expertise at UC Davis in the fields of molecular, cellular, systems, and cognitive neuroscience as well as bioengineering, physics, and chemistry.

The Discovery Science Research Fund

Our discovery science efforts are curiosity-driven; we neither pre-judge an outcome nor focus on an expectation of usage, but rather build on prior knowledge to develop new understanding. Discovery science often requires a team-based approach, but maximizing the likelihood of truly advancing scholarship necessitates deep domain expertise as a prerequisite from team members. For these reasons the Discovery Science Research Fund will embrace high-risk, pioneering research in physical and biological science that enables both individual investigation and team-based enquiry, depending on what the opportunity requires. UC Davis seeks to leverage the success of our initial basic research investments through catalyst programs such as RISE and BRAIN-STIM.

LARGE SYNOPTIC SURVEY TELESCOPE (LSST)

The goal of the LSST project is to develop first-of-its-kind data products that will address some of the most pressing questions about the structure and evolution of the universe and the objects in it. UC Davis's Distinguished Professor of Physics Tony Tyson serves as the Chief Scientist on this critical effort to bring new understanding to our galaxy.

The scientific questions that LSST will address are profound by providing the most detailed and thorough mapping of tens of billions of stars and galaxies. With this map, scientists will explore the structure of the Milky Way, determine the properties of dark energy and dark matter, and make discoveries that we have not yet imagined.

UC Davis's faculty represents an unusually broad range of disciplines. The UC Davis Discovery Science Research Fund will ensure the vitality and robustness of our basic science research enterprise as it serves as the bedrock upon which our translational programs are built. We will accomplish this by leveraging our distinctive resources, facilities, and external collaborations to overcome the systemic barriers currently frustrating academic scientific efforts, creating an almost infinite number of permutations to develop entirely new and exciting research fields at the intersections between existing fields of study.

We will accomplish this by using the following prioritization: (1) seed funds to enable new basic research exploration (at a \$100k individual award level), (2) awards to early career faculty to facilitate basic research enquiry (\$100k - \$250k individual award level), and (3) funding of critical research infrastructure (with funding at the \$500k-\$1M level for selected projects).

We will also take a "balanced portfolio" approach starting with a 50:50 split between single PI and multi-PI programs and refining as we continue to grow the fund and begin evaluating impact.

It is expected that projects funded by the UC Davis Discovery Science Research Fund will lead to transformative new knowledge and the potential for eventual translation via federal, state, foundation, corporate and other private sources. In addition, we will seek opportunities to generate interdisciplinary research training at the undergraduate, graduate and postdoctoral level to ensure that the pipeline for versatile, curiosity-driven scientists is encouraged and supported.

Selecting Opportunities

The Office of Research, in consultation with the Office of the Provost and Executive Vice Chancellor, will lead efforts to provide a thorough assessment of internal applications and choose those that best match the goals of the UC Davis Discovery Research Fund. A peer review process, using methodologies appropriate to the scale and type of award, will be implemented and will encompass both internal and external stakeholders.

UC Davis Discovery Science Seed Fund Program

For smaller seed funding awards, we will use the UC Davis Research Coordinating Council which is composed of 14 Associate Deans for Research from across UC Davis's Schools, Colleges, and Divisions. A multi-criteria review process will be used with the Associate Deans acting initially as individual reviewers, and subsequently convening as a committee to make final recommendations for funding to the VC Research and Provost.

UC Davis Discovery Science Exploratory Research Awards Program

For larger awards, we will incorporate additional peer review processes, calling upon distinguished scientists from outside the UC system. This process will be overseen by the Associate Vice Chancellor for Research, who has extensive prior experience in developing and executing rigorous peer review processes at a national and international level. Building on our very positive selection results from the RISE program, we will again carefully select NAS/NAE/IOM members or individuals of similar stature who will act as an External Science Advisory Committee (ESAC). The Office of Research will solicit nominations for the ESAC from the Deans and the Academic Senate Committee on Research. The ESAC will short-list a subset of the highest ranked proposals, and assemble at UC Davis to have the leading investigators present their concepts in person. The ESAC will rank order their priorities for funding by consensus, and make funding recommendations to the VC Research and Provost with final rankings.

UC Davis Discovery Science Research Infrastructure Program

UC Davis has recently appointed a half-time Faculty Director and full-time Associate Director to assist the university in revitalizing its core research infrastructure. The Director and Associate

SILVIO O. CONTE CENTER FOR BASIC OR TRANSLATIONAL MENTAL- HEALTH RESEARCH

One of 15 such centers in the US, UC Davis is establishing a prestigious, leading-edge center to advance innovative research into the origins of schizophrenia. UC Davis's Conte Center will investigate the novel hypothesis that an origin of schizophrenia may be dysregulation of immune molecules that play a key role in normal development and functioning of connections in the brain.

Director report to the VC for Research. The Office of Research will assemble a broad faculty advisory group composed of faculty members that have specific expertise related to research infrastructure, method development, and core operations. We will use this committee to review competitive proposals for new infrastructure investments utilizing appropriate selection criteria.

Fund Management

The UC Davis Discovery Science Research Fund represents a distinctive opportunity for individuals and organizations to catalyze and accelerate basic science discoveries at UC Davis.

The Division of Development and Alumni Relations ascribes to a donor-centered philosophy where individual and organizational donors can achieve their philanthropic or operational goals. Fundraising is supported with a cadre of more than 100 development professionals dedicated to drawing connections among the friends, alumni, foundation, corporate, and non-governmental organizations and the teaching, research, and service efforts of our university faculty and students.

The UC Davis Foundation has established the UC Davis Discovery Science Research Fund to provide forward-thinking philanthropists interested in investing in the best science at UC Davis. We envision securing support from individuals and organizations.

It has been our experience that outside of endowment support for faculty positions, most support for basic science is presently current-use funding. Our plan will be to approach the development of this fund in a very measured way, initially focusing on current use funds that can help our basic scientists establish proof of concept or develop preliminary data to improve their chances of securing federal support of broader initiatives. As we are able to establish a record of impact—through discovery, invention, technology transfer, and economic development, our focus will shift to moving existing fund donors from a “current-use” mindset to consider perpetually linking their legacy with UC Davis.

The Science Philanthropy Alliance and its mission come at an opportune time for UC Davis. In 2014 we concluded the University’s first-ever comprehensive campaign, securing over \$1.13 billion from over 110,000 donors. It was a notable achievement and testament to the visionary generosity of UC Davis’s global network of supporters. Just as basic research is the underlying theme for many of the initiatives supported by our donors, the Discovery Science Research Fund will serve as an opportunity to increase awareness of the critical role that basic research played in our University’s history as well as how it serves as a beacon for our institution’s future during the next comprehensive capital campaign.