



UNIVERSITY
OF
CALIFORNIA

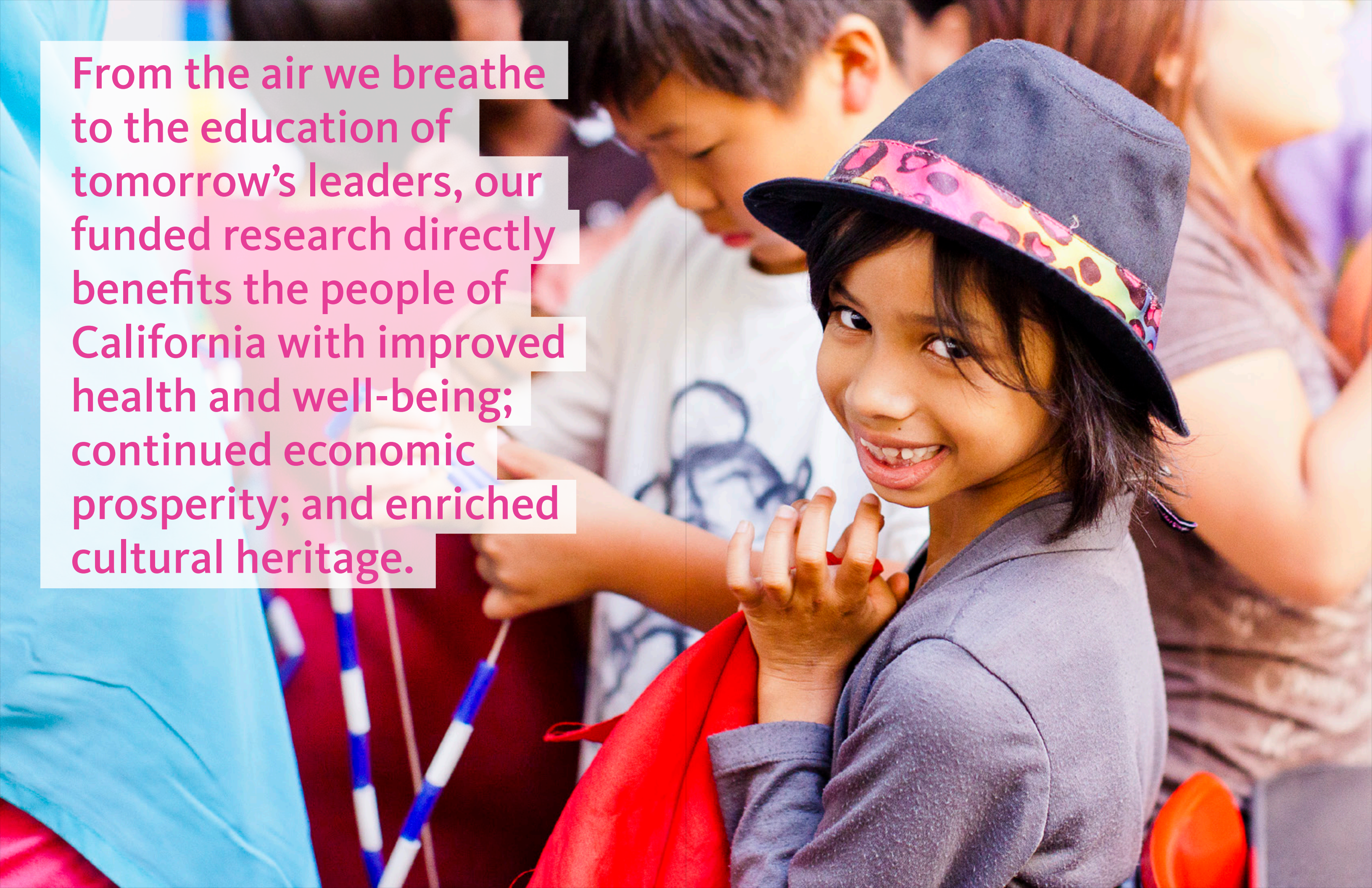
Supporting Research, Partnerships, Solutions

Research Grants Program Office
2016

Our investments
push California
to the forefront
of innovation.



From the air we breathe to the education of tomorrow's leaders, our funded research directly benefits the people of California with improved health and well-being; continued economic prosperity; and enriched cultural heritage.



Supporting Cutting Edge Research in California



At the Research Grants Program Office (RGPO), our grant-making allows innovative research and ingenuity to thrive in California by funding investigators, students and research partners with the resources they need to tackle our society's toughest problems. We believe meaningful engagement of these multiple stakeholders leads to solutions rooted in both rigorous research and real experiences in California communities. This collaborative focus allows California to be on the forefront in addressing the challenges we face in this century and beyond.

In the past four years, RGPO has awarded over \$220 million in grants to researchers at UC campuses, our national laboratories, and other institutions throughout California. We fund research that creatively and effectively pushes the boundaries of discovery across all disciplines.

The staff at RGPO is dedicated to making sure that taxpayer research dollars are spent wisely with low administrative costs. These efforts translate into more research dollars being used to inspire a cutting edge research environment in California while maintaining a rigorous peer review selection process and diligent grant stewardship.

Our commitment to ignite the spirit of innovative inquiry combined with the realities of the lives of all Californians is no different this year. We have worked diligently to do more for California through our grant-making by assuming oversight of the UC Cancer Research Coordinating Committee (CRCC). The CRCC was created in 1947 to fund seed grants for critical cancer research through bequests made to the University of California.

This 2016 RGPO Annual Report gives you a glimpse into the projects we fund and the impact they have on all of our lives. I hope you enjoy it.

Sincerely,

Mary Croughan, Ph.D.

Executive Director

Research Grants Program Office

University of California, Office of the President

“RGPO ensures that every research dollar we fund makes a genuine difference.”

UC's Research Grants Program Office

We oversee a grants portfolio of over \$220 million, funding over 800 projects and thousands of researchers throughout the state.

Our grant-awarding process is as thorough as any in the country, involving peer reviewers who are leaders in their fields. Our research programs build teams across campuses and with communities closest to the problems we're working to solve.

Our programs...

Seed **Discovery**

Spur the **Economy**

Pioneer **Initiatives**

Promote **Collaborations**

Shape **Policy**

CBCRP

California Breast Cancer Research Program fights to end breast cancer through innovative science and community participation.

CHRP

California HIV/AIDS Research Program supports groundbreaking research that speeds progress toward the prevention and cure for HIV/AIDS.

TRDRP

Tobacco-Related Disease Research Program helps protect Californians from the harmful effects of tobacco.

UCRI

UC Research Initiatives supports multicampus research teams, partners UC and national laboratory scientists, and advances innovations that benefit California.

Each of our grants tells a story. Shaped by discovery, innovation and collaboration, these stories impact California and the world.





Understanding the drought

How soil health affects California agriculture

Agriculture is a key driver of California's economy but, unlike other leading industries, its success is beholden to Mother Nature. Global climate change and limited access to water are creating significant challenges for California. In 2015 alone, the drought contributed to estimated losses of over \$2.7 billion and nearly 21,000 jobs in California's agricultural sector.

To address these long-term challenges, UC Riverside environmental scientist Samantha Ying is looking to the land itself for answers. With a \$1.7 million grant from the President's Research Catalyst Award, Ying and a consortium of scientists from four UC campuses, Lawrence Berkeley National Lab, Russell Ranch Sustainable Agriculture Facility, and three cooperative extension sites are studying the factors that impact soil and the way those factors affect agricultural water use.

Healthy soil that has plenty of carbon, a variety of microbes living in it, and good microscopic structure can absorb and hold more water and nutrients during a wet spell. The scientists will look closely at how these microscopic features affect tomatoes, alfalfa and wheat – three crops crucial for the California economy.

The scientists won't just be looking down at the ground, though. They will also work closely with the agricultural community, engaging citizens and policymakers to use their research results to design agricultural and water management strategies that will help improve the health of the soil and economy across California.

Since 1983, CHRP has funded over 2,000 research projects and distributed more than \$275 million in research funding across California.

Monitoring heart health

A test of “good” high-density lipoprotein (HDL) for heart disease risk

The HDL molecules in our bodies work as vehicles to carry excess cholesterol away from arteries to the liver. Cholesterol deposits can lead to the thickening of arterial walls or atherosclerosis, and heart disease.

Clinics routinely measure HDL-Cholesterol (HDL-C) in blood for cardiovascular disease risk. But studies now show that it is not as good an indicator as once believed. Several drug trials designed to increase circulating HDL-C showed that such an approach did not reduce the frequency of cardiovascular events.

TRDRP-funded researcher Michael Oda at UCSF Benioff Children’s Hospital Oakland Research Institute discovered that measuring the “functional ability” of HDL molecules to traffic cholesterol is a powerful new biomarker.

“HDL-C is a poor indicator of cardiovascular risk, and especially gives women a false sense of security as 64% of women who die suddenly from coronary heart disease had no prior warning. Our new method measures HDL function that provides a much more accurate view into the metabolic and cardiovascular health of all patients,” says Dr. Oda.

The test takes a drop of blood and two minutes to measure HDL function. In addition to prognosis, the test will also allow clinicians and patients to monitor outcomes of interventional changes in lifestyle such as nutrition, medication and smoking cessation.

RGPO provides more support for health research than any other California-based funder.

Since 1947, small seed grants from the Cancer Research Coordinating Committee have catalyzed discoveries by UC faculty in cancer detection, treatment, and prevention, helping position the University of California as a national leader in cancer research.

SEEDING DISCOVERY





Earning trust with young men of color

HIV prevention in Oakland

There are multiple barriers to HIV prevention and care in communities of color: stigma against HIV, lack of access to care, and a history of discrimination in medical settings. But the CHRP-funded CRUSH project is rewriting the book in Oakland, by tailoring their services to the needs of a highly specific and highly at-risk population: young men of color who have sex with men.

At the East Bay AIDS Center, these men join friends in the waiting room, chat with caregivers, and learn about an HIV prevention pill that could save their lives. This is an innovative research project that engages and educates this community while providing the PrEP (or pre-exposure prophylaxis) prevention pill. Dr. Ifeoma Udoh, who leads the research team, explains, “One pill a day has become so normalized in reproductive health care. But it’s got a long way to go before being normalized in HIV prevention.”

“It is tough to convince patients that it is safe to get care—especially when there is nothing wrong with them,” says Co-Medical Director of the Center, Dr. Jeff Burack. “The most effective way is having their peers trust us.” By earning that trust, CRUSH hopes to demonstrate that PrEP can help to save lives in Oakland and beyond.

TRDRP ranks 3rd nationwide in funding research on “new tobacco products” such as e-cigarettes.

The CBCRP program is mandated to fund innovative and creative research, with a special emphasis on research that complements, rather than duplicates, the research funded by the federal government and other entities.

Reaching back in time

Discovering environmental causes of breast cancer across generations

In 1959, 15,000 pregnant women joined a study investigating how health and disease are passed on to future generations. Almost six decades later, their contributions have led to the Three Generations Study (3Gs), a groundbreaking CBCRP-funded breast cancer study that is informing our understanding of genetic and environmental contributors to health. The 3Gs researchers are analyzing data on the role of fetal exposure to pesticides, household cleaners and other pollutants in developing breast cancer as an adult. Initial findings show a relationship between pesticide (DDT) exposure in the womb and developing breast cancer later in life.

The 3Gs study is also unique because it involves a committee of individuals from the first two generations of the study as community partners. Together, they are working to determine how to interpret and disseminate the findings from this study to other study participants, the public, researchers and policy makers. The Public Health Institute's Barbara Cohn, the study's principal investigator, adds, "Working with our community partners has made an enormous impact. Our research makes sense and is relevant to the public because of them."

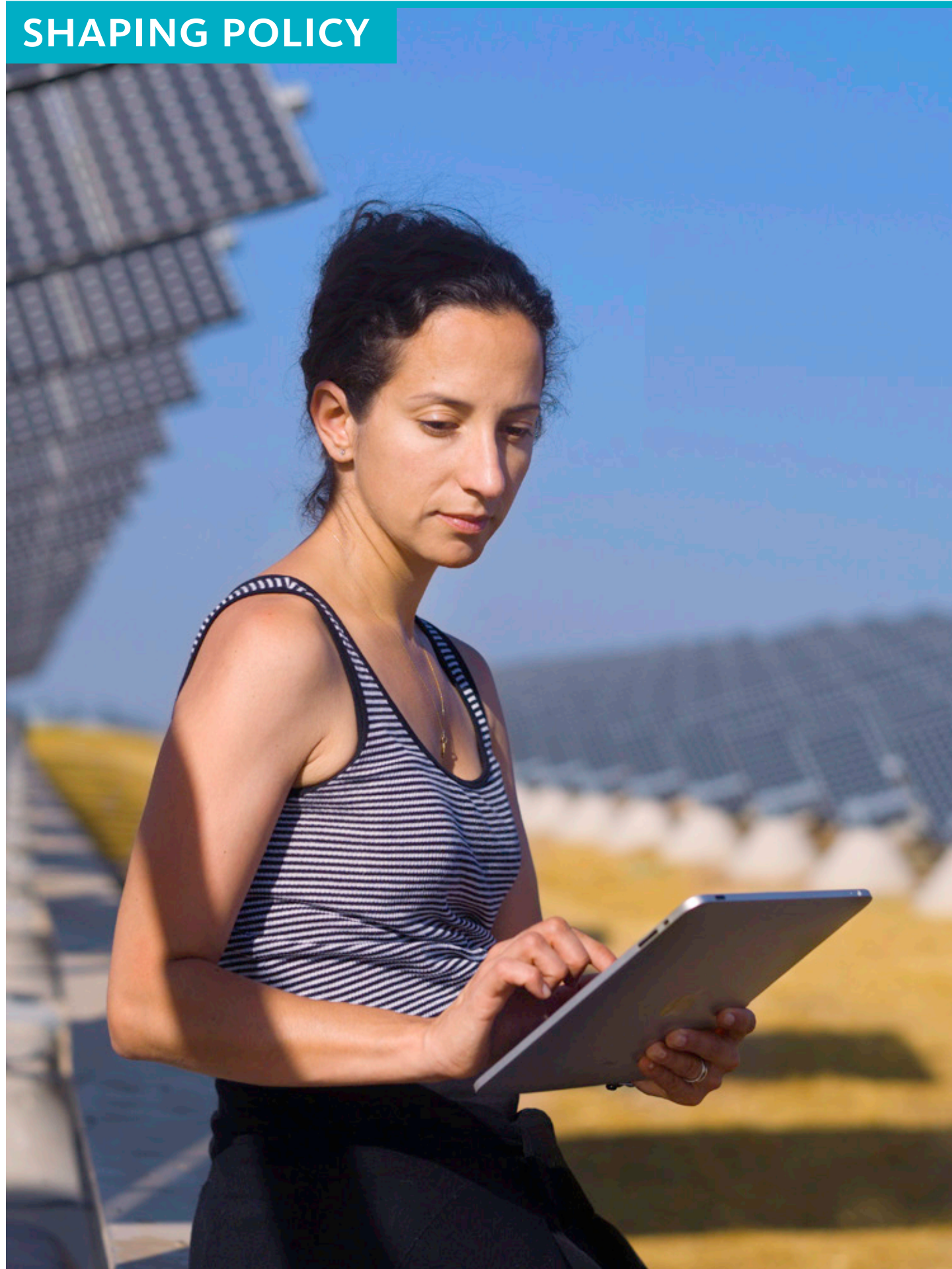
This is the first study to substantiate the theory that the chemicals a pregnant woman is exposed to can lead to cancer in her daughter years later. With direct input from community partners, we can begin to understand and disseminate widely how exposures at critical times in our life influence our health later on.

In 2015, social workers and computer programmers created an HIV prevention app for homeless teenagers. It was number two on Mashable's "26 incredible innovations that improved the world in 2015," and CHRPs funds supported this collaboration.

RGPO stimulates multi-sector research, bringing together leading experts, local leaders, and respected community advocates to address critical issues facing California.

PROMOTING COLLABORATIONS





Creating more efficient energy systems

Study uncovers ways to reduce our energy use

How do you solve a problem that you can't see? Improving California's energy system presents one such challenge—it's easy to measure where our energy comes from, but it's not easy to determine how it's used. Without this key information, engineers and policy makers are shooting in the dark when it comes to finding ways to make our energy use more efficient.

With a grant from the Laboratory Fees Research Program, researchers at UC Davis and Lawrence Livermore National Laboratory have created an automated measurement system that provides detailed, real-time data on how energy is used. For example, this system accounts for how and when factories use energy, the efficiency of furnaces in households and whether there are seasonal differences in energy use.

"Our idea was to show where energy went, so we can see how that energy is transformed into useful services," explained Alan Meier, principal investigator on the project.

The information generated by this project could serve as an important tool in helping institutions achieve their goals, such as UC's Carbon Neutrality Initiative, by providing insight into how, when, where and with what efficiency energy is used. This knowledge can help identify areas for improvement so that we can collectively reach the goal of net-zero energy use.

"Our research has changed the way the Department of Energy is looking at and figuring out how to reduce this huge amount of wasted energy," Meier said.

With funding from TRDRP and the California Department of Education, researchers developed, tested and disseminated a new toolkit to reduce and prevent middle and high school students from using tobacco.

As part of the UC Health Initiative of the Americas, CHRP partners with Programa de Investigación en Migración y Salud (PIMSA) to support HIV research projects that bring together one Principal Investigator from Mexico and one from the U.S.

Working together to reduce health disparities

Fostering partnerships at UC AIDS research centers

In California, significant inequalities exist across the continuum of care for HIV. HIV-positive populations that are hard to reach, have little or no access to care, or face strong stigma fare the worst in health outcomes. CHRP is focusing on HIV-related health disparities by partnering with Centers for AIDS Research (CFARs) at multiple UC campuses, bringing expertise in the needs of marginalized populations to the forefront at those Centers.

The three CFARs at UCLA, UCSD, and UCSF are scientific leaders in California and nationwide, and with support from CHRP, they have initiated intercampus collaborations which focus on HIV/AIDS health inequities across the state. The Center at UCLA, led by Dr. Norweeta Milburn, focuses on the needs of homeless youth, and of young African-American men who have sex with men, in Los Angeles County. Dr. Jamila Stockman is leading an effort at UCSD working with HIV-positive African Americans in San Diego County, and with out-of-care HIV-infected women who face syndemic-related barriers (mental health, trauma, intimate partner violence). At UCSF, Dr. Paul Volberding's team is working with African-American Gay/Bisexual/Transgender youth within the urban "House Ball Community," and with HIV-positive youth, in San Francisco.

Taken together, these collaborations bring world-class leadership from the CFARs and innovative new investigators together to work with our communities to address important health disparities in HIV care and prevention.

CBCRP hosted a conference that brought together nearly 200 advocates, researchers and health care providers and helped them to break out of their silos to form transdisciplinary collaborations.

Since 2009, the UC-National Laboratory Fees Research Program has invested over \$105 million in research collaborations addressing critical national and global challenges in energy, health, and international security.

PROMOTING COLLABORATIONS





Exposing the extent of tobacco use in video games

Innovative study on how imagery in video games may entice smoking behavior in youth

In the United States, 88 percent of youth between the ages of 8-18 years play video games, and many of these games show tobacco use and imagery.

Research by Ph.D. candidate Susan Forsyth and Dr. Ruth Malone of UCSF found that today's youths are frequently exposed to tobacco imagery in these games. The current research evidence suggests that children are susceptible to such exposure and that characters smoking in video games may lead to smoking initiation.

This TRDRP-funded study found that gamers are able to recall tobacco imagery in popular videos games. Among youths, behavioral exposure to imagery depends on length of playing time. Specific tobacco product branding in video games may also lead to brand recognition or general acceptance of tobacco use.

Forsyth and Malone found that among video games identified as popular among adolescents and in the Entertainment Software Rating Board (ESRB) database, 42 percent included tobacco imagery, but only 8 percent had an ESRB tobacco-related content descriptor. Among games rated as suitable for teens, 30 percent included tobacco imagery while only 13 percent had an ESRB tobacco-related content descriptor.

Because video games are a primary choice of entertainment for children and adolescents, this relationship between video games and tobacco use needs further study. A policy to screen games for tobacco use and add relevant descriptor labels is vital.

Supported by a President's Research Catalyst Award, the UC Consortium on Criminal Justice Healthcare is a collaboration of health researchers, legal scholars, and community members investigating how criminal justice reform can effectively address well-being both inside and beyond prison walls.

Improving memory

A prosthetic device for the brain

Imagine a prosthetic that can help your brain retrieve lost memories. For patients and their families struggling with Alzheimer's disease and other neurological conditions, this may sound like a dream come true.

Neuroscience has made great progress in understanding memory but, currently, there is no way to restore it. Supported by a grant from UCRI's Multicampus Research Programs and Initiatives (MRPI), a team of UC neuroscientists, engineers and computer scientists is leveraging existing knowledge about how memory works to create a brain implant that can recover some memory function in patients with severe impairment.

Led by UC Irvine neuroscientist Bruce McNaughton, the team is looking for a way to restore memory through stimulating connections in the brain with a wireless, implantable device. If the prototype works, it will be an important first step in developing a fully functional memory prosthetic that could be used to improve quality of life for patients suffering from conditions such as Alzheimer's disease, epilepsy and certain kinds of trauma.

This high-risk, high-reward project could be transformative for improving the lives of California's aging population. According to McNaughton, the MRPI funding has been "a wonderful way of getting different campuses to work together on an innovative scientific idea that might not be seen as ready for 'prime time' by more traditional funding sources."

TRDRP-funded researchers collected the first data on how electronic cigarette fluid and aerosol may be toxic to human cells.

CBCRP is a national leader in supporting research into the causes and prevention of breast cancer, investing over \$25 million over the last five years.

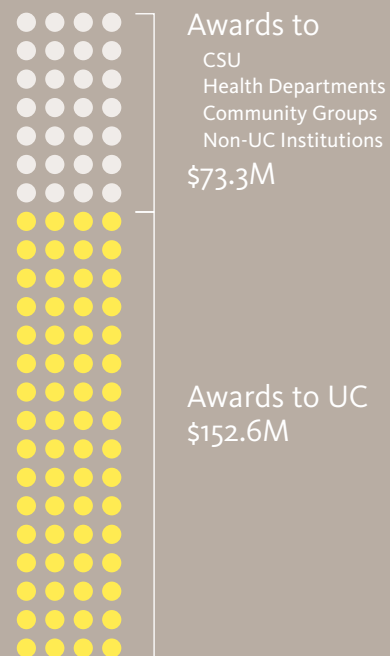
SEEDING DISCOVERY



Investing in Research and California

UC investments in research throughout the state were hit hard by the economic downturn and prior budget cuts. Reinvestment in UC research will benefit the state far into the future.

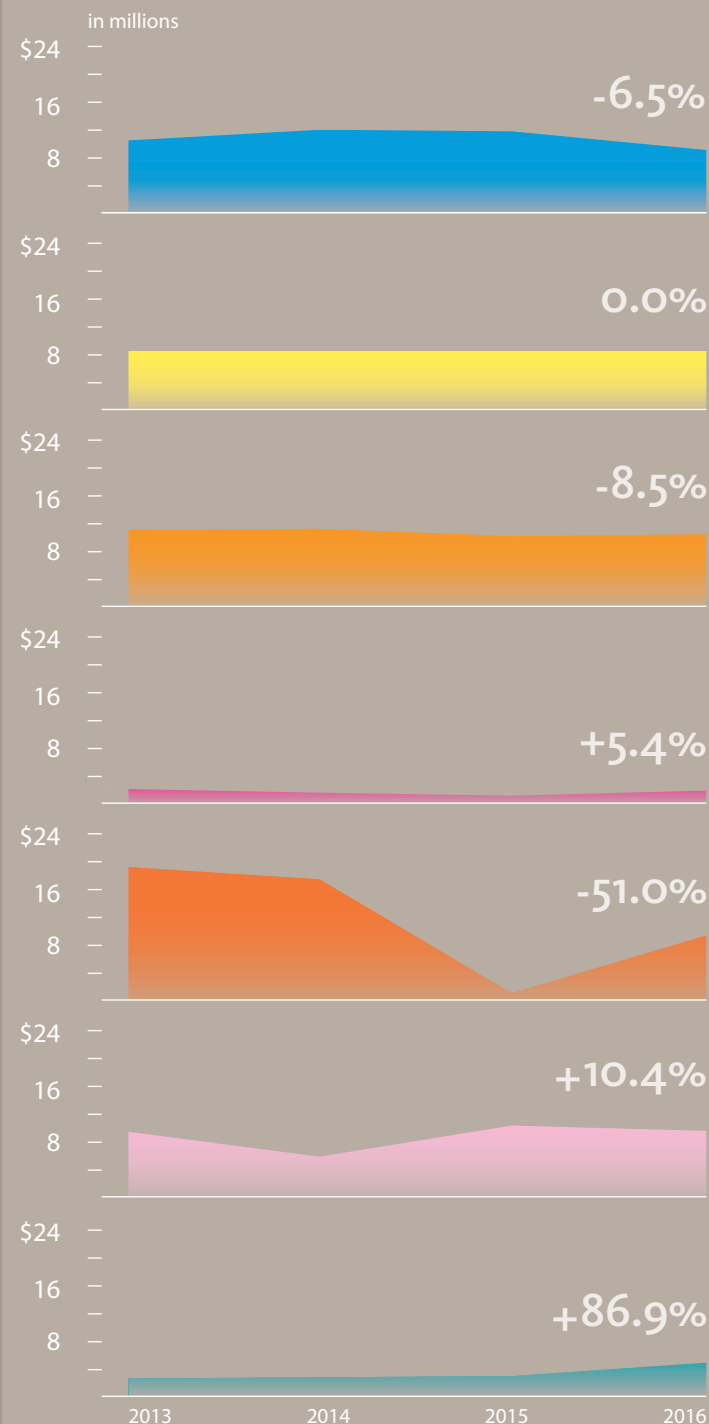
Total: \$225.9M



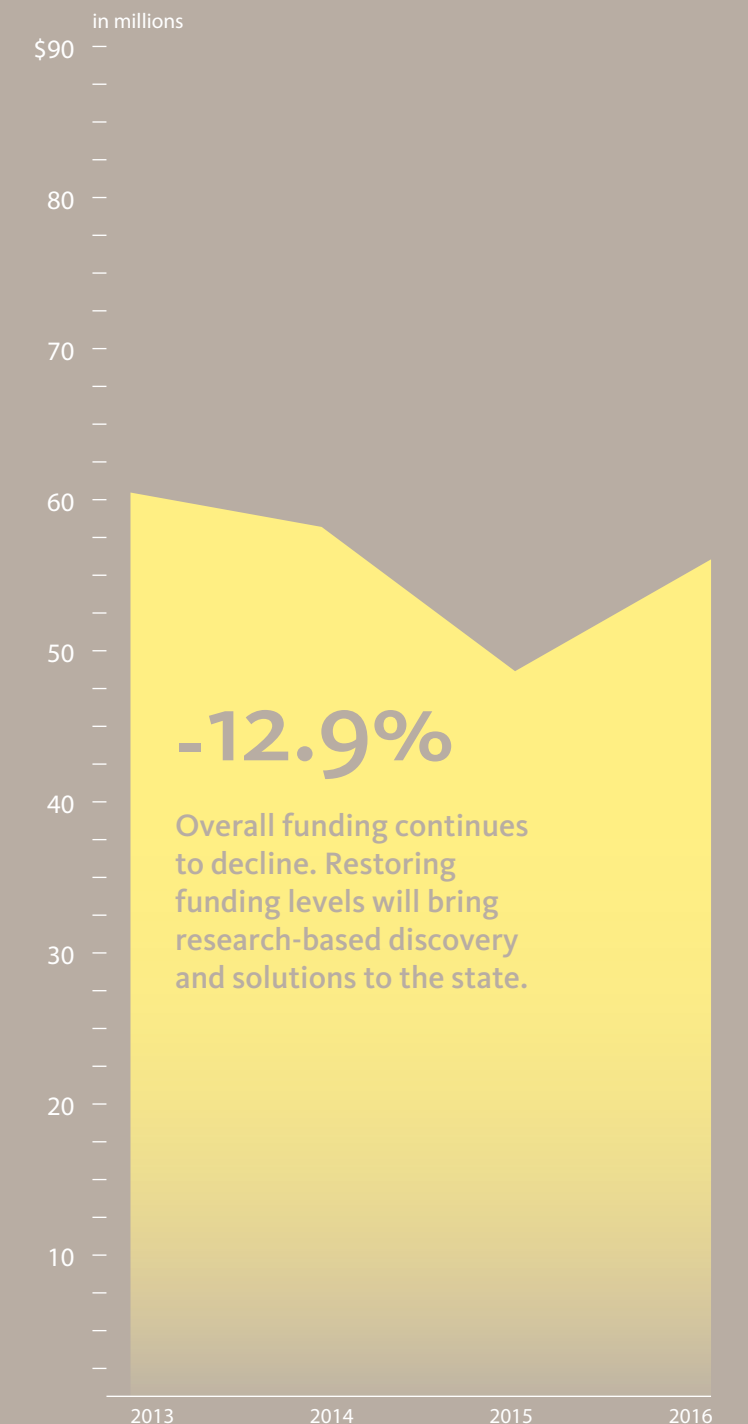
Program	Funding	Awards (2013-16)
California Breast Cancer Research Program		\$32.4M
California HIV/AIDS Research Program		\$34.1M
Tobacco-Related Disease Research Program		\$40.6M
UCRI: Cancer Research Coordinating Committee*		\$7.0M
UCRI: Laboratory Fees Research Program**		\$53.2M
UCRI: Multicampus Research Programs and Initiatives		\$45.4M
UCRI: Special Initiatives***		\$13.2M

CA state tobacco tax UC Office of the President managed funds CA tax return voluntary contribution funds and individual donations


Research Funding Trends (2013-16)



Research Funding (2013-16)



* The CRCC is funded through income from bequests made to the University for cancer research, and has been funding research awards since 1947. The income represented includes annual program income prior to its administrative relocation to RGPO in July 2015.
 ** LFRP is funded by income the University receives for the management of LANL and LLNL, and varies annually in relation to the amount of fees earned.
 *** UCRI manages special initiatives with one-time or short-term funding. This line includes Proof of Concept Commercialization Gap Grants (2013, 2014) and the President's Research Catalyst Awards (2015, 2016).



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