

UNIVERSITY  
OF  
CALIFORNIA

---

# Supporting Research, Partnerships, Solutions

Research Grants Program Office

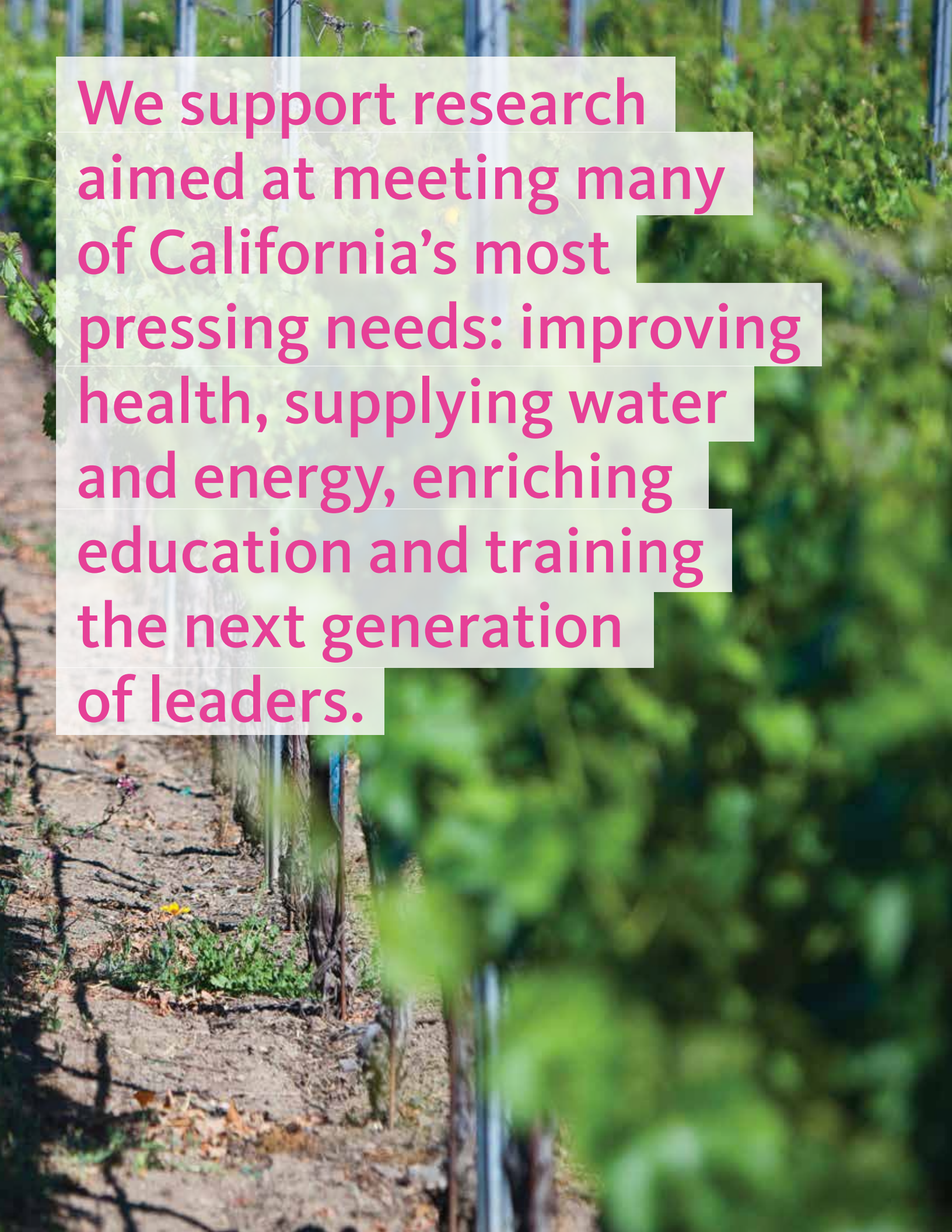
**2014**





**Our research shines  
a light on what's  
possible.**





We support research aimed at meeting many of California's most pressing needs: improving health, supplying water and energy, enriching education and training the next generation of leaders.

# Research for the World



“Teach for California, Research for the World,” the motto championed by President Napolitano, underscores what we do best at UC.

“Teach for California, Research for the World,” the motto championed by University of California President Janet Napolitano, underscores what we do best at UC.

For nearly 150 years, UC has supported California researchers in pioneering discoveries and conducting creative scholarly activities that address our most pressing problems and improve the lives of Californians and people around the world.

At the Research Grants Program Office (RGPO), we provide the grantmaking infrastructure to ensure that research funding is allocated to the investigators, students and community partners who are best equipped to examine today’s problems and seek solutions. We reach out to some of the state’s top experts and respected community leaders to develop bold research initiatives. We make sure that valuable research dollars make a genuine difference.

Over the past four years, RGPO has awarded \$270 million in grants to researchers at UC campuses, our national laboratories and other institutions throughout California.

Combining best practices and streamlined administrative processes to achieve low overhead costs, our grantmaking infrastructure is designed to maximize the money spent on California’s most promising research. From a rigorous peer review selection process to diligent award monitoring, the staff at RGPO ensures that taxpayer research dollars are wisely spent.

We consistently look for opportunities to improve efficiency without sacrificing quality. To that end, this year RGPO will introduce a new online grants management system designed to further enhance our grantmaking processes. This new system also will allow RGPO to provide more comprehensive grant-related data to our grantees, stakeholders and the broader research community.

This 2014 RGPO Annual Report tells the stories of how our funded projects will have a lasting impact throughout California and the world. I hope you enjoy it.

Sincerely,

Mary Croughan, Ph.D.  
Executive Director  
Research Grants Program Office  
University of California Office of the President

# UC's Research Grants Program Office

We oversee a grants portfolio of approximately \$270 million, funding 850 projects and thousands of researchers throughout the state.

Our grant-awarding process is as thorough as any in the country, involving peer reviewers who lead 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 the disease 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.

A person's hands are visible, holding a white model airplane with a purple stripe on the nose. The background shows a modern building with a grid-like facade and a clear sky. The text is overlaid on the upper portion of the image.

Discovery, partnership  
and persistence:  
research that  
promises a better  
future for California  
and the world.





# SEEDING DISCOVERY



# Testing ideas that matter

HIV program funds novel approaches to a cure

In the battle to end the AIDS epidemic, scientists are grappling with a central mystery: What mechanisms allow the HIV virus to stay hidden inside the body, even in the face of powerful antiretroviral medications?

Antiretroviral drugs are effective at suppressing HIV, but they are unable to completely eradicate it from the body. Reservoirs of the virus remain hidden and dormant inside cells, even in patients on effective medication.

Through the Cure Initiative, the California HIV/AIDS Research Program funds some of the most pioneering work into the basic biology of how HIV hides and persists, helping California scientists test innovative ideas about how to control and eliminate virus-harboring cells.

Ultimately, this work could bring an end to an epidemic that has killed millions of people.

The Cure Initiative allows researchers to try promising new ideas and approaches while developing the preliminary data that can bolster the case for doing larger, federally funded studies. Grants provide crucial early-stage funding for graduate researchers, post-doctoral students and others, including young scientists looking to build a track record of successful research.

Not only does CHRP's Cure Initiative help researchers compete more effectively for larger national grants, it fosters significant cross-collaboration in the shared quest for a world without AIDS.

---

CBCRP is a national leader in supporting research into the environmental factors that affect breast cancer. It has invested nearly \$12 million over the last five years into this important area of research.

---

UCRI invests more than \$3 million each year in arts and humanities projects across our campuses, helping position UC as the nation's leading public university in these fields.

# A wellspring of solutions

Improving water quality where it's needed most

In California's drought-stricken Central Valley, water shortages affecting irrigation and livestock aren't the only issues. Rising salinity levels and naturally occurring arsenic in groundwater make safe drinking water a concern.

Recent projects funded through the UC Research Initiatives Proof of Concept program hold promise for addressing those problems with new methods for ensuring that water supplies are clean, safe and reusable.

At UC Davis, professor Bassam Younis has developed a cost-effective method for disinfecting water using ultraviolet (UV) light. Compared with earlier efforts, the new technique uses far less energy and avoids issues related to mercury disposal from UV lamps.

Scientist Ashok Gadgil, at Lawrence Berkeley National Laboratory, has created an inexpensive and easily maintained system for removing arsenic from groundwater. The system could transform water supplies throughout California's Central Valley, where arsenic often is at levels that exceed safety standards.

And at UCLA, professor Yoram Cohen has developed a mobile desalination method that allows the reuse of agricultural wastewater. Using a two-step reverse osmosis process, wastewater is filtered through a series of membranes that results in 95 percent of the water being recovered and clean enough for reuse.

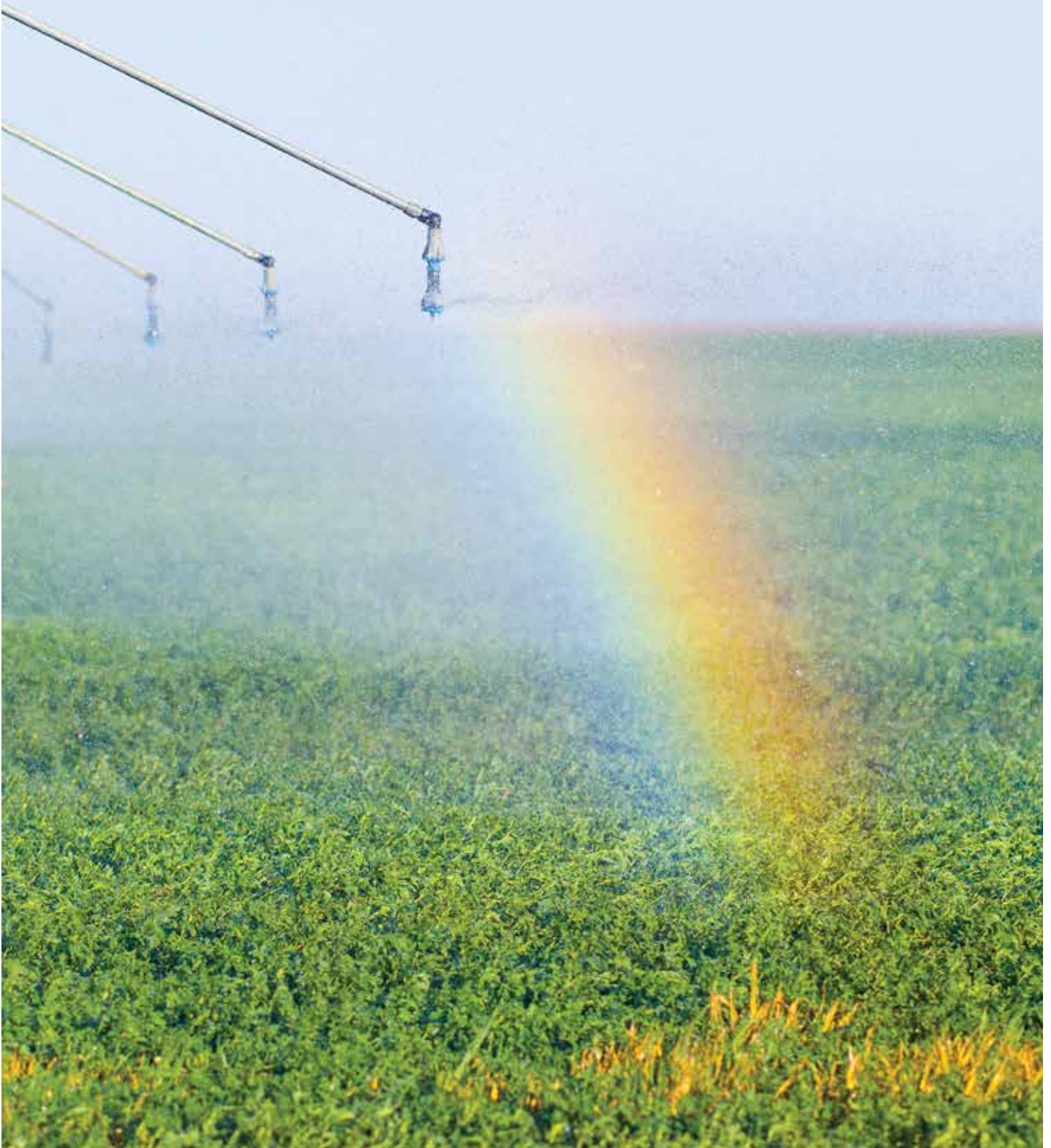
---

Disney blockbuster "Frozen" portrayed incredibly realistic animated snowflakes, thanks to mathematical modeling that was developed at UCLA with the help of a UCRI grant. The movie grossed more than \$1.2 billion worldwide, reinforcing California's pre-eminence in the film industry.

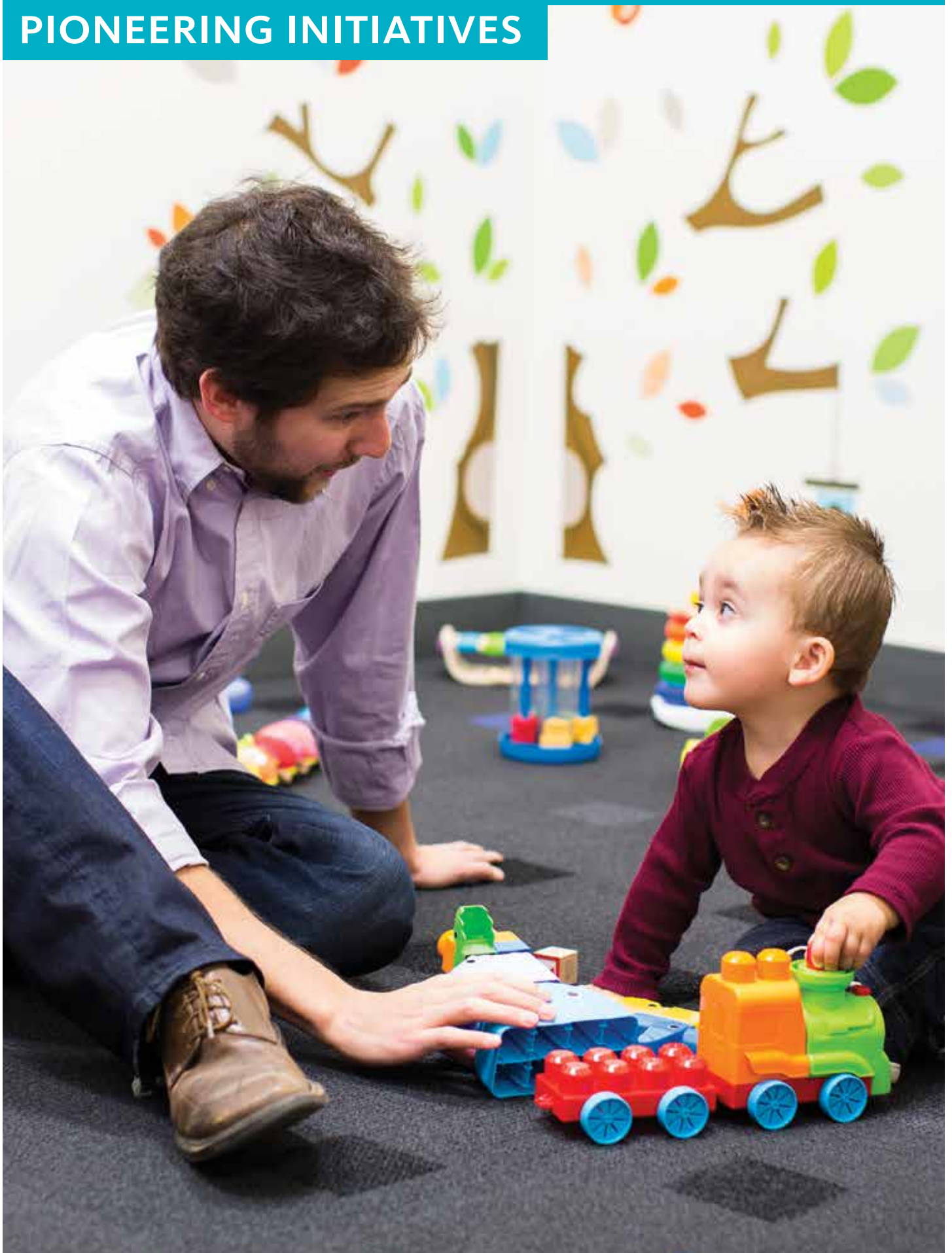
---

On average, every UC research dollar awarded brings in another \$7 of extramural funding to the state.

# SPURRING THE ECONOMY



# PIONEERING INITIATIVES



# Exposing a toxic threat

## Children at risk from third-hand smoke

People who smoke indoors may not realize it, but the fumes from their cigarettes leave a toxic film on furniture and other surfaces that can be as harmful to children as direct exposure to cigarette smoke.

This residue — often referred to as third-hand smoke — persists on the surfaces where it accumulates, growing more toxic over time.

In the first animal study on the health effects of exposure to third-hand smoke, a team led by UC Riverside professor Manuela Martins-Green found compelling evidence that it causes damage to the liver and lungs, and makes wounds slower to heal. In addition, exposed mice showed signs of hyperactivity.

The Tobacco-Related Disease Research Program funded the study, which suggested in its conclusions that children in environments where smoking has been permitted may be at significant risk for developing more severe neurological disorders.

Virtually nothing had been known about the specific health implications of acute or cumulative exposure to third-hand smoke until Martins-Green conducted this groundbreaking work.

Martins-Green's research points to the need for further studies on the impacts of third-hand smoke on humans. It also provides an important foundation to policy debates about how to prevent involuntary exposure to third-hand smoke.

---

The National Institutes of Environmental Health Sciences is incorporating assays developed by the CBCRP's Chemical Testing Initiative into its federal protocols for determining whether chemicals are toxic. That's just one of the ways CBCRP has a national impact.

---

Nearly 40 percent of Californians under care for HIV infection are served by clinics using intervention strategies that were recently funded by CHRP through its strategic research initiatives.

# Uncovering the truth

Girls learn why beauty products may be dangerous

An innovative research partnership in the agricultural community of East Salinas is revealing the breast cancer risk posed by chemicals in some cosmetics, shampoos and other personal care products.

Equal parts scientific training and health empowerment, the Hermosa Project teaches teens to design and conduct research on the levels of endocrine-disrupting chemicals found in the personal care products that they use.

Young girls and minority women tend to have higher levels of hormone-disrupting chemicals in their blood than non-Hispanic whites, making this community effort especially meaningful to the young Latinas who participate.

The project, funded by the California Breast Cancer Research Program, is the result of a unique collaboration between UC Berkeley public health professor Kim Harley and research coordinator Kimberly Parra at the *Clinica de Salud del Valle de Salinas*, which serves a primarily low-income Latino population.

Parra and Harley are investigating whether switching to safer alternatives to chemical-laden personal care products can reduce evidence of exposure to endocrine disrupters among teen participants. Meanwhile, the young women learn about the suspected link between breast cancer and exposure to chemicals that can alter the body's normal hormone system. They also discover safer care product alternatives — information that is shared with their community.

---

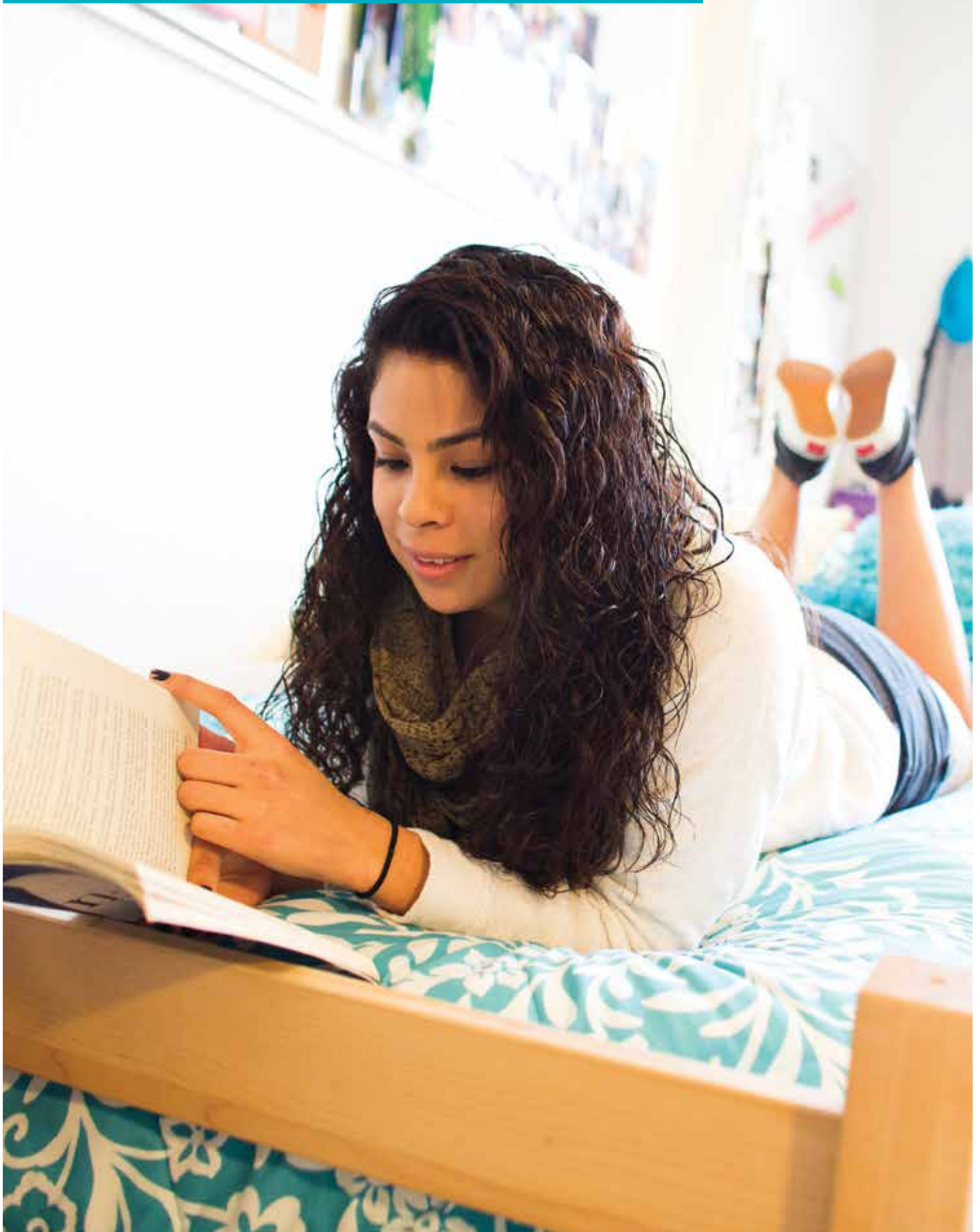
RGPO funds more than 50 studies that involve community partners. This kind of participatory research gives community groups the education and training to understand their unique circumstances and to seek solutions for long-term needs.

---

In the last five years, RGPO sponsored 26 symposia and conferences throughout the state to disseminate research findings to community members and policymakers.



# PROMOTING COLLABORATIONS



# PIONEERING INITIATIVES



# Enriching lives through art

## Classroom-in-Residence stimulates youth creativity

Fostering an understanding of the arts is not just an ivory tower endeavor. As a pilot project at UCLA's Hammer Museum has shown, learning takes on a new dimension when students are given the opportunity to experience the arts outside of a traditional classroom setting.

Developed by two sixth-grade teachers from the UCLA Community School and supported in part by UC's Institute for Research in the Arts, the Hammer's innovative "Classroom-in-Residence" immersion program brings 60 sixth-graders to the museum for an entire school week.

Participating students come from some of Los Angeles' most impoverished neighborhoods. Many of them have never stepped inside an art museum before or spent much time thinking about the power of art to express complicated feelings and ideas.

Throughout the week, students receive arts-integrated instruction from their teachers, sketch and write in the galleries, and get behind-the-scenes tours from Hammer staff.

It's a deeply immersive experience, one that allows students to make cross-curricular connections between the study of art and the rigorous inquiry into other academic subjects. Now in its second year, the program has been so successful that its funders view it as a model to be replicated in other communities.

---

RGPO draws on experts and respected community advocates to develop bold and unique research initiatives. We make sure that valuable research money gets to the right people and communities.

---

RGPO has launched 17 strategic research initiatives over the last five years, some of which go right to the root of thorny California issues that other research funders are reluctant to touch.

# Training new leaders to tackle global challenges

UC-Lab partnerships further non-proliferation and nuclear safety

When a powerful earthquake and tsunami caused a meltdown at Japan's Fukushima Daiichi nuclear power plant, people all along the West Coast wondered whether dangerous levels of radiation would arrive here.

As the crisis unfolded, UC Berkeley nuclear engineering professor Jasmina Vujic and her students collected daily air samples from a rooftop on the Berkeley campus and made the results public. They used that data to bring needed calm to the situation, informing the media about how radiation levels compared with normal daily exposure. Working alongside experts at Lawrence Livermore and Los Alamos National Laboratories, students also had unparalleled opportunities to participate in planning and analysis of nuclear plant safety.

That kind of frontline experience is emblematic of the mentoring, training and collaborative opportunities students gain through the partnership between top UC faculty and national lab scientists enabled by funding from the UC Laboratory Fees Research Program.

The Department of Energy, recognizing the power of those campus-lab partnerships to educate the next generation of nuclear security experts, has tapped Berkeley as the lead partner in a \$25 million, five-year grant that builds on Laboratory Fees Research Program funding to expand those critical training opportunities.

---

CBCRP is helping to build California's research infrastructure by training teams of researchers and community members across the state to work together on questions that can change policy, environment and behaviors to reduce the incidence of breast cancer in their communities.

# PROMOTING COLLABORATIONS



# SHAPING POLICY



# Improving patient care

## Testing an integrated approach to medicine

One of the most significant trends in the HIV epidemic is the growing number of people with HIV who are 50 years or older. In San Francisco — one of the cities hardest hit by the AIDS epidemic — more than half of those living with HIV are 50 or older.

Although antiretroviral therapies are helping people live longer lives, new medical challenges have emerged: HIV patients often show signs of premature aging and are more likely to develop early onset of conditions associated with old age.

The California HIV/AIDS Research Program is helping medical caregivers better understand how to serve the unique needs of this growing population.

Through its Patient-Centered Medical Home Initiative, CHRP is funding the Silver Project, a collaboration between two HIV clinics: the Ward 86 Positive Health Program at San Francisco General Hospital, and 360: The Positive Care Center at UC San Francisco.

In the nation's largest study of aging and HIV, the Silver Project is assessing the physical, psychological and cognitive health of more than 400 people and testing new models of care, including the integration of geriatric and HIV services.

The findings will shape HIV elder care statewide and nationally, and provide a model of care for other elder populations facing multiple medical conditions.

---

As e-cigarettes rise in popularity, TRDRP is addressing critical questions about the risk posed by the devices, including whether they are a gateway to nicotine addiction for American teens.

---

With UCRI funding, UC Irvine researchers created a tool for helping California achieve mandated reductions in greenhouse gas emissions. The tool lets users model greenhouse gas emissions related to land use and travel choices.

# Generating bright ideas

UC experts join with industry to advance solar solutions

Rising from the soil in California's Central Valley, a new commodity has sprouted, transforming the landscape: parallel rows of solar thermal collectors that are unlike anything else in the world.

These solar collectors, called External Compound Parabolic Concentrators, or XCPCs, generate thermal energy by gathering and concentrating sunlight onto specially made collector tubes.

What makes the XCPCs unique? Their stationary design offers a big cost advantage over solar collectors that require tracking mechanisms to follow the sun. They also can capture thermal energy even on hazy or foggy days.

The new technology — developed by UC Merced professor Roland Winston, director of UC's Advanced Solar Technologies Institute (UC Solar) — has drawn commercial interest both in California and abroad for its ability to reduce carbon emissions and provide a cost-effective strategy for heating and cooling buildings.

That's just one of the bright ideas to emerge from UC Solar. With funds from the UC Multicampus Research Programs and Initiatives, the institute brings together UC's collective expertise in the quest to make solar power the cheapest, cleanest source of energy for California and the world. Not surprisingly, that lofty goal has garnered the backing and support of industry sponsors, public utilities, government agencies and entrepreneurs.

---

The 30-day hospital readmission rate for HIV patients was reduced by 44 percent through efforts jointly funded by CHRP's Patient-Centered Medical Home Initiative.



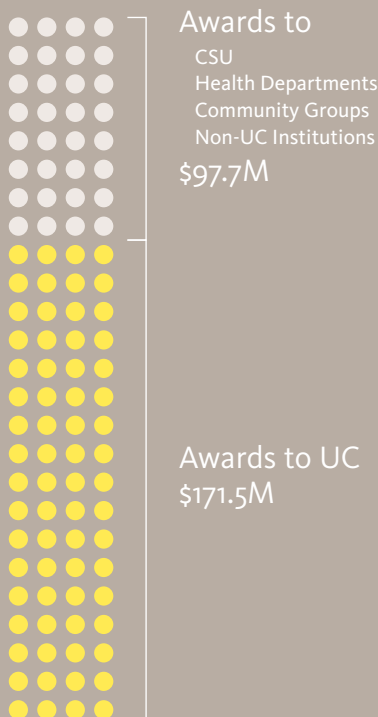
# SPURRING THE ECONOMY



# Investing in Research and California

UC investments in research throughout the state were hit hard by the economic downturn and budget cuts. But the economy is rebounding. Now is the time to reinvest in UC research that will benefit the state far into the future.

Total: \$269.2M



Program

Funding

Awards  
 (2011-14)

California Breast Cancer Research Program\*



\$46.5M



California HIV/AIDS Research Program



\$32.3M



Tobacco-Related Disease Research Program



\$51.5M



UCRI: Laboratory Fees Research Program



\$53.4M



UCRI: Multicampus Research Programs and Initiatives



\$57.0M



UCRI: Proof of Concept and Discovery Grants\*\*



\$28.4M



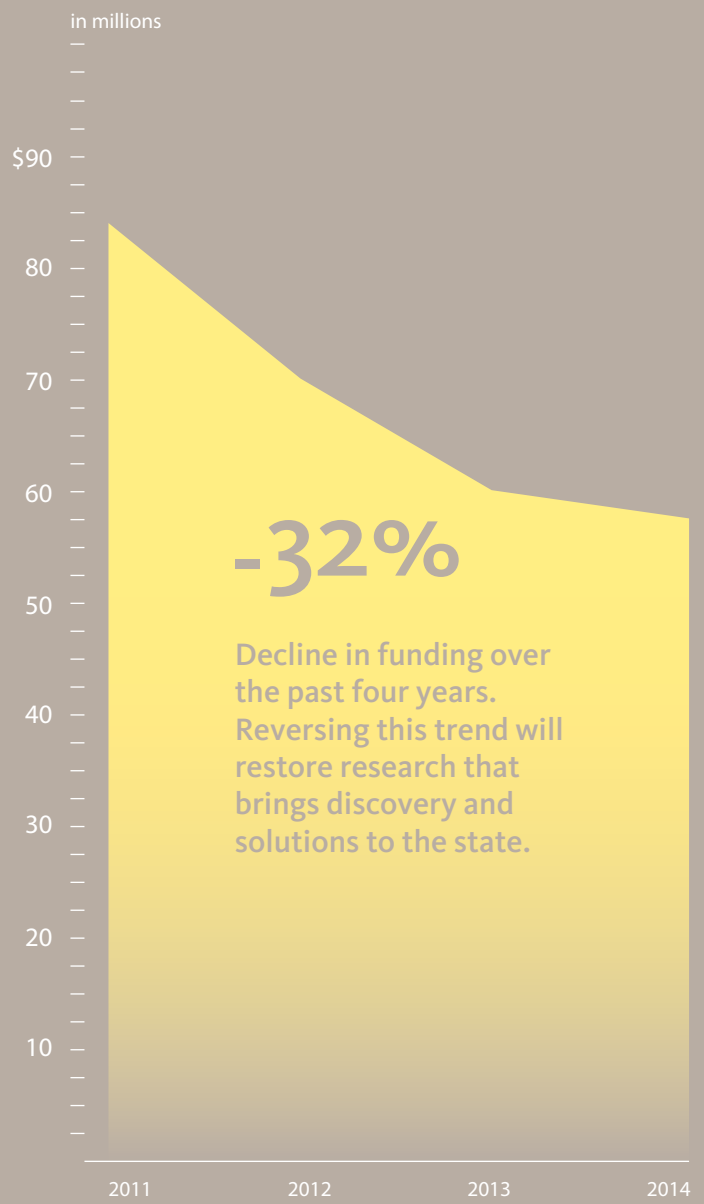
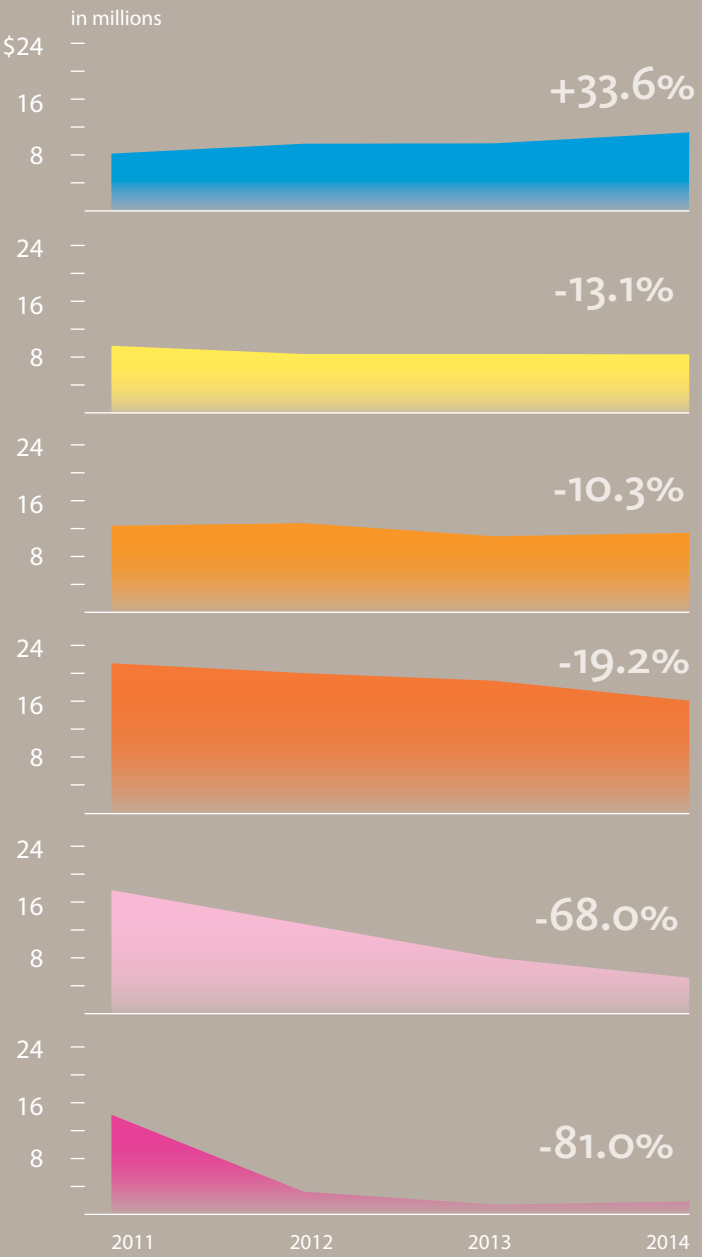
CA state tobacco tax

UC Office of the President

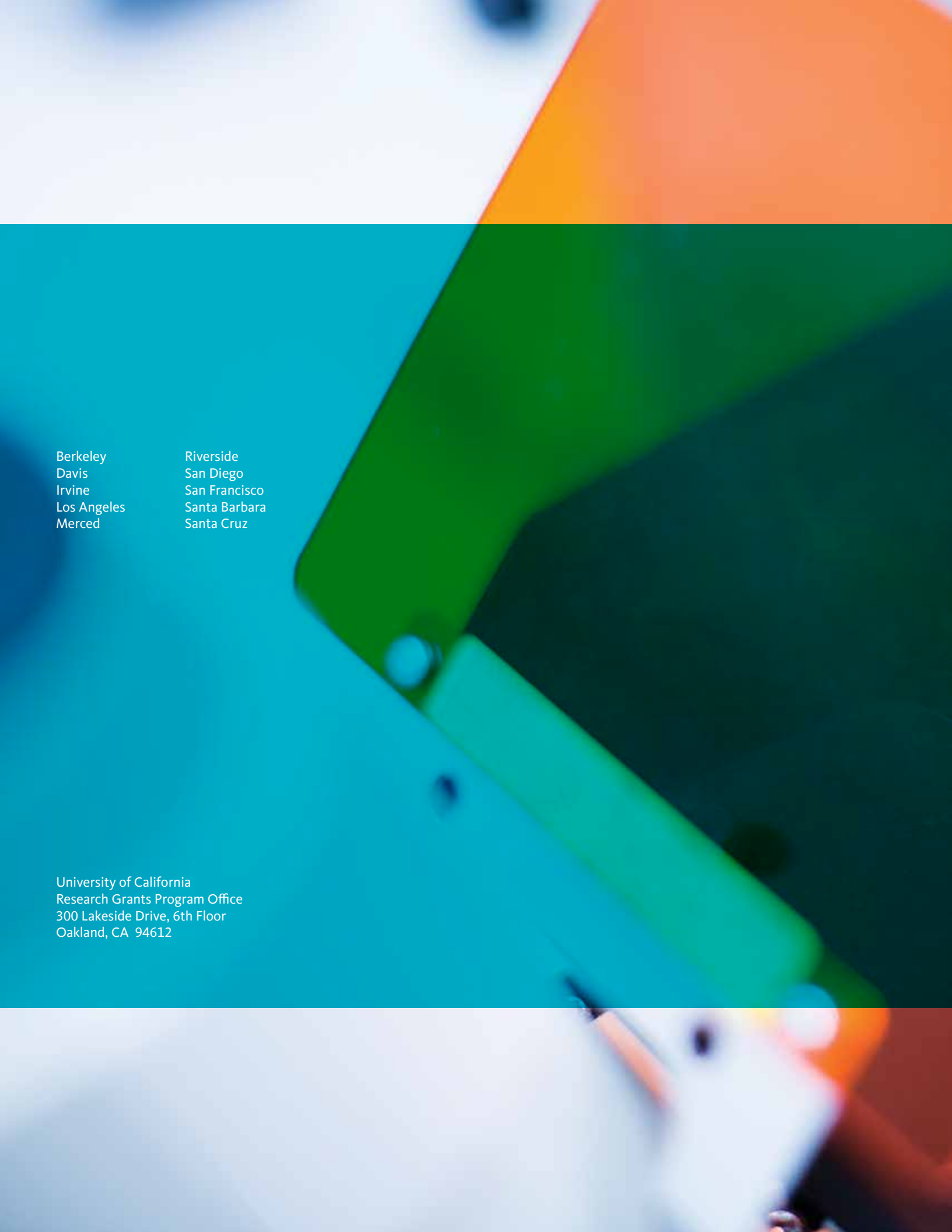
Individual donations

### Research Funding (2011-14)

### Research Funding (2011-14)



\* The CBCRP allocation in 2011 was \$2.2 million lower than the average of the two years before and after.  
 \*\* New UC Discovery and Proof of Concept awards have been discontinued due to UC budget cuts.



Berkeley  
Davis  
Irvine  
Los Angeles  
Merced

Riverside  
San Diego  
San Francisco  
Santa Barbara  
Santa Cruz

University of California  
Research Grants Program Office  
300 Lakeside Drive, 6th Floor  
Oakland, CA 94612