Office of Research

ANNUAL REPORT

FISCAL YEAR 2018-19

UCDAVIS

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Greetings

I am delighted to share this report which captures the key metrics related to research and technology commercialization at UC Davis for fiscal year 2018–19.

The accomplishments within — driven by our bold researchers, innovators and entrepreneurs — are a testament to UC Davis' commitment to deliver knowledge and solutions that promote a healthy planet and the physical and societal well-being of its inhabitants.

To learn more about how the Office of Research supports research and technology commercialization, I encourage you to visit our website at research.ucdavis.edu and subscribe to our quarterly newsletter.

Sincerely,

Prasant Mohapatra

Vice Chancellor for Research
UC Davis

Rankings

1st
in the nation for veterinary medicine

1st
in the nation for agriculture

2nd
in the nation among Affordable Elite Colleges

5th
among public universities in the U.S.

SECTION ONE:

@ a Glance

$846
million in research funding

154
records of invention

98
patents issued

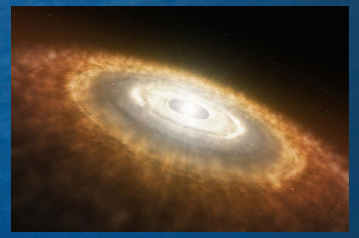
14
startups enabled

RESEARCH @ a Glance

Large Stretches of Coral Reefs Can Be Rehabilitated

Even after being severely damaged by blast fishing and coral mining, coral reefs can be rehabilitated over large scales using a relatively inexpensive technique, according to a study led by UC Davis, in partnership with Mars Symbioscience.

Photo Credit: Jordan Hollarsmith/UC Davis



New Research Illuminates Earth's Formation

New research finds the Earth formed relatively quickly from the cloud of dust and gas around the sun, trapping water and gases in the planet's mantle. Apart from settling Earth's origins, the work could help in identifying extrasolar systems that could support habitable planets.

Early Intervention in Autism Improves Language, IQ and Social Skills

A major study demonstrated that children with autism as young as 18 months can vastly improve their language, cognition and social skills with an early intervention.

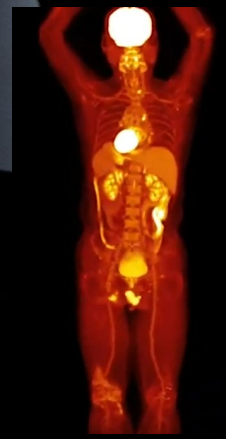
Walnut Growers Can Improve Production with New Approach to Irrigation

A long-term experiment shows that growers can improve crop production if they hold off irrigation until later in the season and directly measure their trees' water needs.

Ebola Species Found in Bats Ahead of Any Potential Outbreak

For the first time, scientists were able to discover a new ebolavirus species in a host prior to detection in an infected human or sick animal. The discovery of Bombali virus adds to growing evidence that bats are the likely hosts of these viruses.

INNOVATION @ a Glance



Human Images From World's First Total-Body Scanner Unveiled

EXPLORER is a combined positron emission tomography (PET) and X-ray computed tomography (CT) scanner that can image the entire body at the same time. Because the machine captures radiation far more efficiently than other scanners, EXPLORER can produce an image in as little as 1 second and, over time, produce movies that can track specially tagged drugs as they move around the entire body. The team recently unveiled the first human images.

Novel Approach to Treat Wounds Using Tilapia Skin

Veterinarian Jamie Peyton developed a tilapia skin xenograft for use in burn patients to alleviate pain and encourage rapid healing. The approach was successfully used to quickly heal the severely burned paws of animals injured in recent wildfires.

Treatment for Postpartum Depression

Neurologic disease research at UC Davis led to the first treatment specifically approved for postpartum depression by the FDA. The initial platform for the drug was licensed to Sage Therapeutics which has commercialized the treatment.

Breakthrough in Rice Plants That Reproduce as Clones From Seed

Plant biologists at UC Davis discovered a way to make crop plants replicate through seeds as clones. The discovery, long sought by plant breeders and geneticists, could make it easier to propagate high-yielding, disease-resistant or climate-tolerant crops.

Computer Scientists Create Programmable Self-Assembling DNA

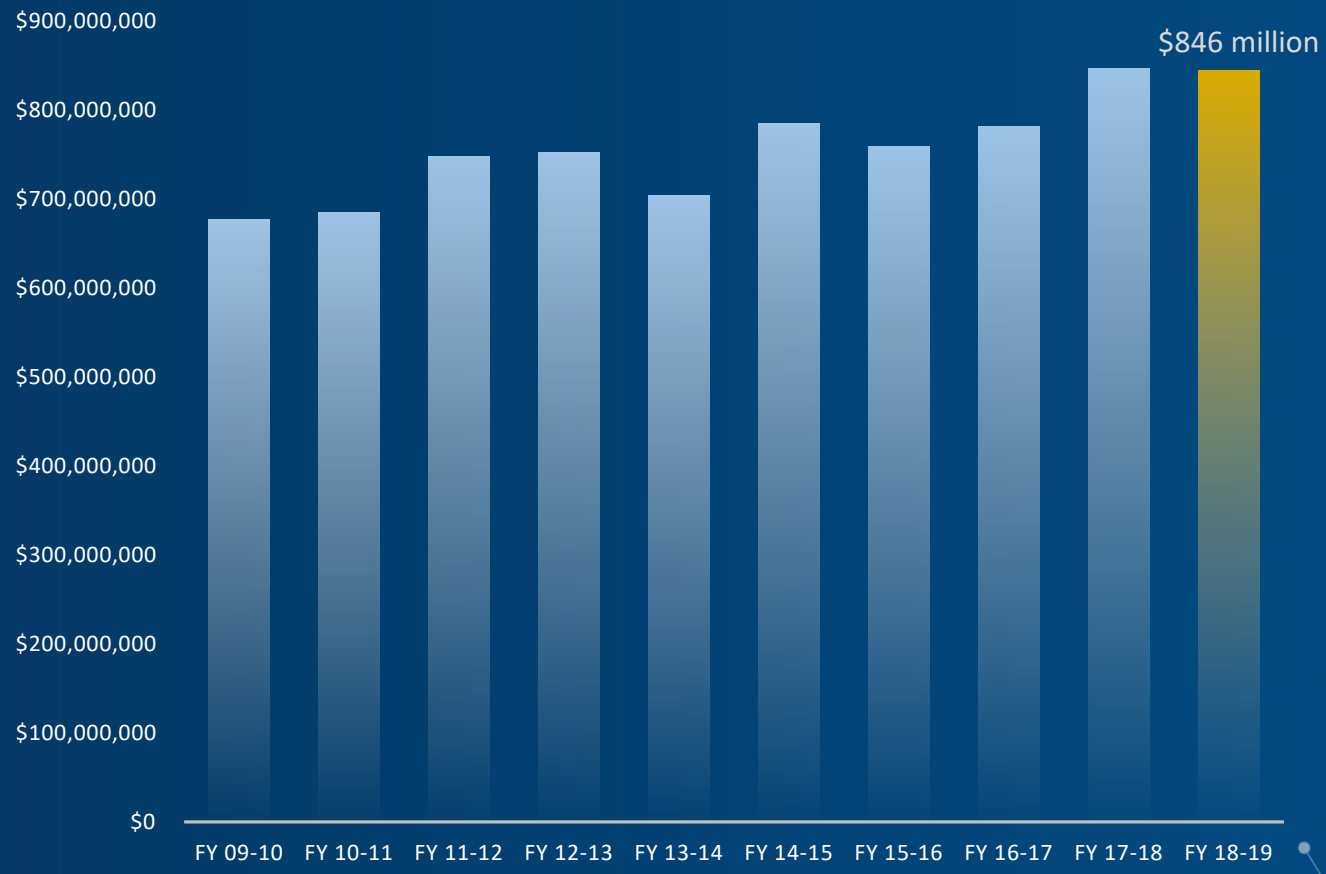
Computer scientists at UC Davis and the California Institute of Technology have created DNA molecules that can self-assemble into patterns essentially by running their own program.

SECTION TWO:

RESEARCH FUNDING

RESEARCH FUNDING

Total Research Awards



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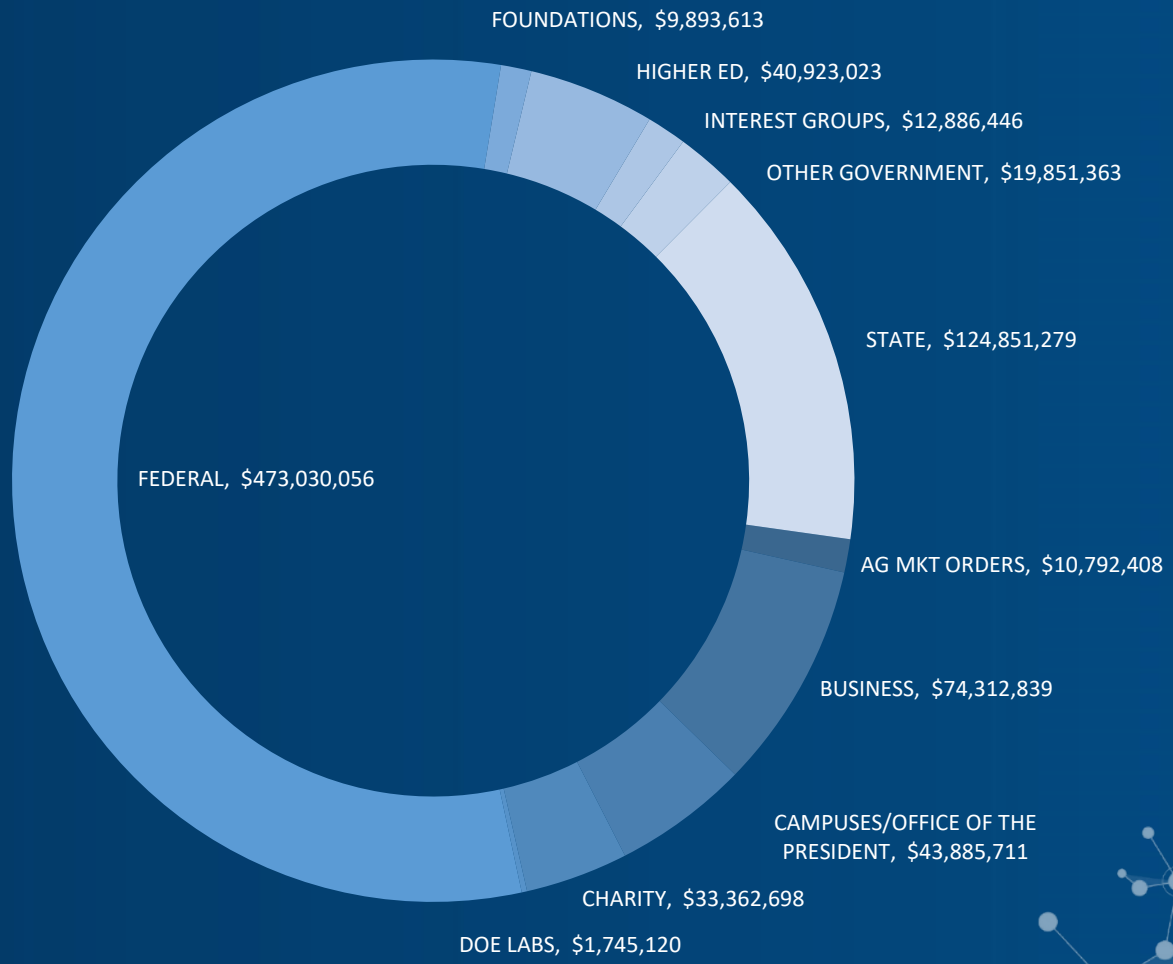
RESEARCH FUNDING

Funding Source



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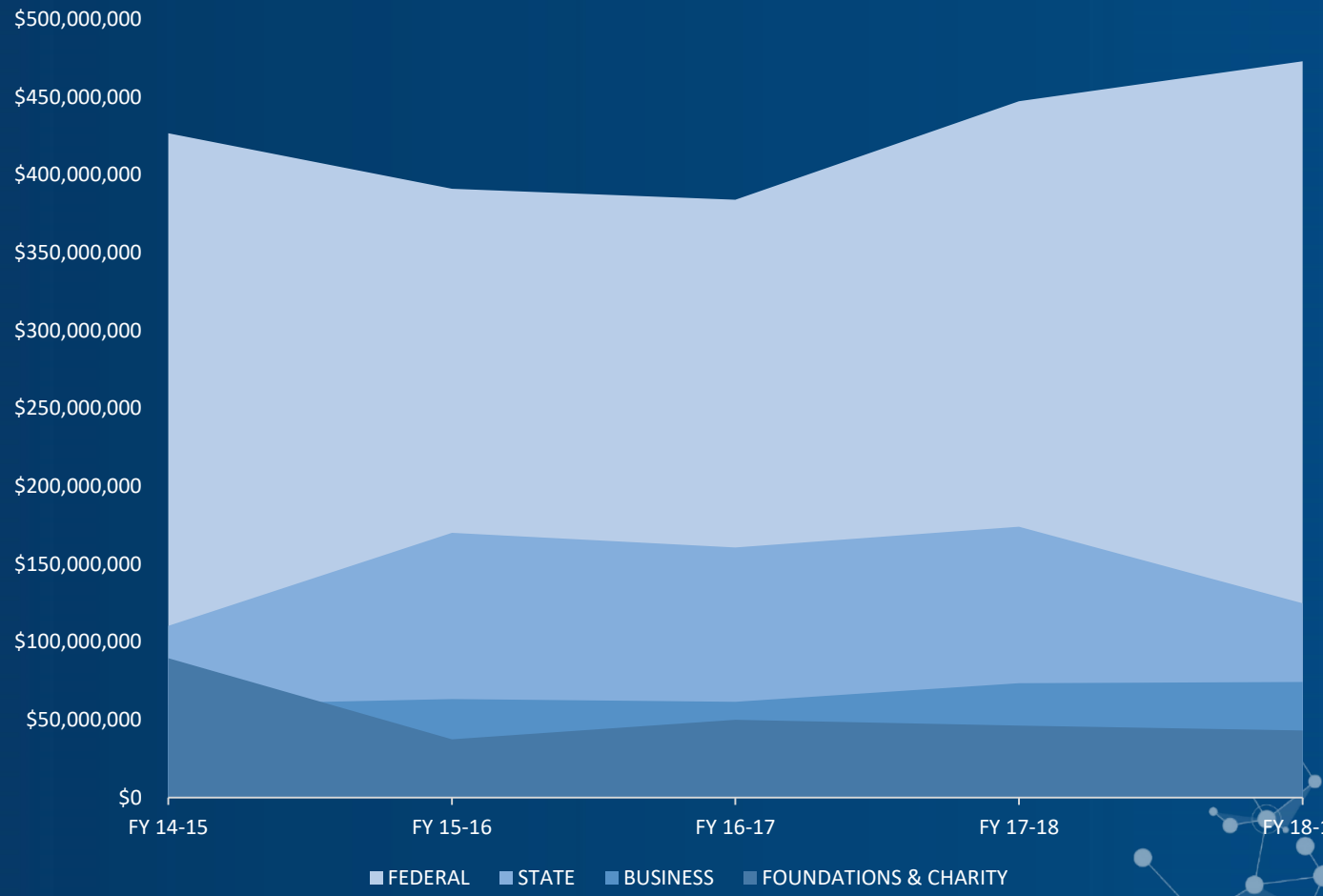
RESEARCH FUNDING

Funding Source Trends



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RESEARCH FUNDING

Federal Funding Breakdown

	2015	2016	2017	2018	2019
TOTAL FEDERAL	$426,771,819	$391,115,786	$384,159,347	$447,416,525	$473,030,056
DEPT OF AGRICULTURE	$43,666,073	$33,311,705	$28,475,876	$42,634,789	$34,610,998
DEPT OF COMMERCE	$191,546	$689,921	$82,314	$686,795	$96,999
DEPT OF DEFENSE	$16,999,646	$16,146,650	$14,713,561	$18,569,387	$28,145,820
DEPT OF EDUCATION	$7,456,563	$6,692,815	$9,317,405	$10,884,247	$15,155,197
DEPT OF ENERGY	$10,668,191	$8,014,170	$9,822,404	$12,398,150	$10,736,120
DEPT OF HOMELAND SECURITY	-$35,761				
DEPT OF INTERIOR	$7,463,499	$5,816,022	$13,418,878	$10,975,152	$7,097,636
DEPT OF JUSTICE	$1,468,976	$0	$1,445,337	$719,964	$2,019,914
DEPT OF LABOR			$20,000		
DEPT OF STATE	$69,775,379	$52,742,169	$32,634,835	$24,133,345	$25,744,486
DEPT OF TRANSPORT	$2,129,320	$1,145,560	$3,140,042	$3,510,186	$2,814,567
DEPT OF VET AFFAIRS	$626,540	$876,926	$874,344	$526,743	$567,652
EXECUTIVE BRANCH				$29,056	
HEALTH & HUMAN SVCS	$206,097,026	$213,551,521	$221,316,124	$270,219,874	$285,312,325
LEGISLATIVE BRANCH	$229,900	$225,000	$225,000	$450,002	
NATL ARNATC & SPC AD	$4,349,852	$3,091,631	$3,064,311	$3,273,254	$3,129,577
NATL FND ARTS & HUM	$173,400	$178,381	$180,000	$15,000	$170,000
NATL SCIENCE FND	$53,023,873	$43,012,752	$39,863,561	$41,388,879	$54,896,768
OTHER AGENCIES	$2,433,556	$5,610,135	$5,271,830	$6,984,875	$2,531,997
SMITHSONIAN	$3,573	$10,428	$238,848	$16,827	$0

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RESEARCH FUNDING

Top 5 Research Awards

$34,932,178
Richard Breitmeyer
California Department of Food and Agriculture
“Operate CDVLS”

$18,012,398
Jonna Mazet, One Health Institute
United States Agency for International Development
“Emerging Pandemic Threats Program 2: PREDICT-2”

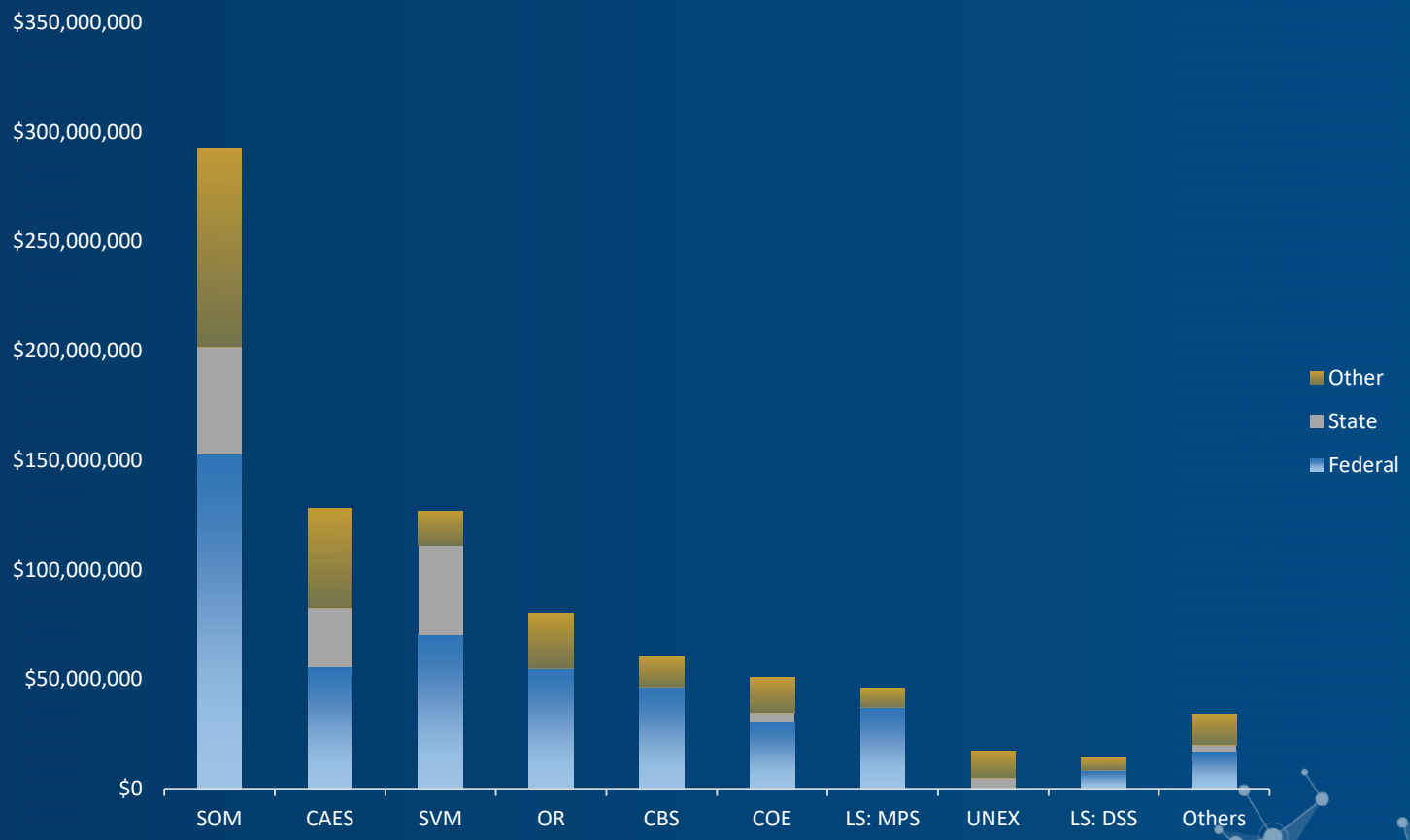
$17,419,741
Marc Schenker, Public Health Sciences
California Department of Public Health
“Emergency Preparedness Office (EPO)”

$12,171,143
Rachel Whitmer, Public Health Sciences
NIH National Institute on Aging
“Epidemiology of Age-related Dementia, Mild Cognitive Impairment and Brain Pathology in a Multiethnic Cohort of Oldest-Old”

$12,000,000
Jan Nolta, Stem Cell Research Program
UC Office of the President
“Jordan’s Center Research”

RESEARCH FUNDING

Funding by College/School



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RESEARCH FUNDING

Industry Funding Trend

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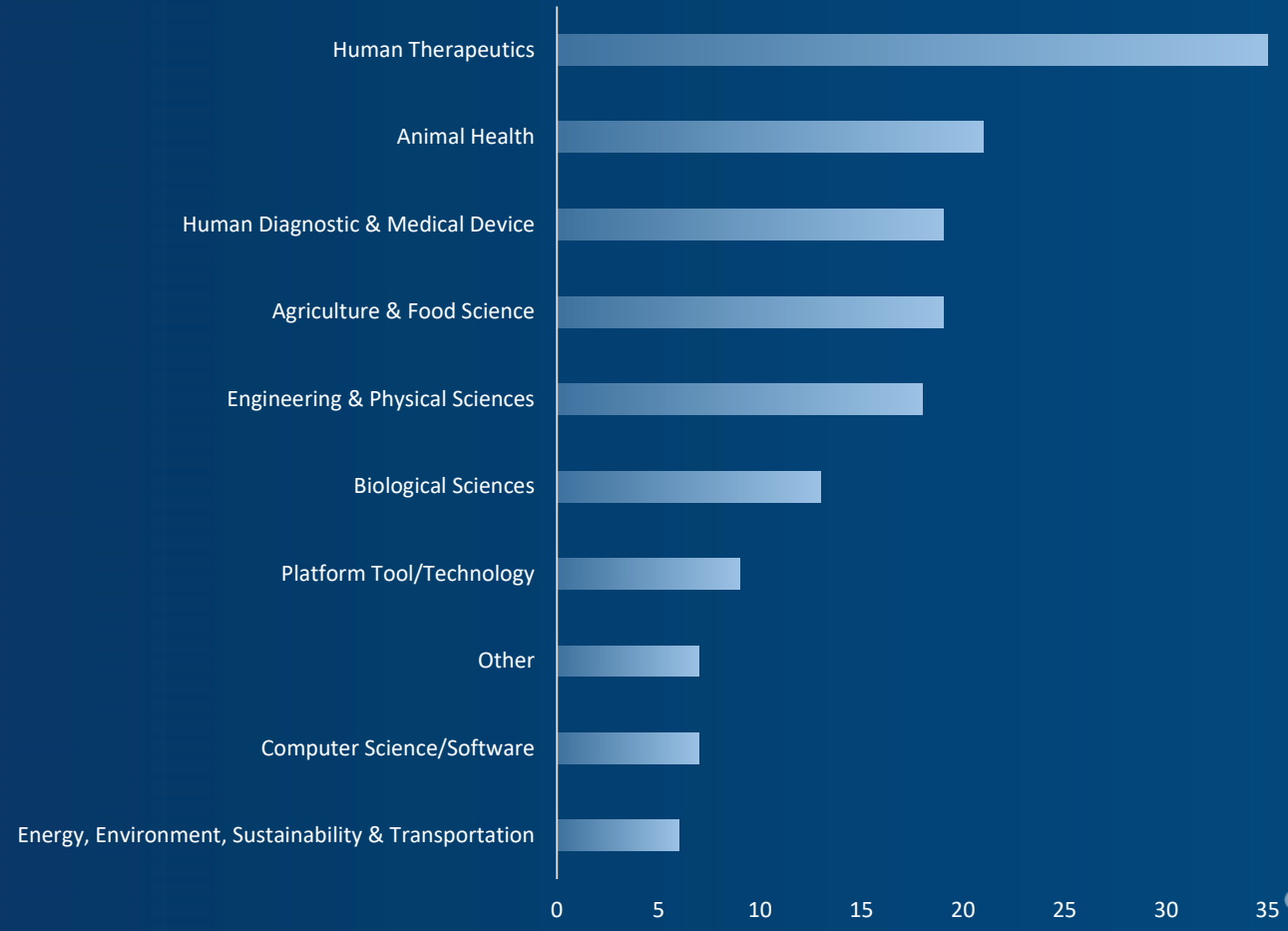
SECTION THREE:

TECHNOLOGY COMMERCIALIZATION

TECHNOLOGY COMMERCIALIZATION

Records of Invention

154 Records of Invention for Fiscal Year 2018-19



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TECHNOLOGY COMMERCIALIZATION

Startups

14 Startups Enabled in Fiscal Year 2018-19

Digestiva
Engineering novel enzymes that enhance bioavailability of protein in food products

Seven Biosciences
Novel platforms for G protein-coupled receptor (GPCR) drug discovery

EffectorBio
Biomarker-based drug development, testing and implementation for cancer and lung disease

Delix Therapeutics
Compounds for increasing neural plasticity

Theranostec
Full/high active pharmaceutical ingredients loaded nano-platform

eVitals Technologies
Certified registry of birth certificates on Distributed Ledger Technology (DLT) private/public network

Sierra Biopharma
Peptides and uses thereof for diagnosing and treating Myasthenia gravis

Keen Therapeutics
Fermented wheat germ extract and its purified low molecular weights proteins for treatment of lung cancer

GalactMed
LLS30, a galectin-1 inhibitor, is a new potential drug against a number of different cancers

Syncanica
Synthetic, inexpensive, non-scheduled cannabinoid for reducing the frequency and severity of seizures

AgriNerds
Data management and visualization tool built to address the needs of the agriculture industry

NanoCue
Atomic Force Microscopy–based platform for investigating single cell mechanics

Bouncer Technologies
Software to help protect apps against fraud, account takeover, coupon abuse and other product safety features

Note: One company elected to remain in “stealth mode” for competitive reasons and is not listed.

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SECTION FOUR:

OFFICE OF RESEARCH KEY ACCOMPLISHMENTS

KEY ACCOMPLISHMENTS

Interdisciplinary Research and Strategic Initiatives

The Interdisciplinary Research and Strategic Initiatives (IRSI) division provides services to initiate, develop and advance interdisciplinary research at UC Davis. These services include providing management and financial support to organized research units and other interdisciplinary centers, development of large-scale grant proposals, coordination of limited submission programs, identification of funding opportunities and establishment of impactful research partnerships – both across campus, and with other research institutions.

Key Accomplishments

- Launched new interdisciplinary research centers under the auspices of the IMPACT Center Program. From a competitive field of over 60 proposals, four new research centers have been selected in exciting research areas that align campus strengths with unique opportunities for global impact
- Delivered 50 presentations across campus on grantsmanship and funding opportunities
- Assisted faculty with 113 grant and contract proposals, 36 of which involved three or more staff members and >101 person hours
- The Interdisciplinary Research Catalyst program supported the establishment of several new research discussion groups that subsequently received >$15 million in awards in areas of strategic importance for the university
- Established and facilitated institutional research interactions with national laboratories including Lawrence Livermore and Lawrence Berkeley Labs, with complementary science-focused organizations such as the Exploratorium, San Francisco, and the Buck Institute, Novato and with a select number of international universities including University of Sydney, Australia

KEY ACCOMPLISHMENTS

Research Administration and Compliance

The Research Administration and Compliance division supports campus researchers and staff in their efforts to secure and steward extramural funding. The division also guides the university toward achieving the highest ethical and legal standards of research conduct.

Key Accomplishments

- Receipt of AAHRPP Accreditation—an independent, non-profit accrediting body that ensures Human Research Protection Programs (HRPPs) meet rigorous standards for quality and protection
- Rollout of new SOPs and forms to support the implementation of the new Common Rule required for federal grants involving human subject research
- Completion of the Cayuse SP system roll-out to simplify the process of preparing and submitting grant proposals
- Rollout of new international agreements guidelines and procedures
- Conversion of conflict of interest process to a paperless process
- Enhancement of campus communications by increasing attendance at our annual Research Expo (600+ attendees) and launch of a campus focused newsletter (Research Insights)
- Marketing and communications support for organized research units and technology commercialization (723k website views, 1.5 million impressions on social, 4k subscribers to newsletters, 25 press releases/announcements)

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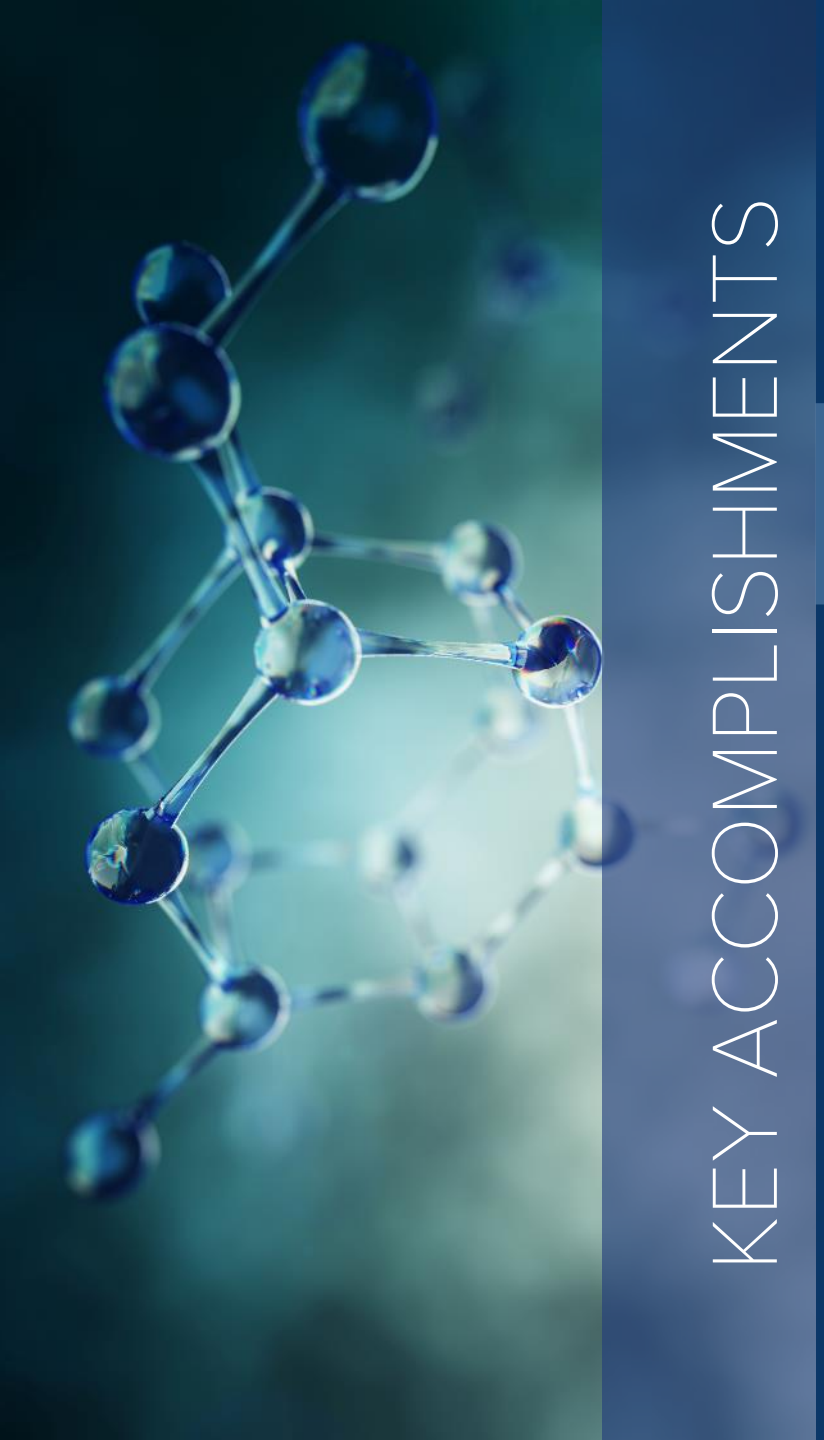

KEY ACCOMPLISHMENTS

Innovation and Technology Commercialization

Innovation and Technology Commercialization translates university research into societal impact through commercial engagement.

Key Accomplishments

- Processed 154 invention disclosures (ROIs), filed 164 patent applications, issued 98 patents and executed 1,160 agreements (licenses, options, material transfer agreements, copyright, data)
- Enabled the launch of 14 new startup companies
- Launched the Biotech Innovation Gallery (BIG) accelerator, event and investor engagement platform at the J.P. Morgan Healthcare Conference to showcase commercial platforms enabled by UC Davis
- Organized a collaborative effort to showcase UC Davis' leadership in agricultural technology innovation at the 2018 World Agri-Tech Summit in San Francisco (over 1,300 attendees)
- Supported technology development and commercialization through STAIR™ Grants and business incubator space

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KEY ACCOMPLISHMENTS

Animal Care Program for Research and Teaching

The Animal Care Program, led by the Campus Attending Veterinarian, consists of three units. While each serve a unique purpose, together they ensure the humane care and use of animals in research and teaching at UC Davis.

- Campus Veterinary Services
- Institutional Animal Care & Use Committee
- Teaching and Research Animal Care Services (Husbandry)

Key Accomplishments

- Established the Research and Teaching Animal Care program on campus which serves to unify the 45 different research and teaching animal units within UC Davis
- Established program description committee to complete required documentation for AAALAC site visit this fall
- Expanded the Rodent Health Surveillance program to include a newly defined virus associated with kidney disease in mice
- Developed the Aquatics Health Surveillance program to ensure health of the majority of the animals within our program
- Developed a rodent quarantine program to minimize the risk of bringing in research rodents from non-approved vendors as is required to maximize the collaborative efforts of our investigators

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KEY ACCOMPLISHMENTS

Research Core Facilities Program

The Research Core Facilities Program ensures researchers at UC Davis have access to the state-of-the-art technology for their scientific research, to streamline the core facility administration while improving accountability and transparency, and to provide training opportunities for faculty, graduate students and staff.

Key Accomplishments

- Initiation of Strategic Business Reviews and Planning of CRCFs including operations, finances, usage, oversight and impact on research rigor/reproducibility and integrity, and research impact
- Launch of a robust, searchable CRCF equipment inventory leveraging the existing Campus Asset Management System (CAMS)
- Implementation of PPMS facility management software
- Delivery of the Pilot and Feasibility Program (PFP) to stimulate core utilization by new investigators
- Release of a second RFP for Enhancement Funding Opportunity

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