UNIVERSITY OF CALIFORNIA

Technology Commercialization Report

2024

COVER PHOTO:
UC Santa Barbara spinout company Cadense, co-founded by professors Tyler Susko (left) and Elliot Hawkes (right), specializes in adaptive footwear designed to help people with walking difficulties. Cadense's adaptive shoe features a patented variable friction technology that allows wearers to more easily slide over obstacles and develop a more normal gait. The shoes were developed based on the professors' research focusing on gait rehabilitation and mobility science. Their intellectual property has been licensed to Cadense, which recently launched its first product line.

INSIDE FRONT PHOTO:
Nanopore sequencing, and nanopore detectors (single-cell, long-read genetic sequencing technologies), were invented and developed at UC Santa Cruz largely through research spanning 15 years by professors Mark Akeson (left) and David Deamer (right). These nanopore instruments are built around a "nano-scale" opening in a thin membrane, for the study of genetic material such as DNA and RNA. Oxford Nanopore Technologies now manufactures and markets sequencing devices used worldwide based on their intellectual property. The smaller device shown is ideal for sequencing viruses and bacteria in remote places such as Antarctica and the Space Station. The larger device is suitable for sequencing larger genomes, such as those in humans.

INSIDE AND OUTSIDE BACK PHOTOS:
The EXPLORER scanner, the first clinically approved total-body PET (Positron Emission Tomography) imaging system, resulted from a 20-year partnership between UC Davis professors Simon Cherry (left) and Ramsey Badawi (right). Their work was funded by the NIH and developed in collaboration with United Imaging Healthcare. It's the first medical imaging device capable of total-body simultaneous imaging, providing drastically higher sensitivity compared to conventional PET scanners. This opens new possibilities for PET applications in biomedical research and clinical practice. The scanner is installed on campus and at more than 20 sites across the world.

Message from the Vice President

The Office of Research and Innovation (R&I) presents the 2024 Technology Commercialization Report, which highlights UC accomplishments in innovation and entrepreneurship. Invention disclosures increased in fiscal year 2024, as did the number of U.S. and foreign patents issued to UC. According to the National Academy of Inventors (NAI), UC was second worldwide in U.S. utility patents granted in 2024 compared to other universities. The NAI elected 10 UC researchers to the 2024 class of NAI Fellows.

UC helped to bring a first-of-its-kind semiconductor hub to California in 2024, the CHIPS for America Design and Collaboration Facility (DCF). DCF is part of the National Semiconductor Technology Center (NSTC), a consortium of industry, academia and government working together to accelerate domestic onshore production. UC's track record of semiconductor-related innovations is foundational to Silicon Valley. Our deep experience, expertise, and resources across our 10 campuses and three national labs are unmatchable assets in the effort to reestablish America's leadership in technology design and innovation.

UC is a founding member of the Department of Energy California Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES). Launched in 2024, ARCHES brings together state agencies, academia, industry, labor, and community organizations to advance renewable hydrogen technologies and infrastructure, steering up to $1.2 billion in federal funding toward 39 hydrogen infrastructure projects up and down the state.

UC Merced earned the highest tier for research activity among national research institutions, alongside all other UC campuses, by receiving R1 status from the Carnegie Classification of Institutions of Higher Education. This designation affirms the strength of an institution's research enterprise and reinforces its role as a hub for innovation, workforce development and public impact.

Our perennial success in securing patents and getting inventions to market reflects our investment in research that tackles society's most intractable problems. Our entrepreneurial leadership demonstrates our commitment to ensuring that the fruits of UC research benefit all Californians.

Sincerely,

Theresa A. Maldonado

Theresa A. Maldonado, Ph.D., P.E.
Vice President, Research & Innovation

This report documents University of California intellectual property activities for fiscal year 2024. Through a collaborative management approach, UC's Office of the President (UCOP), all ten UC campuses and the Lawrence Berkeley National Laboratory (LBNL) share responsibility for these activities. The extraordinary innovations generated by our researchers originate at the campuses, affiliated medical centers and LBNL. Each campus or lab actively manages its invention portfolio, fosters relationships between inventors and industry, and nurtures entrepreneurs through its technology commercialization office.

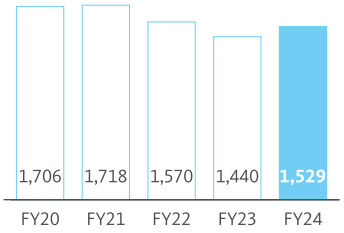
LBNL is a DOE national laboratory managed by UC. Its operations differ from those on the campuses in certain respects. LBNL's fiscal year runs from October to September; UC's fiscal year runs from July to June. UC campus offices contract with attorneys at outside law firms for all patent prosecution activity; LBNL manages most US patent filings internally through its own legal department and contract out only for selected matters, such as foreign prosecution. LBNL maintains proprietary databases that track its intellectual property activities. This report includes LBNL data separately and in systemwide totals.

UC Startups counted in this report meet the following criteria: a legally organized and/or incorporated company that acquired rights to UC technology under a license, option, or letter of intent; this agreement was essential to the startup's formation; the startup was founded to develop products and/or services based on UC technology; the startup operated independently of any pre-existing company when formed; the startup's operations are not integrated into the operations of another company.

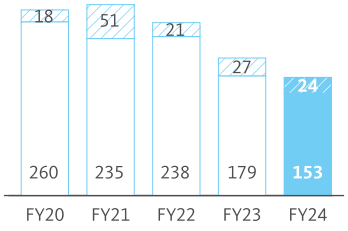
All charts indicate systemwide figures, unless otherwise noted.

Metrics

INVENTIONS DISCLOSED

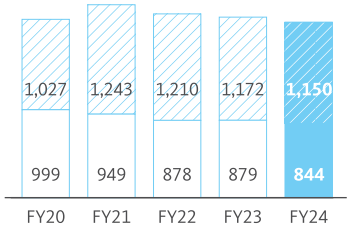


LICENSES ISSUED



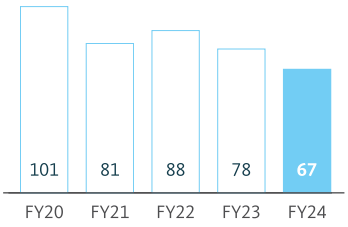
Plant Licenses
Utility Licenses

U.S. PATENT APPLICATIONS FILED



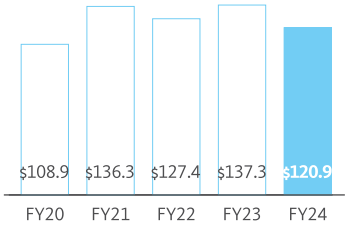
Applications – Secondary Filings
Applications – First Filings

STARTUP COMPANIES FORMED

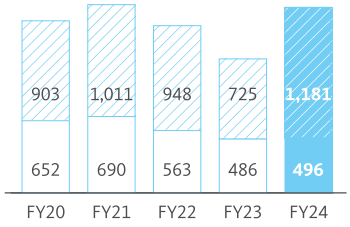


ROYALTIES, FEES & OTHER INCOME

(in millions)

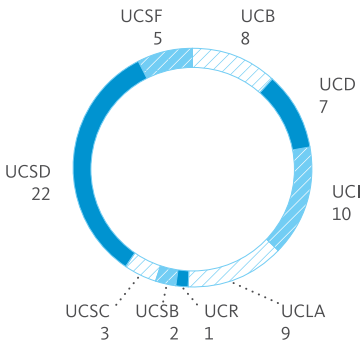


PATENTS ISSUED



Foreign Patents Issued
U.S. Patents Issued

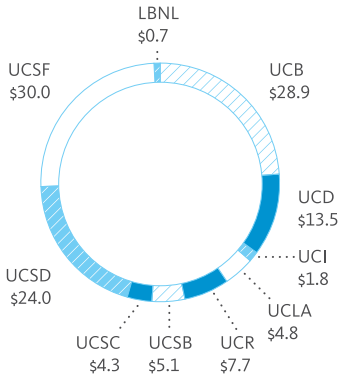
STARTUP COMPANIES FORMED (BY CAMPUS), FY 2024



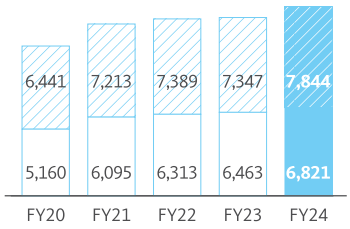
Campus numbers may include startups formed by more than one campus.

ROYALTIES, FEES & OTHER INCOME (BY CAMPUS), FY 2024

(in millions)



TOTAL ACTIVE PATENTS



Total Active Foreign Patents
Total Active U.S. Patents
Includes LBNL active patents in FY2021-24

Highlights

1,529
New inventions disclosed by UC researchers in 2024

1,994
U.S. patent applications filed based on UC inventions in 2024

153
New licenses for UC's utility inventions in 2024

496
U.S. patents issued for UC inventions in 2024

24
New licenses for UC plant cultivars in 2024

6,821
Active U.S. patents covering UC inventions

67
New startup companies formed in FY2024 based on UC inventions

1,181
Foreign patents issued for UC inventions in FY2024

$121M
Total income for UC in 2024 from technology commercialization

7,844
Active foreign patents covering UC inventions

Top-earning inventions

INVENTIONS FY 2024 (campus)	TOTAL INCOME *(in thousands)*
Nephropathic Cystinosis Treatment (UCSD)	$12,866
Strawberry Varietals (UCD)	$8,616
Macromolecules for Drug/Diagnostic Delivery (UCSD)	$8,570
Mandarin Varietals (UCR)	$5,944
Nanopore Sequencing Technology (UCSC)	$4,088
Subtotal (Top 5 Inventions)	**$40,084**
Pistachio Varietals (UCD)	$2,621
Tissue Oxygenation (UCSF)	$2,516
Nitrogen-Fixing Microbes for Agriculture (UCSF)	$2,291
Bovine Growth Hormone (UCSF)	$2,167
Gene-editing Tools and Reagents (UCB & UCSF)	$1,823
Tunable Fluorescent Polymers (UCSB)	$1,375
Eosinophilic Esophagit Treatment (UCSD)	$1,010
Pharmacometrics Software (UCSF)	$844
Healthcare Mobile Apps Framework (UCLA)	$717
Single/Multiple Field Gates for Transistors (UCSB)	$704
Irreversible Electroporation for Soft Tissue Ablation (UCB)	$611
Clinical Trials Software & Data (UCSF)	$506
Portable Osmometer (UCSD)	$484
Single-Cell Sequencing Platform (UCSF)	$365
Agriculture Nutrient Assimulators & Optimizers (UCR)	$311
Walnut Rootstocks (UCD & UCR)	$278
Digital Microfluidics Platform (UCLA)	$235
Cognitive Curcumin Capsules (UCLA)	$227
Cancer Risk Assessment Test (UCSF)	$216
Human Microglia-like Cells Generation (UCI)	$200
Subtotal (Top 25 Inventions)	**$59,585**
Total (All Inventions)	**$120,878**
% of Total from Top 5 Inventions	**33.2%**
% of Total from Top 25 Inventions	**49.3%**

List of revenue-generating technologies and plant varietals that have been commercialized

UC Technology Commercialization Program – FY2024

Summary Table

	UCB	UCD	UCI	UCLA	UCM	UCR	UCSB	UCSC	UCSD	UCSF	LBNL	UC system	% change from FY23
Inventions[1]													
Inventions Disclosed	174	152	112	249	20	69	64	51	419	221	20	1,529	6.2%
Patent Prosecution[1]													
U.S. Applications Filed													
First Filings	123	61	53	173	8	53	51	18	183	122	15	844	(4.0%)
Secondary Filings	145	96	86	268	11	53	60	6	271	212	27	1,150	(1.9%)
Total U.S. Filings	**267**	**157**	**139**	**441**	**19**	**106**	**111**	**24**	**454**	**334**	**42**	**1,994**	**(2.8%)**
First Foreign Filings	87	50	41	141	4	18	28	12	125	118	6	621	7.6%
Patents Issued													
U.S. Patents Issued	73	34	29	119	2	21	19	32	87	66	36	496	2.1%
Total Active U.S. Patents	**882**	**564**	**681**	**1,310**	**24**	**214**	**392**	**245**	**1,263**	**767**	**639**	**6,821**	**5.5%**
Foreign Patents Issued	247	86	57	311	0	28	54	12	86	319	7	1,181	62.9%
Total Active Foreign Patents	**1,302**	**708**	**429**	**2,400**	**3**	**295**	**347**	**203**	**613**	**1,608**	**148**	**7,844**	**6.8%**
Licensing[1]													
Letters of Intent (LOI) Issued	17	8	20	13	1	0	4	0	14	11	1	87	(11.2%)
Options Issued	4	6	6	9	0	2	5	2	8	1	1	44	(18.5%)
Utility Licenses Issued	20	6	7	25	0	1	11	1	55	29	0	153	(14.5%)
Plant Licenses Issued	0	14	0	0	0	10	0	0	0	0	0	24	(11.1%)
Startup Companies[1]													
Startup Companies Formed	8	7	10	9	0	1	2	3	22	5	0	67	(14.1%)
Royalties, Fees & Other Income *(in thousands)*[2]													
Earned Royalties (above minimum)	$1,099	$12,203	$430	$1,016	$0	$6,554	$1,926	$4,051	$20,848	$6,029	$52	$54,243	(6.2%)
Equity Income	$616	$0	$0	$1,141	$0	$0	$0	$0	$109	$586	$0	$2,452	(64.2%)
Other Income (royalties, fees, misc)	$27,177	$1,257	$1,409	$2,593	$2	$1,143	$3,185	$236	$3,075	$23,404	$649	$64,183	(11.6%)
Total Income	**$28,892**	**$13,460**	**$1,839**	**$4,750**	**$2**	**$7,697**	**$5,111**	**$4,287**	**$24,032**	**$30,019**	**$701**	**$120,878**	**(11.9%)**
Distributions *(in thousands)*[2]													
Inventor Shares Distributed	$4,050	$5,537	$1,440	$1,688	$1	$3,299	$3,834	$966	$9,032	$16,872	$217	$46,939	7.4%

This table only reports technology commercialization activity governed by the UC Patent Policy for inventions managed by all UC technology commercialization offices, including LBNL. It does not include copyright, trademark and material transfer agreement activity that is also carried out by the campus and laboratory offices.

1 Technology commercialization activity related to inventions having one more inventors at each campus/lab. A number of inventions involve inventors from multiple UC campuses and/or LBNL. Activity statistics for these inventions are reported multiple times, once for each campus/lab involved. Thus, for any given measure of activity, the sum of individual campus numbers may be greater than the systemwide totals reported in the right-hand column.

2 Financial activity related to inventions having one or more inventors at each campus/lab. A number of inventions involve inventors from multiple UC campuses and/or LBNL. Financial activity statistics for these inventions are pro-rated among the campuses and LBNL according to the number of inventors each campus/lab has. Since some financial activity reported here is credited to UC inventors who are not associated with a campus or with LBNL (including staff at other DOE laboratories), the sum of individual campus numbers may not equal the systemwide totals reported in the right-hand column.

UC Technology Commercialization Sites

Available Technologies	Website
Systemwide	techtransfer.universityofcalifornia.edu

Technology Commercialization Offices	Websites
UC Berkeley Intellectual Property & Industry Research Alliances (IPIRA)	ipira.berkeley.edu
UC Davis Technology Transfer Office (TTO)	research.ucdavis.edu/technology-transfer
UC Irvine UCI Beall Applied Innovation	innovation.uci.edu
UC Los Angeles (UCLA) Technology Development Group (TDG)	tdg.ucla.edu
UC Merced Office of Technology, Innovation, and Industry Relations (OTIIR)	otiir.ucmerced.edu
UC Office of the President Innovation Transfer & Entrepreneurship (ITE)	ucop.edu/innovation-entrepreneurship
UC Riverside Office of Technology Partnerships (OTP)	techpartnerships.ucr.edu
UC San Diego Office of Innovation and Commercialization (OIC)	innovation.ucsd.edu
UC San Francisco (UCSF) Innovation Ventures	innovation.ucsf.edu
UC Santa Barbara Technology & Industry Alliances (TIA)	tia.ucsb.edu
UC Santa Cruz Innovation & Business Engagement Hub	innovation.ucsc.edu
Lawrence Berkeley National Laboratory Intellectual Property Office (IPO)	ipo.lbl.gov

University of California
Innovation Transfer & Entrepreneurship
1111 Franklin Street
Oakland, CA 94607-5200