

Intellectual  
Property  
and  
Industry  
Research  
Alliances

Berkeley  
UNIVERSITY OF CALIFORNIA







# Contents

Background and Mission	4
Industry Sponsored Research	6
IP Licensing	9
Startups	13

# Background and Mission

Berkeley established the Office of Intellectual Property and Industry Research Alliances (IPIRA) in 2004 with goals to:

- Increase industry sponsored research (from 10M to \$20M)

- Implement a “relationship approach” to campus interactions with industry

- Accelerate the pace of innovation

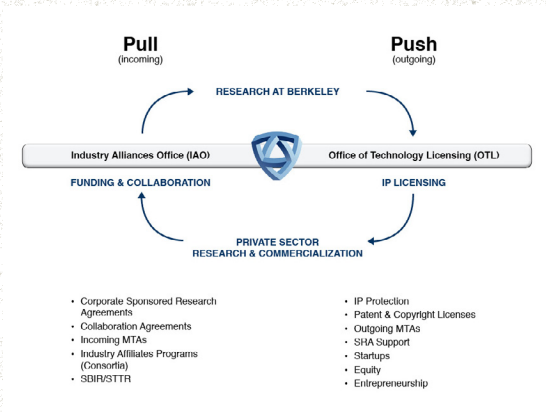
- Catalyze commercial uptake

In doing so, responsibility and authority for negotiating and signing contracts with industry were transferred from the Sponsored Projects Office (SPO) to IPIRA. (SPO continues to be responsible for federal, state, and other nonprofit contracts and grants).

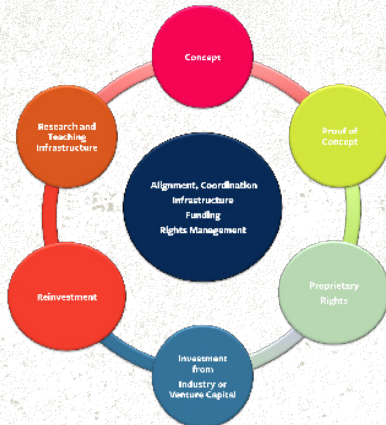
IPIRA consists of two peer divisions, the Industry Alliances Office (IAO) and the Office of Tech Licensing (OTL). The two offices work together to support a cycle of discovery, invention, commercialization, and reinvestment into the research enterprise.

The IAO is responsible for bringing in industry funding, personnel, and materials to support Berkeley’s research enterprise (such as industry-sponsored research agreements, industry affiliate program membership agreements, and incoming material transfers) with assistance from OTL. We refer to this as the “pull” component of technology transfer. When companies sponsor research at Berkeley, they are able to get access to results that are typically more applied (and therefore closer to commercial applicability) than federally sponsored research. Berkeley owns the IP rights as with any sponsored research, but the corporate sponsor can license and commercialize the results. License fees and royalties paid on sales of licensed products are collected from companies and distributed to inventors, departments and the campus. In FY15, IAO executed 269 industry sponsored research agreements, 288 material and data transfer agreements, and 62 nondisclosure agreements.

The OTL is responsible for review of inventions disclosed, patent protection, and transactions in the outgoing direction, such as IP licensing to companies including Berkeley start ups that commercialize our inventions and copyrightable works, and transferring Berkeley materials and data. We refer to this as the “push” component of technology transfer. In FY15, OTL filed 68 foreign patent applications (68 foreign patents were issued) and 195 US patent applications (55 US patents were issued).



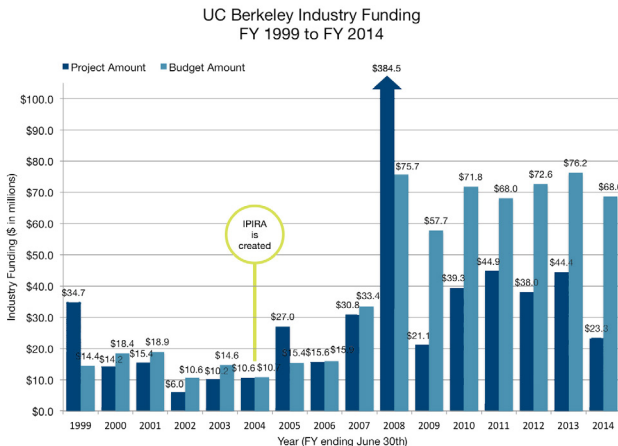
The pull and push elements work together to create a virtuous cycle. After all, companies are likely to be interested in licensing IP rights based on discoveries for which they provided research funding. On average, 25% of our ~220 new invention disclosures per year are sponsored by industry.





Since 2000, IPIRA has brought in close to \$1B in external funds to the campus through industry-sponsored research and licensing revenue. IPIRA has also assisted professors and departments with research gift funding from companies that amounts to millions of dollars.

# Industry-Sponsored Research



Since its launch in 2004, IPIRA has negotiated thousands of contracts with >825 companies, bringing in >\$750M in academic, industry-sponsored research. IPIRA currently brings in over \$80M in annual industry-sponsored research funding, over an 8-fold increase compared to ~\$10M in 2004. This figure represents straight industry funding, not federal flow through funds.

The biggest success to date on the industry “technology PULL” side of the house is the ground-breaking, \$500M sponsored research agreement between Berkeley and BP that established Berkeley’s Energy Biosciences Institute. It is still the largest industry-university sponsored research agreement in existence. Our proposal won a global competition with 46 applicants. We send funding to our collaborators at Lawrence Berkeley National Laboratory (LBNL) and University of Illinois at Urbana Champaign (UIUC) through subawards. Indirect costs from the agreement (along with \$70M from the State) funded the Energy

Biosciences Building, an asset that will survive long after the agreement expires. See: “Our Generation’s Moonshot: Launching the Energy Biosciences Institute. The focus is on the feasibility of making biofuels from lignocellulosic plant materials and enables multidisciplinary research at the intersection of chemistry, molecular and cell biology, engineering, land use, public policy, law, sociology, agricultural economics, physics and plant and microbial biology.

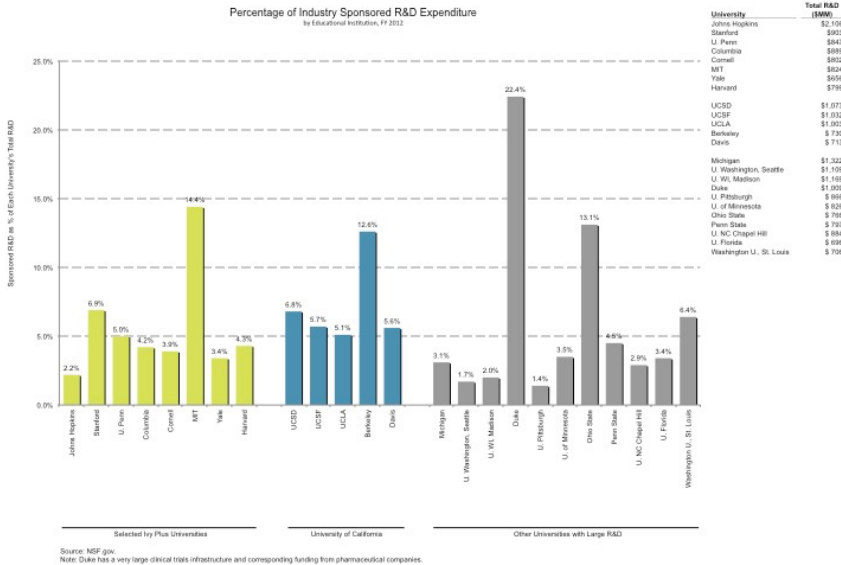
For this deal, we were recognized by the Licensing Executives Society, an international body, as a Deal of Distinction.

There are hundreds of additional examples of industry-funding, including Parallel Computing, the Intel Research Lab at Berkeley, and one sponsored research project that generated DNA sequencing reagents and instruments under IP licenses that have returned over \$33M in royalties to date.

Since the BP deal, additional industry-sponsored institutes and initiatives have been launched at Berkeley with agreements negotiated and signed in IPIRA. These include the California Research Alliance by BASF (on new materials), the Innovative Genomics Institute (on genome editing with gift funding from a foundation and industry support from Astra-Zeneca and Agilent) . Most recently in March, 2016 the Immunotherapeutics and Vaccine Research Initiative will launch (biological sciences) under sponsorship of Aduro Biotech.

Other examples include the Parallel Computing Laboratory in Engineering, funded with \$10M from Intel and Microsoft. Intel also funded an Intel Research Lablet, bringing in over \$24M in research funding. Another sponsored research project generated DNA sequencing reagents and instruments under IP licenses that have returned over \$33M in royalties to date.

In 2013, MARCO, an industry consortium of semiconductor companies, committed \$28M in the formation of Berkeley’s Terraswarm Research Center. This funding supported 10 Berkeley faculty members and 9 other institutions to perform fundamental research in the semiconductor space.



IPIRA has supported 18 industry affiliate programs, 13 of which are currently active, supporting 11 Schools and Colleges. Over 12% of research expenditures at Berkeley are funded by industry. Among peer universities, Berkeley’s percentage of industry-sponsored research is second to MIT, where over 14% of research expenditures are funded by industry. UC Berkeley receives the fifth largest amount of industry-sponsored research by total dollars among US research universities when pharmaceutical-initiated clinical trials are included in the total. Pharmaceutical-sponsored clinical trials are highly directed, “work for hire” tasks that are performed under a human subjects protocol and are not the same as industry-sponsored academic research that is carried out under the direction of a professor.



# TOP 20 SPONSORS



BP Group



Intel Corporation



Chevron Corporation



Pacific Gas and Electric Company



BASF Corporation



Siemens AG



SRC Semiconductor Research Corporation



Dow Chemical Company



Hewlett-Packard



BAE Systems



Aduro Biotech



Microsoft

Microsoft Corporation



Samsung Electronics Company, Ltd.



Lawrence Livermore National Security, LLC



TOYOTA

Toyota Motor Corporation



Cooper Companies, Inc.



Wellspring Advisors, LLC



Agilent Technologies

Agilent Technologies



Pfizer, Inc

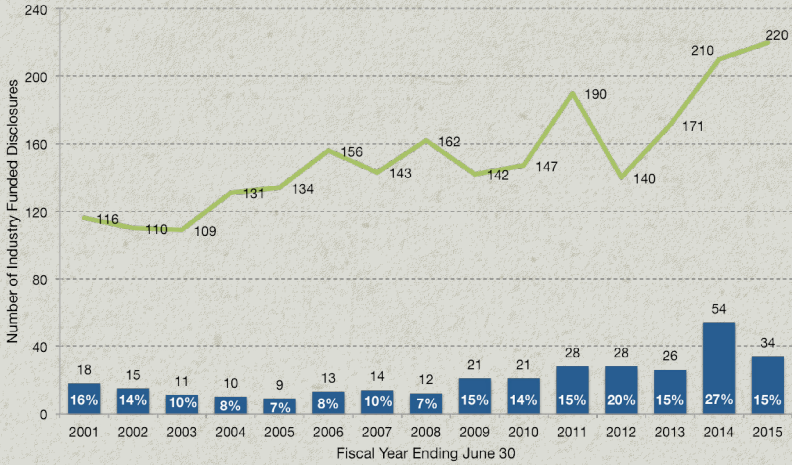


General Motors Corporation

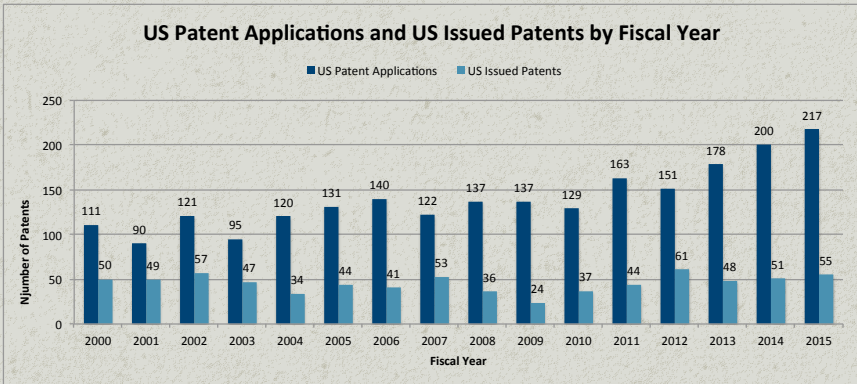
# IP Licensing

## UCB IP Disclosures by Year

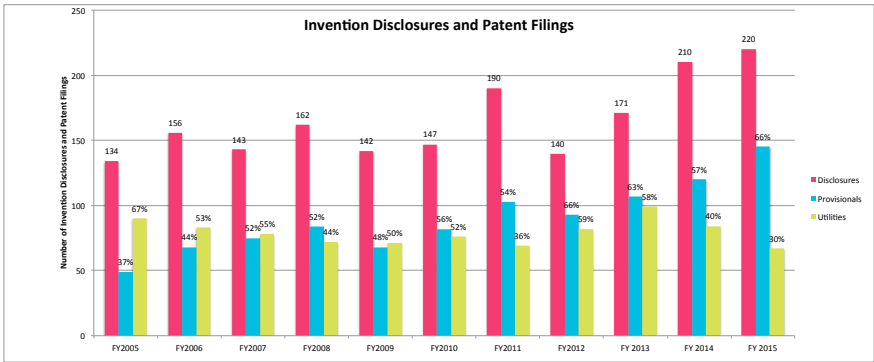
FY 2001 to FY 2015 <sup>(1)</sup> ~15% from Industry Sponsored Research



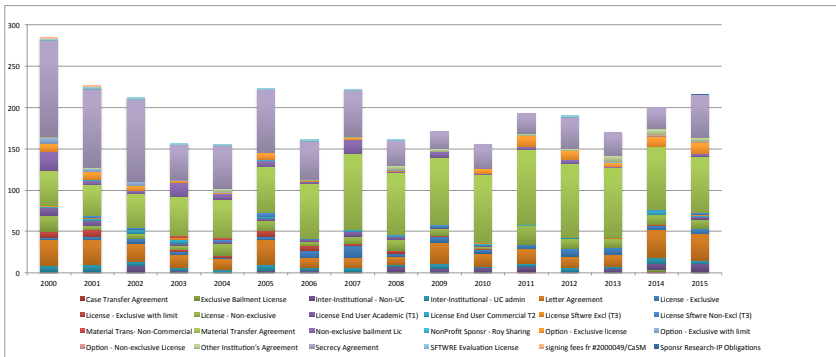
IPIRA has received over 2,000 invention disclosures from Berkeley Faculty, Students and Staff over the last 15 years.



Over the same period, IPIRA has filed over 2,000 patent applications in the US alone.

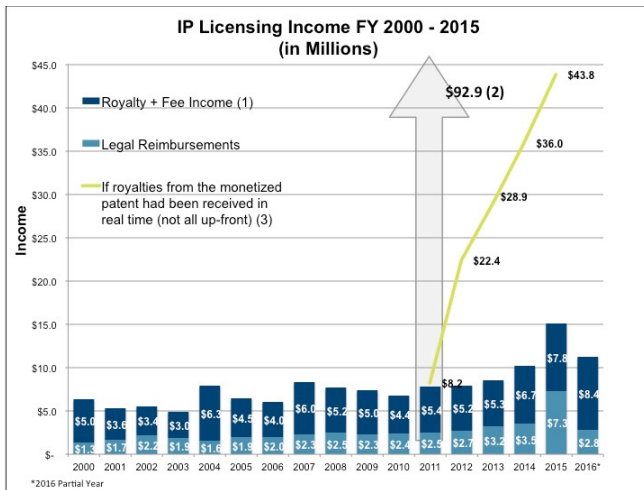


Statistics among our peers show that ~70% of most invention disclosures are licensed ~4 years following disclosure and IPIRA's relatively high patent filing and conversion rates support our strategy of investing in IP rights in order to preserve the upside potential of future licensing returns. (IPIRA also receives disclosures of copyrightable works, which are not necessarily patented.)



Over 780 companies have licensed IP rights from UC Berkeley. There are over 600+ products that have been commercialized under an IP license from Berkeley. In addition to license agreements, IPIRA supports researchers by negotiating and executing material transfer agreements, nondisclosure agreements, data agreements, interinstitutional agreements, stock purchase agreements and the like.





Since 2000 IPIRA has generated over \$208M in IP licensing income and legal reimbursements. Licensing revenue has resulted in inventors receiving over \$46M and the entire campus receiving over \$103M. (The campus distribution includes the “general fund,” which in certain years was distributed to UCOP, and in other years to the campus.)

The biggest success on the “technology PUSH” side of the house is the cancer drug, Yervoy™, which is sold by Bristol-Myers Squibb. It was the first drug approved by the FDA to treat phase IV melanoma. We monetized our running royalties for \$87.5M in 2011 with the possibility of two additional \$20M milestones based on global sales.

This windfall revenue was distributed entirely to the inventors, to research departments and the campus. Even the “office share” of revenue was distributed to campus due to dire needs of the campus in 2011.

~\$26M was distributed to inventors, and \$62M funded:

- Cancer Research Lab core facilities

- Two new biology teaching labs

- Molecular and Cell Biology funds for recruitment, retention, and infrastructure development

- Shared equipment for Li Ka Shing Building research

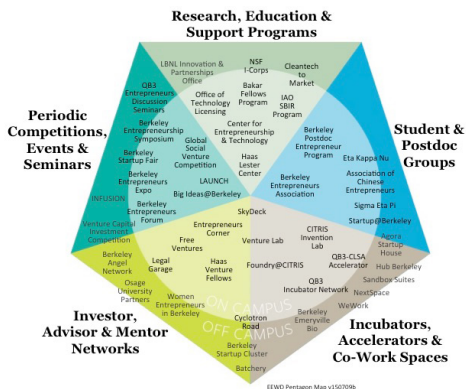
Flow Cytometry Facility in Li Ka Shing building operated under Cancer Research Laboratory

Equipment for vivarium -Laboratory Animal Care

Service on campus bonds to complete the neuroscience labs in Li Ka Shing building

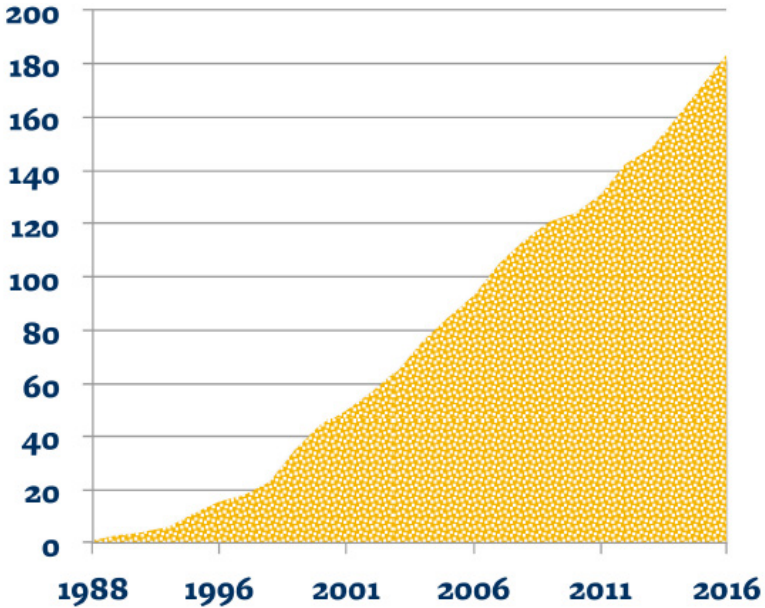
IPIRA developed a socially responsible licensing program in 2004 by creating “humanitarian use” contract clauses in research and IP license agreements that result in access to technology invented at Berkeley by the world’s poorest. One of the highest-profile success stories under the program is the development of a low-cost malaria drug that was created through a partnership among UC Berkeley (through Jay Keasling, lead inventor of the patents), Berkeley’s startup company, Amyris, and the Institute for One World Health (now PATH) with funding from the Bill and Melinda Gates Foundation. Later, Sanofi Aventis joined the partnership as the ultimate commercialization partner. To implement the program three contracts were negotiated and signed by IPIRA, a deal that earned IPIRA an inaugural Patents for Humanity award from the US Patent and Trademark Office.

IPIRA’s approach to Tech Transfer, including that deal, was highlighted by the National Academy of Sciences Institute of Medicine in it’s Breakthrough Business Models publication.



# Startups

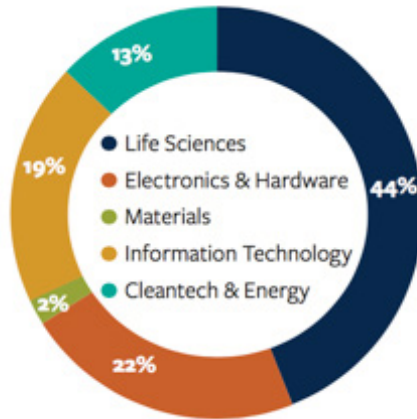
UC Berkeley has a vast entrepreneurial ecosystem, consisting of numerous units and organizations on campus that support entrepreneurs.



Over one hundred eighty startup companies have been founded with an IP license from Berkeley, which is the second highest number within the UC system. These startups have created thousands of jobs in California (66 alone created 1,543 jobs), have raised over \$1.6 billion in VC funding since 2005, and have generated over \$8.1 billion through mergers and acquisitions.



## Distribution of UC Berkeley Startup Companies



A 2014 study by the San Francisco Business Times analyzed 24 UC-licensed startups in the Bay Area from UC San Francisco and UC Berkeley. 18 of the 24 were from Berkeley. Updates since that time include:

Atheer Labs raised \$8.9M DiAssess has raised \$2M in seed funding

Zephyrus raised \$1.9M from Life Science Angels, Stanford StartX, and Mission Bay Capital in Sept. 2014

Caribou raised an \$11M Series A in April, 2015

Intellia Therapeutics raised \$70M in Series B

4D Molecular did a development deal with Roche up-front payment was undisclosed

Cerebrotech has raised at least \$3.5M in rounds from 2012 and early 2014

Berkeley Lights raised \$90M series Acer Research Laboratory

Equipment for vivarium -Laboratory Animal Care

Service on campus bonds to complete the neuroscience labs in Li Ka Shing building



**Thank you.**