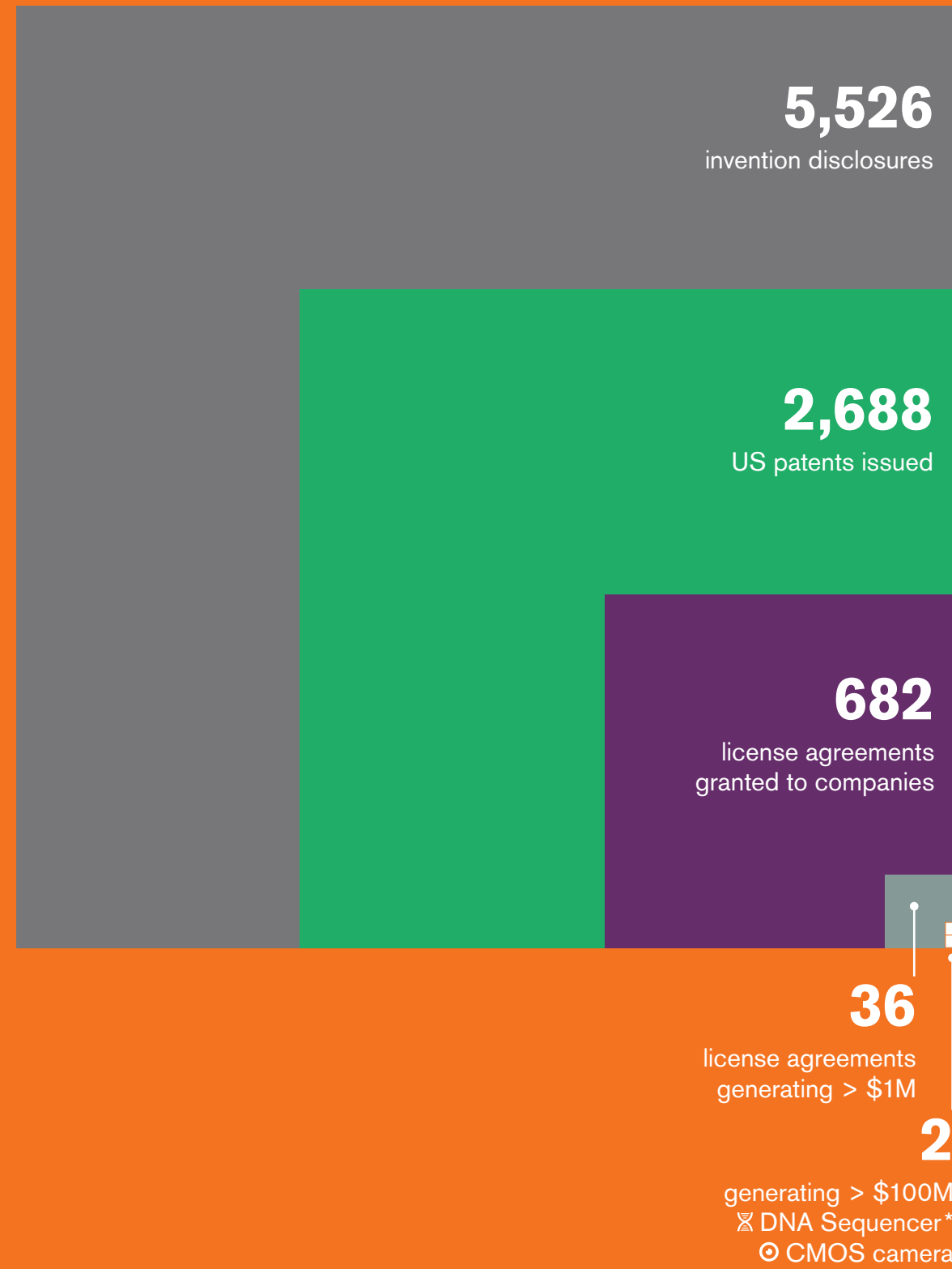


Caltech's Record of Innovation

since 1995



*Invention pre-dates 1995

Caltech Technologies in the Clinic



Calimmune

Calimmune Inc. is a clinical-stage biotechnology company built on technology developed in the lab of President Emeritus and Robert Andrews Millikan Professor of Biology, David Baltimore (Nobel Prize in Physiology or Medicine, 1975). Calimmune is developing novel gene therapy that aims to enhance the patient's own immune system. Cal-1, the company's lead therapeutic candidate, is engineered as a one-time treatment for control of HIV infection to prevent progression to AIDS. The therapy is currently being evaluated in Phase I/II clinical trials.



Cleave Biosciences

Cleave Biosciences was founded by Professor of Biology and Howard Hughes Medical Institute Investigator Raymond Deshaies. Focused on the development of novel small molecule inhibitors of the zinc metalloenzymes that regulate proliferation and metastasis of cancer cells, Cleave's leading candidate compound, CB-5083, is currently being evaluated in Phase I clinical trials for treatment of multiple myeloma and advanced solid tumors.



Calhoun Vision

Founded by Victor and Elizabeth Atkins Professor of Chemistry Robert H. Grubbs (Nobel Prize in Chemistry, 2005) and Professor of Chemical Engineering Julia A. Kornfield, Calhoun Vision's Light Adjustable Lens addresses the unique vision needs of cataract surgery patients by eliminating residual refractive errors after the lens is implanted. The Light Adjustable Lens can be implanted in the eye using the customary surgical technique and is currently in Phase III clinical trials.



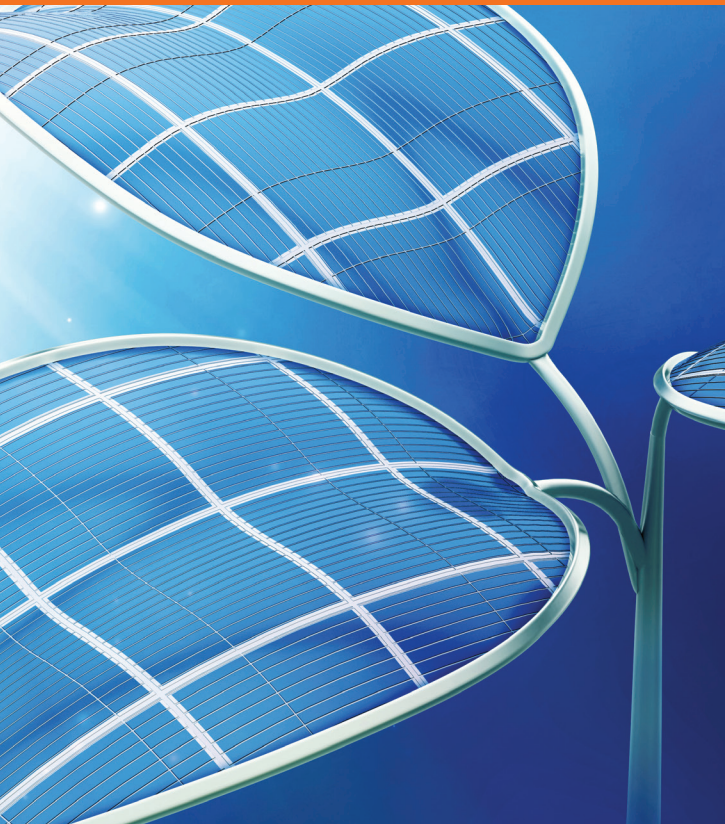
Immune Design

Focused on oncology and engineering technologies to activate the immune system's natural ability to fight cancer, Immune Design was founded by President Emeritus and Robert Andrews Millikan Professor of Biology, David Baltimore (Nobel Prize in Physiology or Medicine, 1975). The company is currently developing two primary product candidates, CMB305 and G100, which utilize distinct immuno-oncology approaches: CMB305 targets specific antigens and/or epitopes; and G100 leverages the endogenous antigens found in the tumor microenvironment. Both of these approaches have the potential to treat a broad patient population and are currently in Phase II clinical trials.

Caltech Technology Transfer & Corporate Partnerships

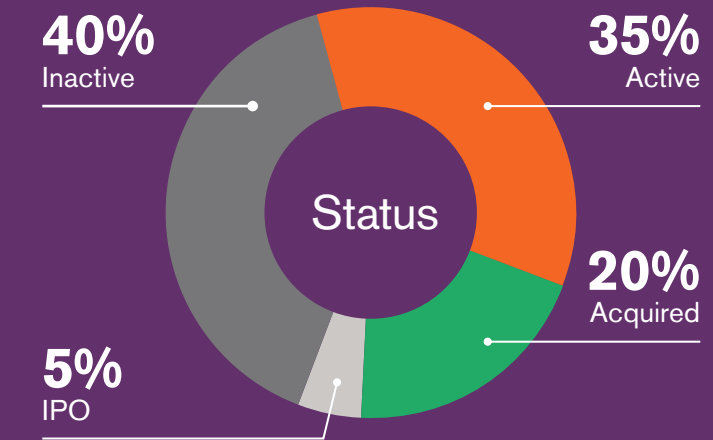


Caltech Technology Transfer & Corporate Partnerships

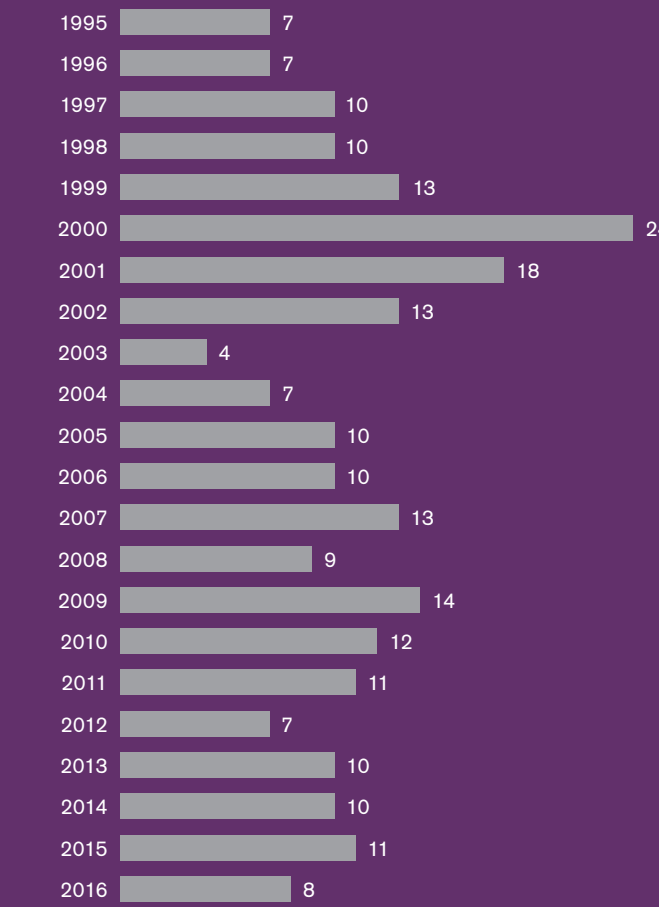


Caltech's Startups

1995-2016

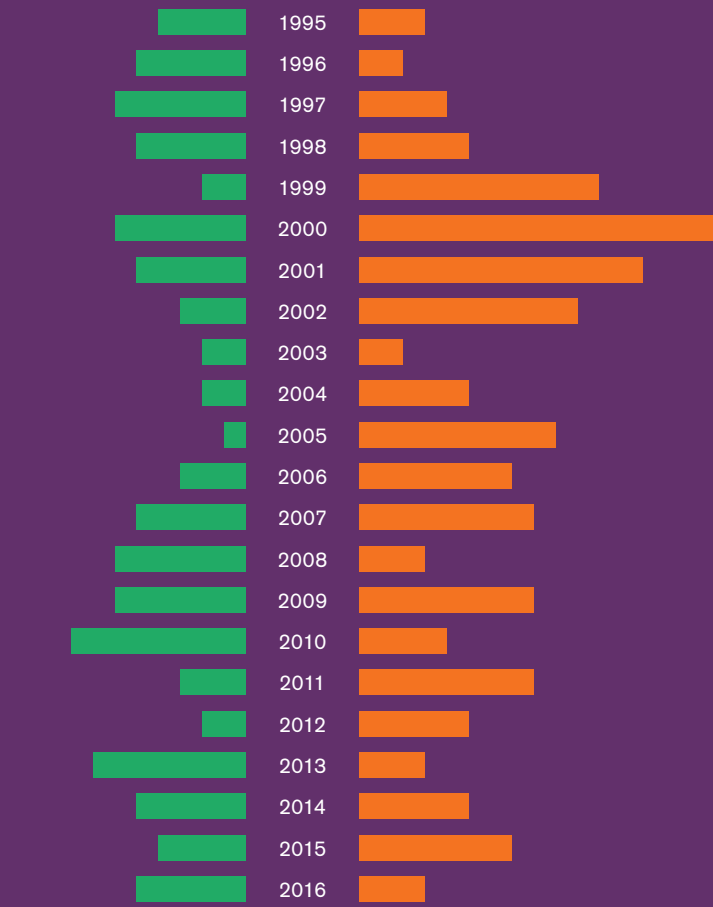


Number of Startups



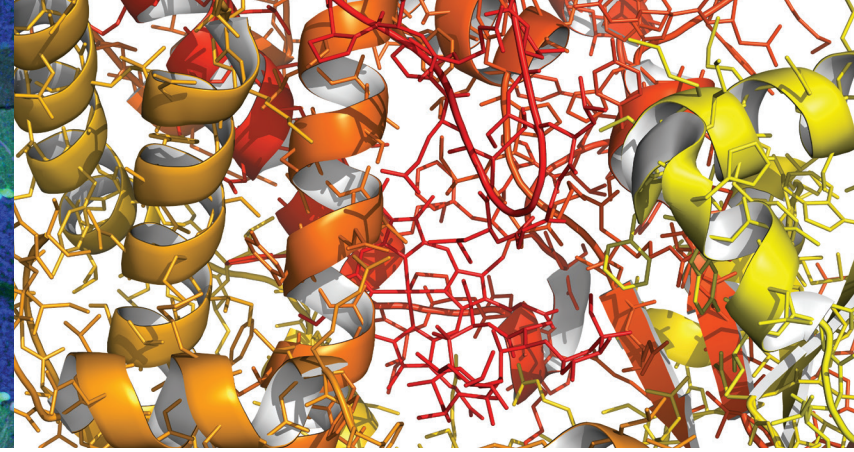
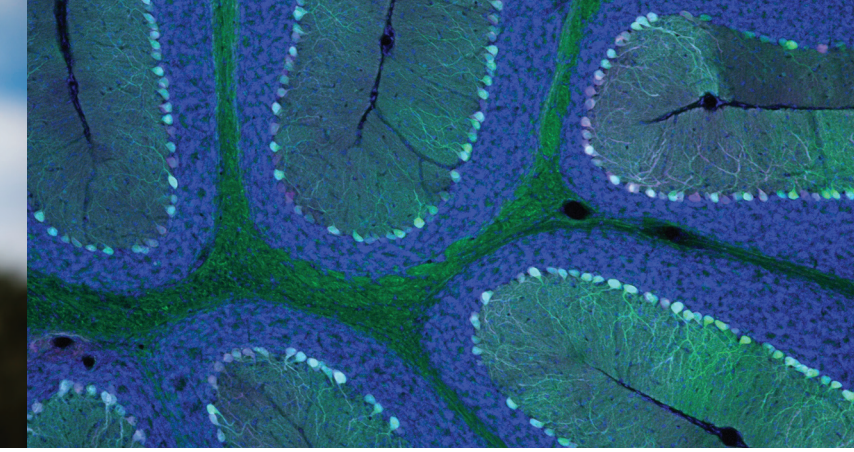
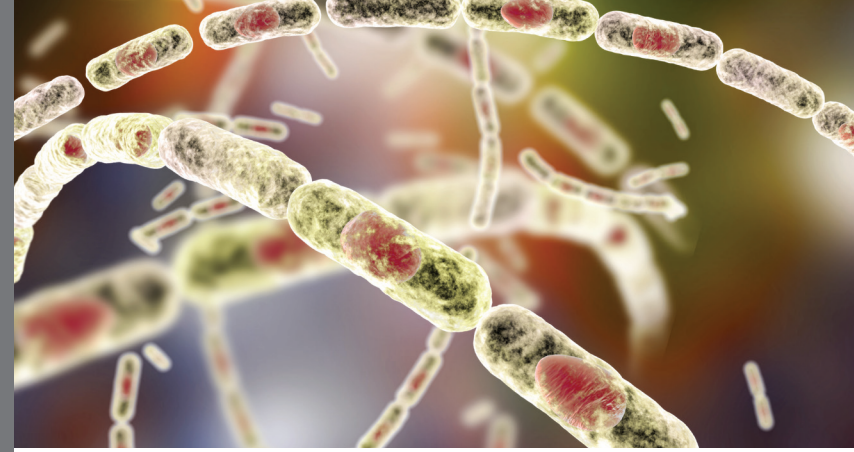
238 Total

Life Science VS. Physical Science



95 Total

143 Total



Our vision is to drive the transfer of scientific and engineering knowledge created by our researchers to maximize societal impact by developing partnerships with industry through the creation of new ventures, collaborations with corporations, and transfer of intellectual property while nurturing an entrepreneurial environment.

FY 2016

Rapid Biological Indicators for Planetary Protection and Medicine

JPL scientists Dr. Leon Alkalai and Dr. Adrian Ponce (PhD, Chemistry, '11) co-founded biotechnology company Verrix using technology originally developed at JPL for the purpose of planetary protection. Their novel chemistry for the detection of biological spores was originally used for detection of contaminants on spacebound craft such as the Mars rover Curiosity, but was easily translated to additional applications ranging from improving sterility in hospital environments to uncovering bioterrorism-associated agents such as anthrax. Verrix offers timescale improvements over current state-of-the-art measurements and their lead product aims for detection of biological agents in minutes instead of hours. In March 2016, Verrix announced a successful Series A funding round; this support over the next few years will help further push this technology to the market.

A New Center for Autonomous Systems and Technologies

The newly formed Center for Autonomous Systems and Technologies (CAST) promotes interdisciplinary research and innovation in the expanding field of autonomous systems. Research conducted at the center will aid in the discovery of new technologies for the development of drones, robots, and other systems with potential applications ranging from smart implantable medical devices to autonomous vehicles for planetary exploration. The establishment of CAST provides a collaborative environment for the rapid advancement of ideas, and brings together four major facilities on campus including a novel open-air wind tunnel for drone testing. CAST will also serve as an information hub for educational outreach to promote the understanding of autonomous technologies.

CAST was established in 2016 through a generous endowment from Foster and Coco Stanback in partnership with JPL, GALCIT, and the divisions of Engineering & Applied Sciences and Geological & Planetary Sciences.

Viral Vector Delivery of Genes Across the Blood Brain Barrier

In a groundbreaking paper published in early 2016, Assistant Professor of Biology and Biological Engineering Viviana Gradinaru and collaborator Ben Deverman, Director of the CLOVER center in Caltech's Beckman Institute, described the development of a novel method to identify adeno-associated virus (AAV) variants capable of transducing specific cell types, including crossing the Blood-Brain Barrier, which is an important step towards making gene therapy a reality for diseases of the central nervous system. Using their Cre Recombination-based AAV Targeted Evolution (CREATE) method, they identified a variant that is 40-90 times more efficient than previous state-of-the-art viruses at delivering genes to the brain; they named this variant AAV-PHP.B in honor of the late Professor of Biological Sciences Paul H. Patterson, a pioneer in the field of neuroimmunology. If AAV-PHP.B proves to be safe and effective, it might advance treatment of previously intractable neurological diseases such as Huntington's, Alzheimer's, Parkinson's, and ALS. Caltech has licensed AAV-PHP.B to several companies who are further developing the technology for potential therapeutic use.

Pest Control as Nature Intended

Launched in 2013 and currently based in Santa Monica, Caltech startup Provivi seeks to pioneer natural pheromone solutions for effective pest control and crop management. Its biocatalyst and fermentation technology was developed in the lab of Frances Arnold, the Dick and Barbara Dickinson Professor of Chemical Engineering, Bioengineering, and Biochemistry; and in addition to its use in agriculture, the technology has applications in industries as diverse as pharmaceuticals, nutrition, flavors, and fragrances. Following a successful Series A funding round in late 2015, Provivi was listed as one of the "10 Startups to Watch" by Chemical & Engineering News, and also received a Small Business Technology Transfer (STTR) grant from the National Science Foundation to support joint work with Caltech on the synthesis of several drugs and crop protection agents.

JCAP Celebrates Six Years

The Joint Center for Artificial Photosynthesis (JCAP) is the nation's largest research program dedicated to the advancement of solar-fuels generation science and technology. Headquartered at Caltech under the direction of Howard Hughes Professor of Applied Physics and Materials Science Harry Atwater, JCAP brings together more than 100 world-class scientists and engineers from Caltech, its lead partner Lawrence Berkeley National Laboratory, and other key partners including the SLAC National Accelerator Laboratory and University of California campuses at Irvine (UCI) and San Diego (UCSD). Established in 2010 by the U.S. Department of Energy as a 'Fuels from Sunlight' Energy Innovation Hub, JCAP's initial focus was on solar H₂ generation. Now in its second five year term, the team aims to develop scalable technology for the transformation of carbon dioxide into useable fuel through the exclusive use of solar energy. To date, JCAP has generated more than 40 unique invention disclosures and over 30 patent applications, and has established an Industrial Partnerships Program through which corporate partners may pursue joint research with the center.

Inspiring the Future of Innovation

Caltech alumni are consistently at the forefront of technological innovation. They are the visionaries, the makers, and the creators using their entrepreneurial spirits to shape the future. In order to inspire the next generation of leaders, OTTCP supports a course on science and technology-based entrepreneurship. Under the guidance of experienced entrepreneur guest lecturers from a range of fields, students explore the challenges of entrepreneurship, and learn how to: evaluate new technologies for commercial feasibility; to best present their ideas for a business; prepare comprehensive yet focused business plans; attract the resources needed to start a new venture; structure and negotiate important business relationships; and to manage an early stage company headed toward "launch velocity."

The course, E102, is overseen by Ken Pickar, a visiting professor of Mechanical and Civil Engineering. Past guest instructors include entrepreneurs Ed Zschau, Charles Holloway, Rob Chess, and Andrea Belz.



229
Invention Disclosures
(campus only)



196
U.S. Patents Issued



1,922
Active U.S. Patents



67
Licenses Granted
(including options)



8
Startup Companies



41
Companies Sponsoring
Research



82
Companies Giving Gifts



\$23M
Corporate Contracts
& Gifts