

100 SUCCESS STORIES



GOVERNMENT FUNDING

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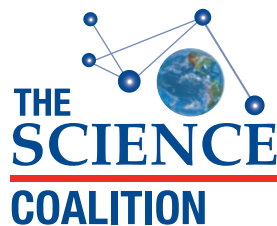
UNIVERSITY RESEARCH

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INNOVATION, COMPANIES, JOBS

SPARKING ECONOMIC GROWTH

How federally funded
university research
creates innovation,
new companies
and jobs



APRIL 2010

www.sciencecoalition.org



ABOUT THIS REPORT

This report was prepared by The Science Coalition (TSC) to illustrate one way in which federal investment in basic research helps to stimulate the economy. The examples highlighted were provided by the member universities of The Science Coalition (each member was invited to submit a small number of examples). They tell an important story about the role federally funded university-based research plays in the economy of the United States.

The companies listed represent only a small sampling of the many companies that are the result of federally funded university-based research. This report is provided for illustrative purposes. The information about the companies was collected in 2009.

The Science Coalition is a nonprofit, nonpartisan organization of more than 40 of the nation's leading public and private research universities. It is dedicated to sustaining the federal government's investment in basic research as a means to stimulate the economy, drive innovation and secure America's global competitiveness.

More information about The Science Coalition is available at www.sciencecoalition.org.



EXECUTIVE SUMMARY

- The federal government is the primary source of funding for basic research conducted in the United States, providing some 60 percent of funding. The second largest source of basic research funding is the academic institutions themselves.
- Universities conduct the majority of basic research in the United States — 55 percent in 2008. Business and industry conduct less than 20 percent of basic research in the United States.
- Basic research is conducted for the sake of knowledge and is essential to scientific discovery and understanding. Basic research is the first step in the innovation process.
- Innovations that flow from university-based basic research are at the root of countless companies. Companies spun out of research universities have a far greater success rate than other companies, creating good jobs and spurring economic activity.
- The US continues to lead in global research and development expenditures from all sources. However, China and other nations are investing aggressively in R&D in order to enhance their innovation capabilities.
- It is essential to America's global competitiveness and long-term economic health that the United States invest significantly and consistently in basic research year after year.



“The government, university and industry partnership of research-fueled innovation that we have in the United States is the envy of the world. It is at the core of U.S. leadership in such knowledge-intensive industries as biotech, telecommunications, and information technology, giving birth to companies like Genentech, Cisco Systems and Google. As head of a health sciences university, a physician, and former biotech industry executive, I have been involved in every aspect of this virtuous cycle. I know the critical impact that federal funding for basic research makes. There is no question that the public benefit is many times greater than the initial investment. Our continued scientific and technological leadership depends on a continued strong federal investment in research that will drive innovation and our economic well-being.”

Susan Desmond-Hellmann, MD, MPH
Chancellor
University of California, San Francisco

innovation

This report illustrates some of the economic benefits the United States reaps when companies are created as a result of discoveries in federally funded university laboratories. While there are countless companies that have made use, to varying degrees, of the fruits of academic research, the roots of the 100 companies featured in this report can be *directly* traced to seminal research conducted at a university and sponsored by a federal agency. *Were it not for the federally supported research, these companies — their products and services, and the jobs and economic growth that have resulted — likely would not exist.*

RETURN ON INVESTMENT

When public money is invested in university-based basic research there is a tremendous return on investment. Research creates jobs directly — for the principal investigator, research team, lab technicians and others who help support the work — and indirectly, through innovations that lead to new technologies, new industries and new companies. University research also is a training ground, educating the next generation of scientists, engineers, doctors, teachers and entrepreneurs. And basic research creates knowledge that leads to the types of discoveries that have a significant impact on society, improving our quality of life, preserving our environment, and enhancing our security.

Universities perform 55 percent of the nation’s “basic” research¹ — that is, research for the sake of knowledge that is essential to scientific discovery and understanding. The bulk of funding for basic research comes from the federal government². Federal support for basic research — provided through many different federal agencies — is based on scientific merit and competitive review. The partnership forged during World War II between the United States government and U.S. universities to conduct research on behalf of the American people continues to be eminently successful. Yet, other nations increasingly are investing aggressively in science to enhance their innovation capabilities and challenge U.S. leadership in this area. Strong and consistent funding for basic research is essential to America’s continued global competitiveness and long-term economic health.

¹ National Science Foundation, Science and Engineering Indicators, 2010

² Ibid

FROM RESEARCH PROJECT TO CORPORATION

The founding of **Google** is a product of the virtuous cycle of investments in research. **Stanford University** graduate students Larry Page and Sergey Brin, whose basic research was supported by a **National Science Foundation** grant, generated the idea at the root of Google — a better kind of search engine. Today, Google has transformed the way we use the Internet and employs more than 19,000 people.

Another example is North Carolina-based **SAS**. Supported by the U.S. **Department of Agriculture** (USDA), SAS began as a research project at **North Carolina State University** to analyze agricultural data. It is today the world's largest privately held software company and the leader in business analytics software and services. SAS employs more than 11,000 people.



SAS was originally created to analyze crop data through a grant from the Department of Agriculture. Forty years later SAS is used in every industry around the world. There are plenty of success stories still to be told. Federally supported university research is vitally important to keeping America at the forefront of technology innovation.”

Dr. Jim Goodnight

Chief Executive Officer, SAS

This report also provides examples of companies that, while they may not (yet) be household names, are nevertheless providing valuable products, technologies and services as a result of innovations grounded in federally funded university-based research. These companies are helping to address critical issues we face as a nation and as a society.

Sharklet Technologies, Inc. of Alachua, Florida, has developed a novel approach to combating hospital acquired infections: a surface technology that mimics the qualities of shark skin, which is resistant to bacterial growth. The original research at the **University of Florida** was supported by the U.S. Navy, which sought a non-chemical, antibacterial coating for the hulls of ocean-going ships to prevent the growth of marine algae and barnacles.

A123 Systems, founded by **Massachusetts Institute of Technology** (MIT) researchers in 2001, is today at the center of efforts to develop an advanced



Basic research provides the critical ‘seed corn’ for our nation’s technological innovations. Certainly that was true in the case of A123, which grew out of DOE-funded basic research into new battery concepts at MIT and is today developing batteries and battery systems to enable the electrification of transportation and improved efficiency for the ‘smart’ electric grid.”

Yet-Ming Chiang

*Co-Founder, A123 Systems
Professor, MIT*

battery manufacturing industry in the United States. The company is developing promising new lithium ion batteries that will provide longer lasting power for electric cars. The original materials basic research at MIT was supported by the **Department of Energy**.

ONY, Inc. of Buffalo, New York, created a lung surfactant that has been administered to more than 250,000 premature babies in the United States to assist with their breathing in the first critical hours after birth. The original work by the company founders was conducted at the **University at Buffalo** with support from the **National Institutes of Health**.



Federal funding was essential to the startup of our company, Buffalo BioBlower. There is no way that our company would even exist had we not received the \$1.6 million in startup money from the Department of Defense.”

James F. Garvey, PhD

*Co-founder and Chief Technical Officer,
Buffalo BioBlower Technologies, LLC
Professor, University at Buffalo*

INNOVATION ACROSS THE ECONOMY

The innovation that results from federally funded university-based research isn’t limited to certain sectors of the economy. Rather, the discoveries emanating from university research span the economy, producing innovations in health care, energy, education, communication, entertainment, transportation, manufacturing and defense, among many others. In Tab 4, the companies are listed by their area of innovation.

Sponsored Research and the 100 Companies

- Department of Agriculture (USDA)
- Department of Commerce (DOC), including:
 - National Institute of Standards and Technology (NIST)
 - National Oceanic and Atmospheric Administration (NOAA)
- Department of Defense (DOD), including:
 - Defense Advanced Research Projects Agency (DARPA)
 - National Geospatial-Intelligence Agency
 - U.S. Air Force
 - U.S. Army
 - U.S. Navy
- Department of Energy (DOE)
- Environmental Protection Agency (EPA)
- Department of Transportation (DOT)
- National Aeronautics and Space Administration (NASA)
- National Institutes of Health (NIH)
- National Science Foundation (NSF)

WHERE FUNDING COMES FROM

Funding for university-based research comes from many different sources, including the universities themselves, state and local governments, industry, foundations and other organizations. However, the bulk of funding for basic research — some 60 percent³ — comes from the federal government through a broad range of agencies and programs. The 100 companies highlighted in this report illustrate the breadth of funding sources: the sponsored research at the root of these companies was supported by at least 10 different entities within the federal government.

In Tab 2, the companies are listed according to the agency that sponsored the university research that was integral to their formation.

It is often the case that researchers receive multiple grants over a period of several years from a variety of sources. For instance, the research at the **University of Illinois at Urbana-Champaign** into genetic manipulation of the fermentation process that is at the core of Chicago-based **TetraVitae Bioscience** was supported by the USDA and DOE.



Federally funded research has been instrumental to developing technologies at Chromatin that can increase crop yields and accelerate the development of new crop products. As a result of funding from the DOE, NIH and Department of Commerce, Chromatin's technology is being tested by leading multinational companies and Chromatin is partnering with several emerging technology companies to create crops that sustainably meet growing global demands.”

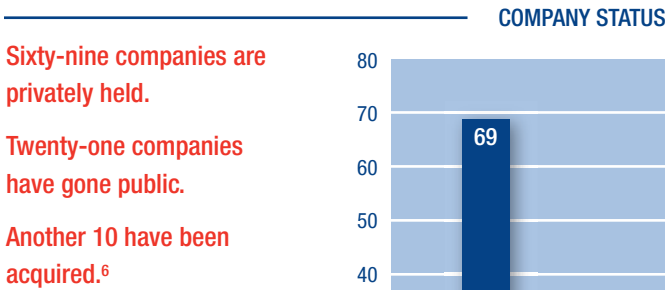
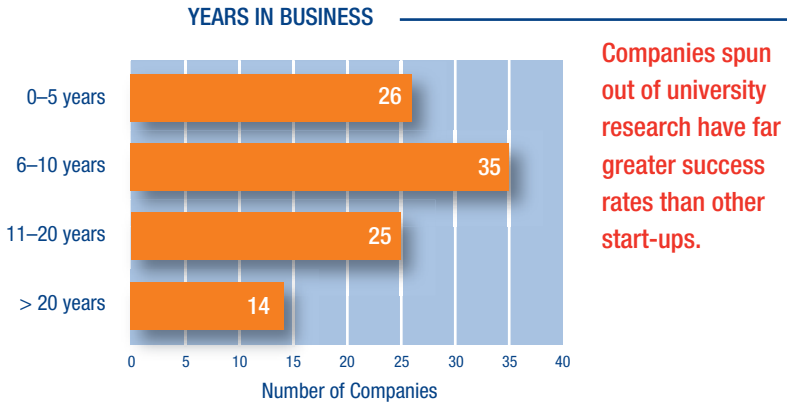
Daphne Preuss

President and CEO, Chromatin, Inc.

³ National Science Foundation, Science and Engineering Indicators, 2010

COMPANIES THAT ARE HIGHLY SUCCESSFUL AND CREATING JOBS

Most of the companies highlighted in this report are small businesses with fewer than 500 employees. These are the companies that today are generating the majority of new jobs in the United States⁴. See Tab 3 for companies listed by number of employees. These companies are also unusually successful: companies spun out of research universities have far greater success rates than other startups⁵. Indeed, of the 100 companies at the heart of this report, 43 were founded ten years or longer ago (in 2000 or earlier). In Tab 5, the companies are listed by their founding date, oldest to newest. Twenty-one companies have gone public. Another 10 companies have been acquired.



⁴ U.S. Dept. of Labor, Bureau of Labor Statistics, Business Employment Dynamics

⁵ Association of University Technology Managers U.S. Licensing Activity Survey FY2007

⁶ Number excludes 2009 acquisitions of Genetech, Inc. and Sun Microsystems, Inc.



“University-launched startups can be powerhouses for value creation, becoming public companies at a far greater rate than the average for new businesses. Higher education can play a crucial role not just in spurring pioneering ideas, but in creating entrepreneurs who turn breakthroughs into innovations. The result benefits everyone. For example, 24 University of Southern California-bred startups currently employ some 500 full-time employees, more than half locally in Los Angeles. And 16 of these companies have raised at least \$148 million in financing over the last two years, during the height of the recession.”

Kristztina “Z” Holly

*Vice Provost for Innovation, University of Southern California
Executive Director, USC Stevens Institute for Innovation*

value

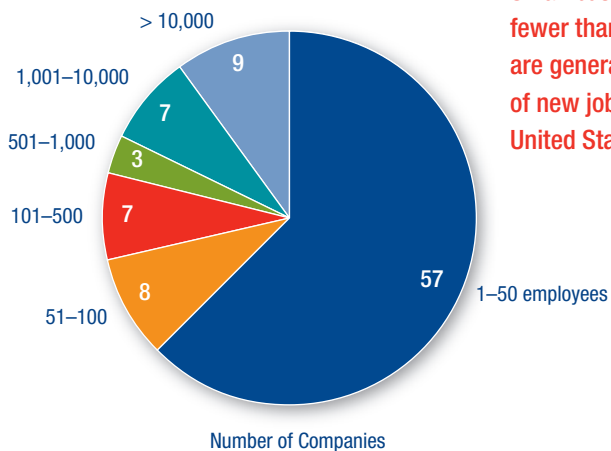


“Our lab at Arizona State University received substantial support from both the Office of Naval Research and the National Science Foundation to develop scanning probe microscopy for biological applications right from the first discovery of the technique (1985-1986). This background led directly to the intellectual property that Molecular Imaging licensed from ASU when it was founded in 1993. Today, Agilent AFM in Chandler is a significant employer of scientists and engineers, manufacturing and further developing the instruments pioneered by Molecular Imaging.”

Dr. Stuart Lindsay

*Director, Arizona State University's The Biodesign Institute, Single Molecule Biophysics
Founder, Molecular Imaging*

EMPLOYMENT



Small businesses with fewer than 500 employees are generating the majority of new jobs today in the United States.

Notes: (1) Number of employees was available for 91 of the 100 companies created from federally funded university research; (2) Numbers reflect employees of the acquiring company when there have been acquisitions:

- 1–50 employees, includes two acquisitions
- 101–500 employees, includes two acquisitions
- 1,001–10,000 employees, includes two acquisitions
- More than 10,000 employees, includes four acquisitions

LOCAL ECONOMIC ENGINES

The economic impact of research universities is felt immediately and directly at the local level. Research universities are a vital component of the local economy in communities across the country. They are often the area's largest employer. They further contribute to the local economy through their purchase of goods and services. Research universities also play an important role in helping to facilitate the transfer of university research results to the public. Often, this is by serving as business incubators that provide the ecosystem necessary to move a company from concept to reality, including mentoring, technical, legal and business support. Importantly, the companies these universities help to create often locate close by, creating local jobs, attracting other research-intensive businesses and stimulating the growth of supporting industries.



Research universities play an essential role in the economic vitality of their home states and the nation. At University of Michigan, we are involved in every phase of economic development, from the basic research that sparks innovation to teaching the skills that enable entrepreneurs and innovators to succeed, and from collaborating with industry on R&D efforts to assisting organizations through the economic transformation process. We believe that this deep involvement is part of our mission to make both the State of Michigan and the United States competitive and secure in this period of rapid globalization.”

Stephen Forrest

Vice President for Research, University of Michigan



Federal funds allowed Dr. Shane Farritor and I to investigate the feasibility and technical requirements needed to perform remote surgery with miniature robots. This research developed key pieces of intellectual property and over 30 scientific publications on miniature robotics. With the help of the University of Nebraska, we were able to obtain patents on these key inventions and later licensed this technology to Virtual Incision Corporation, a company that Dr. Farritor and I founded.”

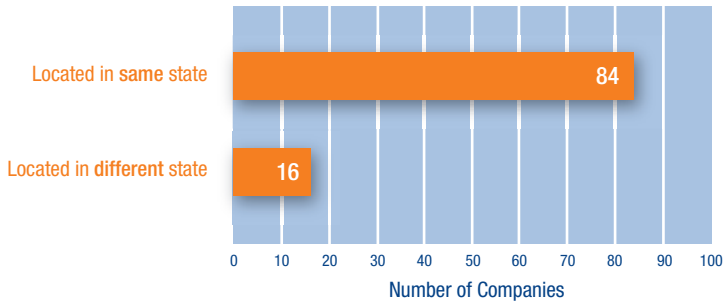
Dmitry Oleynikov

Co-founder, Virtual Incision Corporation

Associate Professor and Surgeon, University of Nebraska Medical Center

Of the 100 companies highlighted in this report, only 16 originally located in a different state than the university from which they spun out. Two others maintain research and development facilities in the same city as their founding universities, contributing jobs and economic activity. In Tab 1, the companies are listed by university affiliation. Company location can be found in Tab 5.

STICKING CLOSE TO HOME





“The core technology of TomoTherapy was developed by National Cancer Institute funding. Each year the technology is responsible for the treatment of tens of thousands of difficult to treat patients. In addition it generates many times its original funding level in salaries and taxes returned to both the U.S. and Wisconsin governments. Federal funding of technology is both economically and scientifically sound.”

Rock Mackie

*Co-founder and Chairman of the Board, TomoTherapy Incorporated
Professor, University of Wisconsin-Madison*

AN INVESTMENT THAT KEEPS ON PRODUCING

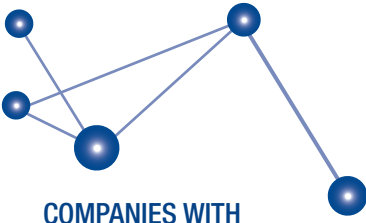
Innovation fueled by basic research has been a cornerstone of the U.S. economy for the last half-century, leading to the creation of countless companies, technologies and products. Federally funded university-based research is essential to America's ability to produce innovation. While the U.S. continues to lead in global research and development expenditures from all sources⁷, China and other nations are investing aggressively in R&D in order to enhance their innovation capabilities.⁸

The American Recovery and Reinvestment Act of 2009 (ARRA) brought an historic infusion of funds for scientific research. While helping to meet some critical needs resulting from previous budget shortfalls, the funding provided by the ARRA was unprecedented and short-term. Scientific research is an ongoing process that requires strong, predictable funding year-in and year-out. A funding tap that runs hot and cold wreaks havoc on the research process and diminishes our ability to benefit from the innovations that flow from it.

It is essential to America's global competitiveness and long-term economic health that the U.S. invest in basic research significantly and consistently year-over-year. This is an investment that pays significant dividends — to our health, security, environment, prosperity and competitiveness — and one the nation can't afford not to make.

⁷ National Science Foundation, Science and Engineering Indicators, International R&D Comparisons, 2010

⁸ American Society for the Advancement of Science, Guide to R&D Funding Data: International Comparisons, August 2008



COMPANIES WITH ACADEMIC RESEARCH AT THEIR CORE

In a separate section of this report, we profile an additional 13 companies submitted by the members of The Science Coalition that have academic research at their core, but whose inception can't be traced directly to federally funded research. In some cases, like that of **Hewlett-Packard (HP)**, **Medtronic**, and Ithaca, New York-based **EMF Corporation**, the companies were founded before the current public-private research partnership was established. In other cases, federal research funding played a significant role after the company was founded, often in the form of Small Business Innovation Research (SBIR) grants. These companies also are excellent examples of the impact university-based research has on our economy.

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100-PLUS: COMPANIES WITH ACADEMIC RESEARCH AT THEIR CORE

FEDERAL FUNDING NOT TRACED TO THE FOUNDING TECHNOLOGY

Indicated by “+” throughout report.

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COMPANIES BY UNIVERSITY

+ Denotes companies created from university research without direct link to federal funding.

Arizona State University

AzERx, Inc.
Molecular Imaging, Inc.
SJT Micropower, Inc. +

Binghamton University

NanoMas Technologies, Inc.
Webscalers

Brown University

Acoustic Magic, Inc.
Seaside Therapeutics

Cornell University

EMF Corporation +
Fingerlakes Aquaculture, Inc.
Kionix, Inc.
Pacific Biosciences

Emory University

GeoVax Labs, Inc.
Pharmasset, Inc.
Neuronetics, Inc. +
Syntermed, Inc.
Triangle Pharmaceuticals

Harvard University

Orbital Sciences Corporation
RainDance Technologies, Inc.

Indiana University

CS-Keys, Inc.
FAST Diagnostics, Inc.
ImmuneWorks
Information in Place, Inc. +
Predictive Physiology & Medicine, Inc. +
Therapeutic Technologies, Inc.

Johns Hopkins University

Reactive NanoTechnologies, Inc.

Lehigh University

Lehigh Nanotech

Massachusetts Institute of Technology

A123 Systems
Cerulean Pharma, Inc.
Cognex Corporation
iRobot Corporation
Momenta Pharmaceuticals, Inc.

Michigan Technological University

Aursos, Inc.
Endres Machining Innovations, LLC +
IR Telemetrics, Inc. +
ThermoAnalytics, Inc.

New York University

Aguru Images with University of
Southern California
Perceptive Pixel, Inc. +
Spin Transfer Technologies
SUGEN +

North Carolina State University

BioMarck Pharmaceuticals, Ltd.
BioResource International, Inc.
CREE, Inc.
SAS

Princeton University

BioNanomatrix, Inc.
TetraLogic Pharmaceuticals
Universal Display Corporation
Vorbeck Materials Corporation

Stanford University

Amati Communications Corporation
Cisco Systems, Inc.
Genentech, Inc. with UC San Francisco
Google Inc.
Hewlett-Packard +
Sun Microsystems, Inc. with UC Berkeley
SunPower Corporation
Xenogen

University at Buffalo

Buffalo BioBlower Technologies, LLC
Kinex Pharmaceuticals
ONY, Inc.

University of California, Berkeley

Cadence Design Systems
Sun Microsystems, Inc. with Stanford University

University of California, Irvine

ALEKS Corporation

University of California, Los Angeles

Agensys, Inc.
ArmaGen Technologies, Inc.
Solarmer Energy, Inc.

University of California, San Francisco

Genentech, Inc. with Stanford University

University of Chicago

Chromatin, Inc.
Integrated Genomics
Maroon Biotech

University of Florida

Banyan Biomarkers, Inc.
Sharklet Technologies, Inc.
Sinmat
Verenium Corporation

University of Illinois at Urbana Champaign

Eden Park Illumination, Inc.
Semiprius
TetraVitae Bioscience

University of Kentucky

AllTranz, Inc. +
Allylix, Inc.
Mersive Technologies

University of Maryland

Zymetis, Inc.

University of Michigan

Arbor Networks
HealthMedia, Inc.

University of Minnesota

Image Sensing Systems, Inc.
Medtronic +

University of Nebraska

J.A. Woollam Co., Inc.
LI-COR Biosciences
Virtual Incision Corporation
Ximerex, Inc.

University of Pennsylvania

Advaxis, Inc.
Avid Radiopharmaceuticals, Inc.
MicroMRI, Inc.
PolyMedix, Inc.
VGX Pharmaceuticals

University of Rochester

iCardiac Technologies
Praxis Biologics
Vaccinex, Inc.

University of South Florida

Nanopharma Technologies, Inc.
Natura Therapeutics, Inc.
Saneron-CCEL Therapeutics, Inc.
Transgenex Nanobiotech, Inc.

University of Southern California

Aguru Images with New York University
Audyssey Laboratories
Big Stage Entertainment
Language Weaver
Response Genetics, Inc.

University of Texas at Austin

Molecular Imprints, Inc.

University of Virginia

Adenosine Therapeutics, LLC
ContraVac +
Directed Vapor Technologies International, Inc.

University of Wisconsin–Madison

FluGen, Inc.
TomoTherapy Incorporated

Virginia Polytechnic Institute & State University (Virginia Tech)

NanoSonic, Inc.

Wayne State University

SenSound, LLC

West Virginia University

Protea Bioscience, Inc.

Worcester Polytechnic Institute

Active Surface Technologies, Inc.
Advanced Body Sensing, LLC
ImagiSonic



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COMPANIES BY FEDERAL FUNDING AGENCY

Department of Agriculture (USDA)

Adenosine Therapeutics, LLC
Fingerlakes Aquaculture, Inc.
LI-COR Biosciences
SAS
TetraVitae Bioscience
Verenium Corporation

Department of Defense (DOD)

ArmaGen Technologies, Inc.
Banyan Biomarkers, Inc.
Buffalo BioBlower Technologies, LLC
Cadence Design Systems
Cisco Systems, Inc.
CREE, Inc.
iRobot Corporation
Kionix, Inc.
Semiprius
Solarmer Energy, Inc.
Transgenex Nanobiotech, Inc.
Universal Display Corporation

DOD – Defense Advanced Research Projects Agency (DARPA)

Arbor Networks
J.A. Woollam Co., Inc.
Language Weaver
Molecular Imprints, Inc.
Sun Microsystems, Inc.
Universal Display Corporation

DOD – National Geospatial-Intelligence Agency (NGIA)

Big Stage Entertainment

DOD – U.S. Air Force

Directed Vapor Technologies International, Inc.
Eden Park Illumination, Inc.
J.A. Woollam Co., Inc.

DOD – U.S. Army

Active Surface Technologies, Inc.
Advanced Body Sensing, LLC
Aguru Images
Directed Vapor Technologies International, Inc.
ImagiSonix
J.A. Woollam Co., Inc.
NanoSonic, Inc.
ThermoAnalytics, Inc.
Universal Display Corporation
Virtual Incision Corporation

DOD – U.S. Navy

Directed Vapor Technologies International, Inc.
Sharklet Technologies, Inc.
Universal Display Corporation
Xenogen

Department of Energy (DOE)

A123 Systems
Directed Vapor Technologies International, Inc.
Pacific Biosciences
Semiprius
Sinmat
SunPower Corporation
TetraVitae Bioscience
Universal Display Corporation
Verenium Corporation

Environmental Protection Agency (EPA)

BioMarck Pharmaceuticals, Ltd.
Lehigh Nanotech

Department of Transportation (DOT)

Image Sensing Systems, Inc.

National Aeronautics and Space Administration (NASA)

iRobot Corporation
J.A. Woollam Co., Inc.
Orbital Sciences Corporation
Virtual Incision Corporation
Vorbeck Materials Corporation

National Institute of Standards and Technology (NIST)

Sinmat
Ximerex, Inc.

National Institutes of Health (NIH)

Adenosine Therapeutics, LLC
Advaxis, Inc.
Agensys, Inc.
ArmaGen Technologies, Inc.
Aursos, Inc.
Avid Radiopharmaceuticals, Inc.
AzERx, Inc.
BioMarck Pharmaceuticals, Ltd.
BioNanomatrix, Inc.
Cerulean Pharma, Inc.
CS-Keys, Inc.
FAST Diagnostics, Inc.
FluGen, Inc.
Genentech, Inc.

National Institutes of Health, *continued*

GeoVax Labs, Inc.
HealthMeda, Inc.
iCardiac Technologies
ImmuneWorks
Integrated Genomics
Kinex Pharmaceuticals
Maroon Biotech
MicroMRI, Inc.
Momenta Pharmaceuticals, Inc.
Nanopharma Technologies, Inc.
Natura Therapeutics, Inc.
ONY, Inc.
Pacific Biosciences
Pharmasset, Inc.
PolyMedix, Inc.
Praxis Biologics, Inc.
Protea Bioscience, Inc.
Response Genetics, Inc.
Saneron-CCEL Therapeutics, Inc.
Syntermed, Inc.
TetraLogic Pharmaceuticals
Therametric Technologies, Inc.
TomoTherapy Incorporated
Transgenex Nanobiotech, Inc.
Triangle Pharmaceuticals
Vaccinex, Inc.
VGX Pharmaceuticals
Virtual Incision Corporation
Xenogen
Ximerex, Inc.

National Oceanic and Atmospheric Administration (NOAA)

Zymetis, Inc.

National Science Foundation (NSF)

Acoustic Magic, Inc.
ALEKS Corporation
Allylix, Inc.
Amati Communications Corporation
Arbor Networks
Audyssey Laboratories
Chromatin, Inc.
Cognex Corporation
Directed Vapor Technologies International, Inc.
Eden Park Illumination, Inc.
Genentech, Inc.
Google Inc.
Integrated Genomics
J.A. Woollam Co., Inc.
Kionix, Inc.
Lehigh Nanotech
Mersive Technologies
MicroMRI, Inc.
Molecular Imaging, Inc.
NanoMas Technologies, Inc.
Nanopharma Technologies, Inc.
Pacific Biosciences
PolyMedix, Inc.
RainDance Technologies, Inc.
Reactive NanoTechnologies, Inc.
Seaside Therapeutics
Semiprius
SenSound, LLC
Sinmat
Solarmer Energy, Inc.
Spin Transfer Technologies
Vorbeck Materials Corporation
Webscalers



SPARKING ECONOMIC GROWTH

How federally funded
university research
creates innovation,
new companies
and jobs

COMPANIES BY EMPLOYEES

+ Denotes companies created from university research without direct link to federal funding. Companies in (parentheses) have been acquired; employee count is for the acquiring company. There are nine companies in this report for which employee data was unavailable.

1–50 Employees

Acoustic Magic, Inc.
Active Surface Technologies, Inc.
Advanced Body Sensing, LLC
Advaxis, Inc.
AllTranz, Inc. +
ArmaGen Technologies, Inc.
Aursos, Inc.
Avid Radiopharmaceuticals, Inc.
(AzERx, Inc.)
Banyan Biomarkers, Inc.
Big Stage Entertainment
BioNanomatrix, Inc.
Buffalo BioBlower Technologies, LLC
Chromatin, Inc.
ContraVac +
CS-Keys, Inc.
Directed Vapor Technologies International, Inc.
Eden Park Illumination, Inc.
Endres Machining Innovations, LLC +
EMF Corporation +
FAST Diagnostics, Inc.
Fingerlakes Aquaculture, Inc.
FluGen, Inc.
GeoVax Labs, Inc.
ImagiSonix
ImmuneWorks
Information in Place, Inc. +
Integrated Genomics
IR Telemetrics, Inc. +
J.A. Woollam Co., Inc.
Kinex Pharmaceuticals
Language Weaver
Lehigh Nanotech
Maroon Biotech
MicroMRI, Inc.
NanoMas Technologies, Inc.
Nanopharma Technologies, Inc.
Natura Therapeutics, Inc.
Neuronetics, Inc. +
ONY, Inc.
Pacific Biosciences
Perceptive Pixel, Inc. +
PolyMedix, Inc.
Predictive Physiology & Medicine, Inc. +
Protea Bioscience, Inc.
Reactive NanoTechnologies, Inc.
Response Genetics, Inc.
Saneron-CCEL Therapeutics, Inc.
Seaside Therapeutics
Semiprius

SenSound, LLC
Sharklet Technologies, Inc.
Sinmat
SJT Micropower, Inc. +
Solarmer Energy, Inc.
Spin Transfer Technologies
Syntermed, Inc.
TetraLogic Pharmaceuticals
TetraVitae Bioscience
Therametric Technologies, Inc.
ThermoAnalytics, Inc.
Transgenex Nanobiotech, Inc.
Vaccinex, Inc.
(VGX Pharmaceuticals)
Virtual Incision Corporation
Webscalars
Ximerex, Inc.

51–100 Employees

ALEKS Corporation
Audyssey Laboratories
Image Sensing Systems, Inc.
Kionix, Inc.
NanoSonic, Inc.
Pharmasset, Inc.
RainDance Technologies, Inc.
Universal Display Corporation

101–500 Employees

(Adenosine Therapeutics, LLC)
(Agensys, Inc.)
Arbor Networks
LI-COR Biosciences
Molecular Imprints, Inc.
Momenta Pharmaceuticals, Inc.
Verenium Corporation
(Xenogen)

501–1,000 Employees

Cognex Corporation
iRobot Corporation
TomoTherapy Incorporated

1,001–10,000 Employees

A123 Systems
Cadence Design Systems
CREE, Inc.
Orbital Sciences Corporation
SunPower Corporation
(Triangle Pharmaceuticals)

More than 10,000 Employees

(Amati Communications Corporation)

Cisco Systems, Inc.

Genentech, Inc.

Google Inc.

(HealthMedia, Inc.)

Hewlett-Packard +

Medtronic +

(Molecular Imaging, Inc.)

(Praxis Biologics)

SAS

(SUGEN +)



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COMPANIES BY AREA OF INNOVATION

+ Denotes companies created from university research without direct link to federal funding.

Agriculture/Life Sciences

BioResource International, Inc.
Chromatin, Inc.
Fingerlakes Aquaculture, Inc.

Antimicrobial Materials/Sterilization

Buffalo BioBlower Technologies, LLC
Sharklet Technologies, Inc.

Audio/Visual

Acoustic Magic, Inc.
Aguru Images
Audyssey Laboratories
Mersive Technologies
Perceptive Pixel, Inc. +

Behavior/Education/Training

ALEKS Corporation
HealthMedia, Inc.
Information in Place +

Bio Fuels/Bio Chemicals

Allylix, Inc.
Chromatin, Inc.
TetraVitae Bioscience
Verenium Corporation
Zymetis, Inc.

Biotechnology/Pharmaceuticals

Adenosine Therapeutics, LLC
Advaxis, Inc.
Agensys, Inc.
AllTranz, Inc. +
ArmaGen Technologies, Inc.
Aursos, Inc.
Avid Radiopharmaceuticals, Inc.
AzERx, Inc.
Banyan Biomarkers, Inc.
BioMarck Pharmaceuticals, Ltd.
BioNanomatrix, Inc.
BioResource International, Inc.
Cerulean Pharma, Inc.
Chromatin, Inc.
CS-Keys, Inc.
FluGen, Inc.
Genentech, Inc.
GeoVax Labs, Inc.
ImmuneWorks

Biotechnology/Pharmaceuticals, continued

Integrated Genomics
Kinex Pharmaceuticals
Maroon Biotech
Momenta Pharmaceuticals, Inc.
Nanopharma Technologies, Inc.
ONY, Inc.
Pacific Biosciences
Pharmasset, Inc.
PolyMedix, Inc.
Praxis Biologics
Predictive Physiology & Medicine, Inc. +
Protea Bioscience, Inc.
Saneron-CCEL Therapeutics, Inc.
Seaside Therapeutics
Sharklet Technologies, Inc.
SUGEN +
TetraLogic Pharmaceuticals
Transgenex Nanobiotech, Inc.
Triangle Pharmaceuticals
Vaccinex, Inc.
VGX Pharmaceuticals
Ximerex, Inc.

Cancer Therapies/Tests

Adenosine Therapeutics, LLC
Advaxis, Inc.
Agensys, Inc.
CS-Keys, Inc.
Genentech, Inc.
Kinex Pharmaceuticals
Nanopharma Technologies, Inc.
SUGEN +
TetraLogic Pharmaceuticals
TomoTherapy Incorporated
Transgenex Nanobiotech, Inc.
Vaccinex, Inc.
VGX Pharmaceuticals
Xenogen

Dental

Therametric Technologies, Inc.

DNA Sequencing

BioNanomatrix, Inc.
Pacific Biosciences
RainDance Technologies, Inc.

Energy Technologies/Renewable Energy

A123 Systems
NanoMas Technologies, Inc.
Semiprius
Solarmer Energy, Inc.
SunPower Corporation

Environmental Remediation

Lehigh Nanotech

Industrial Technologies

Buffalo BioBlower Technologies, LLC
Cognex Corporation
Directed Vapor Technologies International, Inc.
Endres Machining Innovations, LLC +
EMF Corporation +
IR Telemetrics, Inc. +
Kionix, Inc.
NanoMas Technologies, Inc.
NanoSonic, Inc.
Reactive NanoTechnologies, Inc.
SenSound, LLC
ThermoAnalytics, Inc.
Vorbeck Materials Corporation

Instrumentation/Equipment

J.A. Woollam Co., Inc.
LI-COR Biosciences
Molecular Imaging, Inc.
RainDance Technologies, Inc.

Internet Technologies

Arbor Networks
Big Stage Entertainment
Google Inc.
Webscalers

Lighting/Lighting Technologies

Eden Park Illumination, Inc.
Universal Display Corporation

Medical Devices/Medical Diagnostics

Active Surface Technologies, Inc.
Advanced Body Sensing, LLC
Banyan Biomarkers Inc.
ContraVac +
CS-Keys Inc.
FAST Diagnostics, Inc.
iCardiac Technologies
Medtronic +
Neuronetics, Inc. +
Predictive Physiology & Medicine, Inc. +
Response Genetics, Inc.
Therametric Technologies, Inc.
TomoTherapy Incorporated
Virtual Incision Corporation

Medical Imaging Technologies

Avid Radiopharmaceuticals, Inc.
Imagisonix
MicroMRI, Inc.
Molecular Imaging, Inc.
Syntermed, Inc.
Xenogen

Military/Homeland Security

Advanced Body Sensing, LLC
Buffalo BioBlower Technologies, LLC
ImagiSonix
Information In Place +
iRobot Corporation
Mersive Technologies
Nanopharma Technologies, Inc.
Thermoanalytics, Inc.

Nanotechnology

Cerulean Pharma, Inc.
Lehigh Nanotech
Molecular Imprints, Inc.
NanoMas Technologies, Inc.
NanoSonic, Inc.
Reactive NanoTechnologies, Inc.
Sinmat
Transgenex Nanobiotech, Inc.
Vorbeck Materials Corporation

Nutritional Products

Natura Therapeutics, Inc.

Research Services

iCardiac Technologies
Integrated Genomics
Protea Bioscience, Inc.

Robotics

iRobot Corporation
Virtual Incision Corporation

Semiconductors/Semiconductor Technologies

CREE, Inc.
Kionix, Inc.
Molecular Imprints, Inc.
Sinmat
SJT Micropower, Inc. +

Space Systems/Space Technologies

Orbital Sciences Corporation
Vorbeck Materials Corporation

Specialty Chemicals

Allylix, Inc.

Technology/Software/Hardware

Arbor Networks
Big Stage Entertainment
Cadence Design Systems
Cisco Systems, Inc.
Hewlett-Packard +
Mersive Technologies
Perceptive Pixel, Inc. +
SAS
Spin Transfer Technologies
Sun Microsystems, Inc.

Telecommunications

Amati Communications Corporation
Cisco Systems, Inc.

Translation

Language Weaver

Transportation

Image Sensing Systems, Inc.

Vaccines

FluGen, Inc.
GeoVax Labs, Inc.
Praxis Biologics
VGX Pharmaceuticals



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COMPANIES BY YEAR FOUNDED AND LOCATION

Information in (parentheses) is for the acquiring company.

COMPANY	LOCATION	YEAR
LI-COR Biosciences	Lincoln, NE	1971
Genentech, Inc.	South San Francisco, CA	1976
SAS	Cary, NC	1976
Cognex Corporation	Natick, MA	1981
Orbital Sciences Corporation	Dulles, VA	1982
Sun Microsystems, Inc.	Santa Clara, CA	1982
Cadence Design Systems	San Jose, CA	1983
Praxis Biologics (Pfizer)	Rochester, NY (New York, NY)	1983
Cisco Systems, Inc.	San Jose, CA	1984
Image Sensing Systems, Inc.	St. Paul, MN	1984
ONY, Inc.	Amherst, NY	1985
SunPower Corporation	San Jose, CA	1985
CREE, Inc.	Durham, NC	1987
J.A. Woollam Co., Inc.	Lincoln, NE	1987
iRobot Corporation	Bedford, MA	1990
Amati Communications Corporation (Texas Instruments)	San Jose, CA (Dallas, TX)	1992
Verenium Corporation	Cambridge, MA	1992
Kionix, Inc.	Ithaca, NY	1993
Molecular Imaging, Inc. (Agilent Technologies, Inc.)	Chandler, AZ (Santa Clara, CA)	1993
Ximerex, Inc.	Blair, NE	1993
ThermoAnalytics, Inc.	Calumet, MI	1994
Universal Display Corporation	Ewing, NJ	1994
Xenogen (Caliper Life Sciences)	Alameda, CA (Hopkinton, MA)	1994
Triangle Pharmaceuticals (Gilead Science, Inc.)	Durham, NC (Foster City, CA)	1995

COMPANY	LOCATION	YEAR
Agensys, Inc. (Astellas Pharma US)	Santa Monica, CA (Deerfield, IL)	1996
ALEKS Corporation	Tustin, CA	1996
Fingerlakes Aquaculture, Inc.	Groton, NY	1996
Therametric Technologies, Inc.	Indianapolis, IN	1996
Integrated Genomics	Chicago, IL	1997
TomoTherapy Incorporated	Madison, WI	1997
Vaccinex, Inc.	Rochester, NY	1997
Google Inc.	Mountain View, CA	1998
HealthMedia, Inc. (Johnson & Johnson)	Ann Arbor, MI (New Brunswick, NJ)	1998
NanoSonic, Inc.	Blacksburg, VA	1998
Pharmasset, Inc.	Princeton, NJ	1998
Adenosine Therapeutics, LLC (Clinical Data)	Charlottesville, VA (Newton, MA)	1999
BioResource International, Inc.	Morrisville, NC	1999
Response Genetics, Inc.	Los Angeles, CA	1999
Syntermed, Inc	Atlanta, GA	1999
Acoustic Magic, Inc.	Sudbury, MA	2000
Arbor Networks	Ann Arbor, MI	2000
Directed Vapor Technologies International, Inc.	Charlottesville, VA	2000
VGX Pharmaceuticals (Inovio Biomedical Corporation)	Philadelphia, PA (Blue Bell, PA)	2000
A123 Systems	Watertown, MA	2001
Chromatin, Inc.	Chicago, IL	2001
GeoVax Labs, Inc.	Atlanta, GA	2001
Molecular Imprints, Inc.	Austin, TX	2001
Momenta Pharmaceuticals, Inc.	Cambridge, MA	2001
Protea Bioscience, Inc.	Morgantown, WV	2001
Reactive NanoTechnologies, Inc.	Hunt Valley, MD	2001
Saneron-CCEL Therapeutics, Inc.	Tampa, FL	2001
Advaxis, Inc.	North Brunswick, NJ	2002
Allylix, Inc.	San Diego, CA	2002
Audyssey Laboratories	Los Angeles, CA	2002
Banyan Biomarkers, Inc.	Alachua, FL	2002
BioMarck Pharmaceuticals, Ltd.	Raleigh, NC	2002
Language Weaver	Marina Del Rey, CA	2002
Maroon Biotech	Chicago, IL	2002

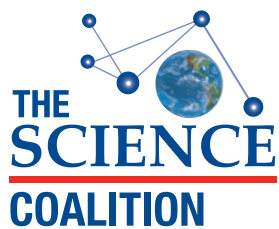
COMPANY	LOCATION	YEAR
PolyMedix, Inc.	Radnor, PA	2002
Sinmat	Gainesville, FL	2002
Transgenex Nanobiotech, Inc.	Tampa, FL	2002
Webscalers	Binghamton, NY	2002
BioNanomatrix, Inc.	Philadelphia, PA	2003
Kinex Pharmaceuticals	Buffalo, NY	2003
MicroMRI, Inc.	Philadelphia, PA	2003
SenSound, LLC	Detroit, MI	2003
ArmaGen Technologies, Inc.	Santa Monica, CA	2004
AzERx, Inc. (Capstone Therapeutics)	Tempe, AZ (Tempe, AZ)	2004
Mersive Technologies	Lexington, KY	2004
Nanopharma Technologies, Inc.	Tampa, FL	2004
Natura Therapeutics, Inc.	Tampa, FL	2004
Pacific Biosciences	Menlo Park, CA	2004
RainDance Technologies, Inc.	Lexington, MA	2004
TetraLogic Pharmaceuticals	Malvern, PA	2004
Active Surface Technologies, Inc.	Worcester, MA	2005
Avid Radiopharmaceuticals, Inc.	Philadelphia, PA	2005
Big Stage Entertainment	Sherman Oaks, CA	2005
Buffalo BioBlower Technologies, LLC	Buffalo, NY	2005
Seaside Therapeutics	Cambridge, MA	2005
Semiprius	Durham, NC	2005
Aguru Images	Los Angeles, CA	2006
Cerulean Pharma, Inc.	Cambridge, MA	2006
CS-Keys, Inc.	Indianapolis, IN	2006
FAST Diagnostics, Inc.	Indianapolis, IN	2006
iCardiac Technologies	Rochester, NY	2006
ImagiSonix	Worcester, MA	2006
ImmuneWorks	Indianapolis, IN	2006
Lehigh Nanotech	Bethlehem, PA	2006
NanoMas Technologies, Inc.	Binghamton, NY	2006
Solarmer Energy, Inc.	El Monte, CA	2006
TetraVitae Bioscience	Chicago, IL	2006
Virtual Incision Corporation	Lincoln, NE	2006
Vorbeck Materials Corporation	Jessup, MD	2006
Zymetis, Inc.	College Park, MD	2006

COMPANY	LOCATION	YEAR
Advanced Body Sensing, LLC	Worcester, MA	2007
Aursos, Inc.	Kalamazoo, MI	2007
Eden Park Illumination, Inc.	Somerset, NJ	2007
FluGen, Inc.	Madison, WI	2007
Sharklet Technologies, Inc.	Alachua, FL	2007
Spin Transfer Technologies	Quincy, MA	2007

100-PLUS: COMPANIES WITH ACADEMIC RESEARCH AT THEIR CORE

Federal funding not traced to the founding technology.

COMPANY	LOCATION	YEAR
EMF Corporation	Ithaca, NY	1936
Hewlett-Packard	Palo Alto, CA	1939
Medtronic	Minneapolis, MN	1949
SUGEN (Pfizer)	South San Francisco, CA (New York, NY)	1991
IR Telemetry, Inc.	Houghton, MI	1994
Information In Place, Inc.	Bloomington, IN	1999
SJT Micropower, Inc.	Fountain Hills, AZ	2000
ContraVac	Charlottesville, VA	2002
Neuronetics, Inc.	Malvern, PA	2003
AllTranz, Inc.	Lexington, KY	2004
Predictive Physiology & Medicine, Inc.	Bloomington, IN	2005
Endres Machining Innovations, LLC	Houghton, MI	2006
Perceptive Pixel, Inc.	New York, NY	2007



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