Faster Forward

8 Cambridge Center
Cambridge, MA 02142
www.akamai.com

Fast Facts

Founders:	George Conrades, Tom Leighton, Danny Lewin, Paul Sagan, Jonathan Seelig
Date Founded:	1999
Employees:	3,000+
Headquarters:	Cambridge, MA
Revenue:	$1.37 billion in FY 2012
University:	Massachusetts Institute of Technology
Federal Funding Agency:	Department of Defense (DARPA, Army Research Office), National Science Foundation
Initial Research Funding:	N/A

Akamai is the leading global service provider for accelerating content and business processes online.

Akamai has deployed the most pervasive, highly-distributed cloud optimization platform with over 127,000 servers in 81 countries within over 1,150 networks. It delivers between 15-30 percent of all Web traffic, with daily Web traffic reaching more than 10 Terabits per second. It also delivers over 2 trillion daily Internet interactions and helps securely enable more than $250 billion in annual e-commerce for its online retail customers.

The Story Behind the Company

In 1996, Dr. Tom Leighton, a renowned expert on parallel algorithms and architecture and head of the Algorithms Group at MIT's Laboratory for Computer Science, recognized that a solution to web congestion could be found in applied mathematics and algorithms. He solicited the help of graduate student Danny Lewin, and several other top researchers, to tackle the problem.

With funding support from the Department of Defense, through DARPA and the Army Research Office, they developed a set of breakthrough algorithms for intelligently routing and replicating content over a large network of distributed servers — without relying on centralized servers typically used by Web site owners today. This novel coding, called consistent hashing, would evolve into the core of Akamai's commercial technology, essentially duplicating a client's online content — HTML code, media, software downloads, and so on — and redirecting its customers to an Akamai server with the best connection for faster download times and fewer vulnerabilities to network issues.

Their research was published in 1997. Jonathan Seelig, then enrolled in the MIT Sloan MBA program, joined the founding team, and they began building the business plan that would lead to Akamai's inception. Akamai obtained an exclusive license to certain intellectual property from MIT, and development efforts began in the fall of 1998. The company launched commercial service in April 1999.

Ultrasensitive Diagnostics & Targeted Therapeutics

1 Broadway, 14th Floor
Cambridge, MA 02142
akrivis.com

Fast Facts

Founders:	Ban-An Khaw
	Joel Berniac
Date Founded:	2009
Employees:	4
Headquarters:	Cambridge, MA
Revenue:	N/A
University:	Northeastern University
Federal Funding Agency:	National Institutes of Health
Initial Research Funding:	$233,000

Akrivis Technologies seeks to improve patients' health and reduce healthcare costs by developing safer and more efficacious cancer therapies, and by providing rapid, ultrasensitive and low–cost diagnostics for both research and clinical applications. The company's core Z–TECT™ technology platform is based on a patented, nanotechnology–derived signal amplification system that provides accurate and reproducible detection of less than a thousand individual molecules. Z–TECT™ also can serve as a novel platform for the targeted delivery of radio– and chemo–therapeutic drugs for cancer treatments. Potentially providing far safer and more efficacious targeted delivery therapeutics, Z–TECT™ could have a major impact on the emerging field of "Theranostics" which combines cancer therapies with *in vivo* imaging diagnostics.

The Story Behind the Company

Akrivis was co–founded in 2009 by Dr. Ban–An Khaw, Behrakis Professor of Pharmaceutical Sciences at Northeastern University, to further develop and commercialize his lifelong work and discoveries on novel ultrasensitive and low–cost immunoassays. The novel delivery mechanism behind Akrivis was originally developed by Dr. Khaw to identify cardiac cell death. The foundational work essential to the development of the Akrivis technology was conducted by Khaw at Northeastern University with support from the National Institutes of Health.

Using Pulmonary Genomics to pioneer molecular diagnostics for lung cancer

6 Clock Tower Place, Suite 225
Maynard, MA 01754
www.allegrodiagnostics.com

Fast Facts

Company Name:	Allegro Diagnostics
Founders:	Jerry Brody
	Avrum Spira
Date Founded:	2008
Employees:	6
Headquarters:	Maynard, MA
Revenue:	NA
University:	Boston University
Funding Agency:	National Institutes of Health (National Cancer Institute)
Initial Research Funding:	$300,000

Allegro Diagnostics Corp. is a molecular diagnostics company focused on the development and commercialization of innovative genomic tests to support the diagnosis and management of lung cancer. These tests have the potential to enable the early diagnosis, staging and informed treatment of lung cancer and other lung diseases.

The company has developed a molecular testing platform that is based on the discovery of a genomic biomarker for lung cancer. This platform has generated multiple product candidates that analyze specific changes in gene expression in epithelial cells of the airway, which are associated with the development in lung cancer in current or former tobacco smokers.

The Story Behind the Company

Allegro Diagnostics was spun off from research by Dr. Avrum Spira and Dr. Jerry Brody, professors at Boston University's School of Medicine. Dr. Spira and Dr. Brody wanted to address a major public health issue: lung cancer, the leading cause of cancer death in the United State and the world. Lung cancer's high mortality rate relates to the physician's inability to detect it at an early and curable stage. Dr. Spira and Dr. Brody leveraged the concept that molecular alterations in relatively accessible epithelial cells that line the upper airway could serve as biomarkers for the early detection of lung cancer among smokers. They developed a gene-expression signature in these cells that can accurately distinguish smokers with lung cancer from those without the disease and serve as a clinically relevant biomarker.

The initial research and development behind Allegro Diagnostics was conducted at BU with a $300,000 grant from the National Institutes of Health, through the National Cancer Institute. Allegro has raised about $10M from venture capital and $3M from non-dilutive sources.

DIAGNOSTICS FOR ALL

840 Memorial Drive
Cambridge, MA 02139
www.dfa.org/index.php

Fast Facts

Founders:	George Whitesides
Date Founded:	2007
Employees:	18
Headquarters:	Cambridge, MA
Revenue:	N/A
University:	Harvard University
Federal Funding Agency:	National Institutes of Health (National Institute of General Medicine Sciences)
Initial Research Funding:	$310,000

Diagnostics For All's (DFA) mission is to save lives and improve health in the developing world through pioneering technological innovation.

DFA is a non-profit enterprise fusing biotechnology and development, dedicated to creating low-cost, easy-to-use, point-of-care diagnostics designed specifically for the 60 percent of the developing world that lives beyond the reach of urban hospitals and medical infrastructures. DFA uses simple and low-cost patterned paper technology to create diagnostic devices, which require minimal training to use, practically no sample preparation, and no electricity or additional equipment to process a sample. Results are displayed quickly in an easy-to-read format and all devices are compatible with telemedicine networks.

Diagnostics for All supports its mission through general public donations, project-specific funding, and philanthropic support, as well as licensing opportunities for their technology with corporate partners for use in the developed world.

The Story Behind the Company

Dr. George Whitesides, a professor of chemistry, and his research team at Harvard University were studying mammalian and bacterial cell motility and the electrophysiology of ion channels to develop new ways to examine these biological processes using microtools. This research led to the patterned-paper technology that forms the basis of Diagnostics for All's low-cost diagnostics.

The Harvard-based research that led to Diagnostics For All was supported in part by a $310,000 grant from the National Institutes of Health. Additional support came from the National Science Foundation for the lab and an NSF research fellow.

DFA holds an exclusive worldwide license from Harvard for medical and other applications of the technology.

Cambridge Discovery Park
100 Acorn Park Drive, 5th Floor
Cambridge, MA 02140
www.genocea.com

Fast Facts

Founders:	Kevin J. Bitterman, Darren Higgins
Date Founded:	2006
Employees:	Approx. 50
Headquarters:	Cambridge, MA
Revenue:	N/A
University:	Harvard University
Federal Funding Agency:	National Institutes of Health (National Institute of Allergy and Infectious Diseases)
Initial Research Funding:	$205,000

Technology developed by Genocea Bioscience allows for quick insight into the immune system's response to specific viruses or bacteria and helps determine if a strong immune response can be triggered to resist attack by invaders to which the immune system has a weak or no response. The Genocea process has the potential to significantly reduce the time it takes to discover vaccine candidates and to improve preventative medical care in a way that mirrors the body's natural response.

Currently, Genocea is using their innovative approach to vaccine creation to develop vaccines for diseases like malaria and herpes. In the future, Genocea's work may also be applied to existing vaccines in order to make them more effective at protecting recipients against illness and disease.

The Story Behind the Company

Harvard Medical School Professor Dr. Darren Higgins knew that Listeria monocytogenes was the most deadly bacteria causing food-borne illnesses and a prominent public health risk. He also knew that animal models had shown protective immunity to L. monocytogenes. In order to stimulate these protective effector cells, subclinical infection with the live bacteria was necessary. However, infecting patients with live cultures of bacteria posed a significant health risk. Ultimately, Dr. Higgins discovered a novel strategy for the generation of replication-deficient bacterial vaccine capable of stimulating protective cell responses. Thanks to grants from the National Institute of Allergy and Infectious Diseases, part of the National Institutes of Health, Higgins found that his strategy did work with L. monocytogenes and other pathogens. In 2006, he helped launch Genocea Biosciences to apply his strategy to create new and improved vaccines.

Today, Genocea Biosciences is a leading biotech start-up. It was selected as the "Best Vaccine Startup" at the 2008 World Vaccine Congress and one of the 15 most exciting biotech startup companies by FierceBiotech. Genocea is backed by leading investors including Lux Capital Management, Polaris Venture Partners, Morningside Ventures, SR One, Auriga Partners, Cycad Group and Alexandria Real Estate Equities. In 2011 alone, Genocea received $35 million in venture capital funding.

Infinity PHARMACEUTICALS

780 Memorial Drive
Cambridge, MA 02139
www.infi.com/default.asp

Fast Facts

Founders:	Michael Foley, Eric Lander, Stuart Schreiber
Date Founded:	2001
Employees:	176
Headquarters:	Cambridge, MA
Revenue:	$47.1 million in FY12
University:	Harvard University
Federal Funding Agency:	National Institutes of Health (National Cancer Institute)
Initial Research Funding:	$2M

Infinity Pharmaceuticals is an innovative drug discovery and development company primarily focused on discovering and developing oncology related drugs. Utilizing the chemical and biological knowledge it has developed, Infinity's drug candidates seek to combat inflammatory disease and disrupt cancer and tumor growth.

Infinity's mission is to build a community and company capable of sustainably discovering, developing and delivering innovative, important new medicines to people that make a material difference in their health, well-being and lives.

The Story Behind the Company

The foundation for Infinity Pharmaceuticals was laid in 1998, when Harvard Professor Dr. Stuart Schreiber was awarded a grant from the National Institutes of Health to work on new methods for cancer treatment involving cell-permeable small molecules that could be used to manipulate the function of any given protein target. Infinity Pharmaceuticals maintains Dr. Schreiber's focus on small molecules to discover, develop and deliver to patients best-in-class medicines for diseases with significant unmet need, including a therapeutic focus on oncology.

Since its formation, Infinity has developed and refined Dr. Schreiber's research and currently has three drugs in clinical trials.

Metamagnetics Inc.

480 Neponset Street, Suite 12B
Canton, MA 02021
www.metamagneticsinc.com

Fast Facts

Founders:	Vincent Harris
Date Founded:	2008
Employees:	8
Headquarters:	Canton, MA
Revenue:	N/A
University:	Northeastern University
Federal Funding Agency:	National Science Foundation Department of Energy Department of Defense (DARPA, Office of Naval Research, Air Force Office of Scientific Research)
Initial Research Funding:	$4,246,000

Metamagnetics Inc. is a research and development company that combines multidisciplinary expertise in advanced materials and electronics to develop novel microwave materials and device solutions for use in microwave and millimeter-wave electronics and multifunctional integrated circuits.

The company is working to develop leading edge technologies that operate well beyond current operational limits, especially in the area of radar, communication, sensing and other high frequency electromagnetic technologies. Metamagnetics works closely with the Department of Defense and Department of Homeland Security to generate and transfer novel and advanced technologies to the defense community.

The Story Behind the Company

Metamagnetics is a spin-out from the Northeastern University Center for Microwave Magnetic Materials and Integrated Circuits (CM3IC) led by Professor Vincent Harris. CM3IC is internationally renowned for its accomplishments in microwave magnetic materials and devices. Metamagnetics is in the process of licensing various technologies developed there. Harris and the work of CM3IC have received support from the Department of Energy, the National Science Foundation, and the Department of Defense through the Office of Naval Research, DARPA and the Air Force Office of Scientific Research.

Breakthrough Technology for Antibiotic Discovery

767C Concord Avenue
Cambridge, MA 02138
www.novobiotic.com

Fast Facts

Founders:	Slava Epstein
	Kim Lewis
Date Founded:	2003
Employees:	15
Headquarters:	Cambridge, MA
Revenue:	N/A
University:	Northeastern University
Federal Funding Agency:	National Science Foundation
Initial Research Funding:	$65,723

NovoBiotic Pharmaceuticals is a privately held, early stage pharmaceutical company focused on the development of novel antibiotics.

NovoBiotic has developed a method for growing previously "unculturable" microorganisms in the laboratory. The company is using this proprietary technology as a platform for antibiotic discovery.

The Story Behind the Company

While 70 percent of antibiotics are derived from microorganisms, few new classes of antibiotics have been introduced since the 1960s and large pharmaceutical companies have exhausted the <1 percent of bacteria/fungi that are accessible for drug discovery using traditional culture techniques.

NovoBiotic's founding scientists, Northeastern University professors Dr. Kim Lewis, and Dr. Slava Epstein, discovered a unique, proprietary method to isolate and cultivate previously unculturable microorganisms in their laboratory, giving NovoBiotic sole access to a virtually unlimited and as yet unexploited source of novel natural product compound diversity. The novel diffusion chamber technology, called the Cultursys™ chamber, allows the diffusion of growth-sustaining materials from the organisms' natural environment but restricts the movement of cells.

The initial research and development that led to Novobiotic was supported by a $65,723 grant from the National Science Foundation.

1700 West Park Drive
Westborough, MA 01581
www.remotereality.com

Fast Facts

Founders:	Shree Nayar
Date Founded:	1997
Employees:	6
Headquarters:	Westborough, MA
Revenue:	N/A
University:	Columbia University
Federal Funding Agency:	National Science Foundation, Department of Defense, U.S. Navy
Initial Research Funding:	$11M

RemoteReality builds high performance video systems with real-time 360-degree viewing for surveillance, situational awareness, and entertainment applications supporting military, government and commercial markets. Using unique patented optics, the latest in image sensors, and advanced video processing, RemoteReality's solutions deliver high resolution, low latency video for a variety of cutting edge applications. RemoteReality's video solutions are available in both day and night configurations, spanning the visible, LWIR and MWIR spectra.

RemoteReality has solved many of the shortcomings, including imaging-quality limitations, of conventional multi-camera systems rooted in dated technology. In most cases, just one, single-lens, solid-state RemoteReality appliance is needed to provide the highest-resolution, real-time video of an entire area, even in low-bandwidth network environments. RemoteReality's cameras allow customers to improve awareness of military vehicles, provide advanced navigation of unmanned vehicles, allow continuous perimeter surveillance, reduce maintenance costs and develop customized security solutions.

The Story Behind the Company

RemoteReality is a startup company based on omnidirectional cameras developed by Dr. Shree Nayar in the Columbia Vision and Graphics Center. Dr. Nayar co-directs the Columbia Vision and Graphics Center and heads the Computer Vision Laboratory (CAVE), which is dedicated to the development of advanced computer vision systems. Nayar's research is focused on three broad areas, namely, the creation of novel vision sensors, the design of physics based models for vision, and the development of algorithms for scene interpretation. His work was supported by grants from the National Science Foundation and the US Navy. RemoteReality applies Nayar's work in the design and manufacture of ultra wide-angle computational cameras and video systems. RemoteReality has received venture capital funding from companies including Chart Venture Partners (CVP) and Connecticut Innovations. Since 2006 the company has raised over $12M in venture capital funding.

Diagnostic Brilliance for Food Safety and Healthy Environments

27 Drydock Avenue, 2nd Floor
Boston, MA 02210
www.sample6tech.com

Fast Facts

Company Name:	Sample6 Technologies
Founders:	James Collins, Michael Koeris, Timothy Lu
Date Founded:	2010
Employees:	16
Headquarters:	Boston, MA
Revenue:	NA
Federal Funding Agency:	National Institutes of Health National Science Foundation
Initial Research Funding:	$5.2M

Sample6 Technologies is at the intersection of breakthroughs in synthetic biology, sensors, and data modeling and visualization. The company's mission is to improve the health and safety of global consumers by building integrated systems that can quickly and easily detect harmful and unwanted bacteria in the food, healthcare, and other industries. Sample6's technology is based on a proprietary Bioillumination Platform™ that allows for the rapid engineering of bioparticles that cause bacteria to effectively "light up" when a specific bacterium is identified. The platform can be applied to a narrow set of bacterial strains or a panel of bacterial species. This capability is coupled with highly sensitive sensor technology that can detect low levels of pathogens in hours or faster, all on-site.

The Story Behind the Company

The Bioillumination Platform™ was developed by Tim Lu and Michael Koeris in the lab of Professor James Collins at Boston University, one of the nation's foremost labs in synthetic biology. As graduate students in Professor Collins' lab, Koeris and Lu worked in the fields of synthetic biology and systems biology. Their work was supported by grants from the National Institutes of Health and the National Science Foundation. Initially they focused on developing next-generation antibiotics approaches for drug-resistant infections, winning several business plan competitions on the national stage. After surveying the market and financial landscape, Koeris and Lu pivoted the company to the industrial application space, while keeping the core technology platform intact.

Koeris quit his day job, and he and Lu raised $150,000 in seed money from Boston University. In January 2011, they set out to raise a Series A from top venture investors with a sharper focus: the rapid detection of pathogens. With $5.75 million in equity funding to date, Sample6 is now poised to enter the industrial food market with a first-in-class solution to break through the time barrier (usually 24 hours or more) posed by conventional pathogen testing.

Inventing for better life

One Kendall Square, Suite B2305
Cambridge, MA 02139
www.sand9.com

Fast Facts

Founders:	Matt Crowley Raj Mohanty
Date Founded:	2007
Employees:	34
Headquarters:	Cambridge, MA
Revenue:	NA
University:	Boston University
Federal Funding Agency:	National Science Foundation
Initial Research Funding:	$2M

Sand9 has developed a MEMS (micro-electromechanical systems) timing device to replace quartz crystal timing devices. Timing devices are used in virtually all electronics, where they are used to transmit data at the right time and speed. Sand9's lead MEMS product, the TCMO™, has many advantages over traditional quartz crystal, including greater durability, power efficiency and immunity to electromagnetic interference than quartz. The product can be used in GPS, LTE, 3G, WiFi, networking and industrial goods.

The Story Behind the Company

Sand9 is a spin-off from research conducted by Raj Mohanty, professor of physics at Boston University. In his lab, Mohanty built high frequency silicon-based MEMS resonators that could reach gigahertz frequencies. He realized these resonators could replace quartz in timing devices used in wireless communications and an idea for a company was born. Mohanty's work at BU that developed the core technology behind Sand9 was supported by grants from the National Science Foundation. Sand9 has raised $50 million in venture capital funding from General Catalyst, Flybridge Ventures, Ericsson, Khosla Ventures, Vulcan Ventures, Commonwealth Capital and Intel Capital.

WiTricity

Wireless Electricity Delivered Over Distance

149 Grove Street
Watertown, MA 02472
www.witricity.com

Fast Facts

Founders:	Peter Fisher, John D. Joannopoulos, Aristeidis Karalis, Andre Kurs, Marin Soljačić
Date Founded:	2007
Employees:	50
Headquarters:	Watertown, MA
Revenue:	N/A
University:	Massachusetts Institute of Technology
Federal Funding Agency:	Department of Defense (Army Research Office) Department of Energy
Initial Research Funding:	N/A

WiTricity Corp. is working to developing wireless electricity technology that will operate safely and efficiently over distances ranging from centimeters to several meters—and will deliver power ranging from milliwatts to kilowatts.

WiTricity's vision is to develop a family of wireless electric power components that will enable original equipment manufacturers in a broad range of industries and applications to make their products truly "wireless." Their goal is to provide wireless electric power delivered over room scale distances, with high efficiency.

The Story Behind the Company

The technology behind WiTricity was developed when MIT Professor Marin Soljačić set out to find a way to charge his cell phone wirelessly. A team of physicists, led by Soljačić, developed the theoretical basis for a novel method for wireless electric power transfer in 2005, and validated their theories experimentally in 2007. Their work at MIT was supported by grants from the National Science Foundation, the U.S. Department of Energy and the Army Research Office.

The technology behind WiTricity involves the magnetic fields of two properly designed devices with closely matched resonant frequencies that can then couple into a single continuous magnetic field. Soljačić's team showed how to use this phenomenon to enable the transfer of power from one device to the other at high efficiency and over a distance range that is useful for real-world applications.

WiTricity Corp. received its initial venture capital funding in November of 2007 from Stata Ventures and Argonaut Private Equity.