

Deshpande Center for Technological Innovation

The Deshpande Center for Technological Innovation serves as a catalyst for innovation and entrepreneurship by supporting research of MIT faculty and students and facilitating collaboration with entrepreneurs, venture capitalists, and innovative businesses. It carries out its mission through several activities, including the Grant Program, the Catalyst Program, the Innovation Teams (“i-Teams”) subject, and sponsored events. The center’s goal is to be able to accelerate the movement of technology from the laboratories at MIT into the commercial marketplace where the technology can have an impact.

The Deshpande Center was founded in 2002 through a generous gift of \$20 million from Jaishree and Gururaj “Desh” Deshpande, cofounder and chairman of Sycamore Networks, Inc. The center depends on the generous support of the entrepreneurial community at large and the MIT alumni communities, and seeks additional support to sustain its programs beyond the initial five years made possible by the Deshpande gift.

Leon Sandler, Executive Director, spearheads the Deshpande Center’s efforts, along with Charles L. Cooney, Faculty Director and Robert T. Haslam professor of chemical engineering. Guidance is provided by a steering committee that includes Ed Anderson of NorthBridge Ventures, Alex d’Arbeloff, Honorary Chairman of the MIT Corporation, Desh Deshpande, Robert Langer, Institute Professor, Thomas Magnanti, Institute Professor and former dean of the School of Engineering, Rafael Reif, provost, and Subra Suresh, dean of the School of Engineering.

Highlights

In the academic year 2007, the center continued to see more of its projects move towards commercialization. Since inception, the Deshpande Center has funded more than 70 projects with more than \$8 million in grants. Sixteen projects have spun out of the center into commercial ventures, 15 as startups and one as a license to an existing company. The 15 startups have collectively raised more than \$130 million in outside financing. Twelve venture capital firms have invested in these start-ups that now employ more than 130 people.

Spin-offs in Academic Year 2007

1366 Technologies

A company founded by Professor Emanuel Sachs, Department of Mechanical Engineering, in 2007 that offers a new manufacturing process to produce low-cost solar cells; received \$12.4 million in venture capital funding. <http://www.1366tech.com>

Arch Therapeutics

A company, founded by research scientist Rutledge Ellis-Behnke, Department of Brain and Cognitive Sciences, that creates a novel liquid that uses nanoscale protein fragments to promote blood clotting; in early stage funding. See <http://www.archtherapeutics.com/>.

SAAFWater

A company impacted by the work of senior lecturer Amy Smith, Department of Mechanical Engineering; it develops chlorine water-treatment cartridges for use in developing countries and is in early stage funding. See <http://www.saafwatezr.com/>.

Awards and Recognition for Grantees and Spin-offs

Deshpande Center grant recipients and spin-offs received notable media attention for their work.

Grant Recipients

Professor Carol Livermore's research of microscopic carbon nanotubes and their impact on energy generation and storage was featured in an article in the *Boston Globe* in May, 2008, titled "Thinking small could pay off big." She is an associate professor in the Department of Mechanical Engineering.

Professor Francesco Stellacci, Department of Materials Science and Engineering, discussed his work on nanomaterials, including a nanomesh wire that can absorb up to twenty times its weight in oil, with the MIT News Office in May 2008.

Spin-offs

Myomo, Inc. was granted clearance from the Food and Drug Administration (FDA) to market a robotic arm brace designed to help stroke survivors regain use of paralyzed limbs and relearn how to move affected muscles.

Pervasis Therapeutics, Inc., a pioneer in regenerative cell-based therapies and technologies, closed an additional \$9.75 million in funding to support further development of its Vascugel® technology currently in phase two clinical trials.

Active Spectrum was awarded an Army Phase I contract to develop miniature turnable bandpass filters for JTRS Cluster 5 applications, in early 2008.

The Boston Globe featured an article in April 2008, about advancements in 'digital dentistry' being made with the aid of a device called the Lava Chairside Oral Scanner. The scanner was developed by Brontes Technologies, part of 3M.

QD Vision, a company whose advances in nanotechnology leverage the light-emitting qualities of a new class of nanomaterials called quantum dots, announced in April 2008 that it raised \$9 million in venture-capital financing.

Vertica unveiled a new, on-demand version of its blazingly fast, grid-enabled columnar database that will enable companies to create large, high-performance analytic data marts; it was also a recipient of the Red Herring 100 Award that honors the top 100 private technology companies in North America, both in May 2008.

Deshpande Grant Program Awards

The Grant Program provides research funds that permit MIT faculty and students to create and investigate new technologies and support the transfer of new knowledge and technologies from the Institute to young companies. The Grant Program consists of two types of awards: Ignition Grants of up to \$50K and Innovation Grants of up to \$250K. Multiple experts in academia and industry review each application in two stages: pre-proposal and full proposal. The center announces awards twice annually.

The Deshpande Center awarded 17 grants in fiscal year 2008 totaling almost \$1.5 million. The awards support a wide range of emerging technologies.

Ignition Grants

With up to \$50K, Ignition Grants target projects focusing on novel, enabling, and potentially useful ideas in all areas of technology. Though it might enable only exploratory experiments to establish proof of concept, an Ignition Grant can position projects to receive further funding, such as an Innovation Grant, to take a concept to full development.

Academic Year 2007 Ignition Grant Recipients

Joel Dawson: A New Architecture for Highly Efficient Broadband RF Transceivers. Very energy efficient, high data rate transmitters for broadband wireless communications, which will increase battery life in handsets and reduce heat generation in base stations.

Utkan Demirci: CD-4 T Lymphocyte-Counting Microchip. A disposable CD-4 T lymphocyte-counting microchip providing fast, cost-effective on-site HIV virus monitoring to improve patient care in the developing world.

Douglas Hart: Digital Ear Canal Scanner. An in-ear, 3D digital scanner for custom fitting hearing aids, resulting in better hearing for hearing aid users.

Susan Lindquist: Developing Novel Strategies to Arrest Biofilms. The development of novel therapeutic strategies to combat difficult-to-treat bacterial biofilm infections.

Carol Livermore and Timothy Havel: Portable Power Sources. A new method for creating efficient long-lasting portable power sources that could change the battery market (renewal from Fall 2006 grant round).

Henry Smith and Rajesh Menon: High Throughput Nanoscale Imaging . An absorbance modulation technique enabling economical high-resolution, high-throughput nanoscale imaging for faster more flexible analysis of nano-structures.

Peter So: A 3 Dimensional Lithographic Microfabrication System. A 3D two-photon microfabrication system to rapidly build high resolution micro-scale structures.

Michael Stonebraker: Integrating the Deep Web with the Shallow Web. This project will provide sophisticated search capability for the “deep web” of pages dynamically generated from data entered into forms.

Jefferson Tester: Renewable Propane from Biomass. Technology to allow the production of propane from biomass such as sugar, starches, or cellulose.

Ionnis Yannas and François Berthiaume: Drug Delivery System to Enhance Healing of Wounds and Burns. Novel skin substitutes designed to accelerate blood vessel growth and improve wound and burn healing, and reduce the risk of infections.

Innovation Grants

With as much as \$250K, an Innovation Grant benefits projects that have established proof of concept and identified a research and development path and intellectual property strategy. Each grant helps a project advance its technology and reduce technical and market risk. The goal is to reach a point where investors would invest in a start-up to commercialize the technology, or where an existing company might license the technology and develop it.

Academic Year 2007 Innovation Grant Recipients

Yet-Ming Chiang: Low-Cost Continuous Drug Delivery. A new device to provide medicine through a portable delivery device to assist individuals with chronic diseases. (renewal from Fall 2006 grant round).

Patrick Doyle: Rapid Multiplexed Analysis for Molecular Diagnostics. A new method to perform multi-target bioassays using microparticles that may enable clinical bedside diagnostics and easier, less-costly diagnosis of disease. (renewal from spring 2007 grant round).

Elazer Edelman: Drug Delivery for Heart Surgery Patients. A unique means of safely administering perioperative drugs for heart failure patients.

Gerald Fink: Compound to Enhance Immune Stimulation. A compound to stimulate a more powerful immune response to specific monoclonal antibodies, potentially enabling development of effective new disease therapies.

Klavs Jensen: High Throughput Cell Microinjector. A new automated microinjector that promises high-throughput delivery of any molecule or nanoparticle into single cells to accelerate laboratory research (renewal from Spring 2007 grant round).

Keith Nelson: Power Source for Terahertz Imaging. A compact power source enabling safe and efficient terahertz imaging for explosive detection and other applications.

Tomás Palacios: Gallium Nitride High Electron Mobility Transistors. A new approach to the fabrication technology of Gallium Nitride semiconductors to reduce the cost and improve the performance of electronic products (renewal from Spring 2007 grant round).

Donald Sadoway: High-Amperage Energy Storage Device. A new technology to store high-amperage energy for industrial settings. (renewal from Fall 2006 grant round).

Catalyst Program

Volunteers from the business community are integral to the Deshpande Center's mission of helping MIT innovators achieve market impact.

Catalysts are a highly vetted group of individuals with experience relevant to innovation, technology commercialization, and entrepreneurship. Catalysts provide individual contributions to the center and do not represent any company interests in their role as Catalysts.

Catalysts are chosen based on the following qualifications:

- Experience in commercializing early-stage technologies and/or mentoring researchers and entrepreneurs, as well as industry expertise
- Willingness to proactively provide assistance to MIT research teams
- Willingness to abide by the time commitment, confidentiality, and conflict of interest guidelines
- Commitment to the interests of MIT researchers and the Deshpande Center

All Catalysts must sign a Catalyst guidelines document and agree to abide by the Deshpande Center's volunteer guidelines for managing privileged information and conflict of interest.

Innovation Teams

The Innovation Teams (i-Teams) subject is a full-credit subject taught jointly by the School of Engineering and the Sloan School of Management. The subject is designed for entrepreneurial and highly qualified graduate students throughout the Institute who want to help bring innovations from Deshpande Center-funded research projects to the marketplace. Guidance is offered by the project's principal investigators, faculty from MIT's Entrepreneurship Center, and Deshpande Center Catalysts, and each team is expected to create a go-to-market strategy for a technology developed by Deshpande Center-funded research.

The subject has been offered nine times by founding senior lecturer Ken Zolot, focused on go-to-market strategies for over 45 projects, and has engaged more than 225 students.

Deshpande Center Events

Through its sponsored events, the Deshpande Center seeks to bring together the components needed for MIT technologies to reach commercialization. These events connect faculty and students with members of the emerging technology industry.

IdeaStream Symposium

On April 29, 2008, the Deshpande Center held its annual IdeaStream Symposium aimed at connecting MIT researchers with the entrepreneurial community. The symposium

included presentations highlighting grantees at different stages, from new grantee to spin-off; an Innovation Showcase, at which MIT researchers pitched their innovative technology ideas and received market feedback from venture capitalists and successful entrepreneurs attending the symposium; and addresses by Subra Suresh, dean of the School of Engineering, and Commander Sunita L. Williams, NASA astronaut and the first person to ‘run’ the Boston Marathon in space. More than 300 entrepreneurs, industry executives, venture capitalists, and MIT researchers attended this year’s conference, which had the generous support of nine corporate sponsors.

Catalyst Events

Near the start of each semester the Deshpande Center arranges a small reception to celebrate the latest grant recipients. This event is held in advance of announcing the grant round to the general public. It is an opportunity for the grant recipient teams and Catalysts to get to meet and mingle with each other, and with staff and other volunteers. All new grant recipients are also asked to give a brief “elevator pitch” of their project.

Open House

The Deshpande Center hosted its premier fall event, the Open House, in November, 2007. The event served as a poster session for active grant projects and gathered over 200 members of the Deshpande Center community, including members of the MIT Corporation, for an evening of camaraderie and networking.

Other Collaborations

The Deshpande Center met with delegates from various national and international organizations to discuss the center’s and MIT’s approach to innovation and technology commercialization. The Deshpande Center’s staff also spoke at numerous forums and events across the United States and around the globe, particularly in Scotland, Singapore, and Spain, and the center is seen as an internationally renowned model for stimulating technological innovation.

Within the MIT community, the Deshpande Center actively collaborates with other members of MIT’s ecosystem, including the Technology Licensing Office, the Entrepreneurship Center, the Venture Mentoring Service, the Industrial Liaison Program, and numerous student organizations.

Administrative Changes

Carol Sardo joined the center as program coordinator as did Irene Laurens, as administrative coordinator.

Leon Sandler
Executive Director

More information on the Deshpande Center for Technological Innovation can be found at <http://web.mit.edu/deshpandecenter/>.