

## **Deshpande Center for Technological Innovation**

The [Deshpande Center for Technological Innovation](#) serves as a catalyst for innovation and entrepreneurship by supporting the 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 10.807/15.371 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 industry, the entrepreneurial community, and the MIT alumni communities to sustain its programs.

Executive director Leon Sandler 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 Hemang Dave; Desh Deshpande; Mark Gorenberg of Hummer Winblad Ventures; Robert Langer, Institute Professor; and Ian Waitz, dean of the School of Engineering.

### **Highlights**

In academic year 2012, the center continued to see more of its projects move toward commercialization. Since its inception, the Deshpande Center has funded more than 90 projects with more than \$11 million in grants. Twenty-five projects have spun out of the center into commercial ventures, 26 as start-ups and one as a license to an existing company. The 26 start-ups have collectively raised around \$400 million in outside financing.

### **Deshpande Grant Program Awards**

The Deshpande 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 \$50,000 and Innovation Grants of up to \$250,000. Multiple experts in academia and industry review each application in two stages: preproposal and full proposal. The center announces awards annually.

The Deshpande Center awarded eight grants in fiscal year 2012 totaling \$668,000. The awards support a wide range of emerging technologies.

## **Ignition Grants**

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.

## **Innovation Grants**

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.

## ***FY2012 Grant Recipients***

Daniel Anderson: An Ultrasound Pill for Localized Delivery of Therapeutic Compounds. Many drugs cannot be delivered orally as they cannot penetrate the gastrointestinal (GI) tract tissue at a sufficient rate to be effective. The only option is to inject them into patients. This project will develop an ingestible miniature “pill” that will apply an ultrasound signal to the GI tract while delivering a drug. The ultrasound will improve the uptake of the drug in the GI tract. This would allow a new class of drugs to be delivered orally, improving patients’ clinical outcome and quality of life.

Geoffrey Beach: On-Chip Diagnostic Device. There are many tests that clinicians send to a lab and wait hours or days for results. This project will develop a chip-based, point of care diagnostic technology for use in clinical settings to provide rapid test results (renewal from fall 2010).

Vladimir Bulović: MEMS for Large Area and Flexible Applications. A flexible paper thin microelectromechanical system (MEMS) array that can be used for sensing and actuation over large surfaces (renewal from fall 2010).

Gang Chen: Treatment of Water Produced from Shale Gas Extraction. In hydraulic fracturing of shale gas, large quantities of highly saline water are produced. This water needs to be treated to remove the dissolved salts. Current methods are expensive and energy intensive. This project will develop a low-cost solvent extraction process to remove the dissolved salts from this “frac” water, which would improve the economics of shale gas extraction.

Michael Cima: An Intra-peritoneal Implantable Drug Delivery Device for Ovarian Cancer. The delivery of chemotherapy drugs for ovarian cancer currently requires injecting the drugs via a catheter many times, over several weeks. The catheter creates a high risk for infection. This project will develop a device that can be implanted in the peritoneum once and deliver the drugs over a long time period. This would reduce infections and complications for patients.

Elazer Edelman: Tissue-Specific Adhesive Materials. Leakage after surgery, especially in the GI tract, is a problem that affects a significant number of patients. This project is developing a class of biocompatible adhesive materials that can be designed to match tissue type and used in surgery. These adhesive sealants would diminish leakage after surgeries, reducing complications and improving patient health (renewal from fall 2010).

Anthony Patera: Real-time Component-based Simulations for Design. Current computer simulations used in engineering design are very complex to create and very time consuming to execute. The procedures developed in this project offer two key advantages: first, the ability to build (once) parametric computational components and then reuse/assemble these components for rapid and accurate analysis of a wide variety of systems, and, second, the ability to rigorously and rapidly certify the accuracy of these predictions relative to a detailed-physics high-resolution finite element truth. These techniques will allow engineers to perform very fast, reliable, low-cost simulations and, hence, design and support better products.

Kripa Varanasi: Nano-Engineered Surfaces for Ultra High Power Density Thermal Management. Heat needs to be removed rapidly from high power electronics or the semiconductors will fail. This project will develop a system to very rapidly dissipate large amounts of heat from such devices (renewal from fall 2010).

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

The course is led by a faculty team of Charles Cooney and Dr. Luis Perez-Breva from the Department of Chemical Engineering and professors Edward Roberts and Fiona Murray from the Sloan School of Management. The subject has been offered 15 times, has focused on go-to-market strategies for over 100 projects, and has engaged more than 400 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 May 4, the Deshpande Center held its annual IdeaStream Symposium aimed at connecting MIT researchers with the entrepreneurial community. The symposium included presentations and posters highlighting grantees at different stages, from new grantee to spin-off. Roughly 200 entrepreneurs, industry executives, venture capitalists, and MIT researchers attended the 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 December 2011. The event served as a poster session for active grant projects and gathered nearly 150 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 many national and international universities and organizations to discuss the center's and MIT's approach to innovation and technology commercialization. Deshpande Center staff also spoke at numerous forums, conferences, and events; 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 innovation ecosystem, including the Technology Licensing Office, the Entrepreneurship Center, the Venture Mentoring Service, the Industrial Liaison Program, and numerous student organizations.

**Leon Sandler**  
Executive Director