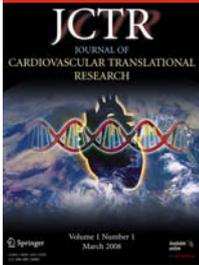


Innovation, Translation, Education



This feature section of JCTR will appear in every issue and include Guest editorials, new listings of biotech companies, and “primers” highlighting new information. We welcome your suggestions.

How to Translate Technology: from Bench to Bedside at the University of Minnesota

Barbara Nelsen

Abstract The unique people and processes within the University of Minnesota’s Office for Technology Commercialization are focused on developing discoveries through to commercialization, advancing scientific research from the bench to the bedside.

Keywords University of Minnesota · Technology Commercialization · Translational Research · Innovation Grant

The University of Minnesota is a world leader in developing innovative ways to treat and diagnose cardiovascular disease (CVD). The opportune collaboration between Medtronic founder Earl Bakken and the University’s open-heart surgery pioneer Dr. C. Walton Lillehei a half-century ago led to the development of the first wearable cardiac pacemaker. This partnership revolutionized the treatment of CVD, and the University has since continued to develop breakthrough innovations that improve and sustain lives.

Recently, university researchers created a beating heart in the laboratory. They decellularized rat hearts using a novel technique that left only the organ’s scaffold matrix behind. The matrix was then successfully repopulated with adult stem cells to create an intact beating heart. This technique, DECELL/RECELL, holds promise as a new treatment for CVD, generating new hearts through whole organ recellularization.

Doris Taylor, Ph.D., Director of the University’s Center for Cardiovascular Repair and principal investigator of the study, envisions using the recellularization process on virtually any organ. “I’d like to think that these kinds of innovations will continue to happen at the ‘U’ because the state realizes that we can change the world of medicine here in Minnesota,” she said.

The University’s Office for Technology Commercialization (OTC) bridges the gap between the lab and the marketplace, overseeing all aspects of technology commercialization and evaluating the commercialization potential of technologies like Taylor’s.

OTC’s Licensing Center identifies, protects, and markets university-developed inventions, focusing on evaluating commercial potential, obtaining patents, and licensing to the private sector for commercial development. In conjunction with the Licensing Center, OTC’s Venture Center aims to pair university inventions with a startup team to create a successful company that can bring the technology to market.

In addition, OTC provides resources to support University researchers in their efforts to develop their work beyond the bench. The office acts as a critical resource for faculty with early-stage ideas who need input as they develop their research plan. For inventions further along in development, OTC completes formal assessments that include an evaluation of scientific merit, intellectual property and regulatory issues, clinical development pathways, and time to market. The full-time professional staff members in the OTC are assigned to specific market segments, ensuring that both researchers and private sector partners receive prompt, knowledgeable service. In addition, OTC contracts with several marketing research firms to expand its capacity to assess technologies with domain experts. Through ongoing dialog and regular contact with researchers, OTC ensures that all technology disclosed to the office is appropriately evaluated. Information learned

from this rigorous evaluation is used to determine the best commercialization strategy.

For many promising technologies, the gap between basic research discoveries and the stage of development where a technology becomes interesting to an industry partner is a significant barrier to commercialization. This critical translational research is difficult to fund through government grants but essential in moving promising inventions forward. One way OTC works to bridge that gap is through innovation grants. Developed to move an invention closer to real world applications, these grants are part of OTC's new model of investing in and supporting early-stage technologies. For example, Dr. Taylor received an Innovation Grant to further her work on her DECELL/RECELL invention. These grants are not meant to act solely as funding mechanisms. They also provide industry-vetted development plans for preclinical development, prototypes, or working systems. By developing the technology further, the OTC offers commercial partners' well-developed life-changing innovations.

The office has the knowledge and expertise to achieve results, too. Executive Director Jay Schrankler built the Aerospace and Automation and Control Solutions businesses at Honeywell through innovative strategies to license

its technologies and renowned trademark. Associate Director Barbara Nelsen, PhD, has expertise in developing funding and commercialization plans, assessing market opportunities, and evaluating competitive technologies for the biopharmaceutical sector. The Venture Center's Director, Doug Johnson, has over 20 years of experience in the venture capital and investment banking industries and is the founding director of the Carlson Ventures Enterprise, a component of the University's MBA program.

In the medical arena, OTC's Strategy and Marketing Managers bring considerable talent and experience. Job requirements include significant scientific expertise as well as a minimum of 5 years experience in the medical device or pharmaceutical industries. They have held a variety of roles spanning all areas of technology commercialization including scientific research, clinical development, regulatory management, scientific affairs, and licensing.

The unique process developed by OTC's talented staff certainly follows the University's long tradition of discovery and commitment to advancing scientific research from the bench to the bedside.

For more information about technology commercialization at the University of Minnesota, visit www.research.umn.edu/techcomm.