

Driving *INNOVATION* Forward

Vanderbilt's Center for Technology Transfer & Commercialization provides professional commercialization services to the Vanderbilt community, thus optimizing the flow of innovation to the market and generating revenue that supports future research activities, while having a positive impact on the global society.



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Message from the Director



Automating MTAs

Throughout the current fiscal year, CTTC has focused on continuing its efforts to improve the way we serve the Vanderbilt community. We have identified more than a dozen key initiatives designed to create a significant and lasting impact on commercialization efforts at Vanderbilt. These include non-traditional marketing efforts for a

variety of technologies, efforts to create transparency and opportunities for engagement in the commercialization process, and the development of an automated system for processing and managing Material Transfer Agreements (MTAs).

Our focus on automating most MTAs stems from the significant, and often unnecessary, amount of time and energy required to transfer hundreds of thousands of materials between research institutions annually. Last year, Vanderbilt alone processed more than 850 MTAs. While we strive to process these agreements as quickly as possible, there are a multitude of antiquated steps that delay the process and ultimately slow down discovery-based research. By utilizing a number of widely accepted standardized agreements, the Office of Biomedical Informatics has helped us build an intuitive, automated system for processing of MTAs within its home-grown popular data management platform, REDCap.

Among the many benefits of this system are the enormous time and cost savings potential - it could save Vanderbilt hundreds of thousands of dollars in annual processing costs. It is fast, easy-to-use, and eliminates unnecessary review and negotiation. Additionally, it reduces administrative burdens, empowers researchers, increases tracking and feedback, and greatly reduces the opportunity for error or delay.

Vanderbilt is currently testing the system with a handful of outside institutions. We look forward to rolling out the system broadly at Vanderbilt in the coming weeks and expect it to have a significant impact on the rate at which we are able to transfer materials to and from other academic research institutions.

To request
an MTA,
click here.

Pictured above: Screen shot of the MTAShare Survey.

Stay Connected to CTTC

To stay informed of the latest innovation news, events and technology commercialization activities, visit our blog, CTTC Muse. There you will find everything from agreement signings to tips for inventors - such as how to publish and patent, entrepreneurship challenges to videos about Vanderbilt technologies and core research capabilities.

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Featured Inventor

"I really want to build things that make a difference." - Paul Harris, Ph.D.

In 1999, Paul Harris came to Vanderbilt to work in clinical research as a biomedical engineer. But what he quickly learned was that there was a huge untapped space in clinical research informatics, an area in which he would soon become a master.

"As I measured things and built analysis algorithms on those measurements, more and more my focus became the data itself," said Harris, now the Director of Biomedical Informatics and Associate Professor of Biomedical Informatics. "Looking across the spectrum of research domains, everything has this common denominator of data in research."

In the early 2000s, Harris began making the focus of his career data management platforms, research data operations, and things that "abstract and scale out at a large level, those things that would help the research enterprise regardless of the scientific domain."

One such platform developed by Harris and a team of programmers was the Research Electronic Data Capture (REDCap) tool, an online data management tool that, at the time of this publication, is being used at nearly 1,000 institutions around the globe. The system allows researchers to custom track data gathered through various research projects while also helping researchers comply with federal research laws.

"We saw a real need for a system that would help researchers collect data and remain in compliance with new healthcare IT laws," Harris said. "We knew that if we could give researchers the power to customize their surveys and case report forms, we could build a system that could support hundreds, even thousands of studies."

Fortunately, the system worked better than ever imagined. To date, REDCap has assisted more than 129,000 users with nearly 100,000 projects. Recently, an extension was developed, called MTAShare, for automating the processing and managing of Material Transfer Agreements (MTAs). The fast and easy-to-use system is expected to save Vanderbilt and other academic research institutions hundreds of thousands of dollars as well as significant administrative effort.



Click to watch.



"Researchers have told us that by putting the power in their hands, and making them own the data process, it has actually improved the science."

But REDCap is just one part of Harris' success story. He also created ResearchMatch, an online forum for clinical study volunteers and researchers to get connected.

After hearing a number of researchers discuss the difficulties associated with recruiting volunteers for their clinical studies, as well as getting a number of calls from the community inquiring about participating in a Vanderbilt clinical trial, Harris launched the site as a local initiative.

In 2008, when Vanderbilt was awarded a large Clinical and Translational Science Award, Harris and his team expanded the online matching site to a national registry in an effort to serve the national research community. Now, a little more than five years later, ResearchMatch has grown to nearly 52,000 registered volunteers, nearly 2,000 researchers, and 350 studies in progress.

"With all our work in the Office of Research Informatics, the thing that I most value is the fact that our tools and processes translate to real impact in the world," said Harris.

And at the end of the day, his motivation is really that simple.

Harris said, "I really want to build things that make a difference."

Learn more:



MTAShare

VU technologies bring real world experience to VU students



Click to watch.



“When I started teaching, it was very important for me to connect students to what we do in the real world and get them out of the classroom,” said John Bers, associate professor of the practice of engineering management, general engineering.

Suffice it to say Bers has accomplished that and more with his series of client project courses that starts with Technology Marketing, followed by Enterprise Systems Design and culminates with the Engineering Management Capstone Project: Innovation Strategy. Through these courses, students work closely with an industry partner to develop marketing strategies for innovative products, design business processes and systems, analyze market potential, and essentially, put all the pieces together for a successful product or business launch.

“Our students work with everyone from established companies such as Bridgestone and Nissan to smaller companies and startups,” said Bers, “several of which are based on technology developed at Vanderbilt.”

Just last semester, Bers placed a team of students with Universal Robotics, a software engineering company that spun out of

Vanderbilt and specializes in state-of-the-art artificial intelligence with multi-dimensional sensing and motion control. Universal Robotics was looking to expand its reach into medical diagnostics and relied on Professor Bers’ students to help analyze the market and develop a marketing strategy for the expansion. That project resulted in an internship for one of the graduating students and some solid market research and strategic ideas for Universal Robotics as they begin their expansion.

“Professor Bers’ Technology Marketing class provided an excellent incubator for business and academia to create something neither could on their own,” said Hob Wubbena, vice president of Universal Robotics, Inc. “The students, Marquicia Pierce and Alana Mann, provided energy and talent to define in detail a market opportunity. Universal gave them a real-world market situation to sort through as well as mentoring along the way. The end result speaks for itself – an internship is continuing to bring this opportunity forward for potential investment.”

(cont. p 5)

Another team of students worked with JetStream, a hybrid alternative energy system developed by a former Vanderbilt management technology graduate student. JetStream has enjoyed the program so much, it has now gone through all three of the engineering management courses. In the spring of 2013, students completed a capstone project that included the development of a business plan and a marketing strategy as well as an early prototype. This spring, in collaboration with the School of Engineering's senior design projects, a student team will build a prototype and work through design challenges. Senior design projects are required of all engineering undergraduates, and according to Bers, this collaboration is doubly beneficial.

"Through this connection, student teams experience the business and technical sides of a technology innovation, just as the founders of technology startups," said Bers. "We've done this successfully for two years now, with JetStream and another small company, and are hoping to build more of these connections for students and business sponsors."

As was the case with Universal Robotics, JetStream executives were quick to bring a student into the corporate mix on a more regular basis. JetStream has a student currently working through an internship and is eyeing other students for similar roles or entry level positions.

"From the minute we begin a project, we start thinking about follow-up opportunities like internships," said Bers. "We want to create a natural progression – from project team member to intern to entry level hire. We are now seeing that happen."

But, Bers pointed out, he expects that his courses help the business as much as they help the students. One aspect that his program stresses is the grooming of quality future employees.

"Our students focus on designing a full roadmap for these companies and learning how to coordinate all the moving pieces and help the company progress," said Bers.

Take for example one of 2014's early projects. After reaching out to CTTC's New Ventures Team, Bers was introduced to a colleague who now serves as a project sponsor. Chemical Engineering Professor Matt Lang developed a mobile application that brings 3-D video recording and content generation to smart phones. A product like this has numerous potential applications - including



*Marquicia Pierce, Vanderbilt University
Graduate Student, Intern Universal Robotics*

medicine and surgery. A team of Bers' students will fully assess the technology this spring as part of the Capstone Project.

"Solid relationships between the Vanderbilt research community, students and companies are forming out of this program," Bers said. "The ongoing reinforcement and evolution of our program is just amazing."

But Bers is quick to add that the pressure is on.

"The students have to deliver," Bers said. "I want these clients to get quality products and information. I want these clients back." Project sponsors must make an upfront commitment of one hour a week mentoring the student team. Students will give presentations at the middle and end of the course.

To learn more, contact Professor John Bers at john.bers@vanderbilt.edu.

New U.S. Patents

Examples of compelling technologies recently patented by Vanderbilt are:

- 8,598,345 - Substituted heteroarylamide analogs as mGluR5 negative allosteric modulators and methods of making and using the same, P. Jeffrey Conn and others at the Vanderbilt Center for Neuroscience Drug Discovery
- 8,609,614 - GBS toxin receptor compositions and methods of use, developed by Carl Hellerqvist from the Biochemistry Department and Changlin Fu
- 8,615,127 - System and method for point-based rigid registration with anisotropic weighting, developed by John Michael Fitzpatrick in the Department of Electrical Engineering and Computer Science
- 8,617,521 - Phage antibodies to radiation-inducible neoantigens, developed by Ray Mernaugh in the Biochemistry Department and Dennis Hallahan, formerly at VUMC
- 8,623,098 - Systems and method for volitional control of jointed mechanical devices based on surface electromyography, developed by Michael Goldfarb, Huseyin Atakan Varol, and Kevin Ha in the Department of Mechanical Engineering
- 8,623,555 - Electrode useable in electrochemical cell and method of making same, developed by Weng Poo Kang, Supil Raina, Shao-Hua Hsu, and SiYu Wei in the Department of Electrical Engineering and Computer Science
- 8,632,988 - Pathogen hemoglobin receptor specificity for human hemoglobin, developed by Eric Skaar and Glib Pishchany in the Department of Pathology, Microbiology and Immunology
- 8,635,940 - Solenoid Valve Assembly, developed by Michael Goldfarb and Xiangrong Shen in the Department of Mechanical Engineering and Physics and Astronomy, respectively

2014 Tech Venture Challenge

Annual technology commercialization competition is in full swing

Last year, a team of five graduate students (pictured right) won the competition with their in-depth commercialization plan for a wireless 12-lead ECG developed by Franz Baudenbacher, Ph.D., and Susan Eagle, M.D., from the Department of Engineering and Cardiovascular Anesthesiology, respectively. The students, Raymond Lui, Sarajane McMahon, Shen Yin, and Akosua Badu-Nkansah, were mentored throughout the competition by entrepreneur Josh Nickols, Ph.D., who is also the CEO of InvisionHeart, a startup company now working to commercialize the wireless system.



It's a competition like no other. Novel technologies, developed right here at Vanderbilt, are handed off to Vanderbilt student-teams, who create full-fledged commercialization strategies for the inventions.

This year, the Challenge started in early February when roughly 50 Vanderbilt University graduate and professional students - from the engineering, medical, law and business schools - convened at the Owen Graduate School of Management to hear pitches for five new Vanderbilt inventions that will be the focus of the 2014 Tech Venture Challenge:

Taculator (VIDEO) – An electronic tool that can be used by Healthcare providers, managers, and leadership to ensure that the provider's "visit template" is robust enough to achieve profitability expectations. Inventors: Paul Schmitz and Jeff Rosedale

GrafDefense – A technology, termed "nano-polyplexes" for the pre-treatment of saphenous vein grafts ex vivo to improve graft patency. Inventors: Craig L Duvall, Brian C Evans, Colleen M. Brophy, Kyle M. Hocking, and Christopher E Nelson

Oto-Pilot – A medical image analysis process that uses cochlear implant recipients' clinical CT (Computed Tomography) images to determine implant settings that lead to significantly better hearing outcomes. Inventors: Jack H. Noble, René H. Gifford, Robert F. Labadie, and Benoit M. Dawant

Dexterous Endoscopic Graspers – A DaVinci surgical robot without the robot, called Dexterous Endoscopic Graspers, which is a hand held surgical tools with dexterous wrists. Inventors: Ray Lathrop, Robert Webster, James Netterville, Stanley Duke Herell, and Arundathi Prasad

Optical 3-D Scanner for Breast Tumor Margin – A 3D scanner that uses light to analyze excised breast tissue and assess the margins for presence of tumor cells within 2 mm of its surface. Inventors: Quyen Nguyen, PhD, Anita Mahadevan-Jansen, PhD, Mark Kelley, MD, and Mary Dockery

After the session, students ranked the technologies in order of preference and were assigned to teams. The teams will work with area mentors, including several from CTTC, and present final commercialization plans in April.

CTTC Services

CTTC supports Vanderbilt researchers who seek to commercialize intellectual property by providing a variety of services. Some of the services are more widely known, while others may be less obvious.

To give you an idea of how we may be able to assist you, here is a snapshot of the services we regularly provide:

- **Evaluating** commercial opportunities and market potential for novel technologies
- **Filing and prosecuting** patent applications
- **Marketing** technologies to industry
- **Negotiating** license agreements and options
- **Executing** various agreements, including: license, material transfer, confidentiality, interinstitutional and research collaboration
- **Facilitating** sponsored research and clinical trial agreements
- **Monitoring** licensee compliance
- **Tracking** milestones and collecting royalties
- **Distributing** payments to inventors, labs, departments, centers, and schools
- **Assisting** in new venture assessment and development
- **Educating** through departmental talks and presentations about intellectual property protection and commercialization as well as educational seminars on commercialization-related topics



SBIR/STTR workshop led by Mark Henry in Stevenson Hall.

Register now for upcoming SBIR/STTR Workshop

As part of its ongoing outreach efforts, CTTC staff regularly host departmental talks and presentations to share information about CTTC and services offered to the Vanderbilt community. In 2013, the Center's New Ventures Team expanded on this effort by launching an Entrepreneurial Boot Camp series that includes a number of workshops throughout the year. The series covers various topics related to commercialization of intellectual property and how entrepreneurship aids commercialization.

Tuesday, April 15, from 10:30 - 1:30 p.m., CTTC's New Ventures Team will host the next event in its series, an **SBIR/STTR Workshop** for Vanderbilt faculty, staff and students. Participants will learn about funding opportunities through national Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grants. Participants will also take away some useful strategies for winning these grants. The session will be led by Mark Henry, a nationally renowned SBIR/STTR grant-writing expert and founder of Grow Emerging Technologies, LLC. Lunch will be provided. To learn more or register, contact Heather McMillan at heather.a.mcmillan@vanderbilt.edu.

What's on Deck

Technology Catalogs

CTTC is currently developing a number of themed technology catalogs to assist in the marketing, and ultimately licensing, of new technologies. Catalogs currently in production include (i) medical devices, (ii) medical imaging technologies, and (iii) biologics. These catalogs not only identify the technologies within each field, but also show where each falls on the research and development pipeline.

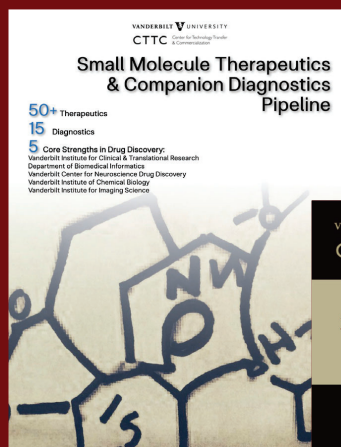
Online Invention Disclosure Form

CTTC's new online invention disclosure form is nearing final stages of development. This online submission tool will assist inventors in submitting invention disclosure forms in a manner that is faster, easier and more efficient for the inventor while allowing CTTC to capture data more consistently.

Expansion of MTAShare

As mentioned previously, Vanderbilt is now using MTAShare to manage and process outbound Material Transfer Agreements to other academic or not-for-profit institutions. Soon, the system will be expanded to allow other academic and not-for-profit research institutions to adopt MTAShare for use with their outbound MTAs. This next step is critical as the **benefits and level of automation scales with the number of system users.**

To better serve Vanderbilt's research community, and assist in the commercialization of technologies, CTTC has developed a number of industry-specific technology catalogs that show the university's current pipeline of technologies.



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Center for Technology Transfer
& Commercialization

Have a question for CTTC?

Feel free to call our main office line at 615.343.2430
or email cttc@vanderbilt.edu.

Visit us online at www.vanderbilt.edu/cttc

