



# CTTC

Center for Technology Transfer  
& Commercialization

# FY17 HIGHLIGHTS

Our annual Highlights report provides a summary of CTTC's activities over the past fiscal year, providing both a statistical snapshot of our productivity as well as sketches of our higher profile programs, contributions to entrepreneurship and other commercial activities. While we continue to place great emphasis on our core function of helping Vanderbilt innovators turn their ideas into new products and services, I wanted to highlight here an emerging area of focus for CTTC - contributing to large scale industry research collaborations.

CTTC engages with hundreds of companies every year as part of our core effort - commercializing Vanderbilt innovations. For the past five years, CTTC has also leveraged these industry interactions to develop partnerships between our industry partners and research laboratories at Vanderbilt.

These research opportunities have typically arisen in one of two ways. One, an industry partner licenses Vanderbilt technology but also has an interest in supporting the inventing laboratory's ongoing research to advance that technology. Two, an industry partner is not yet ready to license a technology but believes it to have scientific merit with potential commercial value and is willing to sponsor research to advance the technology to test its commercial potential. A summary of some of these activities is reported on the back cover of this Highlights Report - see category Sponsored Research Related to Licensed Technologies.

Connecting industry partners to Vanderbilt research capabilities is an important way that CTTC has contributed to the Vanderbilt research enterprise by generating millions of dollars in research support every year. Although the benefits of these "project-level" collaborations are tangible, they have been episodic in nature. This led us to ask how we could facilitate these relationships on a more consistent basis by taking the lead in creating these industry relationships based on CTTC's rather unique relationship with industry.

This line of thinking was consistent with the objectives of Vanderbilt's Office of the Vice Provost for Research (VPR) and its desire to engage with industry in a more in-depth and sustainable manner. CTTC, therefore, has joined this effort to develop more "program-level" industry collaborations - collaborations with industry that involve multiple projects, span several Vanderbilt research laboratories in different departments and schools, are multi-year collaborations and provide additional financial support for Vanderbilt research efforts. At the same time, these program-level collaborations will provide commercially valuable research results that benefit our industry partners.

In FY18, CTTC will be developing a more sophisticated strategy for enabling these program-level collaborations in conjunction with the Office of the VPR and the Vanderbilt University Research Council (VURC). A VURC working group chaired by Professor Doug Adams (Department Chair, Civil and Environmental Engineering) and Professor Laurie Cutting (Associate Director, Kennedy Center) has been formed to provide strategic guidance and direction to this effort. As these efforts mature and bear fruit, we will report their results and impact in future editions of this Highlights Report and in other publications

Should you have any questions about our metrics, our programs, or our operations, please do not hesitate to contact us.

Alan Bentley  
Assistant Vice Chancellor  
Center for Technology Transfer & Commercialization

## START UP SUCCESS

*Startup companies based on Vanderbilt technology have done well. Below are two companies who recently completed their second round of capital raising:*

### **IQuity, Inc.**

IQuity is a life science technology company that was launched in 2015. The company licensed technology developed at Vanderbilt by Dr. Thomas Aune, Founder and Scientific Advisor, and Dr. Chase Spurlock, CEO. It is creating products that leverage machine learning methods to deliver breakthrough RNA diagnostics and analytics. One of its first products, Isolate, utilizes the company's proprietary algorithms to test for autoimmune diseases with over 90% accuracy and allows providers to shorten the diagnostic process for autoimmune disease and related conditions.

The company raised \$2,000,000 in 2015 and an additional \$2,400,000 in 2017 to support the creation and staffing of a clinical lab in downtown Nashville. The company will also receive funding of up to \$1,300,000 from federal SBIR and NIH grants and have applied for \$150,000 more in state matching funds based on the SBIR grant.

### **nPhase, Inc.**

nPhase, Inc., a next generation cloud technology company that is commercializing the "Research Electronic Data Capture" (REDCap) software developed by Dr. Paul Harris and others in the Department of Biomedical Informatics at Vanderbilt University Medical Center, closed on its second round of investment in June of this year. The company's product, REDCap Cloud, is experiencing broad adoption around the globe by major academic research centers and life science companies who require a robust electronic data capture application that is 21 CFR Part 11 validated to support regulated clinical research.

The funds raised will be used to scale sales, marketing and client implementation teams and to continue development of the REDCap Cloud suite of e-clinical software as a service applications.

## LICENSES TRANSACTIONS

### **BOEING**

In FY17, Vanderbilt entered into a license agreement with Boeing for their Defense Systems unit to utilize the Fault Adaptive Control Technology (FACT) software. FACT is an interactive development tool used for modeling physical systems allowing the user to design complex systems with built-in fault diagnostic capabilities. For airplanes, it allows maintenance crews to identify parts and systems that need repair before a critical malfunction. The FACT software was developed by Gabor Karsai and others in the Institute for Software Integration Systems.

### **ZIKA ANTIBODIES**

Interest in licensing of human monoclonal antibodies to Zika virus remained high in FY17. In total, 6 options/licenses for Zika antibodies were executed for the field of vaccines. These agreements included non-exclusive licenses in the field of vaccines, as well as exclusive option agreements in the fields of diagnostics and therapeutics. These antibodies were developed by James E. Crowe, Jr. of the Vanderbilt Vaccine Center and were some of the first available research tools available when Zika virus became a topic of interest.

### **BAXTER HEALTHCARE**

Vanderbilt entered into an exclusive license agreement with Baxter Healthcare Corporation, a global leader in the development of innovative hospital products, for a hemodynamic monitoring technology. The technology allows doctors to more efficiently monitor fluid shifts in hospitalized patients and may be especially useful for monitoring dialysis and congestive heart failure patients. It was developed by Susan Eagle and Richard Boyer, from the Department of Anesthesiology, Franz Baudenbacher, from the Department of Biomedical Engineering, and Coleen Brophy, Kyle Hocking, and Kevin Sexton from the Department of Surgery.

### **BOEHRINGER INGELHEIM**

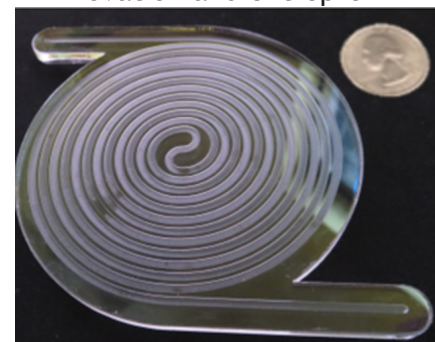
In FY17 Vanderbilt entered into research and license agreements with Boehringer Ingelheim, a multinational pharmaceutical company, for the development of potential drug compounds designed to modulate Ras protein activation by targeting the Son-of-Sevenless protein (SOS). These proteins play critical roles in the development of cancer, particularly blood based and lung cancers. The novel compounds were developed by Stephen Fesik and his team from the Department of Biochemistry.

## STUDENT SUCCESS

### Path Ex, Inc.

CTTC provides ongoing mentorship and advice to Vanderbilt students interested in innovation and entrepreneurship. One student-entrepreneur, Sinead Miller, PhD, a former student in Biomedical Engineering and now Research Assistant Professor in that department, launched a new startup company in 2017, and is getting substantial traction with regional entrepreneurial and investment communities.

Dr. Miller's company, Path Ex, Inc, is designing a novel system for removal of toxic materials from the blood of infected patients, thereby preventing the onset of sepsis. Sepsis is a major clinical problem, affecting over 1 million Americans per year and accounting for at least 250,000 deaths annually. Patients with sepsis are administered a variety of antibiotics without knowledge of which may treat the bacteria causing the underlying infection. This suboptimal treatment is pursued because the tests currently used to identify the specific bacteria take time to complete. The Path Ex product filters such bacteria out of the blood system, halting the onset or progression of sepsis.



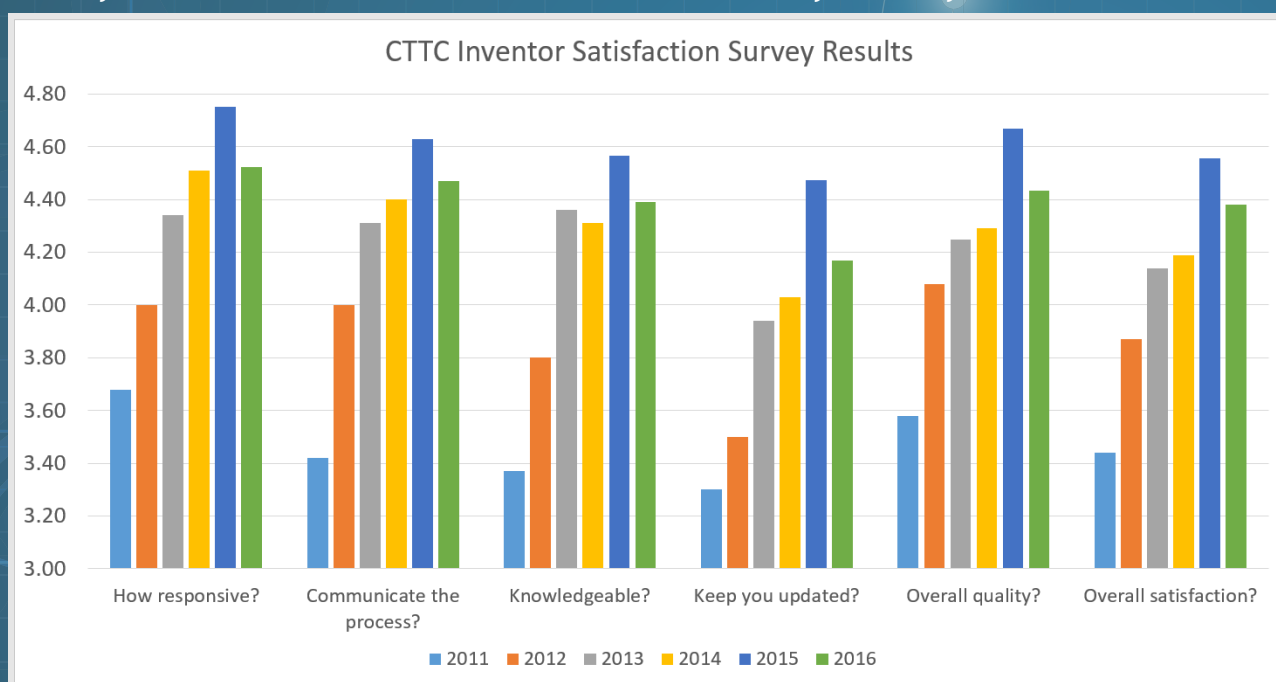
*Path Ex is an extracorporeal blood cleansing device*

Dr. Miller has participated in Vanderbilt entrepreneurship educational programs and regional competitions to assist startups, including IMPACT, Tech Venture Challenge, 36/86 and Zero to 510k (Memphis). Most recently Dr. Miller won the Louisiana Startup Prize business plan competition.

## INVENTOR SATISFACTION

Each year in the fall, CTTC hosts an Inventor Satisfaction Survey to assess Vanderbilt's inventors' level of satisfaction with our office and the services provided.

The fall 2016 survey showed that the overall trend continues to increase year over year.



# THE NUMBERS

Financial Data	FY17	3yr Average*
Revenue Generated	\$9,586,475	\$8,412,070
Sponsored Research Related to Licensed Technologies	\$12,149,966	\$11,476,245
<b>Disclosures/Sources</b>		
New Invention Disclosures	179	176
First-time Vanderbilt Disclosure Submitters	150	155
Total Individual Vanderbilt Submitters	346	344
Total Different Departments, Divisions, Institutes & Centers Represented by Submitters of New Disclosures	74	71
<b>Patent Applications and Patents</b>		
U.S. Patent Applications Filed	239	214
U.S. Patents Issued	51	50
<b>Agreements</b>		
Licenses and Options Executed	87	87
Vanderbilt-Related New Ventures	8	8
Material Transfer Agreements (MTA) Reviewed	1,012	1,022
Incoming Materials	780	752
Outgoing Materials	232	270
Confidentiality Agreements Executed	127	117
End-User Licenses Executed	151	156
Inter-Institutional Agreements (IP jointly owned with other research institutions)	10	7
<b>Research Support Activities</b>		
Sponsored Research/Collaboration Agreements Reviewed	60	55
Clinical Trial Agreements Reviewed	37	31

\*3yr average includes FY15, FY16, FY17



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