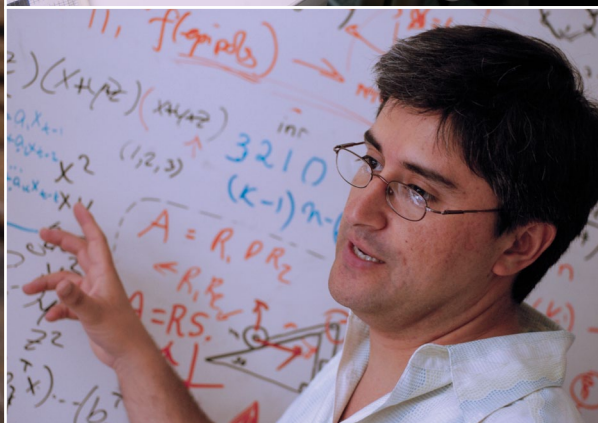
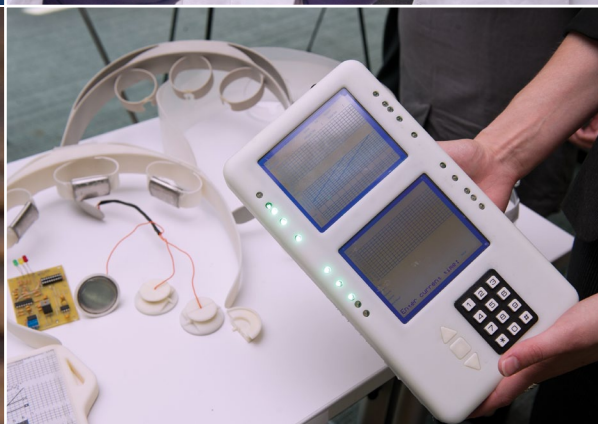


# THE PROMISE OF INNOVATION

FISCAL YEAR 2011 ANNUAL REPORT



# THE PROMISE OF INNOVATION

ARIS MELISSARATOS

Senior Advisor to the President  
Johns Hopkins Enterprise Development

WESLEY D. BLAKESLEE

Executive Director

GLEN L. STEINBACH

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Director, Intellectual Property

PETER BALL

Director, Contracts

HELEN MONTAG

Senior Director, Corporate Relations  
Johns Hopkins School of Medicine

ELIZABETH GOOD MAZHARI

Director, Ventures

MONTSERRAT CAPDEVILA

Director, Sales, Marketing, and International Relations





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# A MESSAGE FROM ARIS MELISSARATOS



*Aris Melissaratos  
Senior Advisor to the President  
Johns Hopkins Enterprise Development*

Our progress in the last 5 years indicates that a substantial cultural transformation has been achieved in the way the university treats and emphasizes the importance of technology transfer. President Daniels, Provost Minor, and all the deans are strong supporters of our mission, and in turn, they have energized the vice deans and department chairs to encourage more participation in invention disclosures and commercialization activity. The support from university leadership has been exemplary, and we could not have hoped for a better working relationship.

This additional emphasis and acceptance has yielded key results, including doubling our revenue to \$15.25 million this past year, and more than tripling the number of companies created as a result of our technology offerings (having formed 19 start-ups this year, resulting in a total of 51 new companies formed over the last 4 years). The number of invention disclosures has almost doubled and the office efficiency has continued to improve to handle the additional load.

This progress has been achieved because the office has benchmarked our peer institutions and has continued to strive to be the best among those universities. We are succeeding at just about every parameter of interest, with the exception of total revenue because we are missing the potential revenue that could accrue from the past decades of indifference toward commercialization and monetization of Johns Hopkins' intellectual property (IP) portfolio. We believe we are now on an appropriate path to rightfully balance the traditional Johns Hopkins values of research excellence, as demonstrated by our mottos of 'The Truth Shall Make You Free' and 'Knowledge for the World.' We intend, with the help of university leadership and our research faculty, to continue to improve our commercialization activities without impeding our well earned reputation as the nation's #1 research university.





## A MESSAGE FROM WESLEY BLAKESLEE

Fiscal Year (FY) 2011 marked the fifth year in a row with new records at Johns Hopkins Technology Transfer (JHTT) for disclosures, licenses, and total revenue. All of our numbers came in above our forecast due to the continued hard work of our entire staff. These numbers were not just a small increase; they were substantial. Disclosures increased to 409 from FY 2010 (355 disclosures). Revenue grew to more than \$15 million, and licenses exploded to 159, buoyed significantly by a software product that was licensed multiple times. Our largest gain however, was in start-up companies, which rose to 19 this year. This is especially impressive when you consider the difficult economic environment facing our nation.

The difficult economic environment is reflected in the funding for the 19 start-ups created this year, but the entrepreneurs who have acquired our technologies and are building their companies are no less enthusiastic regarding their prospects for development. Meanwhile, our start-ups from the preceding 3 years have continued to attract funding and business development opportunities. One of our FY 2008 companies entered into a significant deal with a major pharmaceutical company to provide substantial collaboration and support for the development of a cancer therapeutic. The funds flowing to JHTT as a result of this arrangement were significant and helped us to achieve our goals for this year.

Our biggest concern and focus continues to be our patent costs. With the near doubling of disclosures over the last 5 years, patent costs were inevitably bound to rise. Containing those costs and making good patenting decisions is a significant challenge. To meet this challenge, we added an additional attorney to the Attorney Patent Group, which we began in FY 2010, to increase our capacity for in-house work. In addition, as the year ended, we completed plans that will evolve how we manage our patent portfolio. For example, in FY 2012 we will be creating an Intellectual



*Wesley D. Blakeslee  
Executive Director  
Johns Hopkins Technology Transfer*

# Message From Wesley Blakeslee

Property Management Group. This group will manage all of the office's patent prosecution, both inside and outside counsel, which will not only alleviate the burden on our very busy licensing staff, but will also permit us to focus more directly on managing our patent portfolio and our patent costs. In early FY 2012 we hired Jill Uhl to manage this new group.

As the entire biopharmaceutical industry evolves, so too must our methods of engaging our target companies. Our reorganization effort for FY 2012 will allow us to expand our "demand-pull" marketing process to create relationships beyond new licenses with our engineering and biomedical industry partners. We will be expanding our marketing team, and the advent of our Intellectual Property Management Group will also free up our licensing team to better engage with our customer base and provide the best opportunities for success in FY 2012.

At the invitation of the Spanish biotechnology community, we were invited to participate in BIO Spain, the premier biotechnology conference in Spain, in Pamplona. Following that meeting we travelled to Barcelona, where we signed a cooperation memorandum of understanding (MOU) with Biocat, the biotechnology industry of Catalonia. With Biocat, we co-hosted a significant reception at the Johns Hopkins School of Advanced International Studies (SAIS) during this year's BIO conference in Washington, D.C. with more than 450 attendees.

We were also invited to speak at the North American Technology Transfer Summit in Toronto, Canada

and the European Technology Transfer Summit in Strasbourg, France. Following that appearance we traveled to Lyon where we met with numerous companies of Lyonbiopole.

These collaborations and networking opportunities have resulted in numerous company visits to JHTT, including a significant meeting and presentation by GlaxoSmithKline (GSK) Tres Cantos, the nonprofit entity supported by GSK focused on neglected diseases and diseases of the developing world. We have already entered into several cooperative agreements with GSK Tres Cantos as a result of this interaction. Costs of the foreign travel were covered by the organizations who invited us. For more information about our international efforts, visit the JHTT Features section of this report.

In other FY 2011 innovations, we announced our new Deals on Wheels Program at the 2011 BIO International Convention. This new program will allow us to engage with the significant biopharmaceutical presence in Montgomery County, Maryland. Adopting the vision of our president that we are 'One Hopkins—One Maryland,' we have made it a priority to engage directly with potential partners throughout our state. Deals on Wheels will in no way diminish our efforts in other parts of the state, particularly in Baltimore City, but will be a focused outreach to the biomedical community in Montgomery County. To assist us in these efforts, we have partnered with the Montgomery County Economic Development Office.

In addition, our corporate outreach has continued to attract clients to

the Science and Technology Park at Johns Hopkins, developed by Forest City New East Baltimore Partnership, and the initial building is nearly full.

There are many challenges facing us in FY 2012, but with our strong business plan and the hard work ethic of this office, I am confident that we will be able to rise above them and continue to grow this important office and our work. Integrating our processes with an entirely different organizational structure will be a challenge, but the rewards will be worth it. Managing our patent costs will be difficult as well, but we have strong personnel in place to tackle this area head on. We have experienced little turnover in the last 5 years; our licensing staff continues to grow in knowledge and experience, and we believe we will meet and exceed these challenges.





## MISSION, VISION, AND GOALS

### MISSION

Johns Hopkins Technology Transfer's mission is to 1) protect the intellectual property of Johns Hopkins faculty and to commercialize these inventions for the public good and 2) to bring the benefits of discovery to the world.

### VISION

To be the premier intellectual property administration center for Johns Hopkins University (JHU) and its entities by:

1. Helping Johns Hopkins inventors fulfill their intellectual and commercial potential.
2. Protecting Johns Hopkins inventions through the filing of patent applications and the licensing of technologies for commercialization.
3. Developing partnerships between Johns Hopkins inventors and external parties interested in leveraging JHU research or materials for academic or corporate endeavors.
4. Providing and coordinating licensing agreements, start-ups, core facilities, sponsored research, material transfer agreements, research collaborations, and clinical trial opportunities to those best able to bring JHU technologies to market.
5. Promoting the availability of essential medicines for the world.

### GOALS

1. To strengthen partnerships with large pharmaceutical companies, entrepreneurs, venture capitalists, and academic and corporate entities that can partner with us to bring Johns Hopkins technologies to the marketplace for the public good.
2. To ensure the integrity of, and a respect for, the science and inventions that are produced at Johns Hopkins.
3. To identify the most efficient and effective ways to disseminate Johns Hopkins technologies to the public.



## A YEAR IN REVIEW

### JHTT FEATURES

**T**he Technology Transfer Office was on the go this year and getting noticed. Recognizing the value of the growing international biotechnology and life science markets, we worked closely with foreign companies and embassies in an effort to spark new collaborations and opportunities for commercialization. Below is a summary of our accomplishments.

#### INTERNATIONAL RELATIONS

##### **Canada**

JHTT was invited to be the closing speaker at the BioPartnering North America Conference held in Vancouver, Canada. BioPartnering North America is one of the largest life science conferences in North America with more than 800

decision-makers and industry leaders from over 30 countries in attendance. JHTT partnered with Forest City Science and Technology Group to present a session called New Academic-Industry Partnership Models to more than 100 conference attendees.

##### **China, Singapore, and the Enterprise Europe Network**

JHTT was visited by a series of international enterprise organizations, including the Jiangsu Centre of International Technology Transfer, International Enterprise Singapore, and the Dutch Chapter of the Enterprise Europe Network. During their visits, JHTT led these international guests on tours of the Science and Technology Park at Johns Hopkins, developed by Forest City New East Baltimore Partnership, and arranged meetings between

these representatives and Johns Hopkins faculty members. At the end of these visits, each international party expressed an interest in continuing communications and possibly establishing a long, working relationship with Johns Hopkins.

##### **Spain**

In FY 2011, JHTT traveled to BIO Spain, a premier biotechnology conference in Europe that is attended by more than 640 companies representing countries such as France, Belgium, the United Kingdom, Germany, and Switzerland, among others. Here, JHTT organized a panel discussion on International Technology Transfer, in which JHTT's Executive Director Wes Blakeslee was a panelist. In addition, JHTT conducted partnering meetings with Spanish biotech companies, including GSK Spain, Genetrix, and Esteve. During





## FY 2011 AT-A-GLANCE

\$15

Million  
Total  
Revenue

409

Invention  
Disclosures

159

New  
Licenses

19

New  
Start-Up  
Companies

1,917

Active  
Patents

3,283

Material  
Transfer  
Agreements

the conference, Executive Director Blakeslee met with H.E Cristina Garmendia, the Spanish Minister of Science and Technology, and extended to her a personalized gift from President Daniels.

During our visit to Spain, JHTT signed a MOU with Biocat, the organization that represents the BIO region of Catalonia. It is our intent that through this MOU, JHTT and Biocat will be able to collaborate on future projects that will help boost technology commercialization and development, research partnerships, and enterprise creations between Catalonia, Johns Hopkins entities, and the State of Maryland. Since the MOU signing, Biocat has traveled to JHTT twice to discuss potential partnering opportunities.

## A Year in Review



*Executive Director Wes Blakeslee with H.E. Cristina Garmendia, the Spanish Minister of Science and Technology. While in Spain, JHTT also attended BIO Spain, a leading biotechnology conference in Europe that hosts more than 640 companies representing countries such as France, Germany, Belgium, the United Kingdom, the United States of America, Switzerland, and more.*

Collaborations between JHTT and Spanish companies continued to flourish even after our visit when a group of scientists from GSK Tres Cantos Research Center (Madrid, Spain) visited Johns Hopkins to officially present their Open Lab Program, an \$8 million program established to help fund research and the development of new medicines aimed at aiding developing countries. Through the Open Lab Program, scientists

are encouraged to tap into their expertise, knowledge, and company infrastructure, while pursuing their own projects as part of an integrated drug discovery team.

During their visit, GSK held one-on-one meetings with 20 Johns Hopkins investigators in the fields of malaria and pulmonary tuberculosis. To date, GSK has a number of translational collaborations with many of the inventors they met with.

### France

JHTT also traveled to France in FY 2011 at the invitation of BioCluster of Lyon (Lyonbiopole). During this visit, JHTT representatives met with a number of local biotech and biomedical companies, included Sanofi Pasteur, Biomerieux, and Merial. At Sanofi Pasteur, JHTT toured their research and manufacturing campus, where Sanofi hoisted the U.S. flag in our honor. Since JHTT's visit to France,

*Senior Director of Finance and Administration Glen Steinbach and Director of Sales, Marketing, and International Relations Montserrat Capdevila stand in front of Sanofi, a French biotech company. During JHTT's visit to France, Sanofi raised the American flag at their office in honor of their relationship and partnership with Johns Hopkins.*

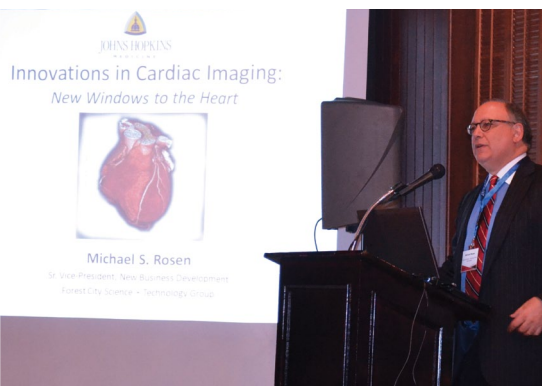




Senior Vice President of New Business Development at Forest City Science and Technology Group Michael Rosen presents at JHTT's Innovations in Cardiac Imaging: New Windows to the Heart Conference.

Director of Ventures Elizabeth Good Mazhari talks about how the Johns Hopkins Alliance for Science and Technology Development event can help start-up companies. To learn more about the Alliance meeting, watch our video at <http://tinyurl.com/Alliance-Video>

Maryland Governor Martin O'Malley with the bio-ambassadors at the 2011 BIO International Convention held in Washington, DC.



Meril, Sanofi-Aventis's animal health arm, has visited Johns Hopkins in order to further explore possible partnerships.

## FIELD EVENTS

### Innovations in Cardiac Imaging: New Windows to the Heart

In May, JHTT hosted the Innovations in Cardiac Imaging: New Windows to the Heart Panel Discussion. This all-day event featured renowned scientific and industry professionals who discussed the latest research and advancements in cardiac imaging. More than 100 people attended the event.

### Johns Hopkins Alliance for Science and Technology Development

Each year, Johns Hopkins Alliance for Science and Technology Development, along with members from the University of Maryland's alliance, gather to review inventor presentations and award the creator of the most commercial invention

with a monetary award. This year, Alliance members awarded Kennedy Krieger's Cynthia Salorio with a \$50,000 prize for her innovative vibrating armband aimed at assisting children with hemiplegia. The award was made possible thanks to contributions by the Maryland Biotechnology Center and The Johns Hopkins School of Medicine.

### 2011 BIO International Convention: Partnering, Reception, and Bio-Ambassadors

During the BIO International Convention, JHTT met with more than 70 companies, exhibited with 6 other Johns Hopkins entities, and organized a reception at SAIS. The reception was attended by more than 450 people and was hosted in conjunction with the Bioregion of Catalonia, the Johns Hopkins Center for Biotechnology Education, Morrison Foerster, and Baker and McKenzie. Moreover, we arranged for a total of 12 students from Johns Hopkins University and the University of Maryland to represent the State of Maryland as bio-ambassadors at the

conference. These bio-ambassadors were charged with communicating Maryland's new biotechnology development and commercialization initiatives to conference attendees as a way to showcase Maryland as a leader in the biotech field.

## PARTNERING DEALS

### Cureveda Partners With GlaxoSmithKline to Develop a Novel Treatment for Chronic Obstructive Pulmonary Disease

GSK and Cureveda joined forces in FY 2011 to research and develop novel treatments for respiratory diseases, such as chronic obstructive pulmonary disease. These treatments are based on a technology developed by Dr. Shyam Biswal, Professor of Environmental Health Sciences at the John Hopkins Bloomberg School of Public Health. JHTT worked with Cureveda to license the technology, and in collaboration with Cureveda, GSK will develop and commercialize any compounds that result from Dr. Biswal's technology.

# A Year in Review

## Amplimmune and GlaxoSmithKline Sign Deal

In FY 2011, Amplimmune, a Johns Hopkins start-up company founded in 2008, and GSK entered into an agreement to develop therapies targeting the programmed cell death 1 (PD1) protein for the treatment of cancer and infectious disease. Under this agreement, Amplimmune received an upfront payment of \$23 million and is eligible for up to \$485 million in milestone payments. GlaxoSmithKline gained a worldwide license to AMP-224, a fusion protein targeting PD1 that entered Phase I trials in cancer patients in 2011, and to other potential fusion proteins that target PD1.

## AgeneBio Receives UO1 Grant From NIH

AgeneBio received a 5 year UO1 NIH grant in the amount of \$2.12 million. Previously the Alzheimer's Drug Discovery Foundation (ADDF) awarded the JHU start-up a grant of \$240,000 to develop a new class of small molecules that have promise in treating amnesic mild cognitive impairment (aMCI). AgeneBio's research platform is based on the technology of Dr. Michela Gallagher, the Krieger-Eisenhower Professor of Psychology and Neuroscience.

## HIGHLIGHTED INVENTIONS

### New Treatment for Spinal Cord Injury

Dr. Andres Hurtado, Research Scientist at the Kennedy Krieger Institute, developed a 3D polymer-based scaffold that early studies show helps align neuron fibers, encourages dendrite connections, and hence increases functionality during spinal cord injury. A group

of Johns Hopkins' students from different schools teamed up to present Dr. Hurtado's invention at the Johns Hopkins Business Plan competition and won second prize.

### Functional Animal Caging

Senior Instrument Designer James Garmon invented a novel all-in-one rodent experimentation system that is composed of customizable enclosures, a novel fluid delivery system, an odor experimentation system, and a sound reduction system. This new system is designed for complex neuro-psychological studies. However, the system is customizable and can be used for any type of sound-sensitive experiment.

## AWARDS

### Dr. Sharon Gerecht Receives CAREER Award

Sharon Gerecht, Assistant Professor of Chemical and Biomolecular Engineering at Johns Hopkins, received the Faculty Early Career Development Award (CAREER) from the National Science Foundation (NSF). The CAREER award, given to faculty members at the beginning of their academic careers, is one of NSF's most competitive awards and emphasizes high-quality research and novel education initiatives. Dr. Gerecht received the award for her technology that focuses on tissue engineering and stem cells.

### Johns Hopkins Faculty Wins Nobel Prize in Physics

Dr. Adam Riess, a Krieger-Eisenhower Professor in Physics and Astronomy, won the Nobel Prize in physics for his leadership in the High-z Supernova Search Team's 1998 discovery that the expansion



In November, Executive Director Wes Blakeslee participated in the Maryland Technology Development Corporation's (TEDCO's) 100th University Technology Development Fund (UTDF) Award live telecast. To watch a recording of the telecast, visit <http://tinyurl.com/TEDCO-UTDF>

Note: Pictured is TEDCO President and Executive Director Robert A. Rosenbaum and JHTT Executive Director Wes Blakeslee.

rate of the universe is accelerating, a phenomenon widely attributed to a mysterious, unexplained "dark energy" filling the universe.



# TEDCO AWARDS



This year, the Maryland Technology Development Corporation's (TEDCO's) University Technology Development Fund (UTDF) awarded six Johns Hopkins researchers \$50,000 each in an effort to help them develop and assess the commercial viability of their inventions, test prototypes, and optimize principle research designs. Similarly, TEDCO's TechStart Program awarded a JHTT start-up \$15,000 to continue their efforts.

Below is a description of the Johns Hopkins' TEDCO award recipients:

## **Robert H. Allen, Ph.D., P.E.**

Dr. Allen will develop a technology that allows obstetricians to more accurately diagnose early preterm labor and prescribe interventions to prolong the pregnancy and to improve fetal development. This device, by bypassing the maternal abdomen and measuring contractions in the cervix and vagina, enables more accurate diagnoses.

## **Emad Bector, Ph.D.**

Dr. Bector will further develop a needle tracking and intervention guidance device which uses ultrasound imaging. This allows needle-guided interventions to be done without the need for expensive, cumbersome external tracking devices that are currently used. This device will also allow the physician

or ultrasound expert to find small or deep tumors which cannot yet be easily spotted by ultrasound.

## **A. Jay Khanna, M.D.**

Dr. Khanna will develop a minimally-invasive bone tissue harvesting device with a softer drill. Bone grafting is used to help fuse bones and for healing in spinal fusions, which are widely used surgical procedures that increase the structural support of the spine. Dr. Khanna's device allows for the collection of more bone tissue, a safer autograft, reduction of pain, and better grafting.

## **Aleksander Popel, Ph.D.**

Dr. Popel will continue to develop his mimetic peptide to treat cancer. These peptides mimic larger antibodies or proteins and show promise in inhibiting metastatic breast cancer and breast cancer that has not been responding to current treatments. The peptides are synthetic and have substitutions in them to make them more active. The advantages of using peptides are that they are smaller, more specific, and more cost-effective to produce than antibodies; they are less toxic than other currently-available cancer treatments and they do not cause immune reactions. This particular peptide also has an amino acid substitution to make it more stable and less likely to be broken down by proteases.

## **Brendan Canning, Ph.D.**

Dr. Canning will further develop a treatment for coughing. Dr. Canning has discovered cough receptors that

play an essential role in regulating the cough reflex and a group of compounds that are more effective in selectively targeting these receptors.

## **Clifford Weiss, M.D.**

Dr. Weiss will further develop a device that makes dialysis more effective. Dr. Weiss's team has designed a device to access naturally high blood flows in the leg, as opposed to the artificially created ones in the arm that cause stenosis. This subcutaneous device provides two ports for access to the femoral vein and a third port for controlling a valve which closes access to the vein when the patient is not in dialysis. The valve also allows the tubing to be cleaned.

## **NexImmune, Inc**

NexImmune will develop a technology that will destroy tumor cells. Based on technology from Jonathan Schneck, M.D., Ph.D., and Mathias Oelke, Ph.D., NexImmune has produced an artificial antigen cell that mimics human immune systems' dendritic cells. Antigens on the surface of dendritic cells stimulate natural killer T-cells (NKT cells) to destroy tumors. The platform technology developed by NexImmune is an easy-to-assemble system in which different immunological signals can be attached to a bead or smaller quantum dot and used to activate NKT cells. The technology can be used to stimulate cells outside the body in culture and also can be injected into patients. The technology is being developed to treat melanoma specifically, but can be applied broadly.

## START-UPS

JHTT's greatest surprise for FY 2011 was the creation of 19 start-up companies, an increase of 90 percent from FY 2010 (10 start-ups). We attribute a portion of this increase to the improving investment climate and the growing entrepreneurial enthusiasm here at JHU. JHTT has actively promoted entrepreneurship through a series of on-campus events, such as the Johns Hopkins Alliance for Science and Technology Development, the Entrepreneur's Bootcamp, Biomatch, and the Vine and Venture Speaker's Series. In addition, this year brought a new emphasis on commercialization to Johns Hopkins, both internally and externally, as granting agencies such as the National Institutes of Health (NIH) and private foundations alike further investigated the results of their investments. We will not know if this

sharp uptick of start-up companies is an aberration or a trend for a couple of years, however we are optimistic that it reflects a new mindset within the Johns Hopkins community, one in which entrepreneurship is cultivated.

Of the 19 companies that were formed in FY 2011, 9 are developing medical devices and 5 are developing therapeutics. The remaining five are developing a broad spectrum of technologies, ranging from diagnostics to software. While none of the 19 companies have publicly announced a round of funding for us to report on individual or aggregate fundraising numbers at this time, the companies displayed to the right showcase some of the exciting technologies being developed by our FY 2011 start-ups.



*Ken Carter, CEO of NexImmune, presents at the Johns Hopkins Alliance for Science and Technology Development Meeting. The Alliance is a partnering event that allows Johns Hopkins faculty to present their inventions to company representatives and venture capitalists.*

## COMPANY HIGHLIGHTS

### NEXIMMUNE

NexImmune, Inc. licensed the Artificial IMMune (AIM™) technology based on artificial Antigen Presenting Cells (aAPC) developed in the laboratory of Professor Jonathan Schneck, Department of Pathology. The technology has broad potential for treating several diseases. The company's first product candidate will be a novel aAPC-based immunotherapy for cancer.

### CERECOR

Cerecor, Inc. was founded in April 2011 as a biopharmaceutical company focused on the discovery, development, and commercialization of prescription pharmaceuticals whose primary activity is in the human brain. Cerecor is focused on translational medicine—the accelerated transfer of technology from the academic laboratory to early human trials—with the goal of rapid commercialization. To date, the company has raised \$3 million in seed financing to support a cough program in Phase II clinical trials and two other preclinical programs in schizophrenia and cognition. Cerecor was founded by three Johns Hopkins Medicine faculty members, Drs. Solomon H. Snyder, Barbara Slusher, and Blake Paterson.



## COOLTECH

CoolTech, LLC. is developing a device that is based on the discoveries of Dr. Harikrishna Tandri. This device will introduce a completely new approach for inducing mild hypothermia and cerebral cooling. The device will work by harnessing a physiologic process that triggers the body to cool itself. The device is specifically designed to meet the needs of emergency responders, requiring no active cooling systems or chemicals, only ambient air.

## AEGERIA SOFT TISSUE

Aegeria Soft Tissue, LLC. (AST) is a Baltimore-based start-up formed to commercialize highly innovative tissue reconstruction technologies invented by Dr. Jennifer Elisseeff's Biomaterials and Tissue Engineering Laboratory in the Translational Tissue Engineering Center at the Johns Hopkins University School of Medicine. The company is privately financed and closed its Series A in October 2011. The product and the processes needed for its manufacturing are protected by two patent applications exclusively licensed to AST.

This fiscal year, we are pleased to provide an updated Product Pipeline Report that reflects the commitment by industry to develop in-licensed JHU technologies by advancing potential therapeutics, diagnostics, and medical devices through the regulatory process. Our product pipeline reflects 771 products that are either on the market or in various stages of development as of July 2011 (see Figure 1). We observed an increase in the number of products that were introduced to the market over this fiscal year and into development in every category of product development as well.

Of the 771 products in our product pipeline, 631 are currently on the market (see Figures 2 and 3). The vast majority of the marketed products are research tools (see Figure 3). There are 269 products currently in development, consisting of potential therapeutics, diagnostics, medical devices, services, software, and other products (see Figures 4, 5, and 6).

Of the products that are subject to the regulatory process, two products were approved by the FDA during FY 2011 and are expected to launch on the market during FY 2012. One potential therapeutic product was in Phase III clinical trial, 30 potential products were in Phase II clinical trials, and 25 potential products were in Phase I clinical trials during this fiscal year (see Figure 2). These numbers reflect the maturing of JHU technologies in product development, our licensees'

steady progression through the regulatory process, and the promise of future therapeutics, diagnostics, medical devices, services, software, and other products that will impact patient care.

During this fiscal year, we enhanced our Product Pipeline Report to include sublicensee products on the market or in development which are included in the aggregate totals seen on the next page two pages. In addition, we expanded our Product Pipeline Report to reflect the medical area served by the marketed product or product in development in each of the product classification categories.

For example, of the 105 therapeutic products on the market or in development, 19 different medical areas are served. The medical area with the greatest therapeutic product development is oncology.

The Product Pipeline Report pie charts included in our FY 2011 Annual Report demonstrate the enhancements to our data-tracking on the marketing and development of products by JHU licensees.

All of these products remain a tangible translation of JHU's intellectual property and represent a measurable, direct benefit of the research conducted at JHU, efforts by Johns Hopkins Technology Transfer in marketing, licensing, and monitoring licensee activity and the activities that our licensees undertake in product development to improve patient outcomes, one disease process at a time.

Figure 1: FY 2011 Entire Product Pipeline by Product Classification (n=771)

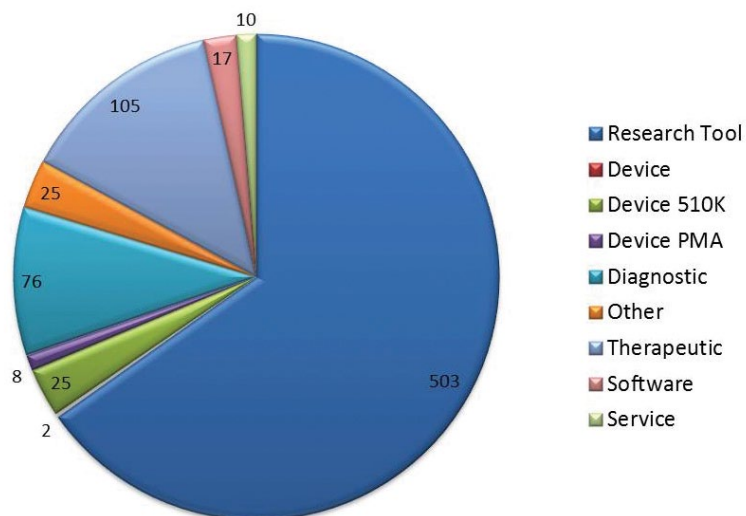


Figure 2: FY 2011 Entire Product Pipeline by Development Stage (n= 771)

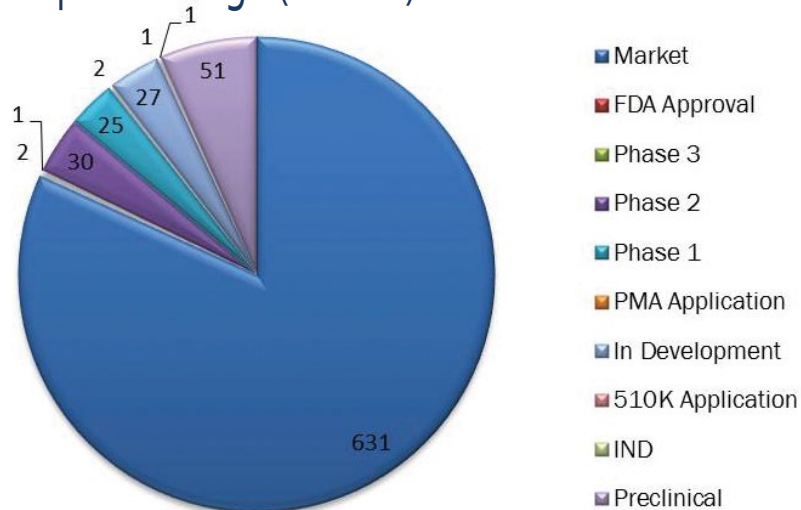


Figure 3: FY 2011 Marketed Products (n = 631)

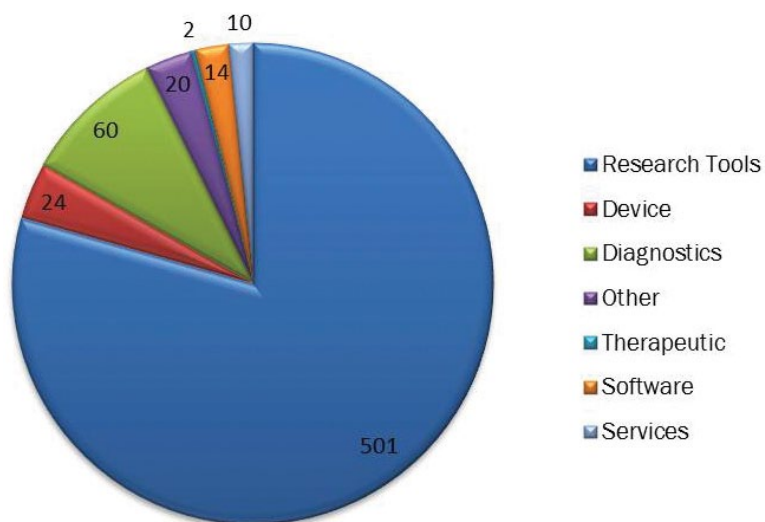




Figure 4: Therapeutic Product Pipeline by Medical Area (n= 105)

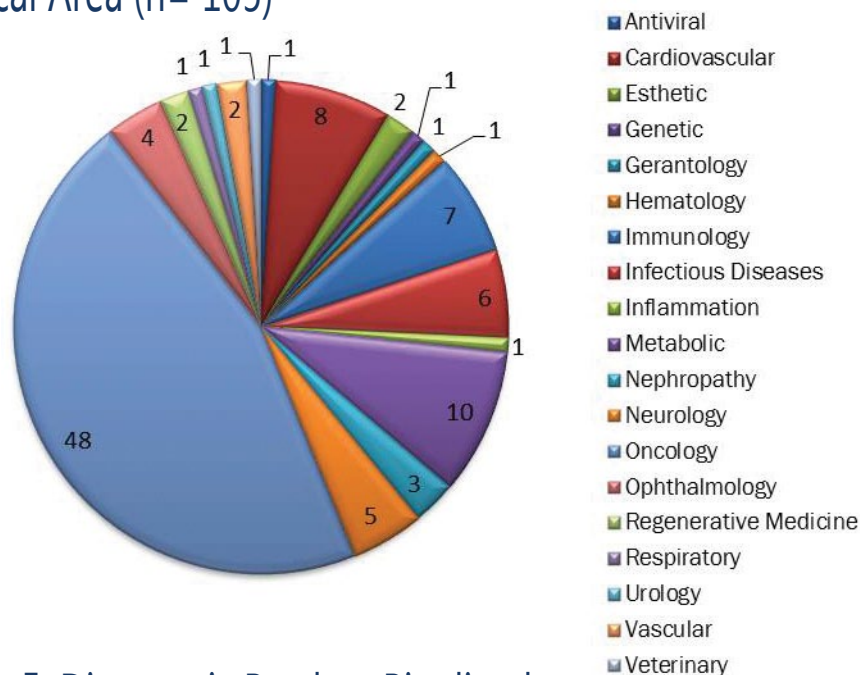


Figure 5: Diagnostic Product Pipeline by Medical Area (n = 76)

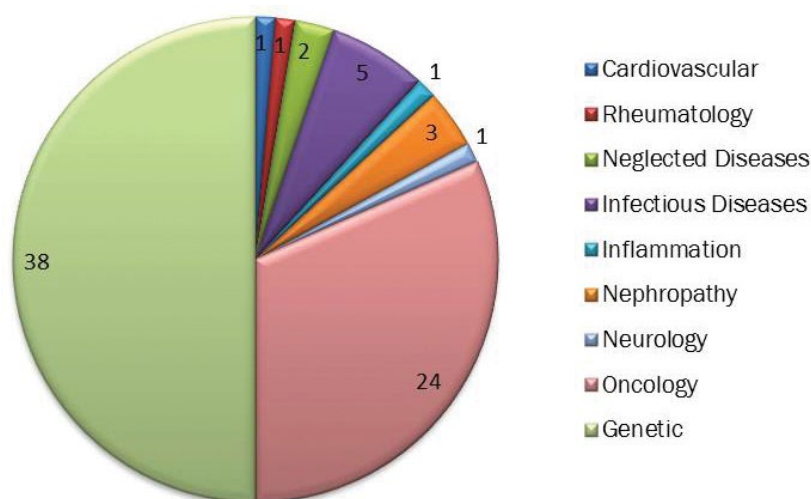
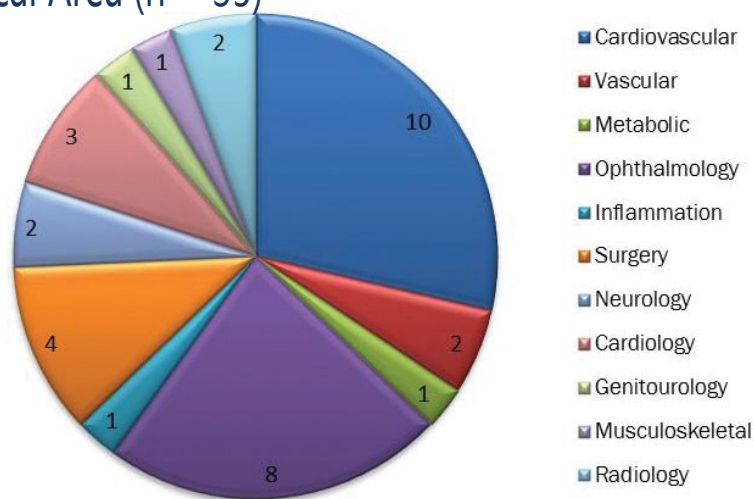


Figure 6: Device Product Pipeline by Medical Area (n = 35)



## MATERIAL TRANSFER AGREEMENTS

**T**angible research materials embody tacit knowledge of enormous value. Sharing these materials with other academic institutions, nonprofit organizations, and commercial entities through material transfer agreements (MTAs) promotes Johns Hopkins University's research imperative.

Successfully negotiated MTAs also provide JHU investigators with essential proprietary materials and technologies at little or no expense. MTAs significantly reduce research costs, bolster grant applications, and enable scientific research and publication. The Johns Hopkins Technology Transfer MTA team has continued to adapt to the ever-changing market and regulatory landscape brought on by economic challenges and technological advances.

Our specific initiatives from the past year include the:

- Expansion of our Technology and Research Agreements Wiki, sharing key knowledge assets among JHTT and other JHU offices to improve negotiation effectiveness across the university;
- Extended utilization of high volume repositories to allow for fast-track processing of popular research materials;
- Enhancement of our internal workflow metrics to reduce turnaround and improve faculty service;
- Contract review and drafting of collaborative research agreements.

As shown in the table below, the overall transaction volume in the MTA group increased to more than 13 percent from FY 2010 to FY 2011.

With these initiatives and improvements, we handled the increased volume over the past year without increasing our staff size. In fact, we reduced our average turnaround time from 10.4 to 9.1 days. More than 90 percent of our agreements were completed in 30 days or less. In FY 2012, we will continue to build upon the progress we made in FY 2011 and expand our role in support of complex collaboration agreements and licenses.

We recognize that obtaining proprietary materials from commercial entities can often be problematic, and concluding such agreements takes significantly more time than the average. We have however, continued to enhance the capability and skills of our MTA team and we work closely with the General Counsel's Office to make the process as efficient as possible.

## STATISTICS

	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Requests received	2,274	2,725	2,873	3,299
MTAs processed	2,231	2,821	2,896	3,283
Inbound	906	994	1,018	1,145
Outbound	1,262	1,825	1,868	2,131
Consortium	63	2	10	7
Total	2,231	2,821	2,896	3,283
Not for profit	1,999	2,588	2,694	3,062
For profit	232	233	202	221
Total	2,231	2,821	2,896	3,283





## APPENDIX

### FINANCIALS

Our Technology Transfer Office recorded very strong operating results for FY 2011. Through FY 2011, all of our metrics exceeded budget. Our total licensing revenue, at \$15.25 million, is 27 percent higher than the previous fiscal year. New invention disclosures and license agreements are 15 and 53 percent higher than last year, respectively, and patent activity continues to increase, as directly related to our steady rise in invention disclosures. Our material transfer group successfully handled another large increase in volume and is achieving its goals. Office expenses finished the year 3 percent below plan.

### OPERATING STATISTICS

We received 409 invention disclosures during the course of the year—the highest number ever recorded by this office—and a 15 percent increase over last year. This reflects an increased focus on commercialization in every school coupled with frequent interactions between researchers and our staff.

We also completed 728 patent filings during the year, a 27 percent increase over last year, and had 49 U.S.

patents issued. By the end of the fiscal year, a total of 1,917 patents had been issued and 3,095 patents were pending.

We executed 159 new license agreements and 29 amendments during FY 2011, a 59 percent increase over last year. We received 3,299 new material transfer requests and completed 3,283 material transfer agreements during FY 2011, a 13 percent increase over last year. Our MTAs took an average of 9.1 days to complete, the best we have ever performed in this metric.

### FINANCIAL

The Technology Transfer Office earned \$15.25 million in licensing revenue and received nearly \$3.8 million in patent expense reimbursements during FY 2011. Our top-line revenue surpassed our FY 2011 plan by approximately 24 percent. We underspent our office expense budget for the year and our net income for the year exceeded our plans by 34 percent.

## COMPARISON OF FY 2010 AND 2011 BY INCOME CATEGORY

	<b>FY 2010</b>	<b>FY 2011</b>	<b>Difference</b>
Royalties	\$6,777	\$7,870	\$1,093
License Fees	\$4,424	\$6,823	\$2,399
Administrative Fees	\$745	\$556	(\$189)
<b>Total Revenue</b>	<b>\$11,946</b>	<b>\$15,249</b>	<b>\$3,303</b>

## REVENUE

We collected \$15.25 million in licensing revenue during FY 2011, significantly higher than our \$12.3 million budget. Of this \$15.25 million total, we received \$2.2 million from the 159 new agreements signed during FY 2011 and \$13 million from agreements signed in prior years.

In addition to measuring upfront fees generated by new license agreements, we also measure the total contract value (TCV) of these agreements. TCV is defined as all scheduled and milestone payments, excluding the value of equity and anticipated product sale royalties, that have been or will be received from an agreement over its first 10 years. We believe that measuring TCV is useful as it indicates the

potential future revenue that we expect to realize from our new agreements. The TCV of our 159 new agreements is \$18.65 million.

## PATENT EXPENSES AND REIMBURSEMENTS

Patent expenses totaled \$8.3 million for the year, \$1.4 million higher than our \$6.9 million plan.

Reimbursements received in FY 2011 totaled \$3.8 million. At 45 percent of incurred expense, our reimbursement rate is better than the 40 percent industry average as reported by the Associate of University Technology Managers (AUTM).

We have analyzed our patent expenses on technology cases for which we are not receiving licensee

reimbursement. As the table below shows, over the past 5 years we have incurred only 3.78 percent of our patenting cost in the first year of a technology case's life. Cases between 1 and 3 years old, when we would typically be converting provisional patents, account for more than 46 percent of our total expense. About 49 percent of our total patent costs have been spent on older cases. This is especially interesting when compared with the age of the technology cases that are being licensed.

## OPERATING EXPENSES

FY 2011 office expenses totaled \$6.2 million. The breakdown of these expenses can be found on the next page.

## ANALYSIS OF PATENT EXPENSES FOR UNLICENSED CASES BY AGE OF CASE\*

	<b>Total</b>	<b>&lt; 1 year</b>	<b>1-3 years</b>	<b>4-6 years</b>	<b>7-10 years</b>	<b>&gt;10 years</b>
FY 2011	\$4,360	\$213	\$1,846	\$1,183	\$732	\$386
FY 2010	\$3,173	\$151	\$1,236	\$769	\$749	\$268
FY 2009	\$3,592	\$130	\$1,840	\$664	\$607	\$351
FY 2008	\$2,661	\$21	\$1,373	\$674	\$433	\$160
FY 2007	\$3,058	\$121	\$1,594	\$607	\$595	\$141
5-year Total	\$16,844	\$636	\$7,889	\$3,897	\$3,116	\$1,306
Percent	100.00%	3.78%	46.84%	23.14%	18.50%	7.75%

\*Measured by the age of the case when the patent expense was paid.



## OPERATING EXPENSES FOR FY 2011 COMPARED TO PAST YEARS

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
Salaries	\$3,272	\$3,488	\$3,825	\$4,068
Benefits	\$1,025	\$1,055	\$1,125	\$1,217
Other Office Expenses	\$1,115	\$830	\$876	\$1,186
UA Credits	(\$300)	(\$294)	(\$279)	(\$279)
Total Office Expenses	\$5,112	\$5,079	\$5,547	\$6,192

## DISTRIBUTIONS

JHTT distributes income it receives each year in accordance with the University's Intellectual Property Policy. Prior to FY 2007, we performed these distributions annually after the close of the fiscal year. Starting with the first quarter of FY 2007, we moved to quarterly distributions. We distributed \$11.3 million during FY 2011, an increase of \$77,000 from FY 2010. Although our license revenue increased \$3.3 million in FY 2011 compared with FY 2010, our distributions remained flat mainly due to a decrease in reimbursement revenue.

for the university. We had targeted 350 invention disclosures for the year. We devoted significant time to

by school versus FY 2010. During FY 2011, 461 first-time inventors and 82 first-time principal

## FY 2010 AND 2011 INCOME DISTRIBUTIONS

<b>Distributed To:</b>	<b>FY 2010</b>	<b>FY 2011</b>	<b>Change</b>
Inter-Institutional (incl. HHMI)	\$919	\$948	\$29
Inventor	\$3,610	\$3,651	\$41
Inventor Research Accounts	\$1,409	\$1,451	\$42
Departments	\$1,424	\$1,485	\$61
Schools	\$3,358	\$3,205	(\$153)
University	\$540	\$597	\$57
TOTAL	\$11,260	\$11,337	\$77

## DISCLOSURES

We received 409 invention disclosures in FY 2011, a 15 percent increase over last year and, for the fifth year in a row, a record number

improving our processes to assist faculty with the disclosure reporting process and, in some cases, to help with start-up companies being formed around the new technology. The table below shows FY 2011 invention disclosures broken down

inventors were listed on inventions disclosed to our office. We are pleased to see the widening interest in technology commercialization and entrepreneurial activities by our faculty.

## FY 2010 VERSUS 2011 INVENTION DISCLOSURES BY SCHOOL

<b>School</b>	<b>FY 2010</b>	<b>FY 2011</b>
Bloomberg School of Public Health	26	11
Krieger School of Arts and Sciences	18	6
School of Medicine	254	295
Whiting School of Engineering	50	80
Other	7	17
TOTAL	355	409

# Appendix

## START-UPS

We are particularly pleased to report one statistic for FY 2011—19 start-up companies, up from 10 in FY 2010. Of the 19 companies, 9 are developing medical devices and 5 are developing therapeutics. The remaining five companies are developing a broad spectrum of technologies, ranging from diagnostics to software. We attribute this increase in activity to the improving investment climate and the growing entrepreneurial enthusiasm here at Johns Hopkins.

## LICENSING

We executed 159 new license and option agreements as well as 29 amendments during FY 2011

exceeding our planned new licenses and option agreements (109) by almost 46 percent. During the year, 28 of these new agreements were low-dollar licenses for software. If we reduce our totals to account for this, we still achieved 131 new agreements for the year, a 26 percent increase over last year. We are very pleased with these results as the economy made licensing especially challenging during the past year.

We have analyzed our new license agreements to study the age of the technology cases (inventions) that we are licensing. In this analysis, we calculated the time from initial disclosure of the invention to the execution date of the license agreement. Our analysis revealed the below information.

From this analysis, we can see that approximately 18.5 percent of the cases licensed over the last 5 years were less than 1 year old. Often these licenses resulted from industry-sponsored research where either the sponsor took a license or the intellectual property was a follow-on technology to a previously licensed case. We can also see that 25.5 percent of the cases that were licensed over the past 5 years were 7 years or older at the time they were licensed.

## ANALYSIS OF NEWLY LICENSED CASES BY AGE OF CASE

<b>Fiscal Year</b>	<b>Agr</b>	<b>Cases</b>	<b>Average</b>	<b>&lt;1</b>	<b>1-3</b>	<b>4-6</b>	<b>7-10</b>	<b>&gt;10</b>
FY 2011	159	316	1.99	78	106	48	51	33
FY 2010	104	144	1.38	33	46	35	13	17
FY 2009	99	172	1.74	21	62	40	28	21
FY 2008	92	153	1.66	22	61	34	16	20
FY 2007	79	121	1.53	14	43	32	14	18
TOTAL	533	906	1.70	168	318	189	122	109
PERCENT				18.5%	35.1%	20.9%	13.5%	12.0%



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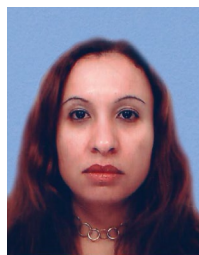
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