ANNUAL REPORT

2017

Office of Technology Commercialization

CONTENTS

The last year has been a tremendous one for the prospects of UK research with commercialization potential. First, we signaled an expanded focus of our office by changing its name to the Office of Technology Commercialization. Next, we adopted a new mission statement that emphasizes commercializing our discoveries for the good of the University, the Commonwealth, and global society. We launched new programs and initiatives intended to increase researcher engagement and recognition, such as UKAccel, UKPitch and Patent Palooza. We developed an experiential learning program that hires graduate students—OTC Fellows—to become an integral part of our technology assessment and licensing processes. We partnered with other campus and community stakeholders, such as the Von Allmen Center for Entrepreneurship and Awesome Inc, to bring together some of the many great resources available to support the translation of UK research. To optimize our ability to originate deals, we hired new staff and formed a new Commercialization & Licensing Team with significant scientific research, market intelligence and license negotiation experience. Moreover, we created a new externally searchable database for UK's licensable technologies, and we adopted a number of new tools to improve our ability to assess commercial viability and identify partners.

The UK research community and ecosystem around us heeded the ante for advancement, as evidenced by the phenomenal support we received from researchers and the Lexington community. Thanks to the foresight and leadership of, among others, President Eli Capilouto, Vice President for Research Dr. Lisa Cassis, and Associate Vice President for Research Rodney Andrews, and thanks to the hard work of a great OTC team, we were able to realize year-on-year increases in licenses & options executed (up 90%), start-up ventures launched (up 33%), patent applications (up 11%) and invention disclosures. Further, UK placed in the top 100 worldwide universities for patent grants in 2016, and we followed that up by receiving more issued patents in FY17 (40) than in any year before (30 in FY16).

Looking ahead, we will continue to innovate ourselves, pushing forward with these and other initiatives to support the great research at the University of Kentucky and help realize the market prospects that exist. Emphases will include, among others, (1) bridging the development gap for UK discoveries between invention and being commercialization-ready, (2) expanding UKAccel to offer a more robust education and services program for start-up ventures spinning out with UK technology, (3) developing new and non-obvious networks for commercialization through partnerships with government, industry associations, state and regional universities, and venture investment channels, and (4) initiating socially responsible innovation programs. Subscribe to our *Commercialization Connect* newsletter through our website and jump on the OTC train as we embark on another great year of research commercialization at UK.

Sincerely,

Ian D. McClure
Director, OTC

OUR TEAM

IAN MCCLURE *Director*

Ian oversees the office, including intellectual property development, licensing, technology commercialization, start-up ventures, business development and student experiential initiatives related to University discoveries.

ALI BOCOOK *Contracts Coordinator*

Ali is responsible for processing and managing Material Transfer Agreements, Data Use Agreements and Confidential Disclosure Agreements.

GINA TUSSEY *License Analyst*

Gina provides support for the OTC budget, as well as license agreement revenues and compliance.

TECHNOLOGY COMMERCIALIZATION & LICENSING TEAM

ERIC CASTLEN *Associate Director, Commercialization & Licensing*

Eric leads the Commercialization & Licensing Team. He is responsible for managing the activities associated marketing and licensing UK intellectual property.

ALEX PORTER
Commercialization Manager

Alex is responsible for marketing and licensing UK intellectual property in the life sciences.

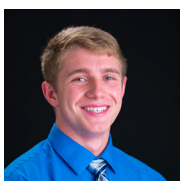
NATASHA JONES
Commercialization Manager

Natasha is responsible for marketing and licensing UK intellectual property in the physical sciences.

STRATEGIC ALLIANCES TEAM

TAUNYA PHILLIPS
Associate Director, Strategic Alliances

Taunya leads the Strategic Alliances team. She is responsible for cultivating and maintaining campus and industry relationships that support the technology commercialization and entrepreneurial endeavors of the faculty, staff and students, and marketing the OTC.



TANNER ANDERSON
Marketing Intern

Tanner assists with OTC marketing activities.

INTELLECTUAL PROPERTY DEVELOPMENT TEAM

DON KEACH *Associate Director, Intellectual Property Development*

Don leads the Intellectual Property Development Team. He is responsible for managing the commercialization process from invention record submission through patent prosecution.

SABRINA DARNELL
Intellectual Property Coordinator

Sabrina is responsible for managing the intellectual property database, and intellectual property compliance.

KATIE OLSON
Intellectual Property Intern

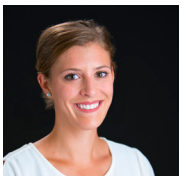
College of Law student

BA in Psychology and Music, University of San Diego

OTC FELLOWS

ISABEL DERERA *OTC Fellow*

PhD Candidate in Physiology
BS in Behavioral Neuroscience, Washington College



KAIA HAMPTON *OTC Fellow*

PhD Candidate in Pharmacology & Nutritional Sciences
BS in Biochemistry, University of Tampa

MITCH LYON *OTC Fellow*

College of Law Student
BS in Mechanical Engineering, Purdue University

KENDRA STAGGS *OTC Fellow*

Post-doctoral scholar in the lab of Eric Blalock in the Department of Pharmacology & Nutritional Sciences

54
INVENTION DISCLOSURES

19
FULL PATENT APPLICATIONS

$3.75 MILLION
DISTRIBUTED TO INVENTORS SINCE 2010

40
PATENTS ISSUED

13
NEW LICENSES & OPTIONS EXECUTED

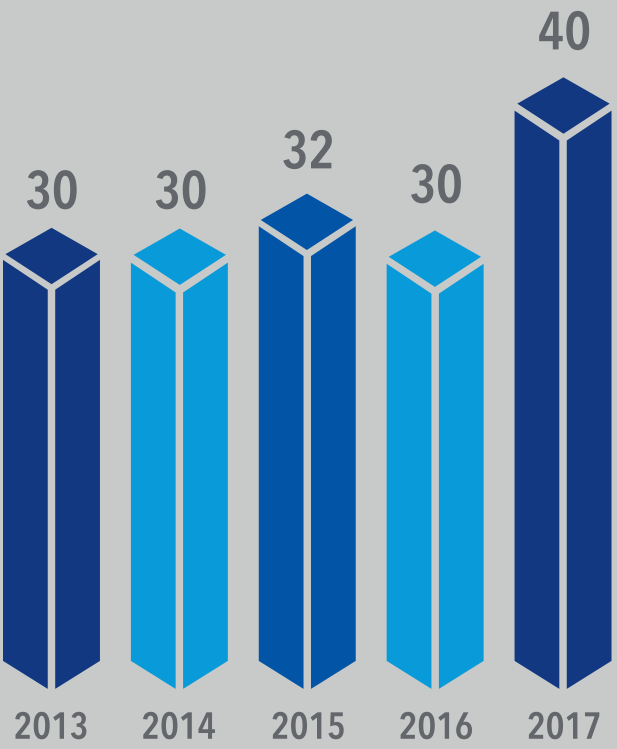
$13.37 MILLION
DISTRIBUTED TO COLLEGES AND DEPARTMENTS SINCE 2010

$2,393,069
GROSS ROYALTY INCOME IN FY17

54

2017 INVENTION DISCLOSURES

PATENTS ISSUED OVER PAST 5 YEARS



UK RESEARCHERS DISCLOSED SOME VERY INNOVATIVE TECHNOLOGIES IN FY2017

REDOX FLOW BATTERY

Dr. Susan Odom has designed and synthesized materials that mitigate overcharging when used in lithium-ion batteries, without the protection circuitry that is currently being used commercially to prevent overcharging. This innovation has the potential to increase the battery's ability to store energy, while also making it safer to use. The need to develop this technology into a commercially viable solution for overcharging is very important, as the demand for lithium-ion batteries in consumer and industrial applications (smartphones, computer tablets, automotive devices) is growing.

ANTIFUNGAL COMPOUNDS

Dr. Sylvie Garneau-Tsodikova has discovered a library of anti-fungal drug compounds that have the potential to be effective therapeutic treatments for humans and various fungi infected crops and livestock. In humans, these compounds could alleviate the toxicity to organ systems and the drug resistance issues associated with existing commercially available treatments.

STENT GRAFT

Dr. David Minion has designed an endoluminal graft (endograft) with scalloped configurations in the sealing portion of the endograft. This is a strategy for preserving flow in branch vessels that would otherwise need to be sacrificed in order to adequately treat aneurysms or dissections in those vessels. The design of this device solves the challenges of scallops, that they must be aligned to the branch vessel during deployment of the endograft to avoid obstructing blood flow to the branch vessel. This device also eliminates the need to custom manufacture an endograft based on the patient's anatomy.

FISCAL YEAR 2017 INVENTION REPORTS BY TECHNOLOGY AREA

THERAPEUTICS

2181 Antifungal Agents
Sylvie Garneau-Tsodikova, Emily Dennis, Atefeh Garzan, Selina Holbrook

2172 Nanoparticles for Selectively Harvesting Plant-made Pharmaceuticals
John Littleton, Luke Bradley, Barbara Knutson, Stephen Rankin

2171 Nanoparticulate Leukemia Inhibitory Factor for Prolonged Treament of Stroke
Keith Pennypacker, Younsoo Bae

2170 A Novel Class of Proteasome Inhibitors
Kyung Bo Kim, Beepak Bhattarai, Min Jae Lee

2168 A Novel Positive Cardiac Inotropic Strategy
Douglas Andres, Jonathan Satin

2166 Treatment for Colon Cancer
David Watt, Chumming Liu, Vitaliy Svirpa

2165 Treatment and Prevention of Obesity and Diabetes
Sabire Ozcan

2162 Cell Encapsulation for Increased Cell Retention in Tissue Engineering
Anuhya Gottipati, Ahmed Abdel-latif, Bradley Berron, Irina Kalashnikova

2160 New Therapeutics for Treatment of Gonorrhea
Konstantin Korotkov, Alesksandra Sikora

2159 Amidated Dopamine Neuron Stimulating Peptides for Protection against Diseases
Luke Bradley, Don Gash, Greg Gerhardt

2142 Treatments for Drug Withdrawal Associated with Hyperalgsia
John Littleton

2139 Novel Alkylated Azoles as Potent Antifungals
Sylvie Garneau-Tsodikova, Atefeh Garzan, Sanjib Shrestha

2138 Novel Multi-targeted Therapy for Cancer
Sabine Brouxhon, Todd Miller

2134 Novel Formulations of Anti-relapse Agent JR220 for Alcohol Withdrawal
John Littleton, Joseph Wyse

2133 Treatment Regimen for Sepsis
Xiangan Li

MEDICAL DEVICES

2178 Self-healing Esophageal Stent
Tess Cartwright

2156 Imaging Device for the Guidance of Brain Tumor Surgery
Guoquiang Yu, Chong Huang, Thomas Pittman

2154 Storage of Platelets at 4oC
Zhenyu Li, Binggang Xiang, Guoying Zhang

2153 Biofeedback and Brain Stimulation Device
Joshua Lile, Michael Wesley, Arit Harvanko, Dillon Huffman

2150 Method for Creating in-situ Scalloped Configurations in Endoluminal Devices
David Minion

2149 A Tethered Directional Guiding Sheath for Delivery of Endovascular Devices
David Minion

2146 Transparent Dental Dam
Craig Miller

DIAGNOSTICS

2176 Method for Predicting Cell Death
Vincent Venditto, David Henson, Robert Kline

2169 Method of Diagnosis, Prognosis and Treatment of Cerebral Small Vessel Disease
Florin Despa, Larry Goldstein

2143 High Throughput Method for Plasma Exosomal Lipid Analysis for Early Cancer Detection
Andrew Lane, Teresa Fan, Richard Higashi, Sethu Palappiana

2140 PeriBioScore as an Indicator for Periodontal Disease
Craig Miller

BIOMARKERS

2182 Biomarker of Diabetes and Microvascular Dysfunction
Florin Despa

RESEARCH TOOLS

2179 Canine Tumor Cell Lines
Don Cohen, John Yannelli

AGRICULTURE

2177 Microbial Herbicide
Seth DeBolt, Al Sabri Mohammad

2167 Detection and Classification of Coding Moth Infested Apples
Akinbode Adedeji, Nader Ekramirad, Mengxing Li, Ahmed Rady

2158 Lignin Valorization
Jian Shi, Lalitendu Das, Enshi Liu, Joseph Stevens

2157 Production and Formulation of Crop Yield Enhancer from Agriculatural Waste
Jian Shi, Hongyan Zhu

TRANSFORMED PLANTS

2183 Transcription Factor Regulation of Nicotine to Nornicotine Conversion
Ling Yuan, Sitakanta Pattanaik, Sanjay Singh

2175 Map-based Cloning of Genes Involving Nicotine Biosynthesis
Shengming Yang, Qiulin Qin

EQUINE

2163 Treatment for Persistent Breeding-induced Endometritis
Carleigh Fedorka, Mat Troedsson

ENERGY

2137 Packing Material Sonication
Bradley Irvin, Kunlei Liu, Roger Perrone

CHEMICAL DETECTION

Detection of Reactive Oxygen Substances in Foods and Pharmaceuticals
William Boatright

SEMI-CONDUCTOR AND ELECTRONIC DEVICE MATERIALS

2148 Reversibly Reducible Materials
John Anthony

2144 One-dimensional Quantum Strip Heterostructures
Sung Seo, Mark Mattson

2131 Polyborosiloxane Binders for Use in Lithium-ion Battery Applications
Susan Odom, Yang-Tse Cheng, Darius Shariaty

DIGITAL IMAGING

2184 Fast Texture Mapping Generation
Wei Li, Ruigang Yang

2145 Single-shot Time-of-Flight Phase Unwrapping
Changpeng Ti, Ruigang Yang, James Davis

AUGMENTED/VIRTUAL REALITY

2173 The Computation of The Head-Related-Transfer Functions on GPU
Tingwen Wu, Ziqi Fan, Kyla McMullen

SOFTWARE

2180 Grant Administration Database for Departments
Julie Oestreich

2164 Implant Ordering/ Tracking Application
Andrew Simonds

2152 Model for Drug Development and Personalized Medicine
Chee Meng Ng

2151 Computer Assisted Breathing Application
Charles Carlson, Matthew Russell

OTHER

2132 Nurse Manager Practice Environmental Scales
Nora Warshawsky

WATER TREATMENT

2161 Electrodeaeration Cell
Xin Gao, Nicholas Holubowitch, James Landon, Kunlei Liu

2136 Water Treatment Using Activated Carbon
Stephen Lipka, Joanna Mroczkowska, Christopher Swartz

2135 Process and Material for Removal of Nitrosamines from Aqueous Systems
Cameron Lippert, Kunlei Liu, Megan Combs, Jesse Thompson, Leland Widger

TEXTILES

2174 Breast Displacement Reducing Sports Bra
Kali Sebastian, Emma Benedict, Meaghan Dunn, Christina Zhang

2155 Thermoelectric Fiber
Matthew Weisenberger

SUSTAINABILITY

2141 Low Cost Process for Producing Biochar and Wood Vinegar from Biomass
Jeffrey Seay, Chadni Joshi

NEW PROGRAMS FOR INNOVATION

The OTC spent considerable time in FY17 refining and developing new processes to make the invention disclosure and intellectual property development process more efficient, useful, and transparent, including:

- developing a new Invention Report form;
- implementing new personal response and feedback points through the market assessment process;
- hiring new personnel to communicate and work closely with inventors;
- offering faculty programs focused on the impact of patent research;
- doubling the size of the Intellectual Property Committee to provide more robust and diverse feedback; and
- launching a new invention management system with an inventor's portal providing additional transparency in the patent prosecution and technology marketing process.

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MOST EVER PATENT & PROVISIONAL APPLICATIONS

INTRODUCTION TO THE INTELLECTUAL PROPERTY COMMITTEE

Dr. Czar Crofcheck - IPC Chair

Through periodic meetings to review qualified invention disclosures in coordination with the Office of Technology Commercialization and, where appropriate, UK inventors, the IPC works to facilitate the appropriate, timely and equitable application of the University's Intellectual Properties Policy and Procedures (A.R. 7.6). The work of this Committee is of ever-increasing importance to the University community as the impact of intellectual property on research, and vice versa, grows and the complexity of issues relating to intellectual property and university research increases. This Committee provides an important service to UK and the Commonwealth.

NEW RESOURCES FOR MARKET & PATENT RESEARCH

The OTC acquired new research tools to develop market and patent research capabilities. OTC Fellows and employees are trained to use these professional research databases and analytics tools to uncover data points that will assist in patent filing, developing commercialization strategies, and identifying potential partners.

DEVELOPMENT OF COMMERCIALIZATION TEAM

The OTC restructured its organization in FY17, developing three active teams to provide specialized support to UK research: the Intellectual Property Development Team, the Strategic Alliances Team, and the Commercialization & Licensing Team.

In Q4 of FY17, the OTC hired and launched the three-person Commercialization & Licensing Team. This team will be solely focused on marketing UK technologies and originating and executing licensing deals. They will also offer commercialization support services to researchers, existing licensees and UK-affiliated start-up companies having market research and other advisory needs.

EXTERNALLY SEARCHABLE TECHNOLOGY DATABASE

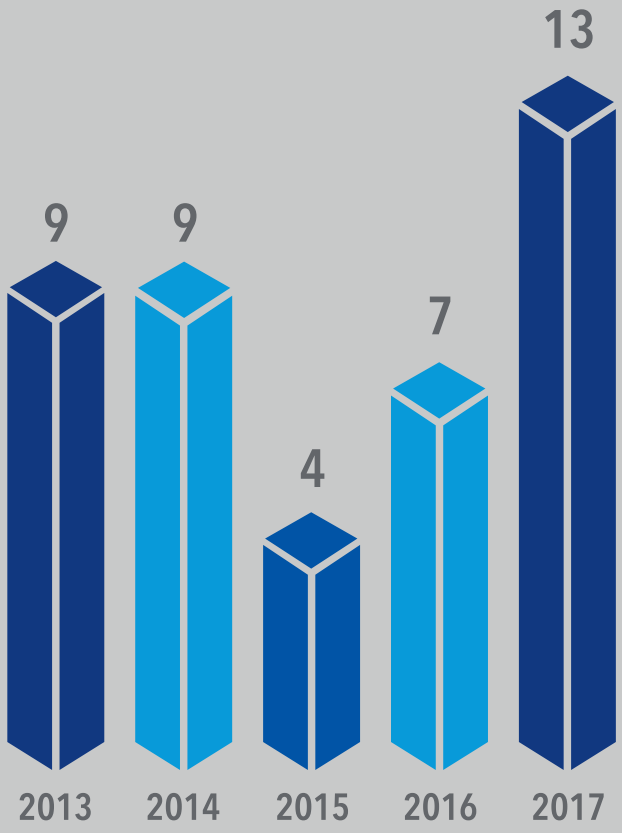
The OTC developed and has begun populating an externally searchable database of UK technologies available for license. This database—now accessible on our website—includes technology summaries and related information and will be a critical interface with industry looking for specific solutions and technologies for adoption.

LICENSES & OPTIONS FOR FISCAL YEAR 2017

- ☐ Palleon Pharma Inc.
  Steve Estus (Physiology)
- ☐ Effective Therapeutics Inc.
  Jayakrishna Ambati (Ophthalmology & Visual Sciences)
- ☐ Pioneer Medicine
  Chang-Guo Zhan (Pharmaceutical Sciences)
- ☐ Epionc, Inc. (2)
  David Watt (Molecular & Cellular Biochemistry)
- ☐ Flow Max, LLC
  Todor Petrov (Mechanical Engineering) and Andrzej Wala (Mining Engineering)
- ☐ Equine Diagnostic Solutions
  John Timoney (Equine Programs) and Sergey Artiushin (Equine Programs)
- ☐ Avast Therapeutics (2)
  Luke Bradley (Anatomy & Neurobiology), Don Gash (Anatomy & Neurobiology) and Greg Gerhardt (Anatomy & Neurobiology)
- ☐ Tokyo Chemical Industry Co. Ltd.
  John Anthony (Chemistry) and Susan Odom (Chemistry)
- ☐ MEL Chemicals
  Mark Crocker (Center for Applied Energy Research)
- ☐ Caprico Biotechnologies, Inc.
  John Thompson (Internal Medicine) and Steven Brown (Internal Medicine)
- ☐ HIPRA
  Thomas Chambers (Veterinary Science)

LICENSES & OPTIONS

FISCAL YEARS 2013–2017



THERAPEUTICS

9,453,226 Protection of cells from Alu-RNA-induced degeneration and inhibitors for protecting cells
Jayakrishna Ambati, Valeria Tarallo

9,464,289 Methods of inhibiting Alu RNA and therapeutic uses thereof
Jayakrishna Ambati

9,447,135 Semi-synthetic mithramycin derivatives with anti-cancer activity
Jugen Rohr, Daniel Scott, Markos Leggas, Jhong-Min Chen, Oleg Tsodikov

9,447,112 Use of parthenolide derivatives as antileukemic and cytotoxic agents
Peter Crooks, Craig Jordan, Xiaochen Wei

9,550,753 Mono quaternary ammonium salts and methods for modulating neuronal nicotinic acetylcholine receptors
Peter Crooks, Linda Dwoskin, Guangrong Zheng, Sangeetha Sumithran, Zhenfa Zhang

9,540,327 Bis-quaternary ammonium salts and methods for modulating neuronal nicotinic acetylcholine receptors
Peter Crooks, Linda Dwoskin, Guangrong Zheng, Sangeetha Sumithran

9,649,301 Bis-quaternary ammonium cyclophane compounds that interact with neuronal nicotinic acetylcholine receptors
Peter Crooks, Linda Dwoskin, Guangrong Zheng, Sangeetha Sumithran, David Allen, Zhenfa Zhang, Paul Lockman

9,433,638 Polymeric prodrug
David Puleo, Thomas Dziubla, Theodora Asafo-Adjei

9,415,092 High activity mutants of butyrylcholinesterase for cocaine hydrolysis
Chang-Guo Zhan, Fang Zheng, Wenchao Yang

9,586,946 Selective immunoproteasome inhibitors with non-peptide scaffolds
Chang-Guo Zhan, Kyung Bo Kim, Vinod Kasam, Na-Re Lee

9,402,875 Amidated dopamine neuron stimulating peptide restoration of mitochondrial activity
Luke Bradley, Don Gash, Greg Gerhardt

9,586,992 Amidated dopamine neuron stimulating peptides for CNS dopaminergic upregulation
Luke Bradley, Don Gash, Greg Gerhardt

9,387,190 Sustained release of topical anesthetics
Michael Jay

9,499,518 Bis-quaternary ammonium salts as pain modulating agents
Joseph Holtman, Peter Crooks, Linda Dwoskin

9,493,439 Proteasome inhibitors
Kyung-Bo Kim, Chang-Guo Zhan (Pharmaceutical Sciences)

9,464,322 Methods for diagnosing and treating alzheimer's disease (AD) using the molecules that stabilize intracellular calcium (Ca2+) release
Philip Landfield, Eric Blalock, Kuey-Chu Chen, Olivier Thibault, Nada Porter

9,567,585 Antisense oligonucleotide modulators of serotonin receptor 2C and uses thereof
Stefan Stamm, Manli Shen, Serene Josiah

9,642,845 Method for alleviating side effects of retinoic acid therapy and/or improving efficacy without interfering with efficacy
Elaine Jacobson, Myron Jacobson, Russell Coyle, Hyuntae Kim, Donna Coyle

DRUG DELIVERY

9,566,341 Compounds including Cox inhibitor moiety and enhanced delivery of active drugs using same
Audra Stinchcomb, Kyung Bo Kim, Ragotham Reddy Pinninti, Priyanka Ghosh, Kalpana Paudel

MEDICAL DEVICES

9,468,557 Compact heat exchanger for veno-venous perfusion-induced systemic hyperthermia systems
Dongfang Wang, Joseph Zwischenberger

9,482,675 Methods and systems for prognosis and diagnosis of brain damage
Mark Lovell, Bert Lynn (Chemistry)

FOOD SCIENCE

9,410,133 Glucan phosphatase variants for starch phosphorylation
Matthew Gentry, Craig Vander Kooi

TRANSFORMED PLANTS

9,487,762 Method and system for producing triterpenes
Joseph Chappell, Thomas Niehaus, David Watt

9,534,237 Sesquiterpene synthase gene and protein
Joseph Chappell, Bryan Greenhagen

AGRICULTURE

9,468,203 Microfabricated surfaces for the physical capture of insects
Michael Potter

EQUINE

9,642,908 Equine disease model for herpesvirus neurologic disease and uses thereof
George Allen

MATERIALS

9,440,858 Carbon particles
Stephen Lipka, Christopher Swartz

9,670,066 Carbon particles
Stephen Lipka, Christopher Swartz

9,413,025 Hybrid flow battery and Mn/Mn electrolyte system
Stephen Lipka, Christopher Swartz

9,390,828 Crystallographically-oriented carbon nanotubes grown on few-layer graphene films
Douglas Strachan, David Hunley

9,388,513 Crystallographically-oriented carbon nanotubes grown on few-layer graphene films
Douglas Strachan, David Hunley

9,533,883 Apparatus and method for harvesting carbon nanotube arrays
Matthew Wisenberger, John Craddock

ENERGY

9,428,705 Enhancement of binding characteristics for production of an agglomerated product
Darrell Taulbee, Robert Hodgen

ENVIRONMENTAL

9,409,125 Method of increasing mass transfer rate of acid gas scrubbing solvents
Joseph Remias, Cameron Lippert, Kunlei Liu

6,675,928 Method of inhibiting nitrosation of an aqueous amine solution used in a process of removing carbon dioxide from a flue gas
Joseph Remias, Payal Chandan, Kunlei Lui

9,468,883 Solvent and method for removal of an acid gas from a fluid stream
Joseph Remias, Cameron Lippert, Kunlei Liu

9,504,957 Flue gas desulfurization apparatus
Kunlei Liu, Joseph Remias

9,409,120 Hybrid process using a membrane to enrich flue gas CO2 with a solvent-based post-combustion CO2 capture system
Kunlei Liu, Reynolds Frimpong, Kun Liu

SEMICONDUCTORS & ELECTRONIC DEVICES

9,647,094 Method of manufacturing a semiconductor heteroepitaxy structure
Zhi David Chen

9,678,583 2D and 3D pointing device based on a passive lights detection operation method using one camera
Fuhua Cheng

MOSQUITOMATE

MosquitoMate produces sterile male Asian Tiger mosquitoes by infecting theme with the Wolbacachia bacterium. When these mosquitoes mate with female mosquitoes, the resulting eggs are unable to hatch, thus eliminating the next generation of mosquitoes. MosquitoMate provides a non-chemical, non-GMO pest control solution that does not harm other species, such as butterflies and bees. It has implications for controlling intractable diseases such as Zika and Dengue. The technology is based on the research of Stephen Dobson, professor of Entomology, in the College of Agriculture, Food and Environment, licensed from UK. MosquitoMate recently expanded its mosquito production operations to a 6000 s.f. facility in Lexington, and has grown to 12 employees. Since partnering with Verily, an Alphabet company (formerly known as Google Life Sciences), the MosquitoMate technology has received quite a bit of media attention, including FastCompany, Wired Magazine, Fortune and CNBC.

WIRED

FAST COMPANY

FORTUNE

CNBC

POWERTECH WATER

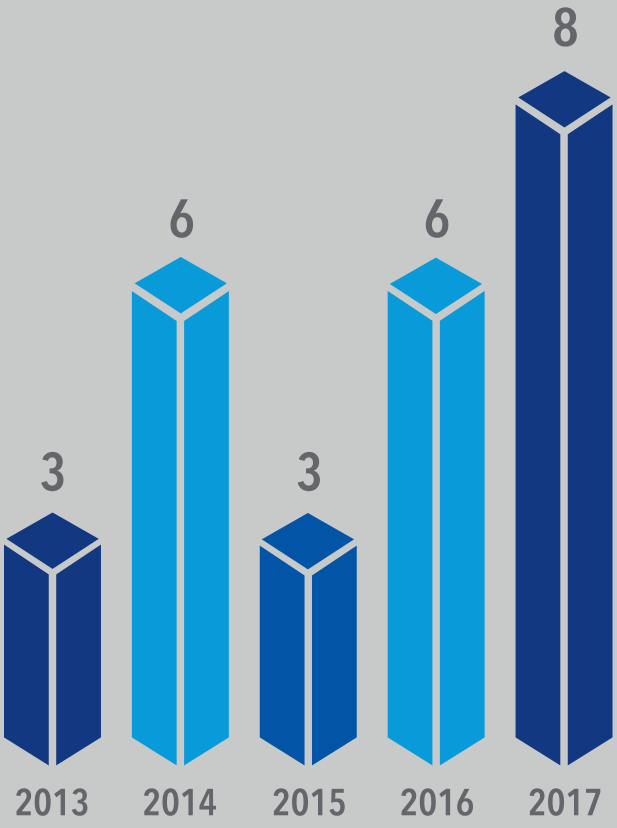
PowerTech Water (PTW) has developed a revolutionary patent-pending INCION™ electro-desalination water treatment system that reduces water purification costs and associated waste by up to 60% and 80% respectively for water intensive industries, such as the food & beverage sector. Unlike traditional water treatment methods, they do not use high pressure pumps, membranes, chemicals, or have any consumables. PowerTech Water's mission is to dismantle the throw away culture of modern water treatment and provide a sustainable solution. The technology was invented by James Landon and his R&D team at the University of Kentucky Center for Applied Energy Research. He founded PTW with his office mate, Cameron Lippert. PowerTech Water has transformed their technology into a viable product through SBIR grants, angel funding and state support.

REDLEAF BIOLOGICS

RedLeaf has developed non-GMO plant-based natural alternatives to potentially harmful synthetic pigments and antioxidants for food applications, in humans and livestock. These products come from a rare variant of the sweet sorghum (Red Leaf) plant, that is grown in Kentucky. RedLeaf's lead product is RedN pigment, which provides a broader stability to pH than other types of natural colorants. The technology is based on the research of Seth DeBolt, professor of Horticulture in the College of Agriculture, Food and Environment. RedLeaf has grown through a variety of funding mechanisms, such as SBIR grants, Kentucky's SBIR grant matching program, NSF i-Corps, and private support.

UK STARTUP COMPANIES

FISCAL YEARS 2013–2017



UK STARTUP COMPANIES IN FISCAL YEAR 2017

- Flow Max – *Todor Petrov (formerly Mechanical Engineering) Andrzej Wala (Mining Engineering)*
- Effective Therapeutics – *Jayakrishna Ambati (formerly Ophthalmology and Visual Science)*
- Epionc – *David Watt (Molecular & Cellular Biochemisty)*
- Avast Therapeutics – *Luke Bradley, Don Gash, Greg Gerhardt (Anatomy and Neurobiology)*
- Pioneer Medicine – *Chang Guo Zhan (Pharmaceutical Sciences)*

UK STARTUP COMPANIES THAT PARTICIPATED IN OTC ENTREPRENEURSHIP PROGRAMS

- Enepret – *Joseph Chappell, Chase Kempenski*
- Nocrobix – *Sylvie Garneau-Tsodikova, Oleg Tsodikova*
- OpenEddi – *Kate Eddens*
- Largus Neurosystems – *Michael Wesley, Josh Lile, Dillon Huffman, Arit Harvanko*
- Stillage Solutions – *Steve Lipka*
- RedLeaf Biologics – *Seth DeBolt*

UK STARTUP COMPANIES THAT RECEIVED SBIR/STTR FUNDING IN FY2017

- CoPlex Therapeutics – *Bert Lynn and Mark Lovell, Chemistry*
- Cytoinformatics, Inc – *Karyn Esser (formerly) Physiology*
- Naprogenix – *John Littleton, Kentucky Tobacco Research Development Center*
- Bluegrass Advanced Material – *Tom Dziubla and Zach Hilt, Chemical Engineering*
- Brockman-Hastings, LLC – *Todd Hastings, Electrical Engineering*
- PowerTech Water – *Xin Gao (Center for Applied Energy Research)*
- MosquitoMate – *Stephen Dobson (College of Agriculture, Food and Environment)*
- Naprogenix, LLC – *John Littleton (Kentucky Tobacco Research and Development Center)*

UKACCEL ASSISTS BUDDING ENTREPRENEURS

On April 13, 2017, the OTC and the Von Allmen Center for Entrepreneurship (VACE) began a new program for UK entrepreneurs, called UKAccel. The program offers a professional development and experiential learning opportunity to UK researchers who have some interest in turning their intellectual property into a startup company. The OTC and VACE provide guidance and a customized work plan for each of the participating teams. Key to this experience is the participants' access to Awesome Inc, a Lexington-based start-up accelerator, that enables participants to take part in an immersive experience in entrepreneurship culture. The goal is for the UK researchers to discover if launching a startup company is the best way for them personally to commercialization their technology.

UKPITCH HELPS FACULTY INVENTORS

The OTC started a new program in December called UKPitch, for UK faculty inventors who have an interest in "pitching" their research, intellectual property, or startup company in a competition or at a conference demo day. For qualified and selected applicants, the OTC provides support for some of the registration and travel related costs. The OTC works with program participants to hone their pitch, and choose the appropriate venue for it.

63 TOTAL ACTIVE STARTUPS RELATED TO UK TECHNOLOGY

FACULTY EDUCATION PROGRAM

The Office of Technology Commercialization began a faculty education program, taught by the OTC, covering the critical areas of patent research (researching patent literature), invention disclosure, patent prosecution, intellectual property (IP)-driven corporate partnering and new venture creation in a variety of business settings in the global economy—all from the perspective of the researcher/inventor. Subtopics include:

- Grant funding and IP
- IP as a product suite of partnership tools
- Methodologies to research, evaluate, value and create value from IP
- Building an IP portfolio
- Commercialization Strategies
- Collaborative IP development
- Collaborative IP management

Participants in the program are engaged via academic theories, scenarios and case studies. The course is taught in four one-hour sessions:

- Patent Literature and Your Research;
- Building a Patent Suite to Build Your Brand;
- Research Commercialization Strategies; and
- IP Policy and Innovation

OTC FELLOWS PROGRAM

In January 2017, the OTC began the Fellows program and hired three positions. Two additional positions were then hired in July 2017. The Fellows Program is open to full-time current undergraduate (90+ hours) and graduate students, and post-doctoral scholars.

The OTC Fellows Programs offers a unique educational experience that gives UK students and post-docs the opportunity to contribute to the commercialization of University of Kentucky technologies. Fellows work closely with the OTC on a part-time basis to enhance the OTC's understanding of the commercial potential of UK technologies, and to assist with the commercialization process. In turn, Fellows gain in-depth experience working on early stage technology assessments, writing technology summaries and preparing marketing campaigns, among other duties.

MONTHLY EMAIL NEWSLETTER

Commercialization Connect is the monthly newsletter of the University of Kentucky Office of Technology Commercialization. This newsletter is a way for the OTC to share pertinent technology commercialization information with stakeholders—UK faculty, staff, students, the local entrepreneurial community, state government, corporations and other interests nationwide.

Commercialization Connect offers, to our 600+ readers, transparency related to the process for commercializing exciting discoveries at the University of Kentucky, including the operations of the OTC and the ways in which we serve our stakeholders. Importantly, the newsletter highlights the great work of our researchers and the entrepreneurial community, and provides information on activities and events of interest to the community.

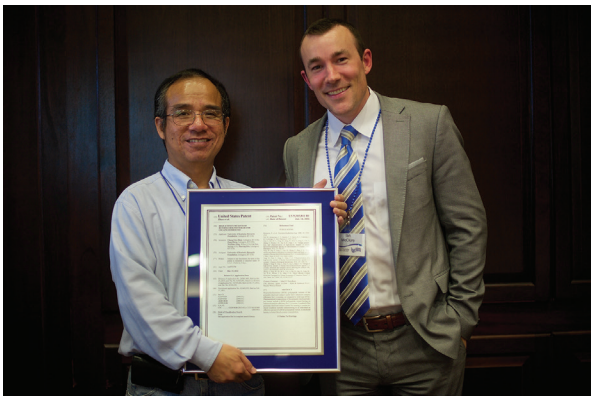
PATENT PALOOZA

The OTC hosted its first annual Patent Palooza on March 28, 2017. Patent Palooza was a festive event that recognized the accomplishments of inventors and entrepreneurs in FY2016. This includes inventors named on a patent that issued, inventors whose technology was licensed, and/or inventors whose technology was the subject of an SBIR/STTR award.

Each inventor named on an issued patent in FY16 was given a coffee mug with the front cover of their patent proudly printed on it. Forty-three inventors were recognized for the 30 patents that issued in fiscal year 2016.

Special recognition—an engraved and framed plaque with replica patent—was given to Dr. Chang-Guo Zhan, who reached a milestone of receiving his 20th patent issued in 2016. He had five patents issued last year alone! Recipients of SBIR-STTR grants in FY16 were recognized, as well as inventors on patents for which a license agreement was executed.

Approximately 100 people attended Patent Palooza!, including President Eli Capilouto and the Vice President for Research, Dr. Lisa Cassis. The room was buzzing with energy, as many attendees expressed that it is wonderful to celebrate UK faculty inventors and entrepreneurs. Many enjoyed connecting with others in the UK research community.



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