

FOSTERING GROWTH IN INNOVATION

ANNUAL REPORT
Fiscal Year 2018



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FISCAL YEAR 2018

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We want to thank the University of Kentucky (UK) research community for proving us right: *there is an amazing amount of innovation going on at UK!*

This year was a period of growth for our office and UK commercialization capabilities. It was our first full year with a Commercialization & Licensing team, rolling out new marketing materials, licensing strategies and technology partnership initiatives. This growth led to 29 licenses and options executed in FY 18, a 123% increase from last year and the most ever in a year for the University. We also checked up on all previously active licenses, auditing all commercialization agreements and communicating with many licensees to build an ongoing and transparent relationship with them. We hired a new head of marketing and expanded our Strategic Alliances team, resulting in new research and commercialization partnerships with other universities, companies, investment firms, foundations, networks and professional associations. Our Intellectual Property Development (IPD) team managed two new cohorts of OTC Fellows, and rolled out a new process for assisting our Intellectual Property Committee's review of inventions. Additionally, IPD implemented new processes for royalty accounting, invoicing, and compliance reporting. These efforts continued to build and convey our client service culture, resulting in nearly

100 inventions disclosed in the year – almost a 100% increase over last year and another UK annual record. We created an intentional focus on cultivating startups affiliated with UK technology, with support from the Von Allmen Center for Entrepreneurship to develop a New Ventures Team and launch co.create, our new suite of services to assist entrepreneurial faculty related to company formation and growth.

We love to see the excitement around UK innovation. Patent Palooza! was a fantastic event this year, with increased attendance by 50% over last year to see over 100 UK researchers recognized for their discoveries and commercialization successes. We built partnerships with regional universities and Kentucky companies to continue building channels for the transfer of these great ideas to market, and continue to see great opportunity in building state and regionally affiliated networks to collaborate on commercialization.

On behalf of the amazing team here at the UK OTC, I invite you to read through the rest of this report on the state of UK commercialization in FY 18. We all think you will be as excited as we are about the potential that lies in UK's research. Of course, the vision and support from UK's leadership - in particular, President Eli Capilouto, Vice President for Research, Lisa Cassis, and Associate Vice President for Research & Innovation, Rodney Andrews - deserves a large deal of appreciation from all involved.

You can keep up with us on a more frequent basis by following us on [LinkedIn](#) and [Twitter](#), and by subscribing to our monthly newsletter, [Commercialization Connect](#).

Sincerely,

Ian D. McClure
Director, OTC



“The University of Kentucky has a rich history in developing technology that transforms the marketplace and improves the health and well-being of those we serve. Each breakthrough starts with an idea, and UK faculty and staff entrepreneurs carry with them a legacy of new ideas, technologies, and inventions manifest in UK's more than 600 worldwide patent assets. UK Research and the Office of Technology Commercialization are integral elements of our commercialization pipeline, and pioneering new innovations is fundamental to our role as the University for Kentucky.”

—Eli Capilouto,
University of Kentucky President

“Working together across disciplines, UK researchers are envisioning new approaches to challenges, developing new solutions to intractable problems, and creating new products to improve lives. Solutions to our real-life challenges in Kentucky are applicable worldwide, and our researchers are engaged in vital commercialization to achieve that reach.”

—Lisa Cassis, Ph.D.
Vice President for Research



THE OTC TEAM



IAN MCCLURE
Director

INTELLECTUAL PROPERTY DEVELOPMENT TEAM



DON KEACH
Associate Director



SABRINA DARNELL
Intellectual Property/Compliance Coordinator



KAYTO BUCHANON
Student
Intellectual Property Assistant



KATIE OLSON
Student
Intellectual Property Assistant

STRATEGIC ALLIANCES TEAM



TAUNYA PHILLIPS
Associate Director



MARIAM GORJIAN
New Ventures Manager



JACQUELINE J. GREENE
Marketing Coordinator



TANNER ANDERSON
Marketing Assistant

TECHNOLOGY COMMERCIALIZATION & LICENSING TEAM



ERIC CASTLEN
Associate Director



ALI BOCOOK
Senior Contracts Coordinator



TASHA JONES
Commercialization Manager



ALEX PORTER
Commercialization Manager

FELLOWS TEAM



MARION COE
Fellow



ISABEL DERERA
Fellow



KAIA HAMPTON
Fellow



MITCH LYON
Fellow



MICHAEL ORR
Fellow



KENDRA STAGGS
Fellow



JOSEPH STEVENS
Fellow

ACCOMPLISHMENTS

ALI BOCOOK: Promoted to Senior Contracts Coordinator

SABRINA DARNELL: Appointed co-chair of the iEdison Compliance Committee for the Association of University Technology Managers (AUTM)

NATASHA JONES: Earned the Certified Licensing Professional™ (CLP) credential

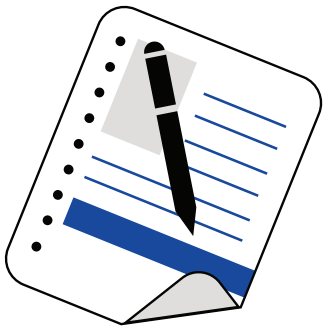
IAN MCCLURE: Selected to IAM-Strategy 300 as one of the world's leading IP strategists in IAM Magazine

TAUNYA PHILLIPS: Appointed to the Midwest Research University Network (MRUN) Board of Directors

\$5,000,000+

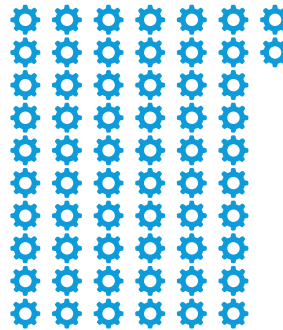
DISTRIBUTED TO INVENTORS SINCE 2010

101 INVENTION
DISCLOSURES



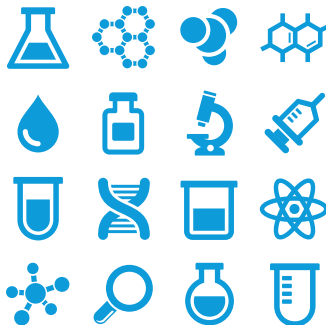
62

PATENT
APPLICATIONS



29

NEW LICENSES
& OPTIONS
EXECUTED



23

PATENTS
ISSUED

\$2,345,029

\$14.62M

DISTRIBUTED TO COLLEGES AND
DEPARTMENTS SINCE 2010

GROSS
ROYALTY
INCOME
IN FISCAL
YEAR

2018

2017

AUGUST

Partnership with Space Tango *(page 12)*

SEPTEMBER

Partnership with ECU *(page 12)*

OCTOBER

Completed New Website

2018

JANUARY

NIH/NIGMS STTR Grant Proposal Submitted *(page 7)*

FEBRUARY

Launch of Expedited Intellectual Property (IP) Track *(page 7)*

APRIL

Partnership with US WorldMeds *(page 12)*

MAY

Completion of Internal License Agreement Audit

JUNE

Launch of New Ventures Team and co.create Program *(page 13)*

ON THE HORIZON

Launch of Southeast XOR and Midwest XOR Platforms *(page 7)*

Launch of UK Startup Network

CATalyst Fund *(page 7)*

Expedited IP Track

UK Office of Technology Commercialization (OTC) and the UK Office of Sponsored Projects Administration (OSPA) announced the pilot of a new “Expedited IP Track” program offering for corporate sponsored research partners hoping to minimize time and transaction costs associated with negotiating sponsored research agreements.



National Institutes of Health (NIH) – National Institute for General Medical Sciences (NIGMS) STTR Regional Tech Transfer Accelerator Hub for IDeA States

The Office of Technology Commercialization (OTC) submitted a NIH-NIGMS STTR grant proposal in January 2018. The University of Kentucky was the lead academic institution, with University of Louisville and West Virginia University as partners, in a consortium of 24 universities in the southeast and Puerto Rico. The principle investigator on the proposal is Ian McClure, director of OTC with XRateHealth, a technology accelerator located in Louisville who specializes in biomedical innovations, as the small business partner. The application proposes to create a coordinated network and commercialization resources of accelerators throughout the Southeast IDeA Region (Arkansas, Kentucky, Louisiana, Mississippi, Puerto Rico, South Carolina, and West Virginia). The goal is to enhance the capacity to move scientific results from academic institutions into commercialization and promote a sustainable culture of biomedical entrepreneurship within IDeA states.

CATalyst

The Office of Technology Commercialization (OTC) is working diligently to activate CATalyst, the first ever University of Kentucky Commercialization Fund. This fund will be established to enhance development of inventions that have been disclosed to the OTC. The funding should enable a project to reach milestones along the commercialization pathway. Agreed upon milestones are expected to be met over the one-year funding period. Be on the lookout for more details coming soon.



Southeast XOR and Midwest XOR Platforms

The Southeast Executives-on-Roster (XOR) is a collaboration between 14 Southeastern Conference (SEC) universities, and the Midwest Executives-on-Roster (XOR) is a collaboration between 11 other Midwest universities. These universities have jointly created these online platforms to broaden access to experienced entrepreneurial talent and to match that talent to university-affiliated startups in need of executive management.

60

TOTAL ACTIVE STARTUPS RELATED TO UK TECHNOLOGY

46

LICENSE AGREEMENTS THAT GENERATED INCOME IN FY 2018

6

UK STARTUP COMPANIES FORMED IN FY 2018

- ConusRx, Inc.
- Flaming Fox, LLC
- Parcure, LLC
- Enepret, Inc.
- Kangaroo Keeper LLC
- Thoroughbred Carbon Sciences LLC

5

UK STARTUP COMPANIES THAT RECEIVED SBIR/STTR FUNDING IN FY 2018

Bluegrass Advanced Materials, LLC – Tom Dziubla and Zach Hilt, Chemical Engineering
CoPlex Therapeutics LLC – Bert Lynn and Mark Lovell, Chemistry
Naprogenix, Inc. – John Littleton, Kentucky Tobacco Research Development Center
Paratechs Corp. – Angelika Fath-Goodin, formerly Entomology
PowerTech Water LLC – Xin Gao, Center for Applied Energy Research

STARTUP COMPANIES

Thoroughbred Carbon Sciences LLC

Thoroughbred Carbon Sciences LLC is utilizing a University of Kentucky patented process to take bourbon stillage and produce high-quality activated carbons. The research uses a method in which leftover spillage is repurposed from the brewing and distilling process to produce activated carbon. Based on this approach, the carbons can be used for water filtration, high energy storage devices (supercapacitors), fertilizer, black paint (used at horse farms), air filtration, dry lubricants, and in several automotive applications. The research was headed up by Dr. Steve Lipka, associate director, and conducted at the University of Kentucky Center for Applied Energy Research (CAER).



Kangaroo Keeper LLC

Kangaroo Keeper is working towards providing a secure method of giving kangaroo care to intubated infants. Because intubated babies are attached to a ventilator, the process is more intensive to prepare, and more caution is needed to ensure that the baby stays connected to the ventilator. The prototype has been developed by Stephanie Jenkins, a respiratory therapist in the Neonatal Intensive Care Unit (NICU) at the University of Kentucky Children's Hospital. Stephanie is also a graduate of OTC & VACE's UKAccel program.

Alkahest

Jayakrishna Ambati (formerly Physiology)
Mark E. Kleinman (formerly Ophthalmology and Visual Sciences)

Arysta LifeScience North America, LLC

Douglas D Archbold (Horticulture)
Marta Nosarzewski (Horticulture)

Avast Therapeutics, LLC (2)

Luke Bradley (Anatomy & Neurobiology)
Don Gash (Anatomy & Neurobiology)
Greg Gerhardt (Anatomy & Neurobiology)

BioLegend, Inc.

John S. Thompson (College of Medicine)
Stephen Brown (College of Medicine)

CBS News Inc.

Seth Parker (College of Engineering)
Jim Griffioen (College of Engineering)

EryDel S.p.A.

Chang-Guo Zhan (College of Pharmacy)
Daquan Gao (formerly College of Pharmacy)
Fang Zheng (College of Pharmacy)
Lei Fang (Forestry and Natural Resources)

ConusRx, Inc. (2)

Peter Crooks (formerly College of Pharmacy)
Linda Dwoskin (College of Pharmacy)
Guangrong Zheng (formerly College of Pharmacy)
Zhenfa Zhang (formerly College of Pharmacy)
Sangeetha Sumithran (formerly College of Pharmacy)
Marharya Pivavarchyk (formerly College of Pharmacy)

Enepret, Inc.

Joseph Chappell (Plant & Soil Sciences)
Shigeru Okada (formerly Plant & Soil Sciences)
Shuiqin Wu
David Watt (Molecular & Cellular Biochemistry)
Timothy Devarenne (formerly Plant & Soil Sciences)
Thomas Niehaus (formerly Plant & Soil Sciences)
Scott Kinison (formerly College of Pharmacy)
Xun Zhuang (formerly College of Pharmacy)

Epionc, Inc (2)

David S. Watt (Molecular & Cellular Biochemistry)
Chunming Liu (Molecular & Cellular Biochemistry)
Vitaliy Sviripa (College of Pharmacy)
Markos Leggas (College of Pharmacy)

Flaming Fox, LLC

Katherine S. Eddens (formerly College of Public Health)

Flow Max, LLC

Todor Petrov (Mechanical Engineering)
Andrzej Wala (formerly Mining Engineering)

Intervet Inc d/b/a Merck Animal Health

Udeni Balasuriya (formerly Veterinary Science)

Kangaroo Keeper, LLC

Stephanie Jenkins (Neonatal Intensive Care Unit)
Lindsey Marie Tarasenko
Nora Warshawsky (formerly College of Nursing)

Nagase Sanbio Co., Ltd.

Douglas D. Archbold (Horticulture)
Marta Nosarewski (Horticulture)

Nufarm Americas, Inc.

Douglas D. Archbold (Horticulture)
Marta Nosarewski (Horticulture)

Palleon Pharma, Inc.

Steve Estus (Physiology)
Manasi Malik (formerly Biology)
James Simpson (Physiology)

Parcure, LLC

Vivek Rangnekar (College of Medicine)

PowerTech Water LLC

Xin Gao (Center for Applied Energy Research)
Kunlei Liu (Center for Applied Energy Research)
James Landon (College of Engineering)
Ayokunle Omosebi (Center for Applied Energy Research)

Rodeo Therapeutics Corporation

Hsin-Hsiung Tai (formerly College of Pharmacy)

Thoroughbred Carbon Sciences LLC

Stephen Lipka (formerly Center for Applied Energy Research)
Christopher Swartz (Healthcare)

Tonya Roth

Nora Warshawsky (College of Nursing)

Zoetis LLC

Thomas Chambers (Gluck Equine Research Center)

Vanderbilt University, Cumberland Emerging Technology

Vijayakumar Sonar (formerly College of Pharmacy)
Sekhar Konjeti
Joseph Roti Roti
Michael Freeman
Peter Crooks (formerly College of Pharmacy)

Virtua Health, Inc.

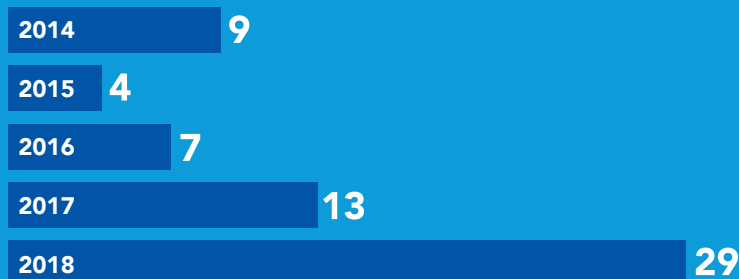
Nora Warshawsky (formerly College of Nursing)

W. Neudorff GmbH KG

Douglas D. Archbold (Horticulture)
Marta Nosarewski (Horticulture)

123%

INCREASE IN LICENSES OVER THE LAST FISCAL YEAR





Dr. Mark Lovell



Dr. Bert Lynn

Alzheimer's Disease Detection

Dr. Mark Lovell and **Dr. Bert Lynn** developed a method for measuring the concentration of a biomarker in patients diagnosed with or at risk of developing Alzheimer's disease or Mild Cognitive Impairment (MCI). The concentration of the biomarker, called lipocalin-PDS/TTR, is measured in patients; a lower level of this biomarker is indicative of the presence of Alzheimer's disease or MCI. This technology enables rapid screening for and detection of Alzheimer's disease in patients thought to be at risk of having Alzheimer's Disease or MCI.

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Central Venous Access



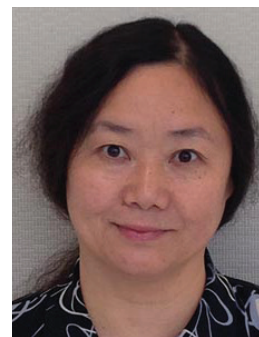
Dr. John Gurley

John Gurley, professor in the College of Medicine, developed a new method of lead placement for patients with central venous occlusions. Central venous access is a life-sustaining practice that can be complicated by the formation of an occlusion around targeted vessels. This invention describes a novel method for gaining central venous access by establishing a tissue track from the skin

to the vasculature using a series of sharp needle wires pushed and pulled through catheters. In some cases, physicians need access to the central venous system, which is deep beneath the skin. Because there are times the vessels can become occluded after establishing a connection, there is the need for further treatment. Using this method enables physicians to establish access quickly and safely, and to re-acquire access to a site that becomes occluded, which enables physicians to provide the best treatment possible.



Dr. Chang-Guo Zang



Dr. Fang Zheng

Anticocaine Medication

Dr. Chang-Guo Zang, professor in the College of Pharmacy, **Dr. Fang Zheng**, associate professor in the College of Pharmacy, and **Dr. Lei Fang**, visiting scholar in Forestry and Natural Resources, have discovered mutants of a naturally occurring enzyme which metabolizes cocaine in humans. These mutants can metabolize cocaine more quickly and are stable at body temperature longer than other forms of this enzyme. Currently, there are no therapeutics available for cocaine use disorder or cocaine overdose. This enzyme could be administered as a preventative measure to block the stimulant effects of cocaine or as a therapeutic to reverse cocaine overdose.

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Dr. YuMing Zhang

Measuring Welding Torch Orientations

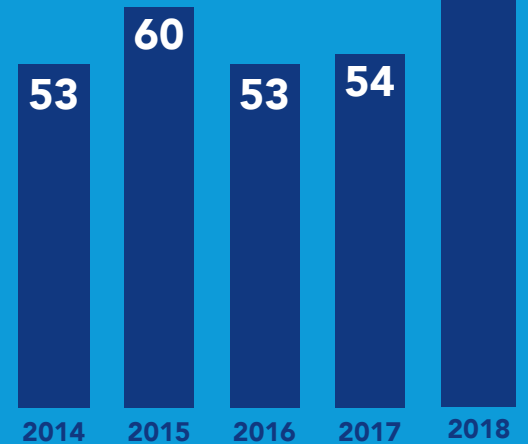
Dr. YuMing Zhang, James R. Boyd professor and director of International Partnerships in electrical and computer engineering, and **Weijie Zhang**, have created an apparatus and method for measuring welding torch orientations throughout a job. Welders adjust the torch orientation during a weld to minimize disturbances in

the process that cause poor weld quality. Mastering this technique often requires long training cycles to learn from experienced welders. This invention allows recording of a welder's adjustments to a torch orientation throughout the job. This data can be used to compare welder techniques to more effectively train welders and improve proficiency.

101

INVENTION DISCLOSURES

INVENTIONS
DISCLOSED
OVER THE
PAST FIVE
YEARS



Managing Your Intellectual Property (IP)

■ WHEN DO YOU NEED A MATERIAL TRANSFER AGREEMENT (MTA)?

When research material is leaving the University for another institution or an industry research partner, an MTA is needed to secure the rights of the University and that of the individual researchers including publication rights. When research material is coming into the University, the other institution may require an MTA to be signed.

■ WHEN DO YOU NEED A NON-DISCLOSURE AGREEMENT (NDA)?

An NDA is needed when confidential information is being communicated to someone outside the University of Kentucky. This includes licensing, sponsored projects, commercialization, and research collaboration communications.

■ WHEN DO YOU NEED A DATA USE AGREEMENT (DUA)?

A DUA is needed before there is any use or disclosure of a limited data set to an outside institution or party.

The UK Office of Technology Commercialization (OTC) handles all MTAs and NDAs for University research purposes.

860

TOTAL AGREEMENTS

411

MATERIAL TRANSFER
AGREEMENTS

413

NON-DISCLOSURE
AGREEMENTS

36

DATA USE
AGREEMENTS

AGRICULTURE

2201 Use of Ryegrass to Ameliorate the Fragipan
John H. Grove, A.D. Karathanasis, Christopher J. Matocha, Lloyd W. Murdock

AUTONOMOUS SYSTEMS

2281 Analytical System for Trace Gas Detection with Unmanned Vehicles

Marcelo I. Guzman, Travis J. Schuyler

BIOFUELS

2187 Oxidation Catalyst

Mark Crocker, Yang Song

BIOINFORMATICS

2246 Bioinformatics Pipeline to Enable Precision Oncology

Kannabiran Nandakumar

BIOMARKERS

2194 Use of Peripheral Blood Exosome Lipids as Biomarkers for Human Inflammatory Bowel Disease Activity

Terrence A. Barrett, Teresa W. Fan, Andrew N. Lane

2227 HSP27 as a Therapeutic Target for Vascular Cognitive Impairment and Dementia

Donna M. Wilcock

2273 Reg3A and related Reg Family Members as Biomarkers for Cancer

Sabine M. Broukhon, Ron Bruntz, Matthew Hoover, Stephanos Kyrkanides, Melvyn Yeoh

CELL TRANSPLANTATION

2273 Intraspinal Injection of Cell Culture- or Soleus Muscle-Derived Mitochondria into Injured Rat

Samirkumar P. Patel, Alexander G. Rabchevsky, Patrick G. Sullivan

CHEMICAL DETECTION

2240 Radiochromic Changes of Leuco Dyes with Various Constituents

John E. Anthony

DATA STORAGE

2278 Accelerator Pre-Processor for Backup Clients

Ray Hyat

DIAGNOSTIC

2216 Evaluation of Acid/Base and Electrolyte Alterations in Food Ischemia to Predict Stroke

Justin Fraser, Keith R. Pennypacker

2263 CAPTURE™ Screening Tool for COPD

David Mannino

DIGITAL IMAGING

2224 Fusing Ground-Level and Overhead Imagery for Fine-Grained Building Classification

Nathan Jacobs, Scott Workman

DRUG DELIVERY

2232 Oxidation Triggered Polymer Degradation

Thomas Dziubla, Zach Hilt, Carolyn Jordan

2264 RNA Nanostructures for Solubilizing and Carrying High Copy Numbers of Paclitaxel or Derivatives

Peixuan Guo, Sijin Guo, Mehdi Rajabi, Dan Shu, Yi Shu, Mario Vieweger, Hongran Yin

2267 Cell Derived Vesicles via Membrane Fragmentation for Targeted Therapeutic Delivery

Jill M. Kolesar, Christopher I. Richards

ENERGY

2200 Dynamic Polarity Packing Material for Increasing Mass Transfer in Aqueous Gas Absorption

Zhen Fan, Kunlei Liu, Joshua Stolaroff, Leland Widger

2208 IEC Plasma Generator Module with Defined Gas Feeding

Helmut Koch, Michael Winter

2213 Rare Earth Recovery from Acid Leachate of Coal Waste Using a Low-Cost Selective Precipitation Circuit

Ricky Q. Honaker, Wencai Zhang

2231 Process and Materials for an Electrochemical Cell to Absorb and Decompose Organic Nitrosamine

Compounds from Water Streams

Xin Gao, James Landon, Kunlei Liu, Jesse G. Thompson

2236 Down Hole Combuster

Joshua Werner

2250 Accelerator Based Fusion Reactor

Keh-Fei Liu

2255 UKY-CAER Heat-Integrated Transformative CO₂ Capture Process

Kunlei Liu, Heather Nikolic, Jesse G. Thompson, Amanda Warriner, Fan Zhen

2272 Wind Turbine for Forced Air Generation to Enhance Drying Rate

Akinbode A. Adediji, Francis Agbali

ENTOMOLOGY

2203 Modified Funnel Trap for Collecting Diabroticina Beetle Pests

Christopher William Kositzke, Amanda R. Skidmore

ENVIRONMENTAL

2190 Cementitious Compositions

Thomas L. Robl

2270 Discovery of Sulfur in Micro and Nanoparticles in Environmental and Animal Disease

Thomas W. Swerczek

EQUINE

2258 Inflammatory and Anti-Inflammatory Indices for Equine and Other Athletes

David W. Horohov, Allen E. Page, John Craig Stewart

2259 Injury-Related Markers in Equine Athletes

David W. Horohov, Allen E. Page, John Craig Stewart

2285 Lateral Flow Test to Detect Equine Insulin in Blood Samples to Aid in Diagnosing and Monitoring of Equine Endocrine Diseases

Amanda A. Adams

FOOD SCIENCE

2205 Food Protein Products with Reduced Levels of Sulfur Odorants

William L. Boatright

INDUSTRIAL PROCESSES

2237 Method and Equipment for Continuous Operation of a Selective Precipitation Circuit for the Recovery of Rare Earth Elements from Acid Leachate of Coal and Coal By-Products

Ricky Q. Honaker, Joshua Werner, Wencai Zhang

2238 In Tank Clarifier

Joshua Werner

2268 Development of a Continuous Operation of a Selective Precipitation Circuit for the Recovery of Rare Earth Elements from Acid Leachate of Coal and Coal By-Products

A.C. Chandra-Shekara, Ricky Q. Honaker, Joshua Werner

2274 A Self-Cleaning, Non-Clogging, Water-Flooded Impingement Screen for Dust-Control

Ashish Ranjan Kumar, Steven Schafrik, Oscar Velasquez, William Chad Wedding

MATERIALS

2219 Materials Related to the Herculanum, En-Gedi and Beowulf Scrolls/Manuscripts

James N. Griffioen, Seth Parker

2228 Low-Temperature Plasma Treatment for Enhanced Recovery of Highly Valued Critical Rare Earth Elements from Coal

Ricky Q. Honaker, Xinbo Yang

2257 Crenulated, Low Thermal Conductivity Carbon Fiber

John Craddock, Matthew C. Weisenberger

2260 Chirality Selected Imbedded Nanoribbons

Armin Ansary, Mathias J. Boland, Mohsen Nasser, Douglas R. Strachan

2262 Nanoscale Membrane Pores Having Multi-Terminal Electrodes

Douglas R. Strachan

2271 Coated Zinc Oxide Nanoparticles for Use as Zinc Fertilizers

Zeinah El Haj Baddar, Jason Unme

2279 Behrgripe 8

Tristana Duvallet, Robert B. Jewell, Anne E. Oberlink, Thomas L. Robl

MEDICAL DEVICES

2196 Kangaroo Keeper Infant Ventilator Circuit Security Strap

Stephanie Jenkins

2206 Image Analysis for Predicting Body Weight in Humans

Chee Meng Ng

2229 Percutaneous Pulmonary Artery Drainage Device

Dongfang Wang, Joseph B. Zwischenberger

2233 Endotracheal Tube Holding Device for Small Infants

John A. Bauer, Brandon L. Schanbacher

2242 Digital Complete Dentures in a Day Technique

Xin Gao, James Landon, Kunlei Liu, Jesse G. Thompson

2277 Eyepiece-Less Stereo Digital Microscope

Eric B. Higgins

2261 DPK Reservoir

William Lewis Dillen, Thomas Pittman

2209 System and Method for an Optical, Spatially Precise "4pi" Detector for Radiotherapy Quality Assurance

Janelle Molloy

2214 Kinematics and Kinetics Modeling of the Human Body for 3-D Printing of Rehabilitation

Justin Huber, Kevin Richardson, Lumy Sawaki Adams, Lydon S. Stephens

OPHTHALMOLOGY

2189 Reduction of Phototoxicity Damage to the Retina during Ocular Surgery using Cold Irrigation

Romulo J. Albuquerque, Nicholas Andrew Bell, Jooyoung Cho

2193 New Antibiotics

Steven Van Lanen

2221 Loperamide Hydrochloride Treatment for Peripheral Ocular Neuropathic Pain

Romulo J. Albuquerque, Nicholas Andrew Bell, Jooyoung Cho

ORGAN TRANSPLANTATION

2254 Patterned Tissue Reconstruction

Ahmed K. Abdel-Latif, Bradley J. Berron, Cong Li

RESEARCH TOOL

2204 Rapid Seed Singulation and Deposition Method for Small Seeds

Sarah Bailey, Joseph Dvorak, Justin Sand, Leland Sowards, Jordyn Tucker

2210 Delivery Method for Heavy Isotope Incorporation into Living Systems

Jacob Roney, Ramon Sun

2225 Improved System and Method for Using Electrical Double Layer in Nanopores for Detection

Samuel Bearden, Guigen Zhang

2226 Malodor Antagonists #1

Timothy S. McClintock, Tomoko Sengoku

SCREENING TEST

2269 A Rapid Screening Test for Sulfonated Nanoparticles in Environmental and Animal Disease

Thomas W. Swerczek

SEMICONDUCTORS & ELECTRONIC DEVICES

2195 Adiabatic Logic-In-Memory Architecture

S. Dinesh Kumar, Himanshu Thapliyal

2230 Nanoporous Metal Oxide Photocatalysts Combining Graphene Quantum Dot Sensitization and Nonmetal Doping

Syed Zahadul Islam, Doo Young Kim, Stephen Rankin, Namal Wanninayake

2243 Analog Integrated Circuit Fabrication – Automation of Photolithography and Deposition

Ted Ferguson

2247 Simplified Photothermal Apparatus for Measuring Thermal Conductivity of Small Samples

Joseph Brill

2251 Memristor Controller for Resistive RAM

Ted Ferguson

2252 Energy-Efficient and Secure Adiabatic Logic for DPA-Resistant Embedded Devices

S. Dinesh Kumar, Himanshu Thapliyal

SOFTWARE

2197 SARA: Sexual Assault Reporting Application

David Carson, Kaylynn Marie Glover

2207 MyoVision: Software for Automated Analysis of Skeletal Muscle Immunohistochemistry

Kenneth S. Campbell, John J. McCarthy, Charlotte A. Peterson, Yuan Wen

2211 Auto-Populating Dental Treatment Plan

Craig S. Miller, Jeffrey T. Witte

2212 Display System for Annotating and Recording Carious Lesion Location and Depth in a Dental Health Record

Craig S. Miller, Jeffrey T. Witte

2217 Vocal Function Exercises (VFEs) Smartphone Application

Vrushali S. Angadi, Ming-Yuan Chih, Joseph C. Stemple

2244 Upocode- Fluid Code

Ted Ferguson

2248 Black Box Emulation

Ted Ferguson

2249 Auto-Populating Dental Treatment (Progress) Note

Craig S. Miller, Andrew Simonds, Jeffrey T. Witte

THERAPEUTICS

2186 Aromatherapy Treatment for Neonatal Abstinence Syndrome

John A. Bauer, John M. Daniel, Lesley N. Davidson, Lori A. Shook

2191 Assessment of Retinal and Choroidal Blood Flow Noninvasively using Color Amplification

Romulo J. Albuquerque, Nicholas Andrew Bell, Paras Vora

2192 RIT2 as a Therapeutic Target in Brain Injury

Douglas A. Andres

2198 Novel Mithramycin Derivates for Cancer Chemotherapy

Markos Leggas, Jurgen Rohr, Oleg V. Tsodikov

2199 Aurone-Based Tubulin Polymerization Inhibitors for the Treatment of Cancer

Jessica Blackburn, Mykhaylo S. Frasinuk, Chunming Liu, David S. Watt, Yangi Xie

2202 Fluorescent Androgens for Drug Development Tools for Castration-Recurrent/Resistant

Michael V. Fiandalo, James L. Mohler, Vitaliy M. Sviripa, David S. Watt

2215 Perlecan Domain-V Treatment Enhances Neurogenic Brain Repair and Functional Recovery

Gregory J. Bix

2220 Cysteine Mutants of Cocaine Esterase

Donald Landry, Chang-Guo Zhan

2223 EIS Inhibitors

Sylvie Garneau-Tsodikova, James E. Posey, Oleg V. Tsodikov

2234 Repositioning of Flubendazole and Related Compounds for Treating Paralysis after Traumatic Spinal Cord Injury

James W. Geddes, Chen-Guang Yu

2235 Fluorinated 4- (Phenylethynyl) Pyridines as Epigenetic Regulators (Linked 2166)

Markos Leggas, Chunming Liu, Vitaliy M. Sviripa, David S. Watt

2241 A novel and more effective bivalent live-attenuated influenza vaccine (LAIV) for the prevention and control of equine influenza virus (EIV) in horses

Thomas M. Chambers, Luis Martinez-Sobrido

2245 Vaccine to Treat and Prevent Chronic Infection with Toxoplasma Gondii

Yasuhiro Suzuki

2253 Intracellular Screening of Plant and Algal Cells for Bioactive Products using Nanoparticles

Luke H. Bradley, Barbara Knutson, John M. Littleton, Stephen Rankin

2256 A Small Molecule that Elevates Signaling through the Insulin Receptor

Rolf J. Craven, Kaia Hampton, Olivier H. Thibault

2265 Fully Human Antibodies Targeting Specific Regions of E-Cadherin and Related Methods for Cancer Therapy

Sabine M. Brouxhon, Stephanos Kyrkanides

2266 Targeting Reg3A and Related Methods for Cancer Therapy

Sabine M. Brouxhon, Stephanos Kyrkanides, Melvyn Yeoh

2275 N,N'-Diaryl-Bishydrazones in a Biphenyl Platform: Broad Spectrum Antifungal Agents

Nishad Thamban Chandrika, Sylvie Garneau-Tsodikova, David S. Watt

2276 Personalized Treatments for Cancers with High Glycogen Content

Matthew S. Gentry, Ramon Sun, Lyndsay EA Young

2280 Inhibition of Alpha5Beta1 Integrin with ATN-161 as a Novel Therapy for Vascular Dementia

Gregory J. Bix, Jill M. Roberts

2282 Method of Treatment with Tradipitant

Sharon Walsh

2283 Preparation of ICP4 Compounds

Robert A. Lodder

2284 ICP4 Compounds for Treatment of Lambert-Easton Myasthenic Syndrom

Robert A. Lodder

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2188 Genetic Modifications for Producing Heat-Resistant Plants

Arthur G. Hunt, Carrie Merrill, Carol Von Lanken

VIRTUAL REALITY

2232 Oxidation Triggered Polymer Degradation

Thomas Dziubla, Zach Hilt, Carolyn Jordan

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2222 Wastewater Treatment by a Hybrid Electrochemical and Membrane Process for Water

Xin Gao, James Landon, Kunlei Liu, Ayokunle Omosebi

2239 Recirculating Water Wash Recovery Column with Active Carbon Particles for Removing Entrained Solvent in Process Emissions

Bradley D. Irvin, Kunlei Liu, Amanda Warriner, Leland Widger

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9,770,033 Compositions and Methods for Pest Control Management

Bruce Webb, Kendra Hitz Steele, Angelika Fath-Goodin

9,930,877 Microfabricated Surfaces for the Physical

Capture of Insects

Catherine Loudon, Robert Corn, Megan Szyndler, Kenneth F. Haynes, Michael F. Potter

BIOMARKERS

9,835,621 Process for Detection of Alzheimer's Disease

from a Serum Sample

Mark A. Lovell, Bert C. Lynn

BIOSYNTHESIS

9,879,043 Synthesis of Non-Natural Cofactor Analogs

of S-Adenosyl-L-Methionine using Methionine

Adenosyltransferase

Jon Thorson, Tyler Huber, Jianjun Zhang, Shanteri Singh

DRUG DELIVERY

9,895,354 Bilayered Calcium Sulfate/Calcium Phosphate Space-Making Composites with Multiple Drug Delivery Capabilities

David Puleo, Bryan Orellana, Mike McQuinn

ENVIRONMENTAL

9,957,284 Method of Increasing Mass Transfer Rate of Acid Gas Scrubbing Solvents

Cameron A. Lippert, Kunlei Liu, Christine Marie Brandewie, Joseph Eugene Remias, Moushumii Sarma

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9,859,513 Integrated Multi-Terminal Devices Consisting of Carbon Nanotube, Few-Layer Graphene Nanogaps and Few-Layer Graphene Nanoribbons having Crystallographically Controlled Interfaces

Douglas Robert Strachan, David Patrick Hunley

9,950,926 Method for Production of Germanium Nanowires Encapsulated within Multi-Walled Carbon Nanotubes

Mark Crocker, Rodney Andrews, Arumugam Pandurangan, Dali Qian

MEDICAL DEVICES

9,861,319 Noncontact Three-Dimensional Diffuse Optical Imaging of Deep tissue Blood Flow Distribution

Guoqiang Yu, Yu Lin, Chong Huang

9,995,801 Static Multiple-Sample NMR Probe

Eric Jon Munson, Matthew John Nethercott

10,004,879 Central Venous Access System

John Gurley

SEMICONDUCTORS & ELECTRONIC DEVICES

9,755,023 Photoelectrochemical Cell including Ga(Sbx)

N1-x Semiconductor Electrode

Madhu Menon, Michael Sheetz, Mahendra Kumar Sunkara, Chandrashekar Pendyala, Swathi Sunkara, Jacek B. Jasinski

THERAPEUTICS

9,707,235 Protection of Cells from Degeneration and Treatment of Geographic Atrophy

Jayakrishna Ambati

9,718,799 3-Aryl-4H-Chromene-4-Ones as Antineoplastic Agents for the Treatment of Cancer

Svitlan P. Bondarenko, Mykhaylo S. Frasinuk, Chunming Liu, David S. Watt

9,724,337 AG-205 for the Treatment of Breast Cancer

Rolf Joseph Craven

9,790,233 Compositions and Methods of Modulating

15-PGDH Activity

Sanford Markowitz, James K. V. Willson, Bruce A. Posner, Joseph Ready, Yongqyou Zhang, Hsin-Hsiung Tai, Monika Antczak, Stanton Gerson, KiBeom Bae, Sung Yeun Yang, Amar Desai

9,821,037 Compounds and Method of Use as Anti-Infection Compounds and Therapeutic Agents to Regulate Cholesterol

Joe Chappell, Tom D. Niehaus, Kristin Linscott

9,873,670 Arylquinoline and Analog Compounds and Use Thereof to Treat Cancer

David S. Watt, Chunming Liu, Vivek Rangnekar, Vitaliy M. Sviripa, Ravshan Burikhanov, Wen Zhang

9,879,240 High Activity Mutants of Cocaine Esterase for Cocaine Hydrolysis

Chang-Guo Zhan, Fang Zheng, Lei Fang

9,895,324 Halogenated Diarylacetylenes and Methods of Treating Cancer

Vitaliy M. Sviripa, Wen Zhang, Chunming Liu, David Watt

9,968,574 Treatment of MCI and Alzheimer's Disease

Mark Lovell, Bert Lynn

TRANSFORMED PLANTS

9,913,451 Alteration of Tobacco Alkaloid Content through Modification of Specific Cytochrome P450 Genes

Ralph E. Dewey, Balazs Siminszky, Steven W. Bowen, Lily Gavilano

WELDING TECHNOLOGY

9,975,196 Measurement of Three-Dimensional Welding Torch Orientation for Manual Arc Welding Process

Yuming Zhang, Weijie Zhang



The University of Kentucky (UK) and Eastern Kentucky University (EKU) became partners in an innovative research commercialization program related to the identification, assessment, and commercialization of discoveries at ECU. In this partnership, the UK Office of Technology Commercialization (OTC) will act as an independently contracted partner and service provider to ECU for intellectual property and commercialization services.

[Read more](#)

Space Tango

UK OTC and Space Tango have formed a unique partnership to foster basic and applied research in the microgravity environment of space for application on Earth. A focus of the partnership will be primarily in the areas of biotechnology and/or biomedicine that encompasses research and development of medical solutions.

[Read more](#)

UK OTC announced an important collaborative research project with US WorldMeds, one of the Commonwealth's fastest growing pharma companies, based in Louisville. A letter of intent was signed for the strategic collaboration pertaining to the research and development of US WorldMeds' drug products.

[Read more](#)

The UKWIN logo features the text "UKWIN" in a bold, blue, sans-serif font. The letters "U" and "K" are slightly offset to the left, creating a sense of depth or a 3D effect.

Women Innovators Network

UKWIN

The UK Women Innovators Network (UKWIN) program has a mission to increase the number of UK women who participate in innovation. This includes getting women involved and prepared to take leadership roles in all stages of the commercialization process. UKWIN provides a forum for women innovators that is supportive and allows them to exchange experience, advice, and strategies for taking their innovations to the next level.

[Read more](#)

NATIONAL ACADEMY OF INVENTORS

UK Chapter of the National Academy of Inventors (NAI)

By forming a local chapter, we can recognize and honor UK innovators who translate their research into inventions that may benefit society. The chapter also serves as a tool to celebrate leaders who foster and nurture innovation at UK.

[Read more](#)

RECENTLY LAUNCHED

The co.create logo features the text "co.create" in a bold, blue, sans-serif font. The "co." is in a smaller font size than "create".

co.create offers a suite of services to assist entrepreneurial University of Kentucky faculty, staff and students in the company formation and development process. This suite of services is managed by UK OTC's New Ventures Team with support from the Von Allmen Center for Entrepreneurship.

[Read more](#)

ENGAGEMENT

FACULTY EDUCATION



UK Office of Technology Commercialization

COMMERCIALIZATION
CONNECT

FACULTY EDUCATION PROGRAM

The College of Agriculture, Food, and Environment and the College of Engineering participated in the Faculty Education Program, which is taught by the Office of Technology Commercialization (OTC). The program covers the critical areas of patent research, invention disclosure, patent prosecution, intellectual property (IP)-driven corporate partnering, and new venture creation.

MONTHLY EMAIL NEWSLETTER

The OTC newsletter, **Commercialization Connect**, launched a new design in April 2018. **Commercialization Connect** helps connect readers to OTC programs, partnerships, services and other news.

[Subscribe to newsletter](#)

Powering change: Women in innovation and creativity

World Intellectual
Property Day 2018
April 26

WORLD INTELLECTUAL PROPERTY DAY

OTC celebrated its first World Intellectual Property (IP) Day on April 26, 2018. The event theme was **Powering change: Women in innovation and creativity**. OTC provided coffee and pastries while sharing relevant information on the data of University of Kentucky women innovators.



PATENT PALOOZA!

The second annual Patent Palooza! was held March 27, 2018. Recognition was given to inventors on patents, inventors whose patents were licensed, researchers and startup companies who received SBIR/STTR grants, UKAccel graduates, and innovators being recognized by the National Academy of Inventors (NAI).

Special recognition was given to Don Keach, associate director of Intellectual Property Development, for completing over 200 licenses and over 400 patents, and Katherine Adams, special counsel, for all the work she completed for OTC. With over 100 attendees, Patent Palooza! was a wonderful celebration and networking event.

[Read more](#)

UPCOMING EVENTS

INAUGURAL UK STARTUP NETWORK KICK-OFF RECEPTION

November 13, 2018
4:00 p.m. – 6:00 p.m.

PATENT PALOOZA!

March 26, 2019
4:00 p.m. – 6:00 p.m.

THANK YOU

Katherine Adams

The University of Kentucky (UK) Office of Technology Commercialization (OTC) wants to thank Katherine Adams for her service to UK research as associate general counsel for Research & Intellectual Property. Katherine spent many years supporting and providing counsel to resolve the many issues that face technology transfer in a university environment. Katherine retired from UK at the end of this past fiscal year and the OTC would not be in its position to support the technology transfer process without her loyal guidance and vast knowledge concerning the legal matters related to the university research system.

"I worked with Katherine on an almost daily basis for two decades. During that time, I grew to value her counsel and friendship. She taught me so much about the law, university governance and most importantly, working with people. I will miss her."

—Don Keach
Associate Director
Intellectual Property Development Team



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