

FCR 13

Office of the President
September 16, 2022

Members, Board of Trustees:

PATENT ASSIGNMENT REPORT

Recommendation: that the Board of Trustees accept the patent assignment report for the period April 1, 2022 to June 30, 2022.

Background: At its March 1997 meeting, the Board of Trustees authorized the University of Kentucky Research Foundation to conduct all future copyright and patent filings and prosecutions. Quarterly reports on patent and copyright applications are to be submitted to the Finance Committee of the Board.

Action taken: Approved Disapproved Other _____

PATENT ASSIGNMENTS
FOR THE PERIOD April 1, 2022 TO June 30, 2022

Patents

The following assignments on behalf of the Board of Trustees of the University of Kentucky Research Foundation have been executed:

- 1. U.S. Patent Application Number:** 17/712,012
UKRFID: 2582
Filed: April 1, 2022
Title: EQUINE ROTAVIRUS GROUP B AND DIAGNOSIS
Inventors: Erdal Erol, Feng Li, Dan Wang and Tirth Uprety (College of Agriculture, Food and Environment)
Description and Application: This is a novel set of primers and probes for detecting a newly discovered sequence of Equine Rotavirus Group B. Rotaviruses from groups A, B and C can infect humans and animals. Group A rotaviruses are of clinical importance as they are a leading cause of acute severe gastroenteritis and life-threatening diarrhea in infants and children worldwide, although groups B and C also infect humans. Given the discovery of a new group B rotavirus, there is a need to provide testing.
License: N/A
- 2. U.S. Patent Application Number:** 17/768,181
UKRFID: 2383
Filed: April 11, 2022
Title: A MACHINE LEARNING ALGORITHM FOR PREDICTING CLINICAL OUTCOMES AND IDENTIFYING DRUG TARGETS IN ISCHEMIC STROKE
Inventors: Keith Pennypacker, Justin Fraser (College of Medicine) and Qiang Cheng (College of Engineering)
Description and Application: This is a method of identifying and analyzing biomarkers, genes and proteins that increase or decrease in response to ischemic stroke damage and predicting edema and infarct volume in a patient using machine learning. Ischemic stroke is the fifth leading cause of death in the United States, accounting for 87% of all strokes. Approximately 800,000 individuals are affected each year and ischemic stroke is the primary cause of severe long-term disability. The invention incorporates patient characteristics, imaging, and genetic and proteomic data into algorithms that can predict new therapeutic targets. The global market for stroke diagnostics and treatment is \$21 billion with an expected 7% CAGR through 2022.
License: N/A

- 3. U.S. Patent Application Number:** 17/770,267
UKRFID: 2403
Filed: April 19, 2022
Title: NOVEL SUPEREBASTINE AGAINST THERAPY RESISTANT PROSTATE CANCER
Inventors: Vivek Rangnekar, Ravshan Burikhanov, Vitaliy Sviripa (College of Medicine) and David Watt (formerly College of Medicine)
Description and Application: The invention is novel compounds for the treatment of Abiraterone (ABT)- and Enzalutamide (ENZ)-resistant prostate cancer cells. Prostate cancer is one of the leading causes of cancer-related deaths in men in the United States. Androgen deprivation therapy (ADT) is the mainstay treatment of prostate cancer. However, about 30% of patients relapse within 3 years of this treatment developing castration-resistant prostate cancer (CRPC). CRPC is treated with Abiraterone (ABT) and Enzalutamide (ENZ). Although ABT and ENZ increase the lifespan of patients with CRPC, these patients quickly develop resistance to this treatment. The novel compounds include ebastine (4-[4-(Diphenylmethoxy)-1-piperidinyl]-1-[4-(2-methyl-2-propanyl)phenyl]-1-butanone (EBS). The treatment involves administering compounds including EBS to a patient with Abiraterone (ABT)- and Enzalutamide (ENZ)-resistant prostate cancer cells. The global market for CRPC is \$6 billion with an expected CAGR of 10.3%.
License: N/A
- 4. U.S. Patent Application Number:** 17/734,571
UKRFID: 2426
Filed: May 2, 2022
Title: 5HT3R ANTAGONIST FOR USE IN TREATING ANEURYSMS AND CARDIOVASCULAR RISK
Inventors: Lisa Cassis, Eric Blalock, Yasir Alsiraj, Mark Ensor (College of Medicine) and Sean Thatcher (formerly College of Medicine)
Description and Application: The invention is a method of reducing cardiovascular risk, and methods of treating aortic aneurysms, hypercholesterolemia, hypertriglyceridemia and atherosclerosis. The method involves the administration of 5-hydroxytryptamine (serotonin) 3-receptor (5HT3R) antagonist. The current market for aneurysm treatments is \$800 million and is expected to reach \$2 billion by 2026 with a CAGR of 8.6%.
License: N/A
- 5. U.S. Patent Application Number:** 17/778,321
UKRFID: 2368
Filed: May 19, 2022
Title: ANTI-CANCER COMPOSITIONS AND METHODS
Inventors: Chengfeng Yang, Zhishan Wang and Yunfei Li (formerly College of Medicine)
Description and Application: The invention is a method for inhibiting and killing cancer cells using platinum (II) and/or lomitapide, which can be encapsulated in a nanoparticle. The invention is a unique strategy for synthesizing ultrasmall

platinum (II) dots (uPTDs) with a diameter of approximately 1 nm. The transformation from free molecules to quantum dot-like structure facilitates nanoparticle (NP) encapsulation of miriplatin, by a nanoprecipitation method disclosed herein, and has the additional benefit of potentiating extra DNA-damaging capability of miriplatin. The invention also contemplates the repurposing of lomitapide for the treatment of triple-negative breast, lung and colorectal cancers. The global markets for breast, lung and colorectal cancer will reach approximately \$64 billion by 2022.

License: N/A

6. U.S. Patent Application Number: 17/779,678

UKRFID: 2401

Filed: May 25, 2022

Title: LOBINALINE N-OXIDES AS POSITIVE ALLOSTERIC MODULATORS OF THE DOPAMINE TRANSPORTER WITH POTENTIAL VALUE IN THE TREATMENT OF SUBSTANCE ABUSE DISORDERS

Inventors: John Littleton (formerly College of Arts and Sciences), Bert Lynn (College of Arts and Sciences), Dennis Rogers (Naprogenix) and Greg Gerhardt (College of Medicine)

Description and Application: The invention is the treatment of substance use disorders. The treatment involves administering a pharmaceutically effective amount of lobinaline N-oxide to a subject diagnosed with a substance use disorder. The effective amount is about 25 mg/kg and may be administered subcutaneously. The lobinaline N-oxide may be either lobinaline mono-N-oxide and/or lobinaline bi-N-oxide. The global substance use disorder treatment market is \$4.4 billion with an expected CAGR of 12.4% through 2024.

License: N/A

7. U.S. Patent Application Number: 17/833,490

UKRFID: 2551

Filed: June 6, 2022

Title: STRUCTURED PHOSPHATE LUMINOPHORES AND STRUCTURED METAL LUMINOPHORES AND THEIR USE IN THE DETECTION OF HYDROPEROXIDES USING CHEMICALLY-STIMULATED LUMINESCENCE

Inventors: William Boatright (College of Agriculture, Food and Environment)

Description and Application: This invention is a method for monitoring and quantifying the presence of free radicals of peroxide in an environment using a novel structured phosphate luminophore (SPL) or structured metal luminophore (SML). The phosphate scaffold includes a mono- or poly-phosphoric acid, including pyrophosphate, tripolyphosphate, tetrapolyphosphate and/or metaphosphoric acid molecules. The industry standard for measuring levels of oxidation in agricultural products, petrochemicals and pharmaceuticals is the peroxide value. This measurement involves iodometric titration procedures that require laboratory glassware, and the use of flammable and toxic solvents that are expensive to purchase and dispose of as hazardous waste. Specific market value is not available;

however, several large companies measuring peroxide value have yearly revenues over \$2 billion.

License: Optioned to VerraGlo, Inc.

- 8. U.S. Patent Application Number:** 17/842,425
UKRFID: 2115
Filed: June 16, 2022
Title: VESICULAR MONOAMINE TRANSPORTER-2 LIGANDS AND THEIR USE IN THE TREATMENT OF PSYCHOSTIMULANT ABUSE
Inventors: Linda Dwoskin, Jon Thorson, Rodney Kip Guy, Stefan Kwiatkowski, (College of Pharmacy, David Watt (formerly College of Medicine), Mark Leggas, Derong Ding, Guangrong Zheng, Jared Hammill, Na-Ra Lee and Peter Crooks (formerly College of Pharmacy)
Description and Application: The invention is a novel treatment for substance use disorder, drug dependence or abuse, and withdrawal that includes administering N-phenylalkyl amphetamine and pharmaceutical compositions containing these compounds. Specifically, the inventive small molecules are adept in the treatment of methamphetamine (meth) addiction. Currently, there are 15 million to 16 million meth users worldwide. With no FDA-approved therapeutics, the current treatment of meth use disorder is behavioral therapy.
License: N/A
- 9. International Application Number:** PCT/US2021/055274
UKRFID: 2330
Filed: October 15, 2021
Title: IMPROVED FLOCCULANTS
Inventors: Zach Hilt, Thomas Dziubla, Angela Gutierrez, Molly Frazar, Skyler Hornback (College of Engineering), Rishabh Shah and Shuo Tang (formerly College of Engineering)
Description and Application: This is a novel flocculant made from multi-component polymer or salts thereof. The multi-component polymer has two or more monomer components capable of being mixed with water with a soluble species and insoluble particles. Flocculants are typically used in water treatment. The global flocculant market is \$6 billion with a CAGR of 5.9%.
License: Licensed to Bluegrass Advanced Materials, Inc.
- 10. International Application Number:** PCT/US2022/24767
UKRFID: 2555
Filed: April 17, 2022
Title: INTELLIGENT MACHINE VISION SYSTEM FOR IN-PROCESS TOOL WEAR MONITORING
Inventors: Julius Schoop (College of Engineering)
Description and Application: This is a novel tool wear monitoring system using an intelligent machine vision system. The system monitors a cutting tool while mounted in the spindle of a CNC cutting machine. The system includes a machine vision camera, an environmentally protected microscope, and a light source for lighting the cutting tool to obtain cutting tool images with the machine vision

camera. The global machine condition monitoring market is currently \$2.6 billion with a 7% CAGR.

License: Option in negotiations

- 11. International Application Number:** PCT/US2022/26477
UKRFID: 2556
Filed: April 27, 2022
Title: DUAL-COLOR CSPBBR3 NANOCRYSTALS PREPARED BY WATER
Inventors: Fuqian Yang and Xiaobing Tang (College of Engineering)
Description and Application: This is a novel “green” method of preparing CsPbBr₃ perovskite nanocrystals. CsPbBr₃ perovskite nanocrystals have excellent optoelectronic properties such as large light absorption coefficient, high carrier mobility, long diffusion length, and thus have good application prospects in solar cells, photodetectors, high-energy radiation detectors and other fields. The novel method of preparation replaces harmful organic solvents used in producing perovskite nanocrystals with deionized water. The global perovskite solar cell market was valued at \$400 million in 2020 and it is expected to reach \$6.6 billion by 2030 growing at a CAGR of 32.4%.
License: N/A
- 12. International Application Number:** PCT/US2022/34309
UKRFID: 2545
Filed: June 21, 2022
Title: INDOLE-SUBSTITUTED QUINOLINES AND THEIR COMBINATION WITH PLK1 INHIBITORS FOR THE TREATMENT OF CANCER
Inventors: Chunming Liu (College of Medicine) and David Watt (formerly College of Medicine)
Description and Application: This invention is a novel treatment for cancer by administering indole-substituted quinolines alone or in combination with polo-like kinase-1 (Plk1) inhibitors. This treatment may be particularly effective against colorectal cancer. The global colorectal cancer therapeutics market was \$8.6 billion in 2018 with a projected CAGR of 6.1% until 2023.
License: N/A
- 13. International Application Number:** PCT/US2022/34590
UKRFID: 2475
Filed: June 22, 2022
Title: TREATMENT FOR AORTOPATHY
Inventors: Alan Daugherty, Zhenyu Li, Hong Lu, Conqing Wu and Dien Ye (College of Medicine)
Description and Application: This is a method for treating aortopathy by reducing the expression of gasdermin D (GSDMD). Antisense oligonucleotide (ASO), miRNA, siRNA, and locked nucleic acid (LNA) nucleotides may be used to inhibit GSDMD. Aortopathies target the largest artery in the body and cause more than 10,000 deaths in the United States per year. No current medications have been

approved to treat the disease progression. The global market for aortopathies is currently \$760 million with a CAGR of 10%.

License: N/A

14. Foreign Application Number: MX/A/2021/010343

UKRFID: 2241

Filed: August 26, 2021

Title: MULTIVALENT LIVE-ATTENUATED INFLUENZA VACCINE FOR PREVENTION AND CONTROL OF EQUINE INFLUENZA VIRUS (EIV) IN HORSES

Inventors: Thomas Chambers (College of Agriculture, Food and Environment), Luis Martinez-Sobrido (formerly University of Rochester) and Kendall King (Zoetis Inc.)

Description and Application: This invention is a novel multivalent immunological composition with at least two equine live-attenuated influenza viruses (LAIV). The first LAIV expresses one or more antigens of a clade 1 H3N8 equine influenza virus. The second LAIV expresses one or antigens of a clade 2 H3N8 equine influenza virus. The second LAIV expresses hemagglutinin (HA), neurominidase (NA), or a combination of A/equine/Lancashire/1/2016 H3N8, A/equine/Ohio/1/2013 H3N8, or A/equine/Texas/6/2017 H3N8. It is currently estimated that H3N8 equine influenza outbreaks result in economic losses of hundreds of millions of dollars each year.

License: Option with Zoetis Inc.

15. Foreign Application Number: BR1120210161821

UKRFID: 2241

Filed: August 26, 2021

Title: MULTIVALENT LIVE-ATTENUATED INFLUENZA VACCINE FOR PREVENTION AND CONTROL OF EQUINE INFLUENZA VIRUS (EIV) IN HORSES

Inventors: Thomas Chambers (College of Agriculture, Food and Environment), Luis Martinez-Sobrido (formerly University of Rochester) and Kendall King (Zoetis Inc.)

Description and Application: This invention is a novel multivalent immunological composition with at least two equine live-attenuated influenza viruses (LAIV). The first LAIV expresses one or more antigens of a clade 1 H3N8 equine influenza virus. The second LAIV expresses one or antigens of a clade 2 H3N8 equine influenza virus. The second LAIV expresses hemagglutinin (HA), neurominidase (NA), or a combination of A/equine/Lancashire/1/2016 H3N8, A/equine/Ohio/1/2013 H3N8, or A/equine/Texas/6/2017 H3N8. It is currently estimated that H3N8 equine influenza outbreaks result in economic losses of hundreds of millions of dollars each year.

License: Option with Zoetis Inc.

- 16. Foreign Application Number:** CA3144075
UKRFID: 2341
Filed: December 16, 2021
Title: PHARMACEUTICALLY ACTIVE PYRAZOLO-PYRIDONE MODULATORS OF DCN1/2-MEDIATED CULLIN NEDDYLATION
Inventors: Rodney Kip Guy (College of Pharmacy), Jared Hammill, Hoshin Kim (formerly College of Pharmacy), Bhuvanesh Singh (Memorial Sloan Kettering Cancer Center), Daniel Scott (St. Jude's Children's Research Hospital) and Brenda Schulman (formerly St. Jude's Children's Research Hospital)
Description and Application: The invention includes novel compounds that reversibly inhibit neddylation. Inhibition of neddylation has several potential disease applications, including antiviral, oncology and Alzheimer's disease. Current FDA-approved drugs that target this pathway have a high level of in vivo toxicity due to irreversible inhibition of neddylation. The combined market for oncology, antiviral drugs and Alzheimer's disease is approximately \$123 billion with growth over 6% annually.
License: Licensed to Cinsano Pharma, Inc.
- 17. Foreign Application Number:** MX/a/2021/016133
UKRFID: 2341
Filed: December 17, 2021
Title: PHARMACEUTICALLY ACTIVE PYRAZOLO-PYRIDONE MODULATORS OF DCN1/2-MEDIATED CULLIN NEDDYLATION
Inventors: Rodney Kip Guy (College of Pharmacy), Jared Hammill, Hoshin Kim (formerly College of Pharmacy), Bhuvanesh Singh (Memorial Sloan Kettering Cancer Center), Daniel Scott (St. Jude's Children's Research Hospital) and Brenda Schulman (formerly St. Jude's Children's Research Hospital)
Description and Application: The invention includes novel compounds that reversibly inhibit neddylation. Inhibition of neddylation has several potential disease applications, including antiviral, oncology and Alzheimer's disease. Current FDA-approved drugs that target this pathway have a high level of in vivo toxicity due to irreversible inhibition of neddylation. The combined markets for oncology, antiviral drugs and Alzheimer's disease is approximately \$123 billion with growth over 6% annually.
License: Licensed to Cinsano Pharma, Inc.
- 18. Foreign Application Number:** BR112021025531
UKRFID: 2341
Filed: December 17, 2021
Title: PHARMACEUTICALLY ACTIVE PYRAZOLO-PYRIDONE MODULATORS OF DCN1/2-MEDIATED CULLIN NEDDYLATION
Inventors: Rodney Kip Guy (College of Pharmacy), Jared Hammill, Hoshin Kim (formerly College of Pharmacy), Bhuvanesh Singh (Memorial Sloan Kettering Cancer Center), Daniel Scott (St. Jude's Children's Research Hospital) and Brenda Schulman (formerly St. Jude's Children's Research Hospital)

Description and Application: The invention includes novel compounds that reversibly inhibit neddylation. Inhibition of neddylation has several potential disease applications, including antiviral, oncology and Alzheimer's disease. Current FDA-approved drugs that target this pathway have a high level of in vivo toxicity due to irreversible inhibition of neddylation. The combined markets for oncology, antiviral drugs and Alzheimer's disease is approximately \$123 billion with growth over 6% annually.

License: Licensed to Cinsano Pharma, Inc.

19. Foreign Application Number: AU2020298330

UKRFID: 2341

Filed: December 20, 2021

Title: PHARMACEUTICALLY ACTIVE PYRAZOLO-PYRIDONE MODULATORS OF DCN1/2-MEDIATED CULLIN NEDDYLATION

Inventors: Rodney Kip Guy (College of Pharmacy), Jared Hammill, Hoshin Kim (formerly College of Pharmacy), Bhuvanesh Singh (Memorial Sloan Kettering Cancer Center), Daniel Scott (St. Jude's Children's Research Hospital) and Brenda Schulman (formerly St. Jude's Children's Research Hospital)

Description and Application: The invention includes novel compounds that reversibly inhibit neddylation. Inhibition of neddylation has several potential disease applications, including antiviral, oncology and Alzheimer's disease. Current FDA-approved drugs that target this pathway have a high level of in vivo toxicity due to irreversible inhibition of neddylation. The combined markets for oncology, antiviral drugs and Alzheimer's disease is approximately \$123 billion with growth over 6% annually.

License: Licensed to Cinsano Pharma, Inc.

20. Foreign Application Number: EU20826136.2

UKRFID: 2341

Filed: December 23, 2021

Title: PHARMACEUTICALLY ACTIVE PYRAZOLO-PYRIDONE MODULATORS OF DCN1/2-MEDIATED CULLIN NEDDYLATION

Inventors: Rodney Kip Guy (College of Pharmacy), Jared Hammill, Hoshin Kim (formerly College of Pharmacy), Bhuvanesh Singh (Memorial Sloan Kettering Cancer Center), Daniel Scott (St. Jude's Children's Research Hospital) and Brenda Schulman (formerly St. Jude's Children's Research Hospital)

Description and Application: The invention includes novel compounds that reversibly inhibit neddylation. Inhibition of neddylation has several potential disease applications, including antiviral, oncology and Alzheimer's disease. Current FDA-approved drugs that target this pathway have a high level of in vivo toxicity due to irreversible inhibition of neddylation. The combined markets for oncology, antiviral drugs and Alzheimer's disease is approximately \$123 billion with growth over 6% annually.

License: Licensed to Cinsano Pharma, Inc.

Patent Activities
Fiscal Year to Date as of June 30, 2022

Total FY2021-22					
	FY22Q1	FY22Q2	FY22Q3	FY22Q4	Total FY22
Invention Disclosures ⁱ	13	20	25	33	91
Full Patent Applications ⁱⁱ	24 ¹	20 ²	19	12	75
Provisional Patent Applications ⁱⁱⁱ	18	21	13	16	68
Patents Issued	9	12	5	6	32
License Income ^{iv}	\$925,684.76	\$73,397.91	\$204,789.15	\$91,141.99	\$1,295,013.81
New Licenses and Options Executed	8	2	10	10	30
New UK Startups Formed	0	1	2	1	4

¹ Number adjusted to reflect previously unreported patent applications filed by licensees.

² Number adjusted to reflect previously unreported patent applications filed by licensees and collaborators.

Patent Activities
FY2020-21 as of June 30, 2021

Total FY2020-21					
	FY21Q1	FY21Q2	FY21Q3	FY21Q4	Total FY21
Invention Disclosures ⁱ	26	28	25	30	99
Full Patent Applications ⁱⁱ	23	16	22	16	77
Provisional Patent Applications ⁱⁱⁱ	26	17	19	18	80
Patents Issued	8	8	4	2	22
License Income ^v	\$810,900.86	\$209,591.78	\$1,250,404.62	\$81,934.69	\$2,352,831.95
New Licenses and Options Executed	6	3	11	7	27
New UK Startups Formed	0	0	5	1	6

Patent Application Summary Table

Inventors	College(s)	Title	Brief description
Biomedical			
Keith Pennypacker, Justin Fraser and Qiang Cheng	Medicine, Engineering	A machine learning algorithm for predicting clinical outcomes and identifying drug targets in ischemic stroke	The use of machine learning in analyzing biomarkers, genes and proteins to predict new therapeutic targets for the treatment of ischemic stroke.
Vivek Rangnekar, Ravshan Burikhanov, Vitaliy Sviripa and David Watt	Medicine	Novel superebastine against therapy resistant prostate cancer	Novel compounds that include ebastine (4-[4-(Diphenylmethoxy)-1-piperidinyl]-1-[4-(2-methyl-2-propanyl)phenyl]-1-butanone for the treatment of resistant cancer cells.
Lisa Cassis, Eric Blalock, Yasir Alsiraj, Mark Ensor and Sean Thatcher	Medicine	5HT3R antagonist for use in treating aortic aneurysms and reducing cardiovascular risk	A method of reducing cardiovascular risk, and methods of treating the risk of developing aneurysm, hypercholesterolemia, hypertriglyceridemia, and atherosclerosis.
Chengfeng Yang, Zhishan Wang and Yunfei Li	Medicine	Anti-cancer compositions and methods	The use of ultrasmall platinum (II) dots encapsulating miriplatin to treat triple-negative breast cancer.

Inventors	College(s)	Title	Brief description
Linda Dwoskin, Jon Thorson, Rodney Kip Guy, Stefan Kwiatkowski, David Watt, Mark Leggas, Derong Ding, Guangrong Zheng, Jared Hammill, Na-Ra Lee and Peter Crooks	Pharmacy	Vesicular monoamine transporter-2 ligands and their use in the treatment of psychostimulant abuse	The invention is a novel treatment for substance use disorder, drug dependence or abuse, and withdrawal that includes administering N-phenylalkyl amphetamine.
Chunming Liu and David Watt	Medicine	Indole-substituted quinolines and their combination with plk1 inhibitors for the treatment of cancer	This invention is a novel treatment for cancer by administering indole-substituted quinolones alone or in combination with polo-like kinase-1 (Plk1) inhibitors.
Alan Daugherty, Zhenyu Li, Hong Lu, Conqing Wu and Dien Ye	Medicine	Treatment for aortopathy	This is a method for treating aortopathy by reducing the expression of gasdermin D (GSDMD).

Inventors	College(s)	Title	Brief description
Rodney Kip Guy, Jared Hammill, Hoshin Kim, Bhuvanesh Singh, Daniel Scott and Brenda Schulman	Pharmacy	Pharmaceutically active pyrazolo-pyridone modulators of DCN1/2-mediated cullin neddylation	Novel compounds that reversibly inhibit neddylation.
Rodney Kip Guy, Jared Hammill, Hoshin Kim, Bhuvanesh Singh, Daniel Scott and Brenda Schulman	Pharmacy	Pharmaceutically active pyrazolo-pyridone modulators of DCN1/2-mediated cullin neddylation	Novel compounds that reversibly inhibit neddylation.
Rodney Kip Guy, Jared Hammill, Hoshin Kim, Bhuvanesh Singh, Daniel Scott and Brenda Schulman	Pharmacy	Pharmaceutically active pyrazolo-pyridone modulators of DCN1/2-mediated cullin neddylation	Novel compounds that reversibly inhibit neddylation.

Inventors	College(s)	Title	Brief description
Rodney Kip Guy, Jared Hammill, Hoshin Kim, Bhuvanesh Singh, Daniel Scott and Brenda Schulman	Pharmacy	Pharmaceutically active pyrazolo-pyridone modulators of DCN1/2-mediated cullin neddylation	Novel compounds that reversibly inhibit neddylation.
Rodney Kip Guy, Jared Hammill, Hoshin Kim, Bhuvanesh Singh, Daniel Scott and Brenda Schulman	Pharmacy	Pharmaceutically active pyrazolo-pyridone modulators of DCN1/2-mediated cullin neddylation	Novel compounds that reversibly inhibit neddylation.
Engineering			
Julius Schoop	Engineering	Intelligent machine vision system for in-process tool wear monitoring	A novel tool wear monitoring system using an intelligent machine vision system.
Fuqian Yang and Xiaobing Tang	Engineering	Dual-color CsPbBr ₃ nanocrystals prepared by water	A novel “green” method of preparing CsPbBr ₃ perovskite nanocrystals.

Inventors	College(s)	Title	Brief description
Zach Hilt, Thomas Dziubla, Angela Gutierrez, Molly Frazar, Skyler Hornback, Rishabh Shah and Shuo Tang	Engineering	Improved flocculants	A novel flocculant made from multi-component polymer or salts.
Agriculture, Food and Environment			
Erdal Erol, Feng Li, Dan Wang and Tirth Uprety	Agriculture, Food and Environment	Equine rotavirus group B and diagnosis	A novel set of primers and probes to detect a newly discovered sequence of Equine Rotavirus Group B.
William Boatright	Agriculture, Food and Environment	Structured phosphate luminophores and structured metal luminophores and their use in the detection of hydroperoxides using chemically-stimulated luminescence	A method for monitoring and quantifying the presence of free radicals of peroxide in an environment using a novel framework.
Thomas Chambers, Luis Martinez-Sobrido and Kendall King	Agriculture, Food and Environment	Multivalent live-attenuated influenza vaccine for prevention and control of equine influenza virus (EIV) in horses	A novel multivalent immunological composition with at least two equine live-attenuated influenza viruses (LAIV).

Inventors	College(s)	Title	Brief description
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Thomas Chambers, Luis Martinez-Sobrido and Kendall King	Agriculture, Food and Environment	Multivalent live-attenuated influenza vaccine for prevention and control of equine influenza virus (EIV) in horses	A novel multivalent immunological composition with at least two equine live-attenuated influenza viruses (LAIV).
Arts and Sciences			
John Littleton, Bert Lynn, Dennis Rogers and Greg Gerhardt	Arts and Sciences, Medicine	Lobinaline N-oxides as positive allosteric modulators of the dopamine transporter with potential value in the treatment of substance abuse disorders	Administering lobinaline N-oxide for the treatment of substance use disorder.

ⁱ Invention disclosures include new technologies and intellectual property disclosed to the Office of Technology Commercialization (OTC) that do not fall under an existing technology number. This number captures the potential new intellectual property disclosed to OTC.

ⁱⁱ Full patent applications, as used by OTC, include nonprovisional patent application filings at the United States Patent and Trademark Office (USPTO), Patent Cooperation Treaty filings, and foreign patent application filings. These are technologies that are assigned to the University of Kentucky that OTC has identified to invest further into in an effort to obtain patent protection and are described in more detail in the patent assignment section above.

ⁱⁱⁱ Provisional patent applications are legal documents filed at the USPTO that establish a filing date and protect the owner from anticipated publication of the technology, but do not mature into an issued patent unless the applicant files a full patent application within one year. Although owned by the University of Kentucky, the provisional patent applications are not included in the patent assignment descriptions as they will not mature into full patent applications without further action and investment.

^{iv} In Q1 an additional \$200,000.00 and in Q2 an additional \$300,000.00 was received from a license to 22nd Century managed by the College of Agriculture, Food and Environment on behalf of the Office of Technology Commercialization.

^v In Q2 an additional \$300,000.00 was received from a license to 22nd Century managed by the College of Agriculture, Food and Environment on behalf of the Office of Technology Commercialization.