

FCR 4

Office of the President
September 15, 2017

Members, Board of Trustees:

PATENT ASSIGNMENT REPORT

Recommendation: that the Board of Trustees accept the patent assignment report for the period April 1, 2017 to June 30, 2017.

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, 2017, TO June 30, 2017

Patents

The following assignment on behalf of the Board of Trustees of the University of Kentucky Research Foundation has been executed:

- 1. U.S. Patent Application Serial Number: 15/472,876**
Filed: March 29, 2017
Title: Herbicide
Inventors: Douglas Archbold and Marta Nosarzewski (College of Agriculture, Food and Environment)
Technical Description: This invention relates generally to compositions useful as herbicides, and their methods of use. The herbicide can be used in methods of treating pre-emergent or post-emergent weeds.
Summary: This invention discloses novel sorbitol dehydrogenase (SDH) substrates that have use as herbicides in pre-emergent and post-emergent weed control. The presently-disclosed subject matter includes an herbicide including SDH substrates such as ribitol and a growth inhibitive effective amount of another adjuvant SDH substrate and/or adjuvant. Methods of treating pre-emergent and post-emergent weeds that include applying the herbicides in an effective amount to suppress weed growth.
- 2. U.S. Patent Application Serial Number: 15/473,794**
Filed: March 30, 2017
Title: A Novel Graphene-Like Si₂BN Material and Method of Making Thereof
Inventors: Madhu Menon (College of Engineering)
Technical Description: This invention relates generally to a new stable graphene-like single atomic layered Si₂BN structure that has all of its atoms with *sp*² bonding with no out-of-plane buckling. The structure is metallic with a finite density of states at the Fermi level. The unique composition and electronic properties show potential for new applications beyond graphene.
Summary: This invention discloses monolayers of Si₂BN or C₂BN, arranged in a graphiticized hexagonal arrangement. Each Si/C atom has a Si/C, B, and N nearest neighbor, while each B (N) has two Si/C's and one N (B) as nearest neighbors. The monolayer can be a 2D composition or can be "rolled" into a nanotubular 3D arm-chair or zig-zag configuration. The structure is metallic and can be rolled into nanotubes in a manner similar to graphene.

- 3. U.S. Patent Application Serial Number: 15/488,007**
Filed: April 14, 2017
Title: Equine Disease Model for Herpesvirus Neurologic Disease and Uses Thereof
Inventors: George P. Allen (College of Agriculture, Food and Environment)
Technical Description: This invention relates to risk factors for post-exposure development of equine herpesvirus-1 neurological disease and their use to provide a new protection for equine. The invention further relates to a new live, attenuated vaccine and its use to prevent neurological disease caused by equine herpesvirus-1.
Summary: This invention relates to an *in vivo* equine disease model for equine herpesvirus-1 neurological disease comprising a horse having a low pre-exposure level of herpesvirus-specific cytotoxic T lymphocytes (CTL) precursors and/or is approximately 20 years of age or older wherein the horse is experimentally infected with a neuropathogenic strain or equine herpesvirus or a mutant thereof. The invention includes a method of preparing an *in vivo* equine disease model for equine herepesvirus-1 neurological disease comprising obtaining a horse that possesses low pre-infection levels of equine herpes virus type 1 (EHV-1) specific CTL precursors and/or is approximately 20 years of age or older and inoculating the horse intranasally with an effective infecting amount of a neuropathogenic strain of EHV-1. Additionally, the invention concerns a method of quantifying the risk factors and predicting the development of clinical neurologic signs of equine herpesvirus-1 neurological disease in a horse. Also described in the invention is the determination of the risk of developing the clinical neurologic signs by use of an equation $y = a + bx$ wherein y is the peak viremic load, $a = 2.97$, $b = -0.027$ and the variable x is the pre-infection CTLp frequency. Lastly, the invention deals with a new live, attenuated vaccine formulation that is effective against neurologic disease due to equine herpesvirus-1.

- 4. U.S. Patent Application Serial Number: 15/493,836**
Filed: April 21, 2017
Title: Vesicular Monoamine Transporter-2 Ligands and Their Use in the Treatment of Psychostimulant Abuse
Inventors: Linda P. Dwoskin, Peter A. Crooks, Guangrong Zheng, Justin R. Nickell, Zheng Cao, Na-Ra Lee (College of Pharmacy)
Technical Description: This invention relates generally to methods of treating disease or pathology of the central nervous system, eating disorders or substance abuse disorders by administering a vesicular monoamine transporter-2 ligand exemplified by the N-phenylalkyl amphetamine derivatives of this invention and pharmaceutical compositions comprising at least one N-phenylalkyl amphetamine derivative for such treatment.
Summary: The invention relates to treatment methods for a disease or pathology of the central nervous system, an eating disorder, or substance use disorder, drug dependence/abuse and withdrawal. The invention comprises administering at least one N-phenylalkyl amphetamine derivative to an individual in need thereof.

- 5. U.S. Patent Application Serial Number: 15/494,789**
Filed: April 24, 2017
Title: 1,4-Disubstituted Piperidines, 1,4-Disubstituted Piperazines, 1,4-Disubstituted Diazepines, and 1,3-Disubstituted Pyrrolidine Compounds
Inventors: Peter A. Crooks, Linda Dwoskin, John Culver, Justin Nickell, Guangrong Zheng (College of Pharmacy)
Technical Description: This application relates to the use of 1,4-disubstituted piperidines, 1,4-disubstituted piperazines, 1,4-disubstituted diazepines, and 1,3-disubstituted pyrrolidine compounds.
Summary: The use of 1,4-disubstituted piperidines, 1,4-disubstituted piperazines, 1,4-disubstituted diazepines, and 1,3-disubstituted pyrrolidine compounds in treatment of diseases and pathologies of the central nervous system, drug dependence/abuse and withdrawal, and eating disorders such as obesity.
- 6. U.S. Patent Application Serial Number: 15/592,510**
Filed: May 11, 2017
Title: Fluorinated Coal Derived Carbons and Electrodes for use in Battery Systems and Similar
Inventors: Stephen M. Lipka and Christopher R. Swartz (Center for Applied Energy Research)
Technical Description: This document relates to electrodes composed of fluorinated and surface defluorinated coal, as well as to electrical systems utilizing said electrodes.
Summary: An electrode including fluorinated and surface defluorinated coal is described, as well as methods of producing and employing such within an electrical system. The coal in the electrodes is fluorinated at an amount of between 0.3 and 1.4. The resulting coal products can be further surface defluorinated and maintain functionality within an electrical system.
- 7. U.S. Patent Application Serial Number: 15/600,305**
Filed: May 19, 2017
Title: Protection of Cells from Degeneration and Treatment of Geographic Atrophy
Inventors: Jayakrishna Ambati (College of Medicine—Department of Ophthalmology and Visual Sciences)
Technical Description: This invention relates to therapeutic uses of inflammasome inhibition, purinoceptor 7 (P2X₇) inhibition, inhibition of interleukin-1 receptor-associated kinase-1 (IRAK1) and/or interleukin-1 receptor-associated kinase-4 (IRAK4), methods of protecting cells, and screening methods for identifying inhibitors.
Summary: Method of protecting cells which involves inhibiting the activation of one or more of P2X₇, IRAK1; or IRAK4 associated with or in the cell. Also, screening methods for identifying inhibitors are described.

- 8. U.S. Patent Application Serial Number: 15/610,860**
Filed: June 1, 2017
Title: Fungal Chromosome-End Knockoff Strategy
Inventors: Christopher L. Schardl, Simona Florea, Mark L. Farman (College of Agriculture, Food and Environment)
Technical Description: This invention relates to compositions and methods for eliminating target genes in endophyte and other fungi strains.
Summary: Non-toxigenic fungal strains and methods of making and use thereof, are provided and have utility as endophytes in forage crops, and as strains that can outcompete toxigenic strains in forage and food crops.
- 9. U.S. Patent Application Serial Number: 15/621,776**
Filed: June 13, 2017
Title: Cyclic Photobioreactors and Method for Biofilm Control
Inventors: Michael Hayes Wilson (Center for Applied Energy Research), John Groppo (College of Engineering), Thomas Grubbs (College of Arts & Sciences, Geography), Charles Cecil, Mark Crocker (Center for Applied Energy Research)
Technical Description: The invention relates to a photobioreactor system for closed-loop production of algae that minimizes biofilm accumulation and energy consumption while providing homogenous harvested cultures.
Summary: This invention is a novel photobioreactor (PBR) system for culturing algae. The PBR system utilized vertical transparent tubes that can be cyclically filled with an algae culture. The vertical tubes further feature pipe pigs developed therein to disrupt formation of biofilm on the inner walls during the cyclic filling and emptying of the cultures.

Patent Activities
Fiscal Year 2016-17 Quarterly Activity
As of June 30, 2017

	September 30	December 31	March 31	June 30	Total Year to Date
Patent Applications	0	5	5	9	19
Patents Issued	15	10	8	7	40
Patent Income	\$445,141	\$855,143	\$60,723	\$3,186,899	\$4,547,906