FCR 32

Office of the President
September 12, 2006

Members, Board of Trustees:

PATENT ASSIGNMENT REPORT

Recommendation: that the Board of Trustees accept the patent assignment report for the period ending July 31, 2006.

Background: At the March 4, 1997 meeting of the Board of Trustees, the University of Kentucky Research Foundation was authorized 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 ASSIGNMENT
QUARTERLY FOR THE PERIOD APRIL 1, 2006 THROUGH JULY 31, 2006

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 Serial Number: (to be assigned)**
Filed: January 24, 2006
Title: "Calpains as Targets for Inhibiting Prion Propagation"
Inventors: Drs. Glen Telling and Roger Guttman (Microbiology and Immunology)
Technical Description: The present invention relates to methods for the inhibition of disease-associated prion formation and propagation. Such methods are based on inhibition of PrP^{sc} cleavage, which prevents PrP^{sc} accumulation and results in reduced prion titers. More particularly, the present invention relates to the endoproteolytic cleavage of PrP^{sc} by calpain, a calcium ($Ca2^{2+}$)-activated cysteine protease, and its inhibition.
Summary: Prion diseases are transmissible neurodegenerative disorders that include bovine spongiform encephalopathy (BSE), scrapie in sheep, chronic wasting disease (CUZ) of deer and elk, and human Creutzfeldt Jakob disease (CJD). There is some evidence that the progression of the disease is dependent on an enzyme (calpain) which attaches to prions within the body. The inventors propose a method of treating prion diseases by inhibiting the activity of calpain.

2. **U.S. Patent Application Serial Number: (to be assigned)**
Filed: February 10, 2006
Title: "Cell-to-Cell Transmission of SiRNA-Induced Gene Silencing in Mammalian Cells"
Inventors: Drs. Pamela Knapp, Tianyong Zhao, Shi Ping Zhao, Yelena Alimova, Guoying Wang, Kurt Hauser, and Mohammed Ghandour (Anatomy and Neurobiology)
Technical Description: The present invention relates to the cell-to-cell transfer of gene silencing in mammalian cells.
Summary: Some human diseases such as cancer occur because a gene is expressed when it should not be. It may be possible to design therapies that specifically disable the inappropriately expressed gene. The inventors have produced a method of silencing genes in mammalian cells by 1) silencing the gene in a first cell in a test tube, 2) bringing the first cell into contact with target cells, and 3) causing the first cell to silence the gene in the target cells.

2. **U.S. Patent Application Serial Number: (to be assigned)**
Filed: February 16, 2006
Title: "CCR3 Inhibition for Ocular Angiogenesis and Macular Degeneration"
Inventors: Dr. Jayakrishna Ambati (Ophthalmology)

Technical Description: The present invention relates to the suppression of ocular angiogenesis by inhibiting the CCR3 receptor.
Summary: Wet macular degeneration, which accounts for 90 percent of legal blindness, occurs when abnormal blood vessels grow in the retina of the eye. The inventor has discovered the role of a protein, the CCR3 receptor, in wet macular degeneration, and proposed a method of treating the illness by inhibiting the protein's function.

3. **U.S. Patent Application Serial Number: (to be assigned)**
Filed: February 24, 2006
Title: "Scopolamine Sublingual Spray for The Treatment of Motion Sickness"
Inventors: Drs. Peter Crooks, Abeer Al-Ghananeem, and Ahmad Malkawi (College of Pharmacy)
Technical Description: This invention relates to a scopolamine spray for sublingual administration, used in the treatment and prevention of motion sickness, as well as the treatment and prevention of similar symptoms, such as nausea and vomiting, caused by conditions other than motion sickness. Also provided are methods of treatment, prevention and inhibition of these conditions and symptoms, as well as a metered dosage system for administration of the spray.
Summary: Scopolamine is an effective drug for treating the nausea and vomiting associated with motion sickness. Currently, scopolamine is administered by pill or skin patch. The inventors have discovered that spraying a metered dose of scopolamine beneath the tongue rapidly and effectively treats the symptoms of motion sickness.

4. **U.S. Patent Application Serial Number: (to be assigned)**
Filed: February 28, 2006
Title: "A System and Method for Secretion of Proteins and Protein Products to Plant Aerial Surfaces"
Inventors: Drs. George Wagner and Ryan Shepherd (Plant and Soil Sciences)
Technical Description: The present invention relates to a system for the secretion of proteins and protein byproducts to a plant's aerial surfaces. For example, the present system can be used to secrete proteins, such as the antifungal protein phylloplanin, to a plant's aerial surfaces. Further, using the present system, one can create transgenic plants that secrete desired proteins which can be collected from the plant's aerial surface.
Summary: The inventors have previously discovered that plants produce an antifungal protein, phylloplanin, on their leafy surfaces. In the present invention, the inventors reveal the genetic mechanism for causing phylloplanins to be deposited on leafy surfaces. The genetic mechanism can be used to confer fungal resistance to plants not naturally having phylloplanins. Alternatively, the genetic mechanism can be used to cause plants to deposit other useful proteins on plant surfaces.

5. **U.S. Patent Application Serial Number: (to be assigned)**
Filed: March 8, 2006
Title: "Viral Vectors Useful in Soybean and Methods of Use"
Inventors: Drs. Said Ghabrial, Chunquan Zhang, and Hongcan Gu (Plant Pathology)
Technical Description: This invention relates generally to the area of plant molecular biology and more specifically to plant viral expression vectors.
Summary: Viral vectors have proven useful for genetically altering crop plants to convey beneficial properties such as increased crop yield and disease resistance. Although soybeans are among the most important commercial crops, there is a shortage of viral vectors that can be used in soybeans. The inventors have discovered viral vectors that are useful in genetically altering soybeans.

6. **U.S. Patent Application Serial Number: (to be assigned)**
Filed: March 10, 2006
Title: "Transfected Mosquito Vectors"
Inventors: Dr. Stephen Dobson (Entomology)
Technical Description: The present invention relates to transfect mosquito vectors and, in particular, Diptera Culicidae (mosquito) vectors transfected with *Wolbachia.*
Summary: Mosquitoes are known to act as hosts for a variety of human diseases. The inventors have discovered a way of reducing the mosquito population by inducing infertility in mosquitoes by infecting them with *Wolbachia* bacteria.

7. **U.S. Patent Application Serial Number: (to be assigned)**
Filed: March 13, 2006
Title: "Withanolide Compounds as Inhibitors of Fibrosis and Identification of Molecular Targets for Anti-fibrotic Drug Developments"
Inventors: Drs. Royce Mohan and Paola Bargagna-Mohan (Ophthalmology)
Technical Description: The present invention relates to methods of screening compounds for treating fibrosis and to methods for treating fibrosis.
Summary: Fibrosis is a serious tissue complication after major surgical procedures and organ transplants, and can also occur during cancerous growth, endometriosis, alcohol-related liver damage, cardiovascular disease, retinal detachment, and other disorders. Thus, fibrogenic complications contribute to the the first stages of many common and devastating diseases, but there is no effective treatment for this chronic problem. The inventors have identified a compound, withanolide, useful in treating and preventing fibrosis, and have discovered a cellular target for drugs to treat fibrosis.

8. **U.S. Patent Application Serial Number: (to be assigned)**
Filed: March 28, 2006
Title: "Nicotinia Hybrids and Plant Varieties for Use in Production of Pharmaceuticals"
Inventors: Drs. David Zaitlin and Richard Mundell (Kentucky Tobacco Research)

Technical Description: The present invention relates to non-food/feed hybrid Nicotiana plant varieties and hybrids as host plants for the purpose of producing plant-made pharmaceuticals (PMPs) and proteins including, but not limited to, therapeutic immunoglobulins, immunoglobulin derivatives, medical enzymes, research enzymes, industrial enzymes, and vaccines.
Summary: As fewer people smoke, new uses for tobacco are being sought to provide opportunities to the tobacco farmer. Nicotania plant varieties, which include tobacco, are capable of being genetically altered for the purpose of producing useful proteins, such as vaccines. The inventors have produced a Nicotania hybrid variety that has many desirable characteristics for this purpose, including a distinctive appearance (compared to other tobacco varieties), grows rapidly, and is resistant to disease.

9. U.S. Patent Application Serial Number: (to be assigned)
Filed: May 2, 2006
Title: "Particle Separation/Purification System, Diffuser and Related Methods"
Inventors: Drs. John Stencel and Tapiwa Gurupira (Center for Applied Energy Research)
Technical Description: The present invention relates generally to the material separation or purification arts and, more particularly, to a particle separation/purification system, including a non-vertically oriented separator, a diffuser capable of use with such a system, and related methods.
Summary: Coal mining produces a large amount of finely crushed coal that is currently treated as waste. Some of the wasted coal could be transformed into useful products if the coal particles could be separated by size. The inventors have improved a method by which particles are separated by subjecting electrically charged particles to an electric field.

10. U.S. Patent Application Serial Number: (to be assigned)
Filed: May 6, 2006
Title: "Nanotubes as Mitochondrial Uncouplers"
Inventors: Dr. Patrick Sullivan (Anatomy and Neurobiology)
Technical Description: The present invention relates to nanotubes as mitochondrial uncouplers. The present invention provides methods of mitochondrial uncoupling as well as methods of treating disease conditions and increasing weight loss by administering the nanotubes.
Summary: In the 1930s, a class of drugs was discovered which "uncoupled" the body's energy production from the energy demands placed on the body, for example, by exercise. Because the body produced high levels of energy at rest, people taking an uncoupler lost weight. Unfortunately, people taking uncouplers were also prone to deadly increases in body temperature. Consequently, the use of uncouplers was banned. The inventor has discovered a method using nanotubes as uncouplers that holds the potential for a new method of treating obesity while avoiding the deadly increases in body temperature.

11. U.S. Patent Application Serial Number: (to be assigned)
Filed: May 19, 2006
Title: "Hybrid Nanocrystals for Treatment and Bioimaging of Disease"
Inventors: Dr. Tonglei Li (College of Pharmacy)
Technical Description: Hybrid nanocrystals able to reach specific targets in the body for treatment and biological imaging are provided, as well as methods of making and administering same for treatment of disease conditions and for bioimaging. The hybrid nanocrystals can be used alone or in combination with other treatment or imaging modalities.
Summary: Most conventional drugs must dissolve in water in order to reach their intended target within the body. Some drug candidates that would otherwise be therapeutic are not successful because they do not dissolve in water. The inventor has discovered a means of delivering drugs which is not dependent on their ability to dissolve in water. This is achieved by forming drugs into minute crystals, or nanocrystals, and attaching each nanocrystal to a chemical that attaches only to targets in the body which require treatment.

12. U.S. Patent Application Serial Number: (to be assigned)
Filed: June 1, 2006
Title: "Nucleic Acids Encoding *Sarcocystis neurona* Antigen and Uses Thereof"
Inventors: Dr. Daniel Howe (Veterinary Science)
Technical Description: The present invention relates to nucleic acids of *Sarcocystis neurona.* In particular, the present invention relates to nucleic acids of *Sarcocytis neurona* and to nucleic acid reagents and antibodies for use in methods of detection and prevention of *Sarcocystis neurona* infection. More particularly, the present invention relates to novel nucleic acid sequences of *Sarcocystis neurona* and to utilization thereof, including primers, probes, antigen/antibody diagnostic kits, vectors for production of peptides encoding the novel nucleic acids, and to antigenic proteins and vaccines against *Sarcocystis neurona.*
Summary: *Sarcocystis neurona* is a parasite that causes disease in the nervous system of horses. Currently, there is no effective means for the early detection of the disease. The inventor has discovered several markers that can be used for the early detection and treatment of the disease in horses.

13. U.S. Patent Application Serial Number: (to be assigned)
Filed: June 13, 2006
Title: "Method For Hydraulically Separating Carbon and Coal Combustion Ash"
Inventors: Drs. Thomas Robl and John Groppo (Center for Applied Energy Research)
Technical Description: The present invention relates generally to hydraulic size classification of particles contained in a slurry. More specifically, the invention relates to a method for cross-flow hydraulic classification of *5* particles in a slurry for recovery of, in particular, particles having a mean particle size from about 2 to 7 micrometers, and to a hydraulic classifier for accomplishing the method. The method and device find a variety of uses, including separation of carbonaceous particles from coal combustion (fly) ash, and classification of such fly ash.

Summary: Coal combustion produces a large amount of ash currently treated as waste. Some of the ash could be transformed into useful products if the ash particles could be separated by size of particle. The inventors have devised a method of separating fine ash particles (between 2 and 7 micrometers) from mixed size ash. The fine ash is useful as an ingredient in concrete.

14. U.S. Patent Application Serial Number: (to be assigned)
Filed: July 25, 2006
Title: "Biomarkers of Mild Cognitive Impairment and Alzheimer's Disease"
Inventors: Drs. Mark Lovell and Bert Lynn (Chemistry)
Technical Description: The present invention relates to the field of detection and of monitoring treatment of neurodegenerative disorders, including Alzheimers disease and mild cognitive impairment (MCI). More particularly, the present invention relates to proteinaceous biomarkers that can be measured in biological fluids, which can be used to aid in the detection of neurodegenerative disorders, including Alzheimers disease and mild cognitive impairment.
Summary: Alzheimers Disease (AD), an age-associated dementing disorder, currently affects four million Americans and is the fourth-leading cause of death in the United States. Detection of early stage AD would be useful for studies of interventions that could stop the progression of AD. The inventors have identified a protein complex in spinal fluid that is present in people with early-stage AD, but not in patients without AD. Detection of the complex can be used to select participants for studies investigating candidate treatments for AD.

Patent Activities
Fiscal year to date as of June 30, 2006

Number of Patent Applications	23
Number of Patents Issued	20
Patent Income	$905,895.35

Fiscal Year July 1, 2006 to July 31, 2006

Number of Patent Applications	1
Number of Patents Issued	0
Income	$33,493.56