FCR 10

Office of the President
June 14, 2011

Members, Board of Trustees:

PATENT ASSIGNMENT REPORT

Recommendation: that the Board of Trustees accept the Patent Assignment Report for the period January 1 through March 31, 2011.

Background: At its March 4, 1997 meeting, the Board of Trustees authorized the University of Kentucky Research Foundation to conduct all 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 THROUGH March 31, 2011

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:** 13/035,576
   Filed: February 25, 2011
   Title: "Nanotubes as Mitochondrial Uncouplers"
   Inventor: Patrick Sullivan (Anatomy and Neurobiology)
   Technical Description: The invention relates to nanotubes as mitochondrial uncouplers and provides methods of treating disease and increasing weight loss by administering nanotubes.
   Summary: Mitochondria generate most of the cell's supply of adenosine triphosphate (ATP) used as a source of chemical energy by the cell. The mitochondria also have a function in the regulation of cellular metabolism. This invention offers a method of uncoupling mitochondria by administering nanotubes in a therapeutically effective amount. This results in decreasing reactive oxygen species and decreasing detrimental loading of Ca^{2+} into mitochondria. It is hypothesized that treatment with nanotubes will have the ultimate effect of reducing weight, treating cancer, reducing the effects of traumatic brain injury, or reducing the effects of aging.

2. **U.S. Patent Application Serial Number:** 13/035,649
   Filed: February 25, 2011
   Title: "Nanotubes as Mitochondrial Uncouplers"
   Inventor: Dr. Patrick Sullivan (Anatomy and Neurobiology)
   Technical Description: The invention relates to nanotubes as mitochondrial uncouplers and provides methods of treating disease and increasing weight loss by administering nanotubes.
   Summary: Mitochondria generate most of the cell's supply of adenosine triphosphate (ATP) used as a source of chemical energy. The mitochondria also have a function in the regulation of cellular metabolism. This invention offers a method of uncoupling mitochondria by administering nanotubes in a therapeutically effective amount. This results in decreasing reactive oxygen species and decreasing detrimental loading of Ca^{2+} into mitochondria. It is hypothesized that treatment with nanotubes will have the ultimate effect of reducing weight, treating cancer, reducing the effects of traumatic brain injury, or reducing the effects of aging.

3. **U.S. Patent Application Serial Number:** 13/044,120
   Filed: March 9, 2011

Title: "Human Consensus Sodium-Iodide Symporter Repressor (NIS-Repressor) Binding Site"
Inventors: Kenneth Ain and Dr. Wei Li (Hematology Oncology)
Technical Description: The invention relates to a consensus nucleotide sequence found within two kilobases of the 5 prime end of 56 different genes in the human genome and use of this sequence to screen for compounds and other molecules that inhibit transcription or that interfere with transcription repressors or repressor complexes.
Summary: Human sodium-iodine symporter (hNIS) is a trans-membrane protein enabling thyrocyte, both benign and malignant, to concentrate iodine; permitting radioiodine to be a unique systemic cytotoxic therapy for metastatic tumors. Unfortunately, when hNIS expression is lost in dedifferentiated thyroid carcinomas, there are no effective systemic agents for treating metastatic tumors. Because of its role in inhibiting the transport of iodine into thyroid cancer cells, there is a need to determine the hNIS repressor binding sites, structure and activities so that anti-thyroid cancer therapies can be maximized.

4. **U.S. Patent Application Serial Number:** 13/005,213
   Filed: January 12, 2011
   Title: "High Activity Mutants of Butyrylcholinesterase for Cocaine Hydrolysis"
   Inventors: Chang-Gao Zhan, Fang Zheng and Wennchao Yang (Pharmacy)
   Technical Description: The disclosure relates to butyrylcholinesterase (BChE) variant polypeptides, and in particular BChE mutants with amino acid substitutions.
   Summary: Cocaine abuse is a major medical and public health problem that continues to defy treatment. This disclosure is an approach to cocaine abuse treatment that interferes with the delivery of cocaine to its receptors and accelerates its metabolism in the body.

5. **U.S. Patent Application Serial Number:** 13/018,641
   Filed: February 1, 2011
   Title: "High Activity Mutants of Butyrylcholinesterase for Cocaine Hydrolysis"
   Inventors: Chang-Gao Zhan, Fang Zheng and Wennchao Yang (Pharmacy)
   Technical Description: The disclosure relates to butyrylcholinesterase (BChE) variant polypeptides, and in particular BChE mutants with amino acid substitutions.
   Summary: Cocaine abuse is a major medical and public health problem that continues to defy treatment. This disclosure is an approach to cocaine abuse treatment that interferes with the delivery of cocaine to its receptors and accelerate its metabolism in the body.

6. **U.S. Patent Application Serial Number:** 13/015,837
   Filed: January 28, 2011

Title: "Method of Treating Ventricular Arrhythmias"
Inventors: Peter Oeltgen (Pathology)
Technical Description: The invention includes pharmaceutically acceptable formulations of opioid receptor (OR) agonists, and methods of using such OR agonists for increasing tolerance to ventricular arrhythmias.
Summary: Ischemia occurs when living tissue is deprived of an adequate flow of oxygen. This invention provides a method of treating ischemia with opioid receptor (OR) agonists such as Deltorphin II.

7. **U.S. Patent Application Serial Number:** 12/829,574
Filed: July 2, 2010
Title: "Intranasal Opioid Compositions, Delivery Devices and Methods of Using Same"
Inventors: Daniel Wermeling (Pharmacy)
Technical Description: The invention relates to pharmaceutical compositions comprising opioids and a liquid nasal carrier, to delivery devices comprising such compositions, and to methods of manufacture and use of such compositions.
Summary: Pain is a major symptom of many diseases. Inadequate treatment of pain can lead to depression, anger, and fear of disease progression. Non-compliance is a problem in pain medication since pain treatment regimens often involve administering medications by injection. Among the many medications available to treat pain, opioids have an extensive history of use and are generally more effective in treating pain than many other treatments. The inventor has developed pharmaceutical compositions and a liquid carrier that allow for the nasal delivery of opioids.

8. **U.S. Patent Application Serial Number:** 13/052,477
Filed: March 21, 2011
Title: "Chelating Compounds and Immobilized Tethered Chelators"
Inventors: Robert A. Yokel, Chang-Guo Zhan (Pharmacy), Wesley Harris, Christopher Spilling (University of Missouri, St. Louis)
Technical Description: The invention relates to novel chelating agents, useful intermediates for synthesizing those chelating agents, the immobilization of those agents on a solid support resin, and the use of those chelating resins to remove metal ions from aqueous solutions.
Summary: A chelator is a compound that bonds to a metal ion. Chelating agents have long been known to be useful in chemical analysis, environmental remediation, and medicine. This invention relates to novel chelating agents or compounds, novel immobilized, tethered chelators and methods of employing these agents to remove trivalent metals such as Al^{3+} from aqueous systems. This system is designed to remove metal ions from parental solutions for infants who may be sensitive to these metal ions.

9. **U.S. Patent Application Serial Number:** 13/041,798
Filed: March 7, 2011

Title: "Thiol-Containing Compounds for the Removal of Elements from Tissues and Formulations"
Inventors: Boyd Haley, David Atwood, and Niladri Gupta (Chemistry)
Technical Description: The invention relates to compounds utilized in covalent binding to a wide range of metals and main group elements, and more specifically to sulfur-containing compounds and the utilization of such to remove contaminants from solids, liquids and gases.
Summary: This disclosure includes methods and pharmaceutical formulations for ameliorating heavy metal toxicity and/or oxidative stress by administering pharmaceutically effective amounts of specified compounds. These compounds are designed to specifically for environmental remediation by removing mercury from water and soil.

10. **U.S. Patent Application Serial Number:** 12/892,464
Filed: September 28, 2010
Title: "Thiol-Containing Compounds for the Removal of Elements from Contaminated Milieu and Methods of Use"
Inventors: Boyd Haley, and David Atwood (Chemistry)
Technical Description: The invention relates to compounds utilized in covalent binding to a wide range of metals and main group elements, and more specifically to sulfur-containing ligands and the utilization of such to remove contaminants from solids, liquids and gases.
Summary: Heavy metal and main group element pollution is a growing worldwide problem. During the last few decades, federal and state governments have instituted environmental regulations to protect the quality of surface and groundwater from contaminants. There are numerous industrial and environmental situations where ligands capable of binding metals and main group elements can be utilized for remediation purposes. However, the limited ability of most reagents presently used on a commercial basis to form stable, covalent bonds with heavy metals is a major concern for remediation applications. The disclosed compounds provide stable, covalent bonds and can be utilized in environmental remediation.

11. **U.S. Patent Application Serial Number:** 12/958,617
Filed: December 3, 2010
Title: "Security Monitoring System for a Bulk Foodstuff Transport Container"
Inventors: Fred Payne, Nasrin Tabayehnejad, Timothy Stombaugh, William Crist, Christopher Dwight, Surjay Alexander, Brian Luck, James Moore, Jonathan Paschal, and Phillip Womble (Biosystems and Agricultural Engineering)
Technical Description: The disclosure relates to methods and systems for preserving security of bulk foodstuffs during transport to prevent unauthorized access, adulteration, and the like.
Summary: Minimal security safeguards exist for the transport of bulk foodstuffs. It is recognized in the transport sector that a need exists for methods and systems for securing bulk foods during transport. In accord with

the identified needs security monitoring methods and systems for implementation in cargo transport operations are provided.

12. **U.S. Patent Application Serial Number:** 12/859,479
    Filed: August 19, 2010
    Title: "Conversion of Triglycerides to Hydrocarbons by Means of a Mixed Oxide Catalyst"
    Inventors: Mark Crocker and Ms. Tonya Morgan (Center for Applied Energy Research)
    Technical Description: The invention relates to the field of hydrocarbon production and catalysts for that purpose.
    Summary: This invention offers a new and improved mixed oxide catalyst of nickel and aluminum that is relatively easy and inexpensive to produce but provides performance previously only exhibited by more expensive palladium and platinum catalysts. The disclosed catalysts are useful in the conversion of vegetable oils and animal fats to hydrocarbon fuels.

13. **U.S. Patent Application Serial Number:** 12/942,396
    Filed: November 9, 2010
    Title: "Method for Production of Germanium Nanowires Encapsulated Within Multi-Walled Carbon Nanotubes"
    Inventors: Mark Crocker and Rodney Andrews (Center for Applied Energy Research)
    Technical Description: The invention relates generally to the field of nanotechnology and specifically to a method of producing germanium nanowires encapsulated within multi-walled carbon nanotubes as well as to such nanowires as produced by that method.
    Summary: This invention is a simple one- or two-step synthesis method using a combined germanium and carbon source. The resulting nanowires are characterized by high thermal stability and high electrical conductivity. In contrast to prior methods, the current method is catalyst free and the reaction product is clean and pure.

14. **U.S. Patent Application Serial Number:** 12/846,352
    Filed: July 29, 2010
    Title: "Adaptive Heat Pump Resistance Heat Controller"
    Inventor: Robert Fehr (Biosystems and Agricultural Engineering)
    Technical Description: The invention relates to an electrical heating apparatus and method for more efficiently and economically heating an area to a desired temperature using primary and secondary heating sources.
    Summary: A heat pump system is a conventional heating device for conditioning air in a living space. Under certain operating conditions a heat pump cannot provide enough heat to meet demand. Accordingly, heat pump systems typically incorporate a secondary resistance heating circuit that operates when the difference in indoor and outdoor air temperature reduces the efficiency of the heat pump. This invention relates to an electrical heating

apparatus incorporating a primary heating-stage heat pump and a secondary heating-stage resistance heating circuit, in combination with an adaptive resistance heat controller. The controller divides the resistance heating circuit into a number of secondary heating stages which allows the use of only those stages necessary to meet secondary heat demand resulting in a reduction in peak electrical demand.

Patent Activities
Fiscal year to date as of March 31, 2011

Number of Patent Applications	16
Number of Patents Issued	21
Patent Receipts	$1,328,036