FCR 15

Office of the President
December 11, 2012

Members, Board of Trustees:

PATENT ASSIGNMENT REPORT

Recommendation: that the Board of Trustees accept the patent assignment report for the period July 1 through September 30, 2012.

Background: The March 4, 1997 meeting of 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 ASSIGNMENT
QUARTERLY FOR THE PERIOD THROUGH SEPTEMBER 30, 2012

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: 13/586,617**
Filed: August 15, 2012
Title: Dopamine Neuron Stimulating Peptide-11 Protection from Complex I Mitochondrial Inhibitors
Inventors: Luke H. Bradley, Don Marshall Gash and Greg A. Gerhardt (Anatomy and Neurobiology)
Technical Description: This invention relates to novel proteins that are useful for treating brain diseases, injuries that result in dopaminergic deficiencies, and diseases or conditions associated with the inhibition of mitochondrial activity.
Summary: Neurotrophic factors are endogenous proteins that modulate cell-signaling pathways that regulate stem cell proliferation, neuronal differentiation, growth and regeneration, and thus they are useful in treating degeneration of nerve cells and loss of differentiated function that occurs in a variety of neurodegenerative diseases. Many neurotrophic factors are both neuroprotective (protecting neurons from injury) and neurorestorative (promoting structural and functional regeneration). Identifying neurotrophic factors with the right combination of protective and restorative actions and developing effective strategies for drug delivery have profound therapeutic implications for degenerative processes in the brain such as Parkinson's disease, Alzheimer's disease, Huntington's disease, and those caused by brain injury. Current treatment has not proven wholly effective.

Glial cell line-derived neurotrophic factor (GDNF) has been shown to dramatically protect and enhance the function of dopamine neurons *in vitro* and *in vivo* in rodents and monkeys. The ideal drug for treating neurodegenerative processes in the brain would possess the positive trophic actions of GDNF, but biologically active peptides have yet to be identified which possess the trophic actions GDNF. This invention discloses that human GDNF (hGDNF) alternative splice form 1 may be translationally processed *in vivo* to yield three small amidated peptides, and these peptides may mediate some or all of the biological effects of GDNF. This invention discloses three peptides with varying amino acid sequences which, when given in pharmaceutically effective amounts, may treat brain disease by relieving the symptoms of the disease or slowing down or stopping the progression of the disease, or repairing the damage already caused.

2. **U.S. Patent Application Serial Number: 13/623,470**
Filed: September 20, 2012
Title: Block Copolymer Cross-Linked Nanoassemblies as Modular Delivery Vehicles
Inventors: Yongsoo Bae, Juergen Rohr (Pharmaceutical Sciences), and Daniel Franklin Scott

Technical Description: This invention relates the field of drug/gene delivery using biocompatible nanoparticles and, more particularly, to block copolymer cross-linked nanoassemblies including a core protected by a biocompatible shell and methods for their production.

Summary: In traditional medicines, drug-release rates are generally controlled by drug-molecule diffusion and drug-carrier erosion, and maintaining constant levels of the drug at the target site is impossible. Biocompatible nanoparticles, ranging from 5 to 200 nanometers in diameter, have garnered increasing attention as drug carriers in recent biomedical applications because of their ability to maintain constant levels of the drug at targeted sites. First, nanoparticles can target specific areas within the body. Nanoparticles can circulate through blood vessels and accumulate preferentially in disease tissues that enhance permeation and retention of large molecules, such as inflammatory tissues and cancerous tumors. Second, nanoparticles can better maintain drug concentrations at therapeutic levels in targeted sites, with delivery of the drug triggered either by the elapse of time or by stimuli. However, precise control of the nanoparticles' drug-release rates continues to prove difficult.

A block polymer is a polymer with repeating units of one type which are adjacent to each other in a linear manner to form a block which is linked to a second block made up of repeating units of a second type which are adjacent to each other in a linear manner. This invention discloses possible compositions of and a simple method of constructing block copolymer cross-linked nanoassemblies. These nanoassemblies both covalently conjugate and physically entrap one or more active agents, thus allowing fine tuning of active agent release rates *in vivo* in order to maximize diagnostic, imaging, and/or therapeutic efficacy at the target site.

3. **U.S. Patent Application Serial Number: 13/653,877**

Filed: September 30, 2012

Title: Method for Hybrid Dry-Jet Gel Spinning and Fiber Produced by that Method

Inventors: Ashley Morris, Matthew Weisenberger, Terry Rantell (Center for Applied Energy Research), and Mohamed Abdallah

Technical Description: This invention relates generally to the field of fiber spinning, which is a step in the carbon fiber production process. Specifically, this invention relates to a hybrid dry-jet gel spinning method for producing polyacrylonitrile-based precursor fiber.

Summary: Carbon fibers are primarily used in aerospace applications but are also used by the boating, sporting, wind, and automobile industries. Polycarylonitrile (PAN) copolymer fibers are spun as a precursor for carbon fiber, and PAN fibers have been in use for over 30 years. Fiber diameter is known to influence fiber tensile strength. The larger the diameter of the PAN fiber, the greater the number of possible voids in the fiber. These voids reduce the strength and quality of the resulting fiber product.

This invention discloses a new method to produce a high molecular weight PAN-based precursor fiber with a high tensile strength and elastic modulus, a small diameter, and presumably fewer voids than fiber made by previously known processes. This new dry-gel spinning method combines a temperature-induced phase transition used in gel spinning and a diffusion used in traditional dry-jet solution spinning. The resulting fiber's increased strength and improved quality represents a significant advance in the art.

Patent Activities
Fiscal year to date as of September 30, 2012

Number of Patent Applications	3
Number of Patents Issued	7
Patent Gross Revenue	$ 3,546,434.91