

FCR 16

Office of the President
March 19, 2013

Members, Board of Trustees:

PATENT ASSIGNMENT REPORT

Recommendation: that the Board of Trustees accept the patent assignment report for the period October 1 through December 31, 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 DECEMBER 31, 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: 13/573,709**
Filed: October 3, 2012
Title: Systems and Methods for the Production of Linear and Branched-Chain Hydrocarbons
Inventors: Joseph Chappell (Plant and Soil Sciences) and Shuiqin Wu
Technical Description: This invention relates to systems and methods for the production of linear and branched-chain hydrocarbons, such as triterpenes. In particular, the invention relates to transgenic plants for use in the production of triterpenes as an alternative source for biofuels and petrochemicals.
Summary:
Terpenes are a large and diverse class of organic compounds, and triterpenes are one type of terpenes consisting of six isoprene units with the molecular formula C₃₀H₄₈. Linear, branched-chain triterpenes have direct commercial value as oil bases for cosmetics and topical skin care products and as emulsifiers in food manufacturing. Triterpene processing can also yield intermediaries of value for chemical manufacturing (nylons, oils, and plastics) and combustible fuel products. Triterpenes are found naturally in bacteria, fungi, plants, and animals, but they accumulate in only select organisms and current extraction and purification processes are costly and generate low yields. This invention discloses systems, methods, and plants engineered for high-level production of triterpenes in a scalable, renewable, and sustainable production platform. This system and method includes transforming plant cells with an isolated nucleic acid encoding a farnesyl diphosphate synthase (FPS) and with an isolated nucleic acid encoding a triterpenes synthase, resulting in increased triterpene production by the plant.

2. **U.S. Patent Application Serial Number: 13/676,898**
Filed: November 14, 2012
Title: Systems and Methods for Diagnosis of *Lawsonia Intracellularis*
Inventors: Harold F. Stills (Division of Laboratory Animal Resources), David W. Horohov and Allen E. Page (Veterinary Science)
Technical Description: The invention relates to an enzyme-linked immunoabsorbent assay (ELISA) for diagnosing *Lawsonia intracellularis* infection and exposure.
Summary: *Lawsonia intracellularis* is a pathogen that affects mammals, including horses and pigs. In horses, *L. intracellularis* causes equine proliferative enteropathy (EPE), the symptoms of which include anorexia, fever, lethargy, depression, peripheral edema, weight loss, colic, and diarrhea. Weanlings and young yearlings typically contract EPE in the fall and early winter, probably from ingesting contaminated fecal matter. Diagnostics are available to detect *L. intracellularis* infections in pigs and

rabbits. This invention can be used to detect *L. intracellularis* infections in multiple species, and it can also be used to assess the effectiveness of *L. intracellularis* vaccines. The method disclosed in this invention involves taking a blood sample from a subject animal, processing the blood sample to separate whole blood cells from the plasma, and processing and purifying the whole blood cells using centrifugation and chromatography. The resulting sample is analyzed using an enzyme-linked immunoabsorbent assay (ELISA) to determine if *L. intracellularis*-specific antibodies are present. The method can also be used to test the effectiveness of *L. intracellularis* vaccines. To do so, a subject animal would be inoculated with the test vaccine, and the subject's blood would be process as described. A test vaccine would be deemed effective if *L. intracellularis*-specific antibodies were detected when the subject did not exhibit symptoms of *L. intracellularis* infections or signs of clinical disease.

3. **U.S. Patent Application Serial Number: 12/818,807**

Filed: December 17, 2012

Title: Method of Ameliorating Oxidative Stress and Supplementing the Diet

Inventors: Boyd E. Haley (Chemistry) and Diladri Narayan Gupta

Technical Description: This invention relates to a dietary supplement for mammals which would aid in the removal of heavy metals and other metals and in ameliorating oxidative stress.

Summary: The intake of heavy metals such mercury, lead, cadmium, and silver affect mammals at the cellular level. Heavy metals can bind to proteins, resulting in abnormal inhibition or activation of their biological properties. Effects include overproduction of free radicals by mitochondria, rendering cells unable to defend themselves from stress factors such as viral infections and cell death. This invention discloses a non-toxic compound with improved membrane-permeating properties, heavy-metal binding properties, and reactive oxygen species scavenging properties and which could be administered to animals as a dietary supplement.

4. **U.S. Patent Application Serial Number: 13/718,519**

Filed: December 18, 2012

Title: Nanotubes as Mitochondrial Uncouplers

Inventor: Patrick G. Sullivan (Spinal Cord and Brain Injury Research)

Technical Description: The invention provides methods of mitochondrial uncoupling as well as methods of treating disease conditions and increasing weight loss by administering nanotubes.

Summary: Mitochondria control cellular metabolism by burning sugars and fats, and manipulating mitochondrial function can facilitate weight loss. The mitochondrial membrane potential is coupled to the control of protons back into the matrix through ATP synthase. Chemical uncouplers exist that can increase basal metabolism and encourage weight loss, but these chemical couplers are difficult to control and can cause death. Thus, there is a need for a safe, controllable mitochondrial uncoupler that can separate the mitochondria respiration from the production of ATP. This invention discloses the synthesis of nanotubes designed to uncouple mitochondria and designed to self-rectify at

unsafe levels. The nanotubes' design facilitate easy passage of the nanotubes across cell membranes, makes them only active in mitochondria, and includes a coating that shuts off their function when a specific pH is reached. This invention describes nanotubes comprised of metal (gold or silver) and various natural or synthetic polymers. In addition to mammalian weight-loss applications, the disclosed invention may be useful in the treatment of cancer, traumatic brain injury, aging, spinal cord injury, and stroke.

Patent Activities

Fiscal year to date as of December 31, 2012

Number of Patent Applications	7
Number of Patents Issued	13
Patent Gross Revenue	\$3,750,815.79