

FCR 13

Office of the President
September 21, 2004

Members, Board of Trustees:

PATENT ASSIGNMENT REPORT

Recommendation: that the patent assignment report for the period April 1, 2004 through August 31, 2004 be accepted.

Background: FCR 5, dated March 4, 1997, authorized that all future copyright and patent filings and prosecutions be conducted by the University of Kentucky Research Foundation (UKRF), and that the Vice President for Research and Graduate Studies or his designee be authorized to execute any needed documents to obtain appropriate patent or copyright protection. 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, 2004 THROUGH AUGUST 31, 2004

Patents

The following assignments on behalf of the Board of Trustees to the University of Kentucky Research Foundation have been executed:

1. U.S. Patent Application Serial Number: (to be assigned), filed April 12, 2004, titled "AGENTS AND METHODS FOR MODULATING INTERACTIONS BETWEEN GONADOTROPIN HORMONES AND RECEPTORS" Inventors: Dr. Tai Ji and Dr. Inhae Ji. The invention provides agents and methods for the modulation of gonadotropin hormones and their receptors, including methods of treating gonadotropin disorders and conditions, and screening and development of therapies. Specifically, the present invention relates to modulation of gonadotropin hormones through the inhibition of activity of exoloop 1, exoloop 2 and exoloop 3 of gonadotropin receptors.
2. U.S. Patent Application Serial Number: (to be assigned), filed March 29, 2004, titled "AEQUORIN AND OBELIN MUTANTS WITH DIFFERING WAVELENGTHS AND BIOLUMINESCENCE" Inventors: Dr. Sylvia Daunert, Dr. Sapna K. Deo, Ms. Emre Dikici and Ms. Laura Rowe. The present invention provides aequorin mutants whose emission is shifted with respect to wild type. The shift in emission is accomplished using a combination of mutations of amino acids within aequorin or obelin that affect bioluminescence; use of different types of chromophores, i.e. coelenterazines with variable emission characteristics; and modifications of photoprotein with fluorophores that will allow for emission of light at longer wavelengths as a result of energy transfer. Additionally, an assay employing aequorin mutants to test for HIV-1 protease inhibitors is disclosed.
3. U.S. Patent Application Serial Number: (to be assigned), filed April 5, 2004, titled "NONPARAMETRIC CONTROL CHART FOR THE RANGE" Inventor: Dr. Arnold J. Stromberg. The present invention provides a method for detecting or predicting an undesired deviation in variability of at least one parameter being monitored, wherein the variation in the parameter is incrementally recorded. The method comprises establishing the number of subsets of a dataset that have a range of the difference between any two datapoints within the dataset, and computing a control chart for the range based thereon. The method accurately detects changes in variability in real time. The true distribution of the data is reflected, and the desired result is achieved without requiring an inordinate number of computations.

4. U.S. Patent Application Serial Number: (to be assigned), filed May 20, 2004, titled "AN ORGANIC CATION TRANSPORTER PREFERENTIALLY EXPRESSED IN HEMATOPOIETIC CELLS" Inventors: Dr. Jeffrey A. Moscow Dr. Xin Lu and Dr. Craig Jordan. The present invention provides a novel organic cation transporter (OCT) gene, OCT6, and use thereof. The OCT6 gene is preferentially expressed in human hematopoietic tissues, including CD34+ cells and leukemia cells. Its narrow tissue distribution, substrate specificity, and close homology to other cell membrane transporters make OCT6 an attractive target for the treatment of myeloid diseases.
5. U.S. Patent Application Serial Number: (to be assigned), filed March 19, 2004, titled "ARTIFICIAL MUSCLE HYDROGEL BLENDS REVERSIBLY ELECTROACTUATED NEAR NEUTRAL pH, IMPLANTABLE ACTUATING DEVICES, AND METHODS OF USING SAME" Inventors: Dr. Sylvia Daunert, Dr. Serban F. Petcu, Dr. Leonidas G. Bachas, Dr. Marc J. Madou and Dr. Elissavet Moschou. The present invention provides a novel artificial muscle material and miniature valves and micropumps made therefrom. The artificial muscle material bends reversibly when electroactuated by applying low voltage, in a wide pH range, even at that of physiological pH, and works without contact with electrodes. Miniature valves made from the artificial material are successfully triggered for the fluid release in a wide pH range, even at that of physiological pH. Novel fluid release devices were manufactured using the artificial muscle, and methods using the same were provided, including an implantable device optimized for trans-scleral drug delivery.
6. U.S. Patent Application Serial Number: (to be assigned), filed August 23, 2004, titled "COMPOSITION AND METHOD FOR MARKING PROCAINE PENICILLIN" Inventor: Dr. Thomas Tobin. The present invention provides a chemically marked procaine penicillin as an antibiotic that can be distinguished from procaine for anesthetic purposes. A preferred embodiment provides a procaine penicillin molecule wherein the procaine portion of the molecule comprises one or more substituted deuterium atoms in place of hydrogen atoms typically found in procaine penicillin. The resulting non-radioactive isotope can be easily identified via mass spectrometry as being distinct from any naturally occurring isotope, without negatively impacting the pharmacological nature of the drug itself. An alternative embodiment of the invention provides a method of marking the procaine penicillin through the substitution of various other isotopes in place of their naturally occurring counterparts. Methods of detection of the marked procaine penicillin molecule are also provided.
7. U.S. Patent Application Serial Number: (to be assigned), filed May 7, 2004, titled "MODIFIED RUBISCO LARGE SUBUNIT N-METHYLTRANSFERASE USEFUL FOR TARGETING MOLECULES

TO THE ACTIVE-SITE VICINITY OF RIBULOSE-1, 5-BISPHOSPHATE” Inventor: Dr. Robert L. Houtz. The present invention provides a modified Rubisco large subunit N-Methyltransferase (Rubisco LSMT, or RLSMT). The present invention also provides a modified RLSMT-carbonic anhydrase (RLSMT-CA). This modified RLSMT-CA improves the efficiency of the reduction of CO₂ during photosynthesis, which may increase plant growth rates. The present invention also provides nucleic acids encoding the modified RLSMT-CA or modified RLSMT. Also, the present invention provides cells including the modified RLSMT-CA or modified RLSMT, plants containing the modified RLSMT-CA or modified RLSMT, and methods using compositions of the present invention. In addition, the present invention provides antibodies conjugated to CA which may bind a modified RLSMT-CA. The invention also provides modified forms of the LS and SS of Rubisco where the modified forms are fusions with CA or biologically active fragments thereof. The present invention provides methods of altering Rubisco carboxylase activity and altering plant growth.

8. U.S. Patent Application Serial Number: (to be assigned), filed April 19, 2004, titled: “SUPER-RESOLUTION OVERLAY IN MULTI-PROJECTOR DISPLAYS” Inventor: Dr. Christopher O. Jaynes and Mr. Divya T. Ramakrishnan. The present invention provides a technique, associated system and computer executable program code for projecting a superimposed image onto a target-display surface under observation of one or more cameras. A projective relationship between each projector being used and the target display surface is determined using a suitable calibration technique. A component image for each projector is then estimated using the information from the calibration, and is represented in the frequency domain. Each component image is estimated by: 1. determining a set of sub-sampled, regionally shifted images, represented in the frequency domain by using the projective relationship; and 2. composing each component image with a respective set of the sub-sampled, regionally shifted images. In an optimization step, the difference between a sum of the component images and a frequency domain representation of the second component of the image for each projector is identified. The information is converted, by inverse Fourier transform of the frequency domain representation of the second image component image, into a spatial signal which is placed into the framebuffer of each component projector, and then projected therefrom to produce the superimposed image.
9. U.S. Patent Application Serial Number: (to be assigned), filed July 23, 2004, titled: “NOVEL ORAL BIOAVAILABLE PRODRUGS” Inventors: Dr. Peter A. Crooks, Mr. Mohamed Omer and Dr. Audra L. Stinchcomb. The present invention provides duplex prodrugs that provide significant increase in the transdermal flux of drugs across human skin.

The prodrugs are prepared by reacting a drug that can form an ester moiety with phosgene to form a carbonate. The drug can be an opiate or an opiate antagonist. When in contact with human skin, the duplex drug is biotransformed by enzymes or by hydrolysis into two drug molecules.

10. U.S. Patent Application Serial Number: (to be assigned), filed April 24, 2004, titled "ORIENTED IMMOBILIZATION OF GROWTH FACTORS FOR IMPROVING TISSUE-IMPLANT INTERACTIONS" Inventors: Dr. David A. Puleo and Dr. Leonidas G. Bachas. The present invention provides a method for oriented attachment of a biomolecule to a substrate, comprising introduction of a single amino acid to a non-binding site of the molecule, formation of an aldehyde functionality at the introduced amino acid, and formation of a hydrazone bond between the aldehyde and hydrazide moiety on a surface of the substrate. The invention provides also a method for oriented attachment of a growth factor to a substrate, comprising introduction of a single serine or a single cysteine to a non-binding site of the growth factor. The substrates may be implanted into recipients. Accordingly, devices comprising substances having growth factors attached to a surface thereto in an oriented manner are provided.
11. U.S. Patent Application Serial Number: (to be assigned), filed July 26, 2004, titled "NOVEL SESQUITERPENE SYNTHASE GENE AND PROTEIN" Inventor: Dr. Joseph Chappell. The present invention provides sesquiterpene synthases and methods for their production and use. Particularly, the invention provides nucleic acids comprising the nucleotide sequence of citrus valencene synthase (CVS), which codes for at least one CVS. The invention further provides nucleic acids comprising the nucleotide sequence coding for amino acid residues forming the tier 1 and tier 2 domains of CVS. The invention also provides for methods of making and using the nucleic acids and amino acids of the current invention.
12. U.S. Patent Application Serial Number: (to be assigned), filed June 4, 2004, titled "HPRG MUTANTS AND USES THEREOF" Inventor: Rolf J. Craven. The present invention provides methods and agents that interfere with HPR6 function in non-sarcoma tumor cells. Anti-HPR6 agents are used to enhance the killing effect of anti-cancer agents in non-sarcoma tumor cells and to treat non-sarcoma tumors.
13. U.S. Patent Application Serial Number: (to be assigned), filed May 12, 2004, titled "CAMPTOTHECIN INTERMEDIATES AND PRODRUGS AND METHODS OF PREPARATION THEREOF" Inventors: Dr. Thomas G. Burke, Dr. Dennis P. Curran and Dr. Wu Du. The present invention provides novel intermediates and prodrugs of camptothecins and related analogs.

14. U.S. Patent Application Serial Number: (to be assigned), filed May 12, 2004, titled "HIGHLY LIPOPHILIC CAMPTOTHECIN INTERMEDIATES AND PRODRUGS AND METHODS OF PREPARATION THEREOF" Inventors: Dr. Thomas G. Burke, Dr. Dennis P. Curran and Dr. Wu Du. The present invention provides novel, highly lipophilic silatecan intermediates and prodrugs of DB-67 and other silatecans.