DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Government-Owned Inventions; Availability for Licensing

AGENCY: National Institutes of Health, HHS.

ACTION: Notice.

SUMMARY: The inventions listed below are owned by an agency of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 209 and 37 CFR part 404 to achieve expeditious commercialization of results of federally-funded research and development. Foreign patent applications are filed on selected inventions to extend market coverage for companies and may also be available for licensing.

FOR FURTHER INFORMATION: Licensing information and copies of the U.S. patent applications listed below may be obtained by writing to the indicated licensing contact at the Office of Technology Transfer, National Institutes of Health, 6011 Executive Boulevard, Suite 325, Rockville, Maryland 20852-3804; telephone: 301-496-7057; fax: 301-402-0220. A signed Confidential Disclosure Agreement will be required to receive copies of the patent applications.

SUPPLEMENTARY INFORMATION: Technology descriptions follow.

Microscopy System for Distinguishing Stimulated Emissions as a Means of Increasing Signal

Description of Technology: The invention pertains to a system and method for distinguishing stimulated emissions as a means of enhancing signal strength of fluorescent markers in fluorescence microscopy applications. The system is arranged such that an excitation beam (e.g., laser beam) illuminates a sample along some axis exciting the fluorescent markers used in the sample. A second light beam, a stimulation beam, illuminates the sample along another axis, possibly the same as that of the excitation beam. It has been found that if the excited fluorescent molecules are illuminated with light of a stimulation beam at a particular wavelength after initial excitation, the fluorescent molecules will emit light at this wavelength that can be separately detected. An excited fluorescent molecule may be stimulated by light at a wavelength different from the initial excitation beam to boost the signal. The stimulated emission then generated by the fluorescent molecules travels along the same access as the stimulation beam and, as such, the system is configured by a stimulation beam block component associated with an objective lens that prevents or reduces stimulation beam detection but allows detection of the stimulated emission. Another way the invention achieves this is by refocusing both the excitation and stimulation beams through capture by an excitation objective. A filter is then used to filter out light focused by the excitation objective from the simulated emission sent back by the fluorescent molecule.

Potential Commercial Applications:

• Fluorescent microscopy

• Sample detection

Competitive Advantages: Enhanced signal strength in small or dilute samples.

Development Stage:

• Early-stage

• Prototype

Inventors: Andrew York (NIBIB), Sanjay Varma (Johns Hopkins University)

Intellectual Property: HHS Reference No. E-247-2014/0 - US Provisional Patent Application 62/072,218 filed October 29, 2014

Licensing Contact: Michael Shmilovich; 301-435-5019; shmilovm@mail.nih.gov

Collaborative Research Opportunity: The National Institute of Biological Imaging and Bioengineering is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize Fluorescent Microscopy resolution enhancement. For collaboration opportunities, please contact Cecilia Pazman at pazmance@mail.nih.gov.

A Novel Virus-Based Expression System

Description of Technology: The present invention is related to a recombinant viral vector for vaccines.

Currently available poxvirus vectors for humans and other animals exhibit suboptimal expression of recombinant gene(s) and high expression of vector proteins which causes weak immunogenicity and high anti-vector immune response.

The present novel virus-based expression vectors are non-replicating in human and animals, have high expression of exogenous genes to achieve strong immunogenicity, demonstrate low expression of vector proteins to minimize anti-vector immune responses and minimize competition with expression of recombinant proteins and are capable of stable propagation in a continuous cell line. The present virus based expression vectors may be suitable for manufacturing vaccines for inducing an immune response in vaccinated individuals.

Potential Commercial Applications:

• Vaccine

• Tool for studying immune responses

Competitive Advantages:

• Non-replicating in human and animals

• Achieve high expression of recombinant genes

• Low expression of vector genes

• Stable propagation in a continuous cell line

Development Stage:

• Early-stage

• In vitro data available

• Prototype

Intellectual Property: HHS Reference No. E-181-2014/0 - US Provisional Application No. 62/055,989 filed September 26, 2014

Related Technologies:

• Moss B, et al. Recombinant poxviruses having foreign DNA expressed under the control of poxvirus regulatory sequences. US Patent 6,998,252 issued February 14, 2006.

• Moss B, et al. Prokaryotic expression in eukaryotic cells. US Patent 5,550,035 issued August 27, 1996.

Licensing Contact: John Stansberry, Ph.D.; 301-435-5236; stansbej@mail.nih.gov

Collaborative Research Opportunity: The National Institute of Allergy and Infectious Diseases, Laboratory of Viral Diseases, is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize A Novel Virus-Based Expression System. For collaboration opportunities, please contact Chris Kornak at chris.kornak@nih.gov.

Ultra-sensitive Diagnostic Detects fg/mL-pg/mL Pathogen/Disease Protein by Visual Color Change

Description of Technology: This technology is an ultra-sensitive colorimetric assay, based on an enzyme-catalyzed gold nanoparticle growth process, for detection of disease-associated proteins (biomarkers) and disease diagnosis. Current detection methods, such as ELISA immunoassays, measure concentrations above 0.1 ng/mL in a sample. PCR, although more sensitive than ELISA, requires expensive and specialized

equipment and reagents, skilled labor, and complex analysis techniques. This assay detects fg/mL to pg/mL concentrations, allowing detection and diagnosis in the earliest stage of disease or infection. A simple to read colorless-to-red change of gold nanoparticle is read with the naked eye, without the need for advanced instruments. This assay can be performed in a standard ELISA plate. Prototype, proof of concept tests using this platform have been designed for enterovirus 71 (EV71) and prostate specific antigen (PSA). The limit of detection (LOD) for a PSA prototype exceeded the commercial ELISA by more than four orders of magnitude. This assay may be particularly well suited for field use/point-of-care detection of infections and early stage disease.

Potential Commercial Applications: Infectious pathogen and disease diagnostics.

Competitive Advantages:

• Orders of magnitude more sensitive than most ELISA (detects fg/mL to pg/mL)

• Plain sight color-based confirmation does not require complex equipment

• Field use/point-of-care detection

Development Stage:

• Early-stage

• In vitro data available

• Prototype

Inventors: Dingbin Liu and Xiaoyuan Chen (NIBIB)

Publication: Liu D, et al. Glucose oxidase-catalyzed growth of gold nanoparticles enables quantitative detection of attomolar cancer biomarkers. Anal Chem. 2014 Jun 17;86(12):5800-6. [PMID 24896231]

Intellectual Property:

• HHS Reference No. E-167-2014/0 - US Provisional Application No. 61/994,622 filed May 16, 2014

• HHS Reference No. E-167-2014/1 - US Provisional Application No. 62/052,866 filed September 19, 2014

Licensing Contact: Edward (Tedd) Fenn; 424-297-0336; tedd.fenn@nih.gov

Collaborative Research Opportunity: The National Institute of Biomedical Imaging and Bioengineering is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize this technology. For collaboration opportunities, please contact Cecilia Pazman, Ph.D. at pazmance@mail.nih.gov.

Cannabinoid Receptor Meditating Compounds for Metabolic Disease

Description of Technology: There is evidence that the metabolic effects of endocannabinoids are mediated by CB1 receptors in peripheral tissues. While prior attempts at generating CB1 receptor blockers have had serious neuropsychiatric side effects, inventors at NIH have discovered compounds that block CB1 receptors with reduced brain penetrance. In addition, some of these compounds also have a direct inhibitory effect on inducible nitric oxide synthase (iNOS), whereas another group of the compounds directly activates AMP kinas. These dual-target compounds may be useful

for treating metabolic disease and related conditions such as obesity and diabetes and their complications, including liver or kidney fibrosis, without the dangerous the side effects.

Potential Commercial Applications: Treatment of metabolic disease and related conditions such as diabetes, obesity and fibrotic disease.

Competitive Advantages: Cannabinoid receptor blockers with reduced brain penetrance relative to older drugs of this class, also having secondary target for improved therapeutic efficacy.

Development Stage: Early-stage

Inventors: George Kunos (NIAAA), Malliga R. Iyer (NIAAA), Resat Cinar (NIAAA), Kenner C. Rice (NIDA)

Intellectual Property: HHS Reference No. E-140-2014/0 - US Provisional Application No. 61/991,333 filed May 9, 2014

Related Technologies:

• HHS Reference No. E-211-2006/0 - US Patent No. 8,293,724 issued October 23, 2012

• HHS Reference No. E-282-2012/0 - PCT Application No. PCT/US2013069686 filed December 11, 2013

• HHS Reference No. E-103-2013/0 - PCT Application No. PCT/US2014/043924 filed June 24, 2014

Licensing Contact: Jaime M. Greene; 301-435-5559; greenejaime@mail.nih.gov

Octopod (8-pointed star-shape) Iron Oxide Nanoparticles Enhance MRI T_2 Contrast

Description of Technology: The octopod-shaped iron oxide nanoparticles of this technology significantly enhance contrast in MRI imaging compared to spherical superparamagnetic iron oxide nanoparticle T_2 contrast agents. These octopod iron oxide nanoparticles show a transverse relaxivity that is over five times greater than comparable spherical agents. Because the unique octopod shape creates a greater effective radius than spherical agents, but maintains similar magnetization properties, the relaxation rate is improved. The improved relaxation rate greatly enhances the contrast of images. These octopod agents appear to be bio-compatible and may be suitable for intravenous delivery. The synthesis of these agents is also easily reproducible and scaled. The superior contrast greatly improves diagnostic sensitivities, compared to current FDA approved spherical contrast agents. These octopod-shaped iron oxide nanoparticle T_2 contrast agents may have a number of medical imaging uses, such as tumor detection, atherosclerosis imaging and delivery of therapeutic treatments.

Potential Commercial Applications: Medical imaging, such as tumor detection, atherosclerosis imaging and delivery of therapeutic treatments.

Competitive Advantages:

- Enhanced T_2 contrast
- Reproducible and scalable synthesis
- Improved imaging and diagnostic capability

Development Stage: In vivo data available (animal)

Inventors: Xiaoyuan Chen (NIBIB), Jinhao Gao (Xiamen University, China), Zhenghuan Zhao (Xiamen University, China)

Publication: Zhao Z, et al. Octapod iron oxide nanoparticles as high-performance T_2 contrast agents for magnetic resonance imaging. Nat Commun. 2013;4:2266. [PMID 23903002]

Intellectual Property: HHS Reference No. E-314-2013/0 - PCT Application No. PCT/CN2013/076645 filed June 3, 2013

Licensing Contact: Edward (Tedd) Fenn; 424-297-0336; tedd.fenn@nih.gov

Collaborative Research Opportunity: The National Institute of Biomedical Imaging and Bioengineering is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize this technology. For collaboration opportunities, please contact Cecilia Pazman, Ph.D. at pazmance@mail.nih.gov.

Dated: December 9, 2014.

Richard U. Rodriguez, M.B.A.
Acting Director,
Office of Technology Transfer,
National Institutes of Health.

[Billing Code 4140-01-P]

[FR Doc. 2014-29319 Filed 12/15/2014 at 8:45 am; Publication Date: 12/16/2014]