[Billing Code 4140-01-P]

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.

Aortic Access from Vena Cava for Large Caliber Transcatheter Cardiovascular Interventions

Description of Technology: The invention pertains to a device and method for transcatheter correction of cardiovascular abnormalities, such as the delivery of prosthetic valves to the heart. Featured is a device implant for closing a caval-aortic iatrogenic fistula created by the introduction of a transcatheter device from the inferior vena cava into the abdominal aorta. The occlusion device includes an expandable transvascular implant with an elastomeric surface capable of extending between a vein and artery which conforms to the boundaries of an arteriovenous fistula tract between the artery and vein. A guidewire channel is disposed within the occlusion device where the channel also has elastomeric wall surfaces that conform or can be expanded to the area so that it occludes the channel when the guidewire is not present. The implant is resiliently deformable into a radially compressed configuration for delivery through the catheter. When not deformed into the radially compressed configuration, the distal end of the device is radially enlarged, relative to the intermediate neck, whereby the distal end forms an enlarged distal skirt, such as a disk or button shaped member. A polymer coating on the radially enlarged distal end conforms to the endoluminal aortic wall for deployment against an internal wall of the artery.

Potential Commercial Applications:

- cardiovascular surgery
- heart valve implantation
- valve-repair

Competitive Advantages:

• closure of the caval-aortic iatrogenic fistula

• vascular access

Development Stage:

• Prototype

• In vivo data available (animal)

• In vivo data available (human)

Inventors: Robert Lederman and Ozgur Kocaturk (NHLBI)

Publications:

1. Kodali SK, et al. Two-year outcomes after transcatheter or surgical aortic-valve replacement. N Engl J Med. 2012 May 3;366(18):1686-95. [PMID 22443479]

2. Makkar RR, et al. Transcatheter aortic-valve replacement for inoperable severe aortic stenosis. N Engl J Med. 2012 May 3;366(18):1696-704. [PMID 22443478]

3. Smith CR, et al. Transcatheter versus surgical aortic-valve replacement in high-risk patients. N Engl J Med. 2011 Jun 9;364(23):2187-98. [PMID 21639811]

Intellectual Property: HHS Reference No. E-553-2013/0 – US Provisional Patent Application 61/863,071 filed August 7, 2013

Related Technologies:

• HHS Reference No. E-115-2013/0 – US Provisional Patent Application No. 61/834,357 filed June 12, 2013

• HHS Reference No. E-027-2013/0 – US Provisional Patent Application No. 61/785,652 filed March 14, 2013

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

Collaborative Research Opportunity: The National Heart Lung & Blood Institute is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize Transcatheter Cardiovascular Interventions. For collaboration opportunities, please contact Ms. Peg Koelble at koelblep@mail.nih.gov or 301-402-5579.

Photoactivatable Nanoparticles for Targeted Drug Delivery

Description of Technology: The invention relates to novel lipid-based nanoparticles (liposomes) for use in targeted drug delivery. The particles include a wall surrounding a cavity, wherein the wall includes (i) a lipid bilayer comprising 1,2-bis(tricosa-10,12-diynoyl)-sn-glycero-3-phosphocholine (DC8,9PC), and dipalmitoylphosphatidylcholine (DPPC), and (ii) a tetrapyrollic photosensitizer, such as 2-[1-hexyloxyethyl]-2-devinyl pyropheophorbide-a (HPPH) within the lipid bilayer. The lipid bilayer may include one or more segregated regions, or pockets, of DC8,9PC with the HPPH being preferentially located within the DC8,9PC pockets. The nanoparticles include at least one therapeutic agent within the cavity. Upon a targeted application of light in the near-infrared range, the particles are disrupted and can release the therapeutic agent at a targeted site. The concurrent release of the photosensitizing agent HPPH may be advantageous in the treatment of certain cancers, since this agent has shown to possess therapeutic ability on its own right.

Potential Commercial Applications: The nanoparticles can be used for targeted drug delivery.

Competitive Advantages:

• The particles are stable and can be activated upon demand to release the therapeutic agent at the desired site.

• The concurrent release of the photosensitizing agent HPPH may be advantageous in the treatment of certain types of cancer, since this agent has shown to possess therapeutic ability on its own right.

Development Stage: In vivo data available (animal)

Inventors: Anu Puri (NCI) et al.

Publications:

1. Yavlovich A, et al. Design of liposomes containing photopolymerizable phospholipids for triggered release of contents. J Therm Anal Calorim. 2009 Oct1;98(1):97-104. [PMID 20160877]

2. Yavlovich A, et al. A novel class of photo-triggerable liposomes containing DPPC:DC(8,9)PC as vehicles for delivery of doxorubicin to cells. Biochim Biophys Acta. 2011 Jan;1808(1):117-26. [PMID 20691151]

3. Puri A, Blumenthal R. Polymeric lipid assemblies as novel theranostic tools. Acc Chem Res. 2011 Oct 18;44(10):1071-9. [PMID 21919465]

4. Puri A, et al. Material properties of matrix lipids determine the conformation and intermolecular reactivity of diacetylenic phosphatidylcholine in the lipid bilayer. Langmuir. 2011 Dec 20;27(24):15120-8. [PMID 22053903]

Intellectual Property: HHS Reference No. E-482-2013/0 – US Application No. 61/845,861 filed July 12, 2013

Related Technologies:

1. Fabrication of phototriggerable liposomes

2. Loading of a drug into the cavity and HPPH in the lipid bilayer of liposomes

3. Laser-triggered release in vitro and in tumors

Licensing Contact: Uri Reichman, Ph.D., MBA; 301-435-4616; ur7a@nih.gov

Collaborative Research Opportunity: The National Cancer Institute is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize photoactivable nanoparticles for drug delivery. For collaboration opportunities, please contact John D. Hewes, Ph.D. at hewesj@mail.nih.gov.

Signatures of Genetic Control in Digestive and Liver Disorders

Description of Technology: Our technology describes unique genetic signatures in patients with digestive diseases and liver disorders. Using comprehensive analysis of 735 microRNAs and 19,000 mRNAs, we have identified a unique set of microRNAs and/or mRNAs which predict disease phenotypes in patients with digestive and liver disorders. The identification of such point-of- care genetic signatures is significant for both personalized biomarkers and novel targeted biotherapeutics. These microRNAs and mRNAs function either together or separately thus modulating protein expressions in one or more signaling pathways. A particular noteworthy signature of genetic control includes miR-150, which is known to modulate target proteins within the Akt signaling pathways

implicated in inflammatory processes as well as processes affecting cancer cell proliferation and/or survival.

Potential Commercial Applications:

• Personalized biomarkers

• Novel targeted biotherapeutic

Competitive Advantages:

• Point-of-care signatures from minimally invasive samples.

• Protocol streamlined for high-throughput analysis.

• Quantitative molecular diagnostics.

• Unique microRNAs and/or mRNAs reveal biological targets within synergistic cellular pathways.

Development Stage:

• Pilot

• Early-stage

• Pre-clinical

• In vitro data available

Inventors: Wendy A. Henderson, Ralph M. Peace, Nicolaas H. Fourie, Sarah K. Abey (NINR)

Intellectual Property:

• HHS Reference No. E-349-2013/0 – U.S. Provisional Patent Application No. 61/825,154 filed May 20, 2013

• HHS Reference No. E-349-2013/1 – U.S. Provisional Patent Application No. 61/825,489 filed May 20, 2013

Licensing Contact: Suryanarayana (Sury) Vepa, Ph.D., J.D.; 301-435-5020; vepas@mail.nih.gov

Histone Deacteylase (HDAC) Inhibitors that Enhance Chemotherapy

Description of Technology: In cancers with KRAS-mutations, such as leukemias, colon cancer, pancreatic cancer, and lung cancer, researchers at the NCI have observed that administration of the HDAC inhibitor romidepsin in combination with certain MAPK pathway and PI3K pathway inhibitors resulted in significant cytotoxicity, regardless of the type of cancer. Further, the researchers have achieved this effect at clinically relevant dosages and time periods.

Available for licensing are methods that employ these findings to treat cancers or induce cell death in tumor cells.

Potential Commercial Applications: Development of therapeutics for cancers with a high instance of KRAS mutations such as leukemias, colon cancer, pancreatic cancer, and lung cancer.

Competitive Advantages: The synergistic combination of agents induces cytotoxicity better than any of the agents alone.

Development Stage: Early-stage

Inventors: Susan E. Bates, et al. (NCI)

Intellectual Property: HHS Reference No. E-097-2013/0 – US Application No. 61/807,574 filed April 2, 2013

Licensing Contact: Patrick McCue, Ph.D.; 301-435-5560; mccuepat@mail.nih.gov

Dipicolylamine-based Nanoparticles for Delivery of Ligands

Description of Technology: Many potential nucleic acid therapeutics have not transitioned from the research laboratory to clinical application in large part because delivery technologies for these therapies are not effective. Most nucleic acid delivery technologies are lipid-based or positively charged and require chemical or physical conjugation with the nucleic acid. These delivery systems are often therapeutically unacceptable due to toxicity or immune system reactivity. The present technology is a nanoparticle complex, containing a polymer substrate, such as a hyaluronic acid, and Zn^{2+}-dipicolylamine (Zn-DPA), that associates selectively with the nucleic acid phosphodiester groups. This complex functions as a simple, easy to scale-up, cost effective, low toxicity delivery system for potential nucleic acid therapeutics, such as siRNA molecules. It may also be capable of co-delivering other small molecule drugs.

Potential Commercial Applications:

• Drug delivery

• Gene therapy

Competitive Advantages:

• Efficient

• Easy to scale-up

• Cost effective

• Low toxicity

Development Stage:

• Early-stage

• In vivo data available (animal)

Inventors: Xiaoyuan Chen (NIBIB), Seulki Lee (NIBIB), KiYoung Choi (NIBIB), Gang Liu (North Sichuan Medical College, China)

Publication: Liu G, et al. Sticky nanoparticles: a platform for siRNA delivery by bis(zinc(ll) dipolyamine)-functionalized, self-assembled nanoconjugate. Angew Chem lnt Ed Engl. 2012 Jan 9;51(2):445-9. [PMID 22110006]

Intellectual Property: HHS Reference No. E-066-2012/0 – U.S. Provisional Application No. 61/729,159 filed November 21, 2012

Licensing Contact: Edward (Tedd) Fenn; 424-500-2005; 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 Henry S. Eden, M.D., Ph.D. at edenh@mail.nih.gov.

Norovirus-neutralizing Monoclonal Antibodies

Description of Technology: Vaccines and therapies to prevent and treat Norovirus infections do not exist, despite the worldwide prevalence of Norovirus infections. Outbreaks of human gastroenteritis attributable to Norovirus commonly occur in group setting, such as hospitals, nursing homes, schools, dormitories, cruise ships and military barracks.

This technology relates to monoclonal antibodies, which specifically bind to Norovirus and have therapeutic potential. In a primate model, these antibodies stimulated

a strong adaptive immune response which may produce a protective effect. These Norovirus antibodies may have application as immunoprophylaxis to protect individuals from infections or as a possible treatment for infected individuals.

Potential Commercial Applications:

• Therapeutic

• Vaccine

Competitive Advantages: Currently, no vaccines or therapies exist to prevent and treat Norovirus infections.

Development Stage:

• Early-stage

• In vivo data available (animal)

Inventors: Zhaochun Chen, Robert H. Purcell, Lisbeth Kim Green, Stanislav Sosnovtsev, Karin Bok (all of NIAID)

Publication: Chen Z, et al. Development of Norwalk virus-specific monoclonal antibodies with therapeutic potential for the treatment of Norwalk virus gastroenteritis. J Virol. 2013 Sep;87(17):9547-57. [PMID 23785216]

Intellectual Property: HHS Reference No. E-226-2011/0 – U.S. Provisional Application No. 61/763,879 filed February 2, 2013

Licensing Contact: Edward (Tedd) Fenn; 424-500-2005; tedd.fenn@nih.gov

Collaborative Research Opportunity: The National Institute of Allergy and Infectious Diseases 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 Maryann Puglielli, Ph.D., J.D. at pugliellim@mail.nih.gov.

September 9, 2013
Date

Richard U. Rodriguez,
Director
Division of Technology Development and Transfer
Office of Technology Transfer
National Institutes of Health

[FR Doc. 2013-22264 Filed 09/12/2013 at 8:45 am; Publication Date: 09/13/2013]