[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

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 CONTACT: Licensing information and copies of the U.S. patent applications listed below may be obtained by emailing the indicated licensing contact at the National Heart, Lung, and Blood, Office of Technology Transfer and Development Office of Technology Transfer, 31 Center Drive Room 4A29, MSC2479, Phone: 301-402-5579.

Bethesda, MD 20892-2479; telephone: 301-402-5579. A signed Confidential Disclosure Agreement may be required to receive copies of the patent applications.

SUPPLEMENTARY INFORMATION: Technology description follows.

Fluorescent Nanodiamonds as Fiducial Markers for Microscopy

Description of Technology:

The invention relates to fluorescent nanodiamonds (FNDs) and their uses as fiducial markers for microscopy. FNDs are bright fluorescent probes that do not blink or bleach and have broad fluorescence excitation and emission peaks. The fluorescence intensity can be readily controlled by the size of the FND, the number of fluorescent centers produced in the nanodiamonds, or in situ through the application of a weak magnetic field. The particular advantage of the FND compositions of this invention are that they are particularly useful for extended imaging of a single sample over time periods that can be as long as a week or more. In an exemplary embodiment, FNDs are immobilized in a substrate that are coated with an inert top coating, like silicon dioxide, or transparent polymer (e.g. poly–L-lysine, poly-L-arginine, or siloxanes). Generally, any suitable methods known for surface functionalization of the substrate can be used to make the composition. In another aspect of this invention, the inventors designed software for super-resolution imaging correction method is employed to precisely determine the position coordinates of each of a set of FNDs in a plurality of images by using Gaussian fitting of the point spread function comprises each of the FNDs in the plurality of images. The calculated correction is then used to displace each image to align the coordinates of

the FNDs. The positions of the FNDs can be tracked with sub-nanometer precision and residual drift can be reduced to the nanometer scale over hundreds of hours of tracking.

Potential Commercial Applications:

• Fluorescent Microscopy

• Super-resolution microscopy

• Correlative imaging techniques combing fluorescence microscopy with electron, x-ray, or atomic force microscopy imaging modalities.

Competitive Advantages:

• Non-blinking, Non-bleaching

• Chemically inert

• Chemically and physically stable

• Broad excitation.

• Longevity

. **Development Stage:**

• In vitro data

Inventors:

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- Chang Yi, Lawrence Samelson, Asit Manna (all of NCI)

Intellectual Property: HHS Reference No. E-217-2015/0 –US-01

• US Provisional Patent Application 62/262,058 filed December 2, 2015.

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Collaborative Research Opportunity: The National Heart, Lung and Blood Institute seeks statements of capability or interest from parties interested in collaborative research to further develop and evaluate metallic nanoparticle vesicles for cancer phototherapy. For collaboration opportunities, please contact Vincent Kolesnitchenko, Ph.D. at kolesniv@nhlbi.nih.gov.

Dated: December 15, 2015

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Michael Shmilovich

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National Heart, Lung, and Blood Institute,

Office of Technology Transfer and Development

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