

X-Ray Enhanced Polymerization Of Nanostructures And X-Ray Activated Release Of Ions From Nanostructures

Tech ID: 23509 / UC Case 2013-325-0

ABSTRACT

A novel drug delivery system that is activated by low dose X-Ray which has further applications in imaging.

FULL DESCRIPTION

Drug delivery is a significant problem for pharmaceuticals and patients alike. To ensure a therapeutic reaches its target pharmaceuticals must come up with a dosage which would allow the therapeutic to successfully traverse the maze that is the human body, reach its target, and still remain bio-active. To combat this, pharmaceuticals often have to increase dosage to get a therapeutic response, thereby increasing cost burden put on patients. Because of the numerous challenges put forward by drug delivery, a number of substantial therapeutics are overlooked, leaving patients with overpriced and outdated drugs.

Researchers at the University of California, Davis have developed a novel nanomaterial platform vehicle to carry therapeutics within the body. This novel technology utilizes nonreactive nanomaterials to traffic any therapeutic to the targeted locations. These nanomaterial vehicles are able to move through the body without being destructed, and are later broken down at the targeted locations using a low dose of radiation from a low energy focusing X-ray source. This unique X-ray modality dually acts as a catalyst for release of the therapeutic, as well as a device for Three-Dimensional Point Scan Imaging. This 3D point scan, which unlike tomographic or sectioning scanning, enables a high sensitivity probe of the target of nanomaterials in the sample, which can be orders of magnitude higher than conventional CT-based methods. By using one source for imaging and drug release, physicians/clinicians will be able to deliver, located and activate high levels of otherwise extremely potent therapeutic drugs to a specific targeted area with great efficiency.

APPLICATIONS

- ▶ Medical Imaging
- ▶ Drug Delivery

FEATURES/BENEFITS

- ▶ Low cost method to treat patients with targeted high dosage therapeutics
- ▶ High resolution 3-D point scan
- ▶ Novel drug delivery system that utilize X-Rays to release therapeutics

RELATED MATERIALS

- ▶ [An Example of X-ray Nanochemistry: SERS Investigation of Polymerization Enhanced by Nanostructures under X-ray Irradiation. J. Physical Chemistry Letters; 3271, 2012.](#) -

CONTACT

Michael M. Mueller
mmmueller@ucdavis.edu
 tel: .



OTHER INFORMATION

KEYWORDS

nano, nanomaterial, X-Ray, low dose X-Ray

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Health
- ▶ **Imaging**
 - ▶ 3D/Immersive
 - ▶ Medical
 - ▶ Molecular
- ▶ **Materials & Chemicals**
 - ▶ Biological
 - ▶ Chemicals
 - ▶ Nanomaterials
- ▶ **Medical**
 - ▶ Delivery Systems
 - ▶ Devices
 - ▶ Diagnostics
 - ▶ Disease: Cancer
 - ▶ Imaging
 - ▶ Research Tools
 - ▶ Screening

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,830,716	11/10/2020	2013-859
United States Of America	Issued Patent	9,993,553	06/12/2018	2013-449
United States Of America	Issued Patent	9,764,305	09/19/2017	2012-304
United States Of America	Issued Patent	9,718,922	08/01/2017	2013-325
United States Of America	Issued Patent	9,604,955	03/28/2017	2012-303

RELATED CASES

2013-325-0, 2012-304-0, 2013-449-0, 2012-303-0, 2013-859-0

University of California, Davis

Technology Transfer Office

1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

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530.754.8649 California
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Fax:
530.754.7620