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UCLA Inventors Create Platform Technology to Create Customizable Materials for Imaging and Detection

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BRIEF DESCRIPTION

UCLA researchers in the Departments of Chemistry, Physics, and Bioengineering, led by Dr. Tim Deming of the Bioengineering department, have developed a platform to create and modify nanoscale vesicles and hydrogels for use in imaging and detection. The poly-peptide based platforms created by the Deming group are customizable in nearly all physical characteristics, can be tailored in size, be loaded with hydrophobic and hydrophilic payloads, adaptable to specific delivery locations, low toxicity, are fully synthetic, possess highly reproducible properties, and are inexpensive to prepare compared to solid-phase peptide synthesis. The platform can be used to create novel, need-based nanoscale vesicles or injectable hydrogels, and can also be used to augment existing nanoparticles.

ADVANTAGES

- ▶ Able to load vesicles and hydrogels with hydrophilic and/or hydrophobic payloads
- ▶ Hydrogel is injectable
- ▶ Able to encapsulate macromolecules and other particles, including a variety of fluorescent and imaging probes
- ▶ Hydrogel version is thermoresponsive – an injectable liquid at room temp, solid at body temp
- ▶ Modifiable for specific cell and tissue type targeting
- ▶ Vesicles can penetrate cell membranes to intracellularly deliver payloads
- ▶ Stable at high temperature (up to 80°C in water) and vesicles can be engineered to various sizes (50 to 1000nm)
- ▶ Inexpensive starting material and process chemistry used to synthesize peptidic polymers

FULL DESCRIPTION

Biologic imaging is a key method for detection and analysis within the medical, pharmaceutical, and biotechnology industries. Core to the biologic imaging industry leaders' competitive strategy relies on acquiring unique imaging reagents based on nanotechnology. For this reason, nanotechnology-based imaging reagents have received significant research and development over the past few years. These nanoscale systems are promising for diagnostic applications including disease detection, augmentation of gold standard methods, and addressing the demand of a molecular approach toward personalized disease monitoring.

OTHER INFORMATION

References: UCLA Cases 1998-072, 2001-307, 2007-014, 2008-767, 2012-598, 2013-315, 2015-124, 2015-452, 2015-612

Deming Group: <http://deming.seas.ucla.edu/>

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OTHER INFORMATION

KEYWORDS

Drug delivery vehicle, cargo, polypeptide vesicles, polymer, nanotechnology, nanomaterial, cell-permeable

CATEGORIZED AS

- ▶ **Imaging**
 - ▶ Medical
- ▶ **Materials & Chemicals**
 - ▶ Nanomaterials
 - ▶ Polymers
- ▶ **Medical**
 - ▶ Delivery Systems
 - ▶ Imaging
- ▶ **Nanotechnology**
 - ▶ NanoBio

