UCLA Inventors Create Platform Technology to Create Customizable Nanoscale Particles and Gels for Use in the Industrial Biomaterials Market

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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 particles and gels for use in the industrial biomaterials market. The polypeptide based delivery vehicle platforms created by the Deming group are customizable in nearly all physical characteristics, can be tailored in size, loaded with hydrophobic and hydrophilic payloads, used in coatings, 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 materials systems.

ADVANTAGES

- Stable at high temperature (up to 80 °C in water) and vesicles can be engineered to various sizes (50 to 1000nm)
- Inexpensive starting materials and process chemistry used to synthesize peptidic polymers
- Highly reproducible at manufacturing levels
- Hydrogel version is thermoresponsive – an injectable liquid at room temp, solid at body temp
- Able to encapsulate macromolecules and other particles
- Potential low toxicity and biodegradability due to synthetic polypeptide building blocks
- Able to load vesicles and hydrogels with hydrophilic and/or hydrophobic payloads
- Easily forms as a coating

INNOVATION

Advanced materials play a critical role within a variety of industries across the globe. From construction, utilities, transportation and logistics, food and beverage, cosmetics, telecommunications, electronics, oil and gas, petrochemicals, and packaging, industries are heavily investing in advanced materials to address their needs. For this reason, nanoscale technologies have received significant research and development over the past few years. These nanoscale systems offer the promise of stability, synthetic, reproducible, and low cost.

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OTHER INFORMATION

KEYWORDS

cargo, polypeptide vesicles, polymer, nanotechnology/nanomaterial, coating, inexpensive

CATEGORIZED AS

- **Materials & Chemicals**
  - Biological
  - Nanomaterials
  - Polymers
- **Nanotechnology**
  - NanoBio

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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