Amphiphilic Derivatives Of Thioether Containing Block Copolypeptides

Tech ID: 29917 / UC Case 2013-315-0

SUMMARY

UCLA researchers in the Department of Bioengineering have developed a new method to generate amphiphilic block copolypeptides.

BACKGROUND

Block copolymers with amphiphilic character can self-assemble into a variety of micellar structures, including spherical micelles, rodlike micelles, or vesicles. These structures have utility in drug delivery, vesicles for medical diagnostic technologies, and as polymer nanoreactors. Methionine-containing copolymers are of interest for their biocompatibility and ability to be modified to add desirable functionality. However, previous protocols require more complex synthesis protocols and are more limited in scope of functional modifications that can be accomplished.

INNOVATION

UCLA researchers led by Professor Timothy Deming have developed a novel strategy to create uniform thioether (methionine) containing block copolypeptides. They have amphiphilic character imparted by selective oxidation and alkylation of methionine residues. This method allows for the preparation of functional block copolypeptides as well as methods to generate micelles, vesicles, hydrogels, and emulsions.

APPLICATIONS

- Can be chemically modified by oxidation and alkylation
- Unique ability to stimulate an antioxidant response in cells

ADVANTAGES

- Therapeutics: Drug Delivery - can be used to encapsulate drugs, DNA, proteins, RNA, water insoluble drugs, both hydrophilic and hydrophobic drugs with high efficiency
- Vesicles for Medical Diagnostics - can be used with active compounds for in vivo diagnostic approaches - Decrease concentration of an imaging agent with known side effects, i.e., ultrasound and MRI scans
- Polymer Nanoreactors - can encapsulate antioxidant enzymes which then detoxify superoxide radicals present in the vesicle environment

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,718,921	08/01/2017	2013-315

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Preparation Of Functional Homocysteine Residues In Polypeptides And Peptides
- Compositions Of Polyion Complex Polypeptide Hydrogels
- Chemoselective Side-Chain Modifications Of Methionine-Containing Elastin-Like Polypeptides

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OTHER INFORMATION

KEYWORDS

copolymer, alkylation, oxidation, copolymer alkylation, copolymer oxidation, block copolymer, micelle, vesicles, drug delivery, amphipathic, thioether copolymer, methionine copolymers

CATEGORIZED AS

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

RELATED CASES

2013-315-0

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