Trehalose Hydrogels For Stabilization And Delivery Of Proteins

Tech ID: 30019 / UC Case 2014-554-0

SUMMARY

UCLA researchers in the Department of Chemistry and Biochemistry have developed a novel trehalose hydrogel to help stabilize proteins for drug delivery.

BACKGROUND

Proteins are at the core of biologic drugs and are used to treat a range of disease states including arthritis, cancer, and diabetes. However, some of the major challenges with this class of drugs include their intravenous injection, inherent instability, and short half-life in the bloodstream. Hydrogels, defined as networks of crosslinked polymers, have been of great interest as a solution to these protein drug delivery issues. In addition, the natural sugar trehalose has been shown to be an exceptional stabilizer of proteins while preserving the activity of the enzymes. Thus, improved hydrogels may serve as a better scaffold for the stabilization and delivery of proteins.

INNOVATION

Researchers in the UCLA Department of Chemistry and Biochemistry have developed a trehalose hydrogel that aids in the stabilization of proteins. The trehalose-based monomers and additional crosslinkers can be treated with proteins to produce a gel that will stabilize the protein and aid in its delivery. This technology utilizes a short procedure with biocompatible reagents and materials, making it suitable for biomedical applications.

APPLICATIONS

- Storage and delivery of proteins
- Protein-based biological therapeutics

ADVANTAGES

- Simple to construct
- Effective in stabilizing proteins
- Biocompatible

STATE OF DEVELOPMENT

The trehalose hydrogels have been synthesized and demonstrated to be effective in stabilizing proteins.

PATENT STATUS

Country	Type	Number	Dated	Case
Japan	Issued Patent	6770508	09/29/2020	2014-554
United States Of America	Issued Patent	10,662,295	05/26/2020	2014-554
Switzerland	Issued Patent	3180030	10/09/2019	2014-554
Germany	Issued Patent	3180030	10/09/2019	2014-554
Spain	Issued Patent	3180030	10/09/2019	2014-554
France	Issued Patent	3180030	10/09/2019	2014-554
United Kingdom	Issued Patent	3180030	10/09/2019	2014-554
Ireland	Issued Patent	3180030	10/09/2019	2014-554
Italy	Issued Patent	502020000000241	10/09/2019	2014-554
Sweden	Issued Patent	3180030	10/09/2019	2014-554

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OTHER INFORMATION

KEYWORDS

Biological therapeutics, protein stabilization, polymer chemistry, hydrogel, nanotechnology

CATEGORIZED AS

- **Materials & Chemicals**
  - Biological
  - Polymers
- **Medical**
  - Delivery Systems
  - Therapeutics
- **Nanotechnology**
  - Materials

RELATED CASES

2014-554-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- PolyProtek: Platform for Delivering and Stabilizing Therapeutic Biologics, Vaccines, and Industrial Enzymes
- Dual-Enzyme Responsive Peptides
- A Novel Basic Fibroblast Growth Factor Conjugate for Broad Therapeutic Application
- Update To Degradable Trehalose Glycopolymers
- Noncrushable/Nonabusable Pill Formulations
- A Novel Glycopolymer to Enhance Protein Stability

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