Method for Efficient Loading of Bioactives into Lipid Membrane Microcapsules

Tech ID: 24655 / UC Case 2014-570-0

ABSTRACT

Researchers at the University of California, Davis have developed a method of delivering targeted bioactives that is applicable to the agricultural, food processing, cosmetic, veterinary and medical industries.

FULL DESCRIPTION

Lack of oxidative stability affects food and medicine shelf lives. Oxidation during either production or distribution can distort food flavors and textures, negatively affecting consumer perceptions. Agricultural interests also seek improved methods for delivering targeted products to specific sections of crops. In addition, animal science professionals could derive tremendous benefit from more precise delivery of nutrients or therapeutics to livestock. All these application will benefit from improved methods for the safe and precise delivery of high loadings of bioactives that maintain their desired properties.

Nanoencapsulation is a common approach used to maintain or enhance the functional properties of products critical to multiple industries. Currently, the encapsulation of many biological materials relies on diffusion-based methods, which suffer from both long cycle times and low encapsulation efficiencies. Thus, there is a need for more efficient encapsulation methods that can help prevent oxidation, preserve product stability and permit high loading levels of bioactives.

Researchers at the University of California, Davis have developed methods that sequentially apply vacuum and high-pressure environments to load high-levels of bioactives into lipid membrane microcapsules efficiently. These methods can occur in either aqueous or non-aqueous solutions, and at temperatures far below those employed by current methods. Additionally, these methods improve both the oxidative stability of encapsulated bioactive compounds and their overall stability (including chemical, pH and *in vivo* stability of therapeutics and nutraceuticals). This method has potential applications for agricultural chemicals (pesticides; fertilizers; etc.), as well as products spanning multiple other industries.

APPLICATIONS

- Highly targeted delivery of stable bioactives for multiple industries

FEATURES/BENEFITS

- Significant reduction in time required to generate microencapsulated bioactives
- Allows higher loading levels of the desired bioactives into the microcapsules
- Improved oxidative stability of the delivered bioactives

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,864,168	12/15/2020	2014-570

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OTHER INFORMATION

KEYWORDS

Bioactives, encapsulation, high-pressure processing, microcapsules, vacuum

CATEGORIZED AS

- **Agriculture & Animal Science**
  - Animal Science
  - Nutraceuticals
  - Other
  - Processing and Packaging
- **Biotechnology**
  - Food
  - Health
- **Materials & Chemicals**
  - Agricultural
  - Biological
  - Chemicals
  - Nanomaterials
  - Pesticides and Insecticides
- **Medical**
  - Delivery Systems
  - Therapeutics
- **Veterinary**
  - Therapeutics

RELATED CASES

2014-570-0

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- In-situ Production of Anti-inflammatory Lipids for Treating Inflammation
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