Producing Protein Microspheres/Nanospheres with Narrow Size Distribution

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Technology description

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Overview

The invention provides a method for producing zein (corn protein) microspheres and nanospheres. The microspheres and nanospheres are restricted to narrow size ranges and are useful in producing drug delivery and biomedical applications.

Technology

This invention describes the composition and method to produce the zein particles at either micron or nanometer sizes. Particle size, shape, and distribution is important because it can significantly affect drug release behavior, biodistribution, body clearance, and toxicity. Past methods produce a wide size distribution of spheres, which would not allow for uniform drug delivery kinetics. A method to develop narrow particle size distribution is needed for product uniformity and predictable drug release. This method involves dissolving the zein into a mixture of water and an organic solvent. This technology can be used for protein delivery, DNA transfection, vaccine delivery, and tissue engineering. This method’ s feature allows the zein particles to be converted to a suitable shape and size and blended with other biopolymers.

Research Interests

Nanoparticles for drug delivery

Cellular trafficking of nanoparticles

TECHNOLOGY COMMERCIALIZATION

Application area

Drug/vaccine delivery
Cosmetics
Agriculture (delivery of growth factors, essential nutrients, and pesticides)

Advantages

Reproducible/Scalable: does not require pharmaceutically unacceptable solvents
Stability: stable for over two months without changes in size and polydispersity index
Applicable: used for both hydrophilic and lipophilic drug encapsulation

Institution

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