

Technology available January 2013

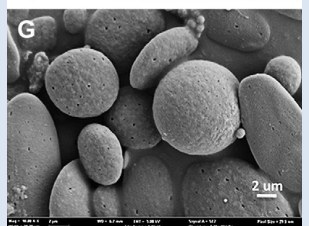
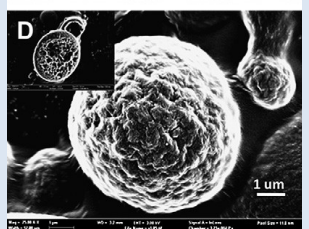
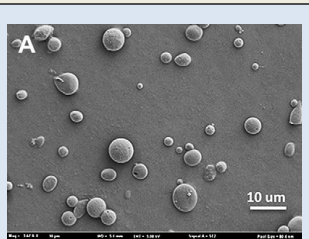
Available
Technologies:

- ◆ T001595
- ◆ T001629
- ◆ T001780
- ◆ T001790

Features and Applications:

- Versatile silk-based micro/nano particles for drug delivery, encapsulation, stabilization, and mechanical lubrication
- Naturally derived, biodegradable, and biocompatible
- Fabricated using FDA approved materials with no heat or harsh chemicals
- Broad utility in biomedical, pharmaceutical, consumer and industrial applications

Silk-based Micro/Nano Spheres and Particles



Silk Microspheres

Scanning electron microscope images of silk microspheres prepared using various techniques

Researchers at Tufts University have developed methods to produce silk-based micro and nano particles with utility in a wide variety of medical, pharmaceutical, cosmetic, food industry, and industrial applications. Silk is a biodegradable, biocompatible, naturally derived protein that is “green” and environmentally friendly. Moreover, silk particles are produced using FDA approved materials, making them conducive to applications involving human implantation and consumption.

A primary use of these silk particles is in the encapsulation and subsequent release of drugs and other substances. Micro/nano particle-mediated drug delivery has recently attracted a great deal of attention. Silk offers an advantage over other particle forming materials in that the silk particles

do not require the use of heat, pressure, or harsh chemicals during synthesis. This allows the bioactivity of sensitive therapeutics to be maintained as they are loaded into silk particles. In addition to therapeutics, silk particles can also be used to encapsulate dyes, fragrances and flavors for a variety of purposes.

Silk particles are also useful as a lubricating material. When placed between two sliding surfaces, the particles significantly reduce the sliding friction force. The robust nature of the silk protein allows the particles to retain their functionality during repeated cycling. These silk particle lubricants have utility in medical applications, such as reducing friction in arthritic joints, as well as in commercial or industrial applications.

Summary

Silk micro/nano particles have great utility across a wide range of applications. Particle properties including size, shape, morphology, and charge can easily be tuned for specific purposes. The

aqueous, ambient fabrication process is conducive to encapsulating sensitive compounds and the robust nature of particles allows them to stand up to repeated mechanical stresses.

Several IP positions are now available for licensing from Tufts University. Check out a full description of the technology at [\[http://techtransfer.tufts.edu/\]](http://techtransfer.tufts.edu/)

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