July 9, 2007

UCSB Researchers Show How to Make Polymeric Micro- and Nanoparticles Using Widely Available Lab Chemicals and Equipment

Creating the Particles Essential to Understanding the Role of Shape in Particle Function

Santa Barbara, CA ? July 9, 2007 ? Researchers in the College of Engineering at UC Santa Barbara have disc overed how to make polymeric micro- and nanoparticles in a wide variety of different shapes and sizes using commonly-available lab chemicals and equipment. Knowing how to create these particles in the average laboratory environment will facilitate further discovery, as the particles are essential to understanding the role of shape in particle function. Their research is published in today?s online edition of the Proceedings of the Na tional Academy of Sciences.

Polymeric micro- and nanoparticles are used in a wide range of applications including medical imaging, drug delivery, and beauty and personal care products. These applications typically use spherical particles. While making particles in other shapes could be extremely useful, fabricating shapes other than spheres has been technically challenging.

The research team, led by Samir Mitragotri, a professor of chemical engineering, with Julie Champion, a graduate student, and Yogesh Katare, a post-doctoral researcher, used spherical polystyrene beads as a starting point. In one approach, the beads were liquefied by heat or solvents and then stretched. In the second, the beads were embedded in a polyvinyl alcohol film and the film was stretched to create voids around the beads. These voids were then filled by liquefying the beads using heat or solvent. From these two simple techniques, more than 20 different shapes were formed, ranging from simple rods and eggs to lenses, diamonds, food-shaped ravioli and tacos.

The methods used to create the potpourri of micro- and nanoparticles allow the researchers to control the size and shape of the particles created, a crucial factor in the development of nonspeherical particles in a variety of fields, including drug delivery, microbiology, advanced materials and rheology. This research was funded by the NIH program of excellence in nanotechnology.

Media Contacts:
Tony Rairden: 805.893.4301; trairden@engineering.ucsb.edu
Samir Mitragotri, 805.893.7532; samir at engineering.ucsb.edu

Released by Barbara Bronson Gray

Media Contact

Tony Rairden
trairden@engineering.ucsb.edu
805.893.4301