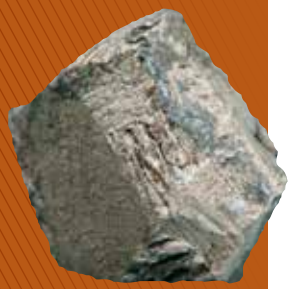

The Shape-Shifting Promises of Microgels

BARIUM | Squishy and mushroom-shaped, flexible microgels hold promise as customized drug delivery vehicles and building blocks for tissue engineering. Now, Arezoo Ardekani and her team have created a new, relatively simple method for producing these shape-shifters that could greatly widen their use.

Using microfluidics, in which tiny tubes and channels control micro-quantities of fluids, the researchers mix sodium alginate and polyNIPAAm into uniform droplets. They then inject the droplets into a collecting solution of glycerol and barium acetate.

As the barium ions turn the droplets into gel with new chemical bonds to hold it together, the interfacial effects cause the droplets to change shape. The resulting mushroom-shaped, squishy particles can be shaped further by varying the concentration of glycerol in the collecting solution.

"The novelty of this work is that it is very simple to generate different shapes just by changing the concentration of glycerol," says Ardekani, an assistant professor of mechanical engineering. Because microgels also can phase-separate, producing a double-sided, or Janus, surface with different physical properties, they could be used to co-deliver two different kinds of medications. Cells also might be reversibly encapsulated into the microgels for tissue engineering. | **L.T.**

AREZOO ARDEKANI

PHOTO BY VINCENT WALTER