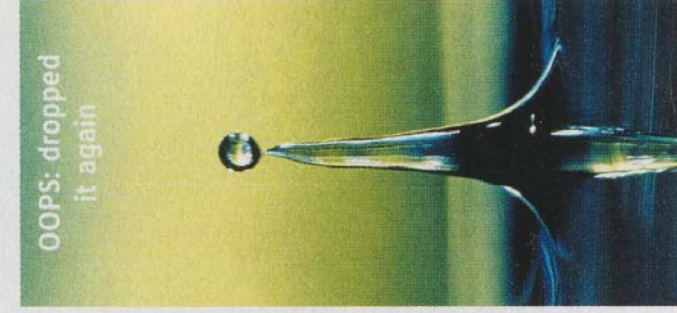


Wrapping a liquid in a liquid helps the medicine go down

HELP is at hand for people who have to take minuscule doses of foul-tasting drugs. Spanish scientists have worked out how to make the tiniest drug capsules ever—by wrapping a liquid in a liquid.

Bitter medicines and pungent health foods like garlic pearls are sealed inside gel capsules that dissolve only after they are swallowed. But for much smaller doses, it has been impossible to produce tiny capsules of uniform size and composition—key requirements for accurately controlling drug delivery.

But now Ignacio Loscertales and colleagues at the University of Malaga say they can produce dual-layered capsules as small as you like. First, they make tiny droplets by passing two immiscible liquids—the inner one being the drug—through concentric nozzles, so the outer liquid forms a layer completely surrounding the inner one. At least one



of the liquids has to be slightly conductive, so an electric field can be used to draw the fluid out of the nozzles. The electric field is used to pull the two-layered liquid into a cone shape, so that a series of tiny droplets can be drawn from its tip.

The outer liquid can be made of a photopolymer that solidifies when exposed to ultraviolet light, forming a tasteless capsule. By careful control of the nozzle width and electric field, Loscertales can produce capsules of varying sizes. In experiments to encapsulate water in olive oil, he has made droplets as small as 0.15 micrometres in diameter—more than 600 times thinner than a human hair. But best of all, the capsule size is consistent, allowing accurate dosing.

Loscertales is also studying the possibility of applying his technique to food, in which the capsules could prevent oxidation of food additives.

Jeff Hecht, Boston

More at: *Science* (vol 295, p 1695)