Dissolvable Plastic Nanofibers could Treat Brain Infections

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A plastic material already used in absorbable surgical sutures and other medical devices shows promise for continuous administration of antibiotics to patients with brain infections, scientists are reporting in a new study. Use of the material, placed directly on the brain's surface, could reduce the need for weeks of costly hospital stays now required for such treatment, they say in the journal *ACS Chemical Neuroscience*.

Shih-Jung Liu and colleagues explain that infections are life-threatening complications that occur in about five to 10 percent of patients who have brain surgery. Current treatment involves intravenous antibiotics for up to eight weeks and extended, costly hospital stays. Previous studies showed that drug-delivering plastics could release antibiotics directly into the brain. However, additional surgery was needed to remove the plastic when treatment finished. Liu's team sought to develop a biodegradable version using a dissolvable plastic called PLGA.

They describe development of PLGA fibers that release vancomycin, a powerful antibiotic that kills many microbes, including the infamous "MRSA," which shrugs off most other known antibiotics. They tested the fibers in rats, which are stand-ins for humans in these types of studies. The fibers successfully released vancomycin for more than eight weeks in the brain and did so without apparent side effects.

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