
Soft Robotics Lend a 'Hand' To Surgery, Drug Delivery



A tiny robotic 'hand' made from flexible, partially biodegradable material could assist physicians with remotely guided surgery, and eventually deliver drugs to parts of the body which are otherwise difficult to reach.

Researchers from Johns Hopkins University and the University of Maryland used hydrogels in the formation of a soft, self-folding material which could generate its own energy through responses to changes in acidity, light and temperature within the body. In this way, the microscopic, star-shaped gripper could access small spaces without being tethered to an external power supply.

To provide some strength and structure to the soft material, the hydrogels were combined with a biodegradable polymer. The resulting stiffness allowed the formation of a tiny tool to wrap around and remove cells, the essential function of a biopsy.

Magnetic nanoparticles within the material permitted the researchers to control the hand-like gripper as it moved through the body. A magnetic probe outside of the body made it possible to guide the microhand, an effective trait which could be helpful in the future assembly and engineering of microscopic biological parts. The method could also be used by surgeons to remotely direct biopsy excisions.

Co-author David H. Gracias said that the use of soft materials like those used in this study is promising for the creation of miniaturised, biodegradable surgical tools which could safely dissolve in the body after an operation.

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Source: [American Chemical Society](#)

Image Credit: American Chemical Society

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