



Cell-sized Robots to Detect Diseases

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Scientists at MIT have developed tiny robots, of size about 10 micrometers, that could be used to monitor oil or gas pipeline, or for disease diagnosis in the human body.

- Scientists also developed ways by which such robots could be mass-produced.
- The microscopic devices are named as "**syncells**" (**short for synthetic cells**).

Manufacturing Robots

- The scientists used the two-dimensional form of carbon, graphene, to form the outer structure of the tiny syncells.
- One layer of the graphene is laid down on a surface, then tiny dots of a polymer material, containing the electronics for the robots, are deposited by a sophisticated printer. Then, the second layer of graphene is laid on top.
- To control the natural fracturing process of atomically-thin, brittle materials, scientists through "**auto perforation**" direct the fracture lines so that they produce minuscule pockets of a predictable size and shape.
- Embedded inside these pockets are robots with electronic circuits and materials that can collect, record, and output data.

Potential Application and Significance

- These tiny robots can be used to monitor conditions inside an oil or gas pipeline or to search out disease while floating through the bloodstream.
- This research demonstrates a way of easily mass-producing such devices.
- This procedure of using controlled fracture as a production method can be extended across many disciplines. It will allow future researchers to tailor atomically thin surfaces into any desired shape or form for applications in other disciplines.
- It can retain the data without the need for power, allowing information to be collected at a later time.

- The tiny-robots are stable over a period of months even when floating around in the water.