



## Cell-sized Robots to Detect Diseases

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.