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Scientists find nanotechnology for detection of foodborne viruses

By Oscar Rousseau+, 28-Mar-2017

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Canadian scientists claim to have developed a "*ground-breaking*" nanotechnology sensing mechanism that can detect mild traces of a foodborne virus, potentially making it easier to stop epidemics.

Professor Suresh Neethirajan and his team, at the BioNano Lab in the University of Guelph, Canada, have claimed the nanotechnology-based platform can help scientists develop a cheap and effective technique for foodborne virus detection.

He also claimed the breakthrough could help industry detect diseases in farm animals before the meat enters the food chain.

Developed alongside researchers in South Korea and Japan, the peer-reviewed research was published in Scientific Reports, a medical journal owned by Nature Publishing Group.

A sensor that could detect the strain of avian influenza

Speed and ease of use

Professor Neethirajan said the current technique for detecting a foodborne virus was "*quite a complex procedure*" and often took a long time to reach a sound conclusion.

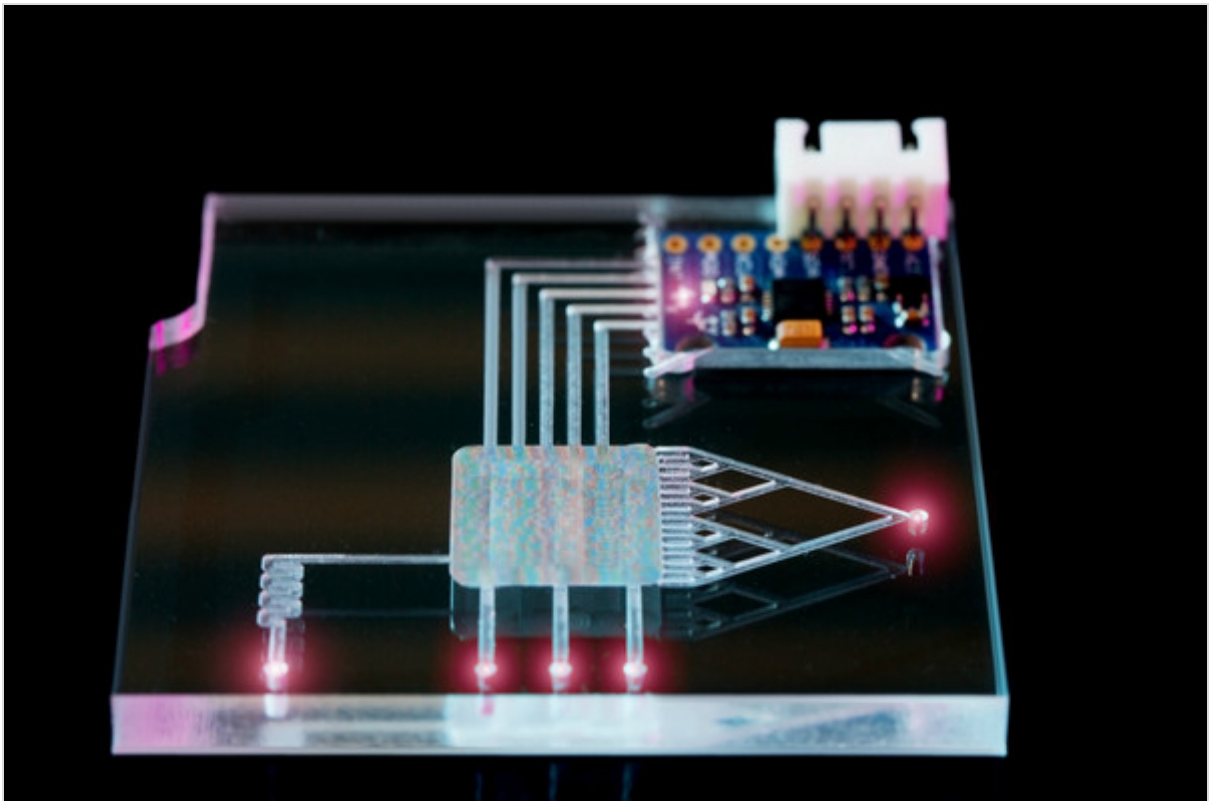
"*Viruses are very difficult to culture, so there is no real-time detection technique,*" he explained. "*So the method of the technology we have developed brings down the time of result to [the time it takes for] shipping samples from the food*

manufacturing plant to the lab."

"*It enables you to test for foodborne viruses in the processing plant itself.*

"*Conventional benchtop detection diagnostic techniques take about three to four days to detect, but we bring down the time of result to a few minutes. Our technique is also 500 times more sensitive than current benchtop-type instruments. It also has the ability to differentiate between the strain levels – for example norovirus versus hepatitis versus rotavirus.*"

Professor Neethirajan and his team in Canada tested gold nanoparticle films using different substrates – or layers. This included glass, 96-well polystyrene plates, and polydimethylsiloxane (PDSM) – a silicon-based polymer.



A microfluidic chip platform used for biological studies

A combination of sodium formate and chloroauric acid was used to prepared the gold nanoparticle films.

When these particles made contact with foodborne versus, such as norovirus or influenza, they were 500 times more sensitive when compared to commercial lateral flow kits used to detect foodborne viruses.

Researchers also claimed the size of the virus needed for detection was lower too: 116 times lower than the amount of virus needed to detect it with conventional testing techniques, according to Neethirajan.

The team of scientists also believe the development of the nanotechnology platform can help others create a cheap, simple and effective foodborne virus detection technique.