

# The Office of Technology Management

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Tech ID: UTA 16:07

## Diagnostic Technology for the Detection of Ultralow-Concentration Biomolecules

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### TECHNOLOGY NEED

The ability to detect low concentrations of biomolecules (DNA, RNA, antigens, antibodies and proteins) plays an important role in diagnosing various diseases (such as cancers), detecting pathogens, detecting bio-warfare agents etc. Current methods of detecting low-concentration biomolecules rely on amplifications of various kinds (PCR, enzymatic and non-enzymatic amplifications etc.), which inevitably involve many process steps, therefore are time-consuming and generally require lab space, expensive instrumentation, reagents, and trained personnel. For all purposes, having a direct detection technique that is highly sensitive, specific, portable and inexpensive would be highly beneficial and much needed.

### INVENTION DESCRIPTION/SOLUTION

A novel ultra-sensitive diagnosing technology for detecting biomolecules (DNA, RNA, antigens, antibodies and proteins) is presented herein. A very low concentration (as low as single molecule) of target biomolecules can be easily and quickly detected. Furthermore, the target biomolecules can be quantitatively detected over a wide range of concentrations. This technology generally applies to any sequences of DNA/RNA and any antigens/antibodies, making it a platform technology. This technology can therefore be branched into broad bio-related sectors like cancer diagnosis, infectious disease detection, bio-warfare agent detection, food safety, agriculture etc.

### APPLICATIONS

- Early detection of various human cancers from a single blood draw
- Ultrasensitive and laboratory-free detection of biological agents (*e.g.*, ebola, zika, anthrax, e-coli, salmonella, HIV etc.)
- Forensics, bio-medical research
- Can replace the current ELISA method (million times more sensitive than ELISA)

### KEY BENEFITS

- Ultra-sensitive, even a single target molecule can be detected
- Portable: the kit size can be made less than a thumb
- Multi-disease detection on a single kit (*e.g.*, simultaneous detection of breast, lung, pancreatic, colon, stomach, esophageal, prostate cancers on a single kit)
- Extremely fast: detection as fast as 10 minutes
- Inexpensive

### STAGE OF DEVELOPMENT

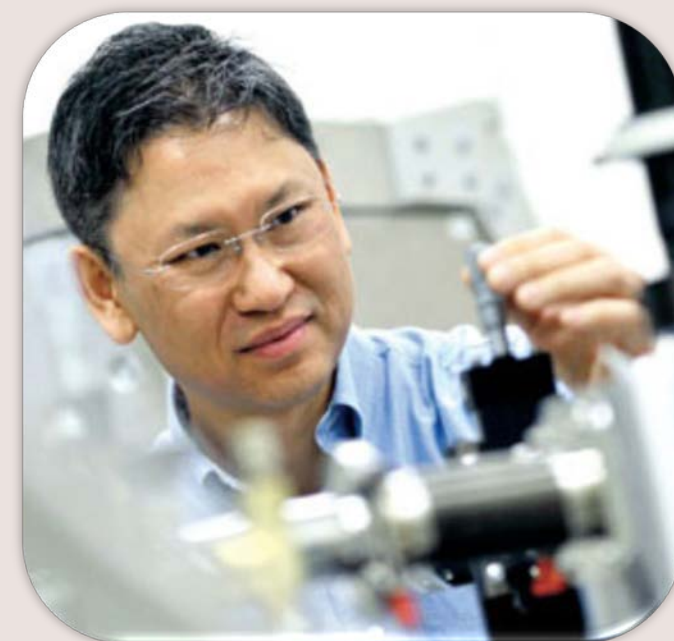
Prototyped

### INTELLECTUAL PROPERTY STATUS

PCT Patent Application filed [W02017123857 A1](#)

### RELATED TECHNOLOGY

[UTA 09-15 Nano-Scale Bridge Biosensors US 8106428 B2](#)



**More about the Inventor:**  
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