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Korean scientists develop fast, accurate pathogen detection sensor

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South Korean scientists said they have developed a fast and accurate pathogen detection sensor that could help save the lives of countless numbers of people around world. Yonhap News Agency reports (http://english.yonhapnews.co.kr/business/2010/03/20/8/0502000000AEN20100320001600320F.HTML) that the Korea Advanced Institute of Science and Technology (http://www.kaist.edu/edu.html) (KAIST) team led by Lee Sang-yup and Kim Bong-soo created a "multiplex pathogen detection" sensor that can use a single array or chip to check for potentially fatal bacterial infections.

On average 540 million people become sick with harmful bacteria every year with fifteen million losing their lives to infectious disease around the world. A person can become infected with a harmful pathogen through wounds, by breathing contaminated air, and eating bad food.

"The key to fighting infectious disease is for doctors to determine quickly what kind of pathogen or infectious agents have entered the body and sidestepped the natural immune system," said Lee, a distinguished professor of life science at the school. He said conventional detection systems take three days to a week to determine what bacteria has entered the body, with accuracy rates sometimes falling below 50 percent.

"Under the current system a patient may die before doctors are able to use the proper antibody for treatment," he claimed, pointing out that the new multiplex approach could finish the necessary blood screening in several hours or within a day at the latest.

This is possible because local scientists created a very fine, gold nano thread and applied bacteria detection DNA agents onto them. Because many nano threads can be packed into a single sensor array, this compact device can pick up numerous bacteria simultaneously and easily. "The accuracy rate on the 47 different types of bacteria checked in laboratories with the newly developed sensor system showed an accuracy rate of 99 percent," he said.

Additional advantage of the new device is that doctors can cut back on antibiotic use. Overuse of antibiotics can create so-called super bacteria that could survive existing drug treatment.

The scientists said that with more work the detection time may be reduced to three hours, but declined to say when a commercial detection kit will reach the market.

The findings have been published in the latest issue of *Nano Letters*, with KAIST researchers taking steps get international patent protection.

-read more in Taejoon Kang et al., "Patterned Multiplex Pathogen DNA Detection by Au Particle-on-Wire SERS Sensor," *Nano Letters* (http://pubs.acs.org/doi/abs/10.1021/nl1000086?prevSearch=Sang-uup&searchHistoryKey=) (11 March 2010) (DOI: 10.1021/nl1000086) (sub. req.)