Food safety and bioterrorism defense may benefit from improved detection test developed at MU

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Sales of chicken products in China plummeted recently during an outbreak of a deadly new strain of bird flu. From bird flu to mad cow disease, numerous food scares have made global headlines in recent years. A technique developed by University of Missouri Professor of Engineering Shubhra Gangopadhyay's group may make food contamination testing more rapid and accurate. The detection test also could accelerate warnings after bioterrorism attacks.

"Quickly stopping the spread of toxins saves lives, whether those toxins are from natural processes or enemy attacks," said lead author Sangho Bok, postdoctoral fellow working under the supervision of Shubhra Gangopadhyay in MU's College of Engineering. "Our technique uses nanoparticles to make detection one hundred times more sensitive than the standard method now used, known as ELISA. We have also reduced the time needed to detect a threat to only one hour, compared to four to six hours for ELISA."

Currently, Bok's testing method detects a toxin that causes food poisoning, a chemical known as *Clostriudium botulinum* neurotoxin A. Engineers and biologists at MU now seek to adapt the test to detect many other dangerous chemicals.

Beyond helping protect people from deadly toxins, Bok's technique may bring jobs and foreign investment to America. Study co-author and MU

research professor, Keshab Gangopadhyay, hopes to open a factory in Missouri that will manufacture the nanoparticles used in the detection technique. To achieve this goal, Gangopadhyay founded Nanos Technologies LLC.

"Science, employment and economic development are all tied together," said Gangopadhyay. "Food safety testing presents a large market that is growing quickly in developing nations like China and India. MU engineering research helps Missouri tap into that market while creating local jobs and attracting the attention of investors."

The study "Femtogram-level detection of *Clostridium botulinum* neurotoxin immunoassay using nanoporous substrate and ultra-bright fluorescent suprananoparticles," was published in *Biosensors and Bioelectronics*.

Provided by University of Missouri-Columbia

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