Biosensing tool to detect salmonella holds promise for preventing common food poisoning

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Pick your poison from this smorgasbord of recent salmonella outbreaks in the United States: ground turkey; fresh papayas; alfalfa sprouts. That's in 2011 alone, and the list goes on, according to the U.S. Centers for Disease Control and Prevention. But perhaps not for long, thanks to a promising new biosensor nanotechnology that could identify the presence of salmonella bacteria before contaminated food or animals reach the marketplace.

In the AIP's journal *AIP Advances*, research collaborators from the University of Pennsylvania and Alabama State University report encouraging early results toward the development of just such a tool.

"The key aspect of our work is that we detect salmonella in a medium that closely resembles the complexity of the real-world applications for food safety surveillance," explains Penn's A.T. Charlie Johnson, Ph.D. Carbon nanotubes are novel materials known for their unique atomic architecture. This endows them with remarkable electrical, mechanical, and physical properties. When combined with biological molecules, such as antibodies, carbon nanotubes have the potential to perform a range of new and useful functions in miniature biotechnology devices – from detecting breast cancer cells to the Penn-Alabama State team's salmonella project.

"The large surface area of carbon nanotubes makes them very sensitive

detectors. By combining that with the chemical specificity of antibodies for salmonella, we hope to create a device to protect the public health," explains Johnson. Further research is needed before a carbon nanotube biosensor for salmonella is available commercially. But these results help bring the concept a step closer to reality – and to controlling food poisoning outbreaks.

More information: "A carbon nanotube immunosensor for Salmonella" by Mitchell B. Lerner et al., is published in *AIP Advances.*

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