Specific and Rapid Detection of Pathogenic Bacteria

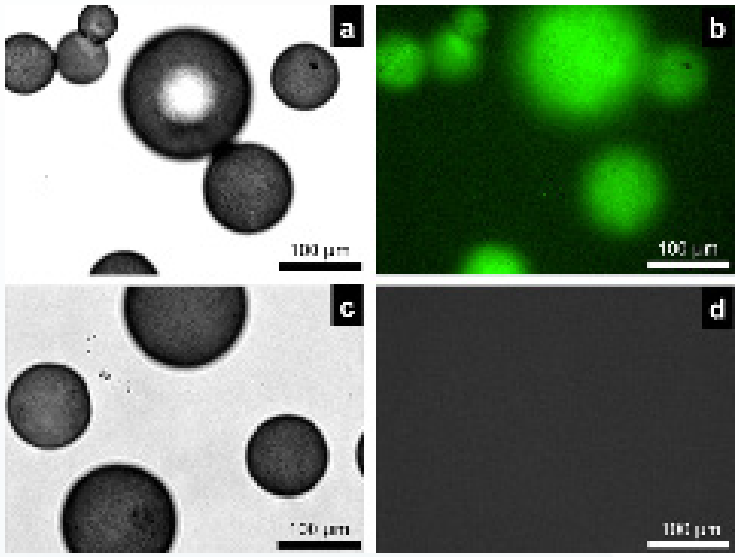
Food contaminated with bacteria can cause death, illness and adverse economic and environmental impacts. Twelve states had 35 outbreaks of contaminated food in 2014, according to the Centers for Disease Control and Prevention (CDC). These outbreaks killed at least seven people and hospitalized many more. There was a recall of numerous products and food. Just the related health care cost from food poisoning is more than 50 billion dollars annually. It is extremely necessary to find detection methods that are both fast and reliable.

Research Methodology, Results and Impacts

This research focuses on ways to detect very small quantities (colony forming units, CFU) of specific bacteria, very quickly. Many current methods take two to four days. This project created and tried devices that can test multiple samples at the same time. The qualitative and quantitative results from Lincoln's testing takes less than two hours.

Microsopic view of E. Coli bacteria

Testing is the only way to ensure fewer fatalities.



Faster detection means that contaminated food can be removed from store shelves more quickly. By creating awareness, this testing safeguards the public by isolating the contaminated food and products. This means fewer infections and fatalities. This sensor can detect multiple pathogens (agents that cause disease). Further development and mainstream use of such a device will have a positive impact on food safety, human health and the environment.

Future Research

Further research will allow the development of testing time to be reduced from two hours to only several minutes. This can be even be done with samples of extremely small concentrations (1-10 CFU/ml). This project also found that pathogen detection is not only a microbiological issue. Therefore, employing an engineering technique or a combination of methods could provide a faster, reliable, alternate sensor.

This study is funded by the United States Department of Agriculture (USDA) - National Institute of Food and Agriculture (NIFA). This project addresses the NIFA priority areas of "Food Safety."

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