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## Quick detection method for foodborne bacterial pathogens

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Globalization of food supplies has increased risks for food safety and contributed to international foodborne outbreaks. Accurate and quick detection of foodborne pathogens is essential for food industry and outbreak investigation. Tremendous efforts have been made to improve current methods and develop new methods, both culture- and molecular-based, by scientists of academics, industries, and government agencies worldwide. The status of quick detection techniques is reviewed. There are many methods available, including conventional polymerase chain reaction (PCR), multiplex PCR, real-time PCR, DNA microarray, metagenomics, whole genomics sequencing (WGS), loop-mediated isothermal amplification (LAMP), isothermal nucleic acid amplification assay based on the nicking enzyme amplification reaction (NEAR) technology (ANSR), biosensors, enzyme-linked immunosorbent assay (ELISA) and lateral flow immunoassay, etc. Nucleic acid-based methods generally are more sensitive and reliable compared to antibody-based methods. Therefore, they are more widely used for the detection of foodborne pathogens. Among nucleic acid-based detection methods, PCR has been accepted as standard detection protocols for numerous pathogens by many organizations. LAMP and ANSR assays are equally effective as PCR for detecting most pathogens, but simpler, faster, and easier to operate. Detection techniques using metagenomics and WGS are advancing rapidly. The future of this technology, in large part, depends on data base construction and development and improvement of software for data analysis. Also, we observed a new trend: mini portable devices, mini devices with smartphone, and 3-D Printing. A few examples of quick detection technology will be illustrated.

### Biography

Guodong Zhang has started his career as a Professor at Northeast Agricultural University of China in 1989. He went to Purdue University in 1993 as a Visiting Associate Professor and worked on crop genetics and breeding with USDA. In 2000, he has decided to focus on Food Microbiology at University of Georgia and the Centers for Disease Control and Prevention (CDC). He is currently a Senior Research Microbiologist at the US Food and Drug Administration (FDA), working on both culture and molecular method development and validation for the isolation, detection and identification of foodborne pathogens. Besides more than 90 publications, he has served on Editorial Boards of several scientific journals. He is actively involved in ISO, IAFP and AOAC. He has developed official analytical methods for FDA. He is a FDA subject matter expert for *Salmonella*, shell eggs, produce, and spices. He also serves on a few scientific committees.

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