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New methods for the detection and mitigation of food-borne toxins

Food-borne toxins such as botulinum neurotoxins (BoNTs) and mycotoxins are food-borne toxins that cause severe human diseases. Because of their acute toxicity, there are intense research efforts to develop sensitive detection tools, vaccines and therapeutics. In our laboratories, high-affinity monoclonal antibodies (mAbs) have been developed for the detection of different BoNT serotypes in commonly used ELISA and new immunoassays using electrochemiluminescence and microfluidic platforms. Detection limits of these new assays fall within the pg per ml range that is well below those of standard assays for BoNTs. New gas chromatography and mass spectrometry (GC/MS) methods are tested for the early detection of fungal contamination in nut products. A better understanding of the biology of toxins in plants and animals and the factors that affect their toxicity, coupled with the development of more sensitive detection and simpler diagnostic tests, would be invaluable for advancing food safety and protection.

Biography

Luisa Cheng has completed her PhD at the University of California, Los Angeles and her Postdoctoral research at the University of California, Berkeley focusing in the pathogenesis of food-borne pathogens. She has joined the Agricultural Research Service in the U.S. Department of Agriculture in 2006 and is currently the Research Leader of the Food-borne Toxin Detection and Prevention Research Unit in the Western Regional Research Center. Her research program focuses on the development of sensitive detection assays for food-borne toxins, the study of biological mechanisms underlying toxin absorption and action and the identification of prevention and therapeutic strategies.

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