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6th International Conference and Exhibition on

Biosensors & Bioelectronics

September 22-23, 2016 Phoenix, USA

Shear horizontal surface acoustic wave sensors for rapid detection of enterohemorrhagic *Escherichia coli*

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Food borne illness affects millions of US residents each year and enterohemorrhagic *E. coli* accounts for a large proportion of severe disease. Current food screening and testing protocols rely on traditional culture and PCR methods and may take multiple days to confirm the presence of pathogenic bacteria in food products. We present a rapid, sensitive, reagent free detection methodology based on a handheld Surface Acoustic Wave (SAW) sensor platform, which has the potential to greatly shorten the time to detection of pathogenic food contaminants. This SAW biosensor can detect strain specific enterohemorrhagic *E. coli* at extremely low concentrations and within a few minutes. No added reagents are required and the sensor operates in a variety of media including buffered water, growth media and river water and sewage effluent. This sensing methodology has the potential to disrupt current food screening methods by eliminating the need for relatively lengthy culture and PCR methods. This approach has the potential to greatly reduce the morbidity and mortality from outbreaks of hemorrhagic diarrhea. At the same time, this will save the agricultural industry millions of dollars by preventing or limiting food recalls. Here, we report on the optimization of the SAW biosensor for specific detection of O:157 *E. coli* and discuss progress in the detection of other important pathogens in food borne illness.

Biography

Justin T Baca is a practicing Emergency Medicine Physician who directs a research program centered on novel diagnostics and point of care testing. He has completed his MD and PhD degrees at the University of Pittsburgh and his Clinical training at Massachusetts General Hospital and Brigham and Women's Hospital in Boston. As a Physician Scientist, he uses his clinical experience to help design and implement new clinical tests for use at or near the point of care. His background in analytical chemistry and physics has allowed him to contribute to the earliest stages of sensor and test development.

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