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Electrochemical biosensors for rapid diagnosis of fungal infections in agriculture

Economic losses to agriculture due to pest and pathogen infections are estimated at $40 billion annually and the economic losses to the health care industry due to food borne illnesses are estimated at $15 billion in the US alone. Early detection of pest or pathogen infection in agricultural crops and reliable detection of harmful pathogens in food are important to minimize agricultural productivity loss, ensure food safety, improve food quality and minimize food related public health issues. There is a pressing need to develop rapid, highly selective and sensitive detection technologies for early identification of plant and human pathogens. While a variety of molecular methods are currently being used for this purpose, an inexpensive, high selective, rapid method for the detection of pathogens is highly desired. Electrochemistry biosensors offer unique advantages to this application. Electrochemical sensors have been widely explored for medical and environmental sensing applications, but not as much for food and agricultural applications. An electrochemical biosensor uses a highly selective bio-recognition element such as enzymes, antibody, aptamer or virus and is capable of detecting biding events with ultra-low detection limits. This presentation will focus on some of the recent developments in our lab in the development of electrochemical biosensors for detection of crop diseases and fungal plant pathogens.

Biography

Ramaraja Ramasamy is currently working as Adjunct Professor in The University of Georgia, USA. His primary focus is on electrochemical energy conversion, but focus areas also include biosensors and bio-nanomaterials. His research is highly interdisciplinary and overlaps with Material Science, Biochemistry, Microbiology, Biotechnology and Analytical Chemistry.

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