conferenceseries.com

Global Summit on ENVIRONMENTAL HEALTH

October 10-11, 2022 | Webinar

Biosensors Based on Isothermal DNA Amplification for Bacterial Detection in Food Safety and Environmental Monitoring

Anna Toldrà

KTH Royal Institute of Technology, Sweden

The easy and rapid spread of bacterial contamination and the risk it poses to human health makes evident the need for analytical methods alternative to conventional time-consuming laboratory based techniques for bacterial detection. To tackle this demand, biosensors based on isothermal DNA amplification methods have emerged, which avoid the need for thermal cycling, thus facilitating their integration into small and low-cost devices for in situ monitoring. This review focuses on the breakthroughs made on biosensors based on isothermal amplification methods for the detection of bacteria in the field of food safety and environmental monitoring. Optical and electrochemical biosensors based on loop mediated isothermal amplification (LAMP), rolling circle amplification (RCA), recombinase polymerase amplification (RPA), helicase dependent amplification (HDA), strand displacement amplification (SDA), and isothermal strand displacement polymerisation (ISDPR) are described, and an overview of their current advantages and limitations is provided. Although further efforts are required to harness the potential of these emerging analytical techniques, the coalescence of the different isothermal amplification techniques with the wide variety of bio sensing detection strategies provides multiple possibilities for the efficient detection of bacteria far beyond the laboratory bench.