



TAL 797 – Seminário

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INNOVATIONS IN RAPID MICROBIAL CONTAMINANT DETECTION

Pós-graduando: Tiago Nogueira de Santana

Orientador: Monique Renon Eller (Departamento de Tecnologia de Alimentos)

The rapid and accurate detection of microbial contaminants is crucial for the implementation of prevention and control measures in the industry, as well as ensuring the food safety of consumers. Cultivation-based methods are often time-consuming, which can result in delays in decision-making and response to food-related disease outbreaks, in addition to causing economic losses to the industry. However, in recent years, new technologies for fast and simple detection and identification of microorganisms have been introduced. Among the main techniques employed are real-time polymerase chain reaction (qPCR), which allows for precise and rapid detection of specific DNA or RNA from pathogens. This technique is highly sensitive and can identify microorganisms within a few hours, enabling the immediate implementation of corrective measures. Another advancement in detection has been enzyme-linked immunosorbent assays (ELISA). These tests are based on the use of specific antibodies to detect the microorganism or proteins and/or antigens. They are rapid and highly sensitive, making them an excellent tool for detection in food. Flow cytometry and mass spectrometry have also been pointed out as methods that can be applied in the detection of microorganisms. In addition to these, biosensor-based technologies are emerging as promising tools for immediate and quantitative detection of contaminants. In this context, the selection of highly specific sensor molecules is crucial. An example is tests that use bacteriophage proteins as sensor molecules. Phage proteins give the phage the ability to recognize and specifically bind to the surface of host bacteria, making these proteins potential tools for pathogen detection. Given the above, innovations in the rapid detection of microbial contaminants in food are evolving in the food industry, making it safer and more efficient.

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Monique Renon Eller
Orientador (a)

Tiago Nogueira de Santana
Orientado(a)