

World Biotechnology Congress

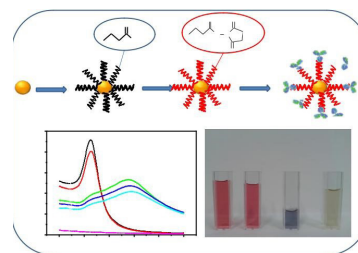
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Nanoparticles based bacterial identification kit

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Brazil is the second largest ethanol producer in the world, using yeast fermentation by sugarcane. Brazil produces 26 billion liters per year, which means a market of 20 billion dollars. Bacterial contamination is a relevant factor in the industrial process, as this can cause damage to the transformation of raw material fermentation in other undesirable substances or consuming part of ethanol, which leads to losses in fermentation yield, causing financial loss. Methods used today to measure bacterial contamination are microscopic counting, plating techniques and MC kit. The problems of these methods are very high response time (one to five days) and the lack of bacteria identification due to measure of sub-products. Our solution aims at the production of a kit for rapid monitoring and identification of contaminant microorganisms



based on immune-sensor colorimetric change. Biosensors based on gold nanoparticles can be bio conjugated with various ligands such as nucleic acids and antibodies. After the bio conjugation, they start forming aggregates, which shifts the absorption band to CA. 600-800 nm. This change can be observed by the naked eye or measured quantitatively with an ultraviolet-visible spectrophotometer. Measure will be carried out in half an hour, in this way alcohol industry will be able to have more timely interventions to stop contamination and use less antibiotics in controlling contaminants. Our experiment indicates that bacteria can be detected quickly and accurately without any amplification or enrichment in around 100 cfu/mL level with excellent discrimination against any other bacteria. In this work we have demonstrated a universal method for detection bacteria using gold nanoparticles. This proves to be a quick, simple and clean way to detect bacteria in real time.

Biography

Débora Colombi is a Brazilian entrepreneur who founded two companies: Genotyping and BPI. She has degree in Biomedicine from UNIFESP and a Masters' and PhD degree in Biochemistry and Molecular Biology from USP and a post doctorate in Genetics from UNESP. The objective of her actual project is the development of a kit for the detection of bacterial contaminants present in the fermentation tanks of sugarcane industries. The company is already expanding the kit to other markets to facilitate the identification of contaminants in loco. Her companies offer genomic solutions for researchers and other companies, in addition to human genetic diagnoses.

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