An Electronic Nose for food safety testing

Carleton University has established a reputation around the world for its groundbreaking research. Within the Department of Systems and Computer Engineering, biomedical engineering researchers investigate issues related to public health issues and food safety.

Food safety testing

Organizations responsible for ensuring the integrity of the global food supply are intensifying their efforts to improve food safety and they are adopting alternative methods for detecting and identifying food-borne pathogens. Reduced cost and analysis time are the most important factors motivating their development. Early detection enables more timely and effective disease control measures, reducing the morbidity, mortality and cost associated with food-borne illnesses.

> "This was a very encouraging result for the detection of dangerous organisms in a more rapid and less costly manner, as compared to the existing methods."

When a food sample originating from the field is tested by a microbiology laboratory at a food inspection facility, the presence and nature of any suspected bacterial pathogen must be obtained as fast as possible.

The current culture method of identifying some important bacterial foodborne pathogens such as Listeria monocytogenes, Salmonella and E. coli can take up to one week to get results.

Carleton University is exploring a new method based on an electronic nose to identify bacteria.

Carleton University

Activity
Research in biomedical engineering

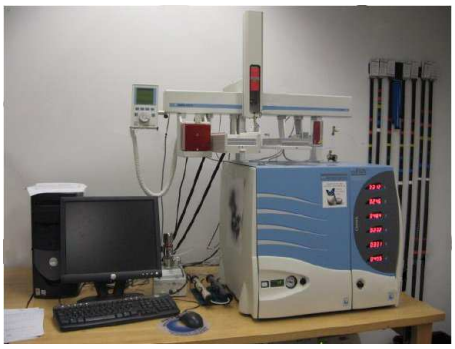
Context
Want a faster method for bacterial foodborne pathogens (the current method can take up to one week)

Equipment
FOX Electronic Nose

Users contact
Dr. Adrian Chan,
Mr. Geoffrey Green,
Department of Systems and Computer Engineering at Carleton University

Website
http://www.carleton.ca/

Bacteria analysis using an E-Nose



Dr. Adrian Chan and Mr. Geoffrey Green, from the Department of Systems and Computer Engineering at Carleton University, comment: "with a FOX Electronic Nose from Alpha MOS, we analyzed the headspace of bacteria culture media. The E-Nose allows us to measure volatile compounds from single bacteria colonies, providing for a specific and sensitive analysis."

"We achieved a classification of two species of bacteria (E. Coli DH 5α and Listeria innocua) with accuracy over 90 per cent. This was a very encouraging result for the detection of dangerous organisms in a more rapid and less costly manner, as compared to the existing methods."

"Now this work needs to be continued on a larger variety of bacteria including pathogenic species."