Combating gastroenteritis

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Gastroenteritis from food borne illness is a major public health concern both in Australia and overseas, and Swinburne University of Technology researchers are working on the early detection of bacteria that significantly contributes to it.

More than 5.4 million cases of gastroenteritis, involving 15,000 hospitalisations and 80 deaths, are reported in Australia each year. The cost to the health care system is estimated to be $1.2 billion annually.

Gastroenteritis is usually caused by viruses and commonly bacteria such as Escherichia coli, Salmonella and Campylobacter jejuni.

Swinburne's Bachelor of Health Science, Program Manager, Louise Dunn, said Campylobacter jejuni is one of the main cause of food-borne illness in Australia and worldwide.

"We have about 6000 cases being reported in Victoria each year," Ms Dunn said.

"The incidence of infection also appears to be increasing across all age groups, including children and young adults," she said.

Ms Dunn said the biggest problem with identifying and controlling Campylobacter jejuni is that most of the infections are sporadic.

"Outbreaks aren't always occurring in a particular pattern or interval, they are just an occurrence, and each year only one or two outbreaks are detected," Ms Dunn said.

"This means that there is not enough information about how to manage and detect the source of the infection."

Current testing methods are time consuming as growing samples for genotyping analysis takes three to four days. The delay can make tracing the origin of the contamination difficult.

Swinburne PhD student Monir Ahmed has been focusing on more rapid ways to detect Campylobacter jejuni with the help of a research scholarship from the Victorian Department of Health.

Using samples from the University of Melbourne's Microbiological Diagnostic Unit, Mr Ahmed is working to identify a selection of toxin genes associated with the campylobacter infection. He uses Swinburne's MALDI-TOF mass spectrometer to accurately identify strain-specific metabolic fingerprints, and the results are then fed into a database of different cell proteins allowing the comparison of new strains with those previously identified.

Mr Ahmed's PhD supervisor, microbiologist, Professor Elena Ivanova,

said using this method makes the analysis quick.

"You can get the preparation stage down to one day and then get the results through the MALDI-TOF in half an hour," Professor Ivanova said.

"This greatly reduces the time and effort required to identify the origin of a Campylobacter jejuni contamination, meaning that improved education, regulation or clean up policies could be applied, therefore also addressing some of the public health costs," she said.

The ultimate aim of the research is to develop a portable biosensor to aide in tracing the source of Campylobacter jejuni contamination.

More information: www.swinburne.edu.au/magazine/17/304/gastro-csi/

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