

## Beaufort Undergraduate Scholarship Programme 2008 Project Template

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**Name of Principal Investigator:** Prof. Dermot Diamond

**Project Title:** Development of a microfluidic device for microbiological monitoring of water

**Duration of Project:**       **From:** 30<sup>th</sup> June 2008       **To:** 30<sup>th</sup> September 2008

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**Project Description (300 words approx):**

The high quality of drinking water is an essential contribution to a healthy functioning of any society. According to the recent EPA reports, the microbiological parameters of water are of the particular concern in Ireland. The presence of bacteria, such as *E. coli* and *enterococci*, represent a significant threat to public health and is an indicator of malfunctioning of water treatment plant or an additional contamination of water after treatment. Human and animal waste is the major sources of the microbiological pollution in sewage and water environments.

Current methods for the microbiological analysis of water require centralised laboratory facilities and are time consuming, laborious and expensive. This restricts the monitoring of national waters to a limited number of analyses and sampling spots. Thus, there is a need for a platform, which is suitable for remote sampling and analysis over extended period of time.

This project aims for the development of a portable miniaturised biosensing device for the determination of target bacteria in drinking water. The work will be focused on the design of the sensing platform, selection of the suitable method of sample handling, detection and quantification. An appropriate sampling unit will be incorporated into the final system in order to enrich the sample and be able to identify even a very small number of microorganisms.

**Key Words (4-5):**

Environment, water, contamination, bacteria, determination, microfluidic

**Background Expertise Required:**

General knowledge of microbiology, analytical methods

**Any other relevant information:**