



Bacterial pathogen sources and transfer hydrodynamics in rural catchments

Context: Bacterial pathogens in fresh, transitional and coastal waters can constitute a human health hazard, and threshold concentrations are considered appropriate in terms of drinking water supply and recreational bathing waters. These thresholds are set according to European Union Directives and are likely to form targets in the umbrella Water Framework Directive. In Ireland, both drinking water supplies and inland and coastal recreational waters can be impacted by bacterial pathogens and viruses; from chronic point source pollution and episodic pollution from diffuse sources. To build on previous Teagasc research investigating the mobilisation potential of bacteria associated with cattle slurry from soils, this project will define the sources of bacteria derived from faecal matter in catchments and assess the magnitude of transfers from each source in runoff pathways and stream discharges during storm and non-storm periods. The aim of the research project will be to develop a conceptual model of bacterial pathogen transfers from rural catchments and delivered via two principal objectives:

1. To identify the sources of bacterial contamination in runoff pathways and stream discharge by developing a Microbial Source Tracking apportionment method; specifically the detection of host-specific 16S rRNA markers that target the order *Bacteroidales*.
2. To investigate the hydrodynamics of bacterial pathogen transfers in stream discharges across a gradient of low and high flows and assessing the links between nutrient loads (concentration and discharge patterns) and faecal bacterial transfers relevant to specific catchments in the Agricultural Catchments Programme.

Requirements: Applicants should have a good primary degree (III or I) or M.Sc. in an appropriate discipline (Biology, Biochemistry, Environmental Science, Agricultural Science, etc.). A full EU driving licence is also required.

Supervisors: Prof Vincent O'Flaherty (NUI Galway), Prof Stephan Wuertz (University of California, Davis), Prof Phil Jordan, Dr Karl Richards and Dr Alice Melland (Teagasc, Johnstown Castle, Wexford).

Amount of award: Each fellowship provides a stipend of €21,000. University fees are paid by the student from the stipend tenable for 4 years from October 2009.

Conditions of Award: The successful applicant will be enrolled as a student and based primarily in the Dept of Microbiology, School of Natural Sciences, NUI Galway. There will be some periods at the Teagasc Johnstown Castle Research Laboratories, Wexford.

Further Information/Applications:

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Application Procedure: Submit an **electronic copy** of Curriculum Vitae and a letter of interest to Prof Vincent O'Flaherty.

Closing date: 30th June 2009.