



MESTECH Research Project



Project Title:

Generic Sensing platform design for marine sensing application: Faecal indicator bacterial application for marine monitoring

Project Researcher:

Brendan Heery

Funding Body:

IRC formerly IRCSET, along with TellLabs under the Enterprise Partnership Scheme and under the ISGEI by the Marine Institute

Project Summary:

This project involves working at the design, manufacture and test of an autonomous system to detect faecal indicator bacteria *E.coli* and Enterococci in Marine and transitional waters. The adopted approach is enzymatically produced fluorescence detection due to its robust nature and its suitability to deployable technology.

Work to date has focused on chemical assay optimization and concept design. Assay optimization involved selecting a suitable enzyme substrate to facilitate continuous measurement at biologically relevant pHs. Concept design has involved choosing a robust design suitable for the harsh Marine environment while maintaining sensitive detection.

A suitable chemistry for the assay has been established which has significant advantages over the state of the art i.e. it can be used in a continuous assay as opposed to requiring a pH adjustment before measurement. Testing and optimization of this is ongoing.

Future work will involve extensive laboratory testing followed by sea trials where the system will be deployed in a number of ways including from a pier and from an offshore buoy.

Key Outputs:

- Three peer reviewed publications
- Improved chemical assay for rapid faecal indicator detection
- One bench analyser for faecal indicators in water
- One marine deployable faecal indicator detection system

- A feasibility study on the commercialisibility of the above two systems