

Resilience of coralline algae to oil contamination via intricate microbial associations

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Project description:

The importance of hydrocarbon-degrading microbiota in hydrocarbon-remediation is well documented in marine sediments and the water column, particularly for high-profile events such as the Deepwater Horizon spill. However, the role of host-associated microorganisms in affected benthic ecosystems is less clear, particularly with regard to sub-tidal habitats such as red coralline algal beds.

Red coralline algae are a uniquely cosmopolitan class of highly calcified seaweeds that provide key ecosystem functions in the coastal zone around the world via provision of 3-dimensional reef frameworks that support a very high biodiversity. Interestingly, red coralline algae exhibit a remarkable tolerance to periodic oil-derived contamination, but the reason why remains unanswered. Associated microbial communities may play a role in this tolerance via substrate provision to the host, but the composition and function of microbial communities associated with red coralline algae is currently poorly understood.



A red coralline algal bed off the coast of Scotland

This project will test the hypothesis that host-associated microbial communities may enable host resilience to oil contamination events. The student will utilise a multi-disciplinary approach that will combine field and laboratory experimentation, developing skills in microbial ecology, next-generation sequencing, macroalgal physiology, bioinformatics and water quality monitoring. At the interface of biology and geoscience, this research will fill a major knowledge gap in our understanding of ecosystem responses to oil & gas activities in coastal seas.

The student will be based at the Lyell Centre for Earth and Marine Science and Technology, a £21 million collaborative venture with world-class facilities for marine and geoscience research, including a state-of-the-art research aquarium and microbiological laboratory. There will also be opportunities to take part in research cruises around the Shetland Islands with project partner Marine Scotland Science, allowing the student to gain an understanding of marine policy and management. Wider engagement with the oil & gas industry will be provided through the CDT partners and the Oil & Gas Response Forum. As such, the project offers excellent opportunities for developing expertise in world-leading applied ecosystem science and creating a broad professional network.

Funding is available for a 4-year period and includes tuition fees, stipend and a Research Training Support Grant. General information on the application procedure and eligibility criteria can be found on the Oil & Gas CDT [website](#). Specific questions about the project should be directed to Dr Heidi Burdett (h.burdett@hw.ac.uk).