

## Marine Biodiversity, Function & Services Theme Small Grant Round - September 2014

**BFSSG14:** Comparison of target gene expression profiles in deep-water corals after exposure to environmental stress (Laura Wicks, Heriot-Watt University)

*Can you provide a summary of the project & how it progressed?*

The aim of this project was to develop methods for investigation of changes in target gene expression in deep-water corals (the scleractinian *Desmophyllum dianthus*) exposed to environmental stress. To achieve this objective, a surrogate coral species, the tropical scleractinian *Stylophora pistillata*, was used for method development, primer design, and gene expression profiling. *S. pistillata* is a well-studied "lab-rat" species that is readily available and preferable because *D. dianthus* is much more difficult and expensive to obtain.

Standard operating procedures for the assessment of target gene expression in *S. pistillata* were developed by MSc student Sara Campana. Following method development, Sara conducted an experiment for her MSc project to demonstrate the expression profile of the heat shock protein 70 (HSP70) gene transcripts after exposure to a five-degree change in water temperature. This work has now been submitted and is in review in the journal *Coral Reefs*.

*How did MASTS MBFS Funding help you to achieve your goal?*

The MASTS MBFS funding was essential for this project and enabled considerable value-added to our ongoing research activities on corals. Specifically, the funds supported purchase of supplies for molecular biology including reagents and kits for total RNA extraction, reverse transcription, and quantitative PCRs. We now have standard operating procedures in place for investigation of gene expression profiles in corals, we have submitted a scientific manuscript on this research, and we currently have a UK NERC standard grant proposal in review with a component based on investigation of gene expression profiles in corals.

*What outcomes have you achieved to date? Please quantify them, if possible.*

The primers developed here will be used in planned future deep-water coral work which has recently been funded (as part of the EU ATLAS project, PI Roberts). Further genetic work has also been incorporated into current grant applications. In addition to the manuscript that is in review for publication on the work supported by this funding, Sara also presented her project as an eposter at the MASTS ASM 2015.

*What outcomes, if any, do you expect to see in the future? Again, please quantify, if possible.*

The following manuscript has been submitted:

Campana S, Murray F, Hennige S, Roberts JM, Henry TB. Rapid induction of heat shock protein HSP70 in the coral *Stylophora pistillata* after exposure to a temperature shock. (In review) *Coral Reefs*.