

Postgraduate opportunity at ORI/UKZN: Accelerated coral evolution

Physiological and transcriptional responses of corals from a range of habitats to future warming.

Climate-induced coral bleaching is considered an existential threat to coral reefs globally and is exacerbated by other stressors, including coral diseases. Some corals are more resistant to bleaching than others, for reasons that include genetic variability among colonies, species and locations or gene expression. In particular, corals growing in extreme environments at high latitude are an excellent model for the potential effects of corals under future conditions as they are exposed to a wide range of environmental stresses including large ranges of temperature and pH. The ability of corals to resist bleaching and disease is additionally dependent on maintaining healthy microbiomes (assemblage of microorganisms, including algae, other protists, bacteria, archaea, fungi, and viruses). While the importance of endosymbiotic microbes in coral health is well known, the effect of temperature on coral-associated bacterial diversity is not yet fully understood. The many interactions between the coral animal and all its symbionts provide many opportunities for adaptation to changing environments and there is some evidence that corals may adapt to climate change. However, it is recognised that they are unlikely to naturally adapt fast enough to avoid catastrophic loss of species and populations.

Our research programme at UKZN and the Oceanographic Research Institute (ORI) in Durban will therefore focus on 'accelerated' coral evolution to increase the rate and scope of adaptation using corals that are able to survive across a wide geographic and environmental gradient.

To this end, we invite applications for a PhD studentship to investigate the physiological and transcriptional basis of resilience of corals to stress. We are looking for motivated, self-driven students with a keen interest in contributing to understanding global coral health.

Studentships have standard NRF bursaries attached, i.e. R120 000 per annum for a PhD. All applicants for PhD projects must be in possession of an MSc or SAQA equivalent in the requisite topics.

The student will be based at the Oceanographic Research Institute at uShaka Marine World in Durban, South Africa and registered at the University of KwaZulu-Natal. They would be involved with the collection of experimental material (inter and sub-tidally), running a long term experimental aquarium system, measuring physiological responses of corals, isolation of RNA and analysis of differential RNA expression via NGS RNASeq (transcriptomics).

Candidates should have experience in molecular biology and a passion for marine science.

Experience with next generation sequencing methods and the requisite bioinformatics techniques will be an advantage. Diving experience is not a prerequisite, but advanced training will be provided to those who are interested and capable.

To apply: Applications should include a CV, academic record, a cover letter stating how you meet the requirements for the project and the names of two academic referees.

Submit documents as one PDF via email to Dr David Pearton (dpearton@ori.org.za). Subject of email: PhD Coral transcriptomics – application.