

RESEARCH DIRECTIONS

Sydney Rock Oysters

Ms Laura Parker of the School of Natural Sciences has been awarded an Australian Research Council Discovery Indigenous Researchers Development Award to investigate whether Sydney rock oysters can adapt to reduced ocean-pH conditions and rising temperatures caused by climate change. Ms Parker will be mentored by a team of experienced researchers including Associate Professor Pauline Ross, UWS, Dr Wayne O'Connor of Industry and Investment NSW, Associate Professor David Raftos, Macquarie University and Professor Hans Pörtner of The Alfred Wegener Institute for Polar and Marine Research, Germany.

'The rise in atmospheric carbon dioxide (CO₂) will have an effect on the reproduction and development of Sydney rock oysters as the ocean becomes more acidic and warmer' Ms Parker warns. 'Our research has found that some Sydney rock oysters cope with these conditions but we need to find out if they can cope over the longer term and if these oysters can be used as a selective breeding strategy as climate change affects the oceans.'

The researchers will combine state-of-the-art techniques in reproductive biology, physiology, genomics and proteomics to compare wild Sydney rock oysters to a specially bred line under specific temperatures and levels of oceanic CO₂. The oysters' physiological processes will be measured frequently and their proteins analysed by mass spectrometry. The next generation of these oysters will be exposed to the same environmental conditions and the effects on this "1st generation" will be analysed to determine if long term exposure to ocean acidification and increased temperature leads to increased resilience or resistance of immature oysters and whether the specially bred oysters do better than the wild population. Importantly, the researchers will also identify



potential biochemical pathways and molecular markers of climate change adaptation that can be used in selective breeding.

This research will determine whether Sydney rock oysters, a sensitive and valuable species, have the potential to adapt to climate change and confirm whether selective breeding can mitigate its effects. The technology developed in this project would be transferable to other important aquaculture species, contributing to the protection of Australia's marine biodiversity, food supply and economy.

Project Title: Climate change research: Can Sydney rock oysters adapt to chronic multigenerational exposure to ocean acidification and temperature.

Funding has been set at: \$199,988 over 2 years

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