

MQRES PhD Investigating the Palaeobiology of Hydrocarbon Biomarkers in the Fortescue Group (2.7 Ga)

Faculty:	Science
Project Name:	Demonstrating the syngeneity and interpreting the palaeobiology of hydrocarbon biomarkers in the Fortescue Group (2.7 Ga)
Department:	Earth and Planetary Sciences
Closing Date:	26 th March 2010
Allocation Number:	2010205
Project Description	<p>It is almost universally accepted that the oxygenation of the previously anaerobic Earth was driven by the oxygenic photosynthesis of cyanobacteria. But there are inconsistencies of hundreds of millions of years in the various lines of evidence for the timing of the oxygenation process. We aim to resolve these inconsistencies by focusing on the record preserved in the Fortescue Group of West Australia, a remarkably well-preserved set of rocks reliably dated as lying in the disputed time range of the rise to prominence of cyanobacteria. As part of a team of 5 internationally well-respected scientists (Malcolm Walter, Brett Neiland, Simon George, Roger Summons and Bill Schopf) and other PhD students, your PhD project will apply new and innovative organic geochemical techniques to the study of the Fortescue Group to critically assess the evidence for the presence of cyanobacteria at 2.7-2.8 Ga. A suite of Fortescue Group rocks, mainly from cores, will be analysed using solvent extraction, fluid inclusion geochemistry and novel pyrolysis methods so as to provide a dataset of molecular geochemical parameters related to the Precambrian organic matter, and especially to the question of presence/absence of cyanobacteria. All techniques used will concentrate on the key issue of proving syngeneity of detected biomarkers.</p>
Other Important information:	<p>You will undertake remote area fieldwork in NW Australia (Pilbara) in order to obtain outcrop material to supplement core material. Macquarie University in Sydney has a new and well-equipped organic geochemistry laboratory. In addition, some analyses will also be carried out at other labs in Australia (e.g. CSIRO) and in the USA (e.g. MIT). You will gain experience in several organic geochemical techniques, especially in those pertaining to the exciting, topical and controversial techniques for obtaining biomarker evidence from Archaean rocks.</p>
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<p>The 2010 MQRES full-time stipend rate is \$22,500 pa tax exempt for 3.5 years.</p> <p>Applicants will need to complete a candidature/scholarship application form and arrange for two academic referee reports to be submitted to the Higher Degree Research Office. Refer to: http://www.hdr.mq.edu.au/information_about/applications for further application instructions. Macquarie University will advise the successful applicant of entitlements at the time of scholarship offer. Please quote the allocation number on your application.</p>	