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Research opportunity:	Honours	X	Masters	PhD
<b>Project title:</b>	<b>Bacterial evolution and its impact on sustainable agriculture</b>			
<b>Short project description &amp; main objectives:</b>	  <p>Chickpea (<i>Cicer arietinum</i>), a globally important grain legume, forms a nitrogen-fixing symbiosis with soil bacteria (rhizobia) in the genus <i>Mesorhizobium</i> that can be harnessed in agriculture to enable chickpea to be grown without nitrogen fertilizer. When cultivated in soil lacking compatible rhizobia, chickpea can be inoculated with a symbiotically effective strain of <i>Mesorhizobium</i>, as occurs in Australia with the inoculant strain <i>Mesorhizobium ciceri</i> CC1192. Although CC1192 has been the only chickpea inoculant used, there is evidence in the field that chickpea may be nodulated by genetically distinct strains, suggesting that these rhizobia have evolved during the past 30 years, possibly through horizontal gene transfer of chromosomal regions called “symbiosis islands” from the inoculant strain to soil bacteria. If so, then these novel strains may not be effective symbionts for chickpea and could reduce the efficacy of the inoculant strain. In this project, you will collect soil and nodules from fields with a history of chickpea cultivation and isolate, cultivate and identify bacteria from these samples. You will also assess whether CC1192 has a mobile symbiosis island and create novel chickpea microsymbionts in the laboratory. In this project you will learn a range of skills in microbiology, molecular biology, field collection and plant propagation.</p>			
<b>Keywords:</b>	Bacteria, microbiology, molecular biology, legumes			
<b>Principal supervisor:</b>	Dr Jason Terpolilli			
<b>Other supervisors:</b>	Dr Yvette Hill, Dr Graham O’Hara			
<b>Contact details for further information:</b>	<a href="mailto:J.Terpolilli@murdoch.edu.au">J.Terpolilli@murdoch.edu.au</a>			
<b>Closing date for applications:</b>	Open-ended			
<b>Start &amp; finish date of project:</b>	N/A			
<b>Available part-time?</b>	Yes			

If applicable:

<b>Research centre/group:</b>	Centre for Rhizobium Studies
<b>Desired background of applicants:</b>	Completion of BIO246 Microbiology I or equivalent; knowledge of molecular techniques and/or plant biology
<b>Additional funding/scholarship provided:</b>	Successful applicants will be eligible to apply for the ALOSCA Honours Scholarship
<b>Other benefits:</b>	
<b>Extra Comments:</b>	