

## Fully funded PhD position on evolutionary epigenomics in New Zealand

We are seeking a highly motivated PhD student to investigate the effect of reproductive mode on epigenetic inheritance. To study this we will use species from the genus *Artemia* where both sexual and asexual reproduction co-exist. This is a fully funded PhD position based in Nelson, New Zealand, for three years to be filled as soon as possible.

### Project description

The role of epigenomic variation in facilitating responses to environmental change is under debate. Epigenetic variants can rapidly integrate environmental information into genomes to extend phenotypic performance, however, long-term consequences for populations depend on the persistence of epigenetic inheritance. Species' reproductive mode (e.g. sexual vs asexual, oviparity vs viviparity) influences the adaptive potential of epigenetic inheritance (Anastasiadi et al. 2021). However, despite support for its importance, critical knowledge gaps exist about how the reproductive mode affects the inheritance of environmentally induced epigenomic responses.

The project seeks to test how the reproductive mode modulates inherited epigenomic variation in response to the environment, and seeks to measure the extent of genetic assimilation over generational time. Our exemplar model is the brine shrimp *Artemia*, where both sexual and asexual reproduction co-exist. The PhD student will use multigenerational, replicated experiments, integrated with state-of-the-art sequencing, to compare between reproductive modes: (1) the extent of epigenomic inheritance, (2) fitness impacts due to inheritance in changing environments, and (3) frequency of genetic assimilation of epigenomic variants. Elucidating how the reproductive mode affects epigenomic inheritance will shed light on one of the most fundamental mechanisms species are equipped with to respond to environmental changes.

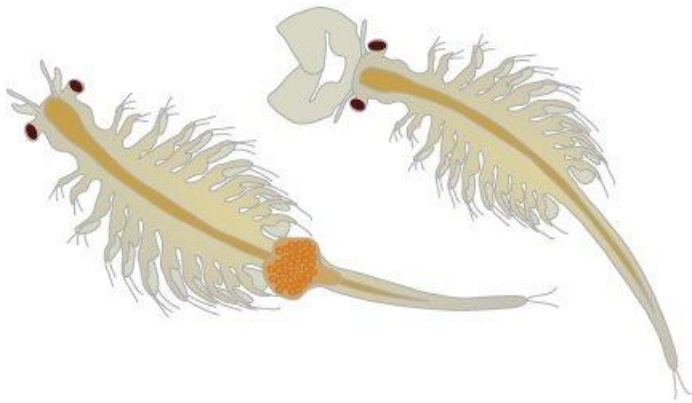


Figure: *Artemia* have a maximum length of just over 1 cm.

### Candidate requirements

The PhD student will set up and oversee experimental *Artemia* multigenerational cultures, prepare DNA methylation sequencing libraries and perform bioinformatics and statistical data analysis to test the hypotheses. The PhD student will present the results of the research via publications and at meetings. Technical and scientific staff and supervisors will support the PhD student from breeding to lab work and computational analyses.

The prospective candidate should have a background in evolutionary biology, epigenetics, bioinformatics or a related field. We are searching for an applicant with experience preparing NGS libraries, and a strong background in bioinformatics and analytical skills to analyse -omics datasets. Data analysis of next generation sequencing data will be the main workload of the project. Therefore, knowledge and experience of a scripting language (e.g., R and Python) is beneficial. A proven ability and motivation to write research papers is essential. The ideal candidate will have a strong interest in evolutionary biology and will be highly motivated, curious, and able to work independently and in a team.

This PhD project will provide an excellent opportunity to learn the latest interdisciplinary technologies including marine invertebrate biology, genomic and epigenomic sequencing and data analysis. The PhD student will gain experience working in academic and government institutions. They will be a member of a highly active and collaborative group of researchers.

### **Funding**

The salary is established according to local University standards. We will provide a three-year scholarship that provides a stipend and university fees. Funding comes from a Marsden grant from the Royal Society in New Zealand (23-PAF-012).

### **Supervisors**

1. Dr Dafni Anastasiadi, Plant and Food Research (PFR), Nelson, New Zealand  
<https://scholar.google.com/citations?user=eW9oOTMAAAAJ&hl=en>
2. Associate Professor Maren Wellenreuther, Auckland University and Plant and Food Research (PFR), Nelson, New Zealand.  
<https://scholar.google.com/citations?user=B6vt1LEAAAJ&hl=en&oi=ao>  
<https://marenwellenreuther.com/>

### **Further information and useful links:**

Students will be based in the Nelson Research Center of the New Zealand Institute for Plant and Food Research (PFR): <https://www.plantandfood.co.nz/>

Beautiful Nelson city: <http://www.nelsonnz.com>

Students will be enrolled at the University of Auckland: [Welcome - The University of Auckland](#)

### **How to Apply**

Applicants should send a CV, contact details of two academic referees and a cover letter that states why you are interested in the position and how your qualifications and experience make you a good fit for the proposed research by e-mail to Dafni Anastasiadi ([dafni.anastasiadi@plantandfood.co.nz](mailto:dafni.anastasiadi@plantandfood.co.nz)). For any further details or questions please contact me directly. Position will be open until filled. International applicants with strong academic record are encouraged to apply.

### **Literature cited**

Anastasiadi D, Venney C, Bernatchez L, Wellenreuther M 2021. Epigenetic inheritance and reproductive mode in plants and animals. *Trends in Ecology & Evolution* 36(12): 1124-1140.