

**Project Title: Linking soil microbial communities and environmental stability: a metagenomic study of soil ecosystem processes.**

A central theme in ecology is understanding what are the mechanisms that promote ecological stability, however, the relationships between ecological stability, biodiversity and ecosystem function in the soil environment are still poor. This is an important knowledge gap as soil microbial communities provide essential ecological services, such as nutrient cycling, carbon sequestration, and pollutant bioremediation. The poor mechanistic understanding of belowground ecosystem stability reduces our ability to predict the effect of disturbances in terrestrial ecosystems.

This project is focused on understanding the relationships between environmental change and soil microbial communities. This primarily a data analysis position focused on an existing large soil environmental DNA sequence dataset spanning a whole seasonal cycle and collected from three soil monitoring sites in Australia. This is a truly unique environmental DNA sequence dataset containing a huge amount of information about microbes and their functional genes in soils. In addition, you will have access to soil property and wireless sensor network data, which will allow the investigation of how environmental conditions and stability determine the ecology of specific microbial groups and their functional genes.

This project is suited to a student with some existing knowledge of statistical analysis and bioinformatics, while further training will be provided in metagenomic and microbiome sequence analysis and multivariate statistics. Ability to or an interest in learning to work in the command line in Linux and R is essential, and an interest in learning ecological modelling would be an advantage. There will also be opportunities for further experiments and molecular analyses of soil and plant-root microbiomes depending on the student's interests.

This position is open to EU and non-EU applicants. The studentship is for four years and covers the EU fees and living expenses to €12,000 per year, while further remuneration from demonstrating and tutoring is also possible. Prospective non-EU students are advised to enquire about non-EU fees.

Deadline for applications 1 of October 2017. For further information, contact [alexandre.demenezes@nuigalway.ie](mailto:alexandre.demenezes@nuigalway.ie)

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