

PROJECT TITLE: Distribution and origin of membrane spanning lipid biosynthesis across life and time

Project Science Theme: Evolution and Biodiversity

Project keywords: Evolution, Microbial stress, Environment

Lead Institution: Bristol

Lead Supervisor: Bernhard David Adriaan Naafs, Bristol, Chemistry

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Project aims and methods:

All life on Earth requires lipids to form membranes around its cells. This project focusses on a unique class of lipids that span the entire membrane. These membrane-spanning lipids are widespread in nature, underpin paleoclimate proxies, and are being trialled in biomedical applications such as drug delivery. Yet the biosynthetic pathways leading to their formation, and the evolutionary history of organisms capable of producing them, remain poorly constrained. This limits both their scientific use and their wider application.

The doctoral researcher will play a central role in addressing these gaps, shaping the project direction by selecting microbial targets for lipid analyses, choosing bioinformatic approaches, and integrating geochemical and evolutionary insights. You will receive hands-on training in cutting-edge laboratory techniques for lipid analysis, alongside computational training in genomics and phylogenetics, supported by (co-)supervisors with complementary expertise.

Partnerships between organic geochemists and evolutionary biologists provide a strong foundation for multidisciplinary training and ensure access to unique cultures, data, and methods.

Core questions to be tackled include: How widespread is the ability to produce membrane-spanning lipids across life? When did this capacity evolve? The answers will reshape our understanding of microbial evolution and adaptation.

Useful recruitment links:

For information relating to the research project please contact the lead Supervisor via:
david.naafs@bristol.ac.uk

Bristol NERC GW4+ DTP Prospectus:

<https://www.bristol.ac.uk/study/postgraduate/research/great-western-four-doctoral-training-partnership-nerc/>

How to apply to the University of Bristol:

<http://www.bristol.ac.uk/study/postgraduate/apply/>

The application deadline is Thursday 8 January 2026 at 2359 GMT