PROJECT TITLE: Understanding how micro- and macro-nuclei support adaptation in Paramecium

Project Science Theme: Evolution and Biodiversity Through Space and Time
Project keywords: Evolution, genetics, nanopore sequencing, Hi-C

Lead Institution: University of Bristol
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Project aims and methods:

Paramecium is a genus of unicellular eukaryotes that are typically found in aquatic environments. An interesting characteristic of these microorganisms is that they contain two different types of nuclei: a micro-nuclei that act as a germline, and a macro-nuclei that is constructed from the micro-nuclei to express genes needed for the day-to-day functioning of the cell. This separation of genetic material and functions offers some unique opportunities for adaptation through the modified construction of macro-nuclei in response to changing environmental conditions, plus the ability for sexual recombination of micro-nuclei to enable mixing of valuable traits across a population. This project will aim to better understand how Paramecium adapt and evolve by altering the genetic content of their different nuclei when exposed to a range of stressors. It will apply advanced nanopore sequencing techniques to characterise the genetic content, gene expression pattern, and three-dimensional structure of both micro- and macro-nuclei over time, offering new insights into how these organisms adapt and evolve. The breadth of this project means that the student will have the opportunity to shape several key directions in terms of the environmental stressors, sequencing approaches used, and the specific species of Paramecium used.

Useful recruitment links:

For information relating to the research project please contact the lead Supervisor via: thomas.gorochowski@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 Monday 13 January 2025 at 2359 GMT.