

PROJECT TITLE: Total evidence approaches to clarify the early fossil record of sponges and the early evolution of animals

Project Science Theme: Evolution and Biodiversity Through Space and Time

Project keywords: Phylogenomics, Porifera, Fossils, Metazoan evolution

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Project aims and methods:

Sponges (Phylum Porifera) emerged close to the root of the animal tree and most early animal fossils is represented by sponges. However, these fossils are often poorly preserved and fragmentary, and most of them have only been tentatively classified (see Botting and Muir 2018 for a comprehensive review). However, the recent study of Wang et al. (2024), showed that early sponge fossils can be included in comprehensive phylogenetic datasets. This project proposes to reassess the sponge fossil record and use modern approaches based on the combination of molecular (Rossi et al. 2024) and fossil dataset to generate a complete framework of sponge evolution. There are many potential research directions that a student could follow. (1) A student interested in understanding fossils could revise the sponge fossil record, and focus on the study of sponge morphology. (2) Phylogenetic-oriented students could use available fossil descriptions to develop new morphological datasets, assemble molecular/morphological datasets and focus on inferring the evolutionary history of early animals. (3) Theory-inclined students could focus on methods for combining molecular and morphological data and study their performance.

References

Botting and Muir (2018) Paleoworld: <https://doi.org/10.1016/j.palwor.2017.07.001>

Rossi et al. (2024) BioRxiv <https://doi.org/10.1101/2024.06.24.600355>

Wang et al. (2024) Nature <https://doi.org/10.1038/s41586-024-07520-y>

Useful recruitment links:

For information relating to the research project please contact the lead Supervisor via:

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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.