



Understanding the peat microbiome and metabolome: from vegetation to organic matter molecules and microbes

Supervisors: Dr Nicholle Bell

Contact: Nicholle.Bell@ed.ac.uk
<https://www.nbellgroup.co.uk/dr-nicholle-g-a-bell>

Funding: This 4-year PhD project is part of a competition funded by [EASTBIO BBSRC Doctoral Training Partnership](#). This opportunity is open to UK and International students and provides funding to cover stipend and UK level tuition. Please refer to [UKRI website](#) and Annex B of the [UKRI Training Grant Terms and Conditions](#) for full eligibility criteria.

Closing date for applications: 16th December 2021

Peatlands are organic matter rich soils that provide countless benefits and ecological services. They represent the largest terrestrial carbon store, containing twice as much carbon as the entire forest biomass on this planet.

Unfortunately, most of the global peatlands are not fully functioning. As a result of human activities, such as drainage, around 80% of UK's peatlands alone are classified as damaged. Global efforts to restore damaged peatlands are currently underway, however, in order to ensure sustainable restoration we require solid baseline characteristics of the key players in peat carbon cycling (the molecules and the microbes) from near-natural and drained peatlands.



Flow Country, Eleanor Bentall/RSPB

Project background: The Bell group, in collaboration with researchers across UK, are examining changes to peatlands on the molecular-level, using the unique facilities offered by the School of Chemistry, University of Edinburgh (which house a 800 MHz NMR spectrometer and a 12T FT-ICR mass spectrometer) and on the microbial-level using the world-class high-throughput sequencing facility, Edinburgh Genomics.

The overall aim of Bell's group research is to uncover causative relationships that govern peatland formation/degradation and to use this knowledge to monitor the effectiveness of restoration interventions. The project will involve peat/vegetation sampling followed by metagenomics and metabolomics using a variety of techniques and statistics. This exciting multidisciplinary project offers the possibility to uncover the true drivers of peatland health.

The project will provide a high-quality training opportunity (<http://www.chem.ed.ac.uk/studying/phd/graduate-school-overview>) for a successful candidate at a world class University as well as offer excellent employment prospects.

Requirements: In order to fulfil the requirements for the project we are seeking to recruit a highly motivated PhD student. This award suits a candidate with background and aptitude for biochemistry. The position is also open to those with analytical chemistry or ecology degrees and can be tailored to suit exceptional

candidates. Experience with analysis of DNA/RNA is essential. Some knowledge of programming is essential for handling large data sets. The project offers the opportunity to become expert in an number of techniques, including NMR and MS, suitable for a wide range of scientific career pathways.

The successful candidate should have or expect to obtain a 1st class or upper 2nd class undergraduate degree.

Eligibility

Applicants must have an undergraduate degree in chemistry or biochemistry (> 2.1 or equivalent) and fulfil the eligibility criteria: <https://www.ukri.org/wp-content/uploads/2020/10/UKRI-291020-guidance-to-training-grant-terms-and-conditions.pdf> Knowledge of programming languages such as Python is desirable.

Application Process

To apply for an EASTBIO PhD studentship, follow the instructions below:

- 1) Informal enquiries should be addressed to Dr. Nicholle Bell. To apply, please send a cover letter outlining your previous research experience and reasons for applying, alongside an up-to-date CV to dusan.uhrin@ed.ac.uk
- 2) After you have discussed the project with to Dr. Nicholle Bell, download and complete our [Equality, Diversity and Inclusion survey](#) and then fill in the [EASTBIO Application Form](#) and submit as per the instructions in the project advert.
- 3) Send the [EASTBIO Reference Form](#) to your two academic/professional referees, and ask them to submit as specified on the project adverts.
- 4) If you are nominated by the supervisor(s) of the EASTBIO PhD project you wish to apply for, they will provide a [Supervisor Support Statement](#).

We anticipate that our first set of interviews will be held 7th – 11th **February 2022** with awards made in the following week.

Please ask your referees to submit your references directly to Dr. Nicholle Bell Nicholle.Bell@ed.ac.uk

If you have further queries about the application/recruitment process please contact [EASTBIO](#)

The School of Chemistry holds a Silver Athena SWAN award in recognition of our commitment to advance gender equality in higher education. The University is a member of the Race Equality Charter and is a Stonewall Scotland Diversity Champion, actively promoting LGBT equality. The University has a range of initiatives to support a family friendly working environment. See our University Initiatives website for further information. University Initiatives website: <https://www.ed.ac.uk/equality-diversity/help-advice/family-friendly>

References: Kitson, Ezra, and Nicholle GA Bell. "The Response of Microbial Communities to Peatland Drainage and Rewetting. A Review." *Frontiers in Microbiology* 11 (2020).