Research Fellow in Microbial Genomics

School of Biological Sciences

Closing date: 07 January 2023
Interview date: To be confirmed
Reference number: SBS127R
INTRODUCTION

The central aim of this project funded by the Royal Society is to elucidate the ecological and evolutionary mechanisms by which microbes adapt and grow under environmental perturbations. Whilst microbial community assembly in fluctuating environments has been described in high-resolution descriptive ecological mapping studies, the mechanisms responsible remain elusive. This is particularly true in soil, in which spatially complex physical and chemical properties and an enormous level of active and latent microbial diversity interact to sustain numerous ecosystem services on Earth. Microbial community shifts critically influence ecosystem functioning and soil sustainability. This project aims to fill this knowledge gap by developing and testing a general mechanism-based framework to understand how microbial communities are assembled and the degree to which they are functionally resilient in the face of human-driven environmental changes.

The successful applicant will employ cutting-edge genomics methodologies to characterise ecological and physiological community shifts and relate them to various perturbations. The available genomics data will be tightly combined with cutting-edge stable-isotope data and ecosystem function measurements. In addition, crucial ecological concepts related to microbial phenotypic states will be integrated to test several hypotheses regarding the cell- and community-level ecological mechanisms controlling the assembly and turnover of microbial communities under a range of fluctuating regimes.

JOB DESCRIPTION

MAIN PURPOSE OF THE ROLE:

You will be responsible for the planning, design and execution of the research programme and will ideally have expertise in soil microbial ecology, genomics assembly and annotation and a strong interest in ecological and evolutionary concepts and theory.

The research of the Gubry-Rangin’s group focuses on the evolution, ecology and ecosystem function of microbial communities and on the use of molecular techniques to characterise natural communities of microorganisms in soil and in aquatic environments. This research has uncovered novel microbial groups involved in biogeochemical cycling processes, in particular nitrification, which plays a central in the global nitrogen cycle. This research is performed at the ecological level, through analysis of community activity and stability (resistance/resilience) to environmental perturbations such as temperature change, or deforestation in oil palm plantations, and over the longer-term evolutionary scales, determining mechanisms leading to 2.5 billion years of diversification (e.g. horizontal gene transfer, gene duplication, molecular selection) associated with major environmental transitions. Our studies focus on environments ranging from boreal acidic soils to temperate plant rhizospheres through marine tropical sponges, each associated with specific adaptation questions. These studies are performed through a range of lab-based (e.g. stable-isotope-probing, enrichment and cultivation, flow-cytometry, quantitative PCR) or computer-based (e.g. metagenomics assembly, phylogenomics reconstruction, multivariate statistics) approaches.

Recent publications of the group can be found at https://scholar.google.com/citations?user=ooCNSNAAAAAJ&hl=fr. More details about the group can be found at https://www.gubry-rangin.com/.
KEY RESPONSIBILITIES:

- Perform bioinformatics analyses, including genomic assembly, comparative genomic and phylogenomic approaches.

- Statistically integrate the genetic data within the ecological and evolutionary context.

- Prepare and submit manuscripts for publications in leading international conferences and journals.

- Contribute to the supervision and training of postgraduate research students.

- Actively participate as a member of a research team.

- Participate in research events and attend research seminars, conferences, staff development workshops and liaise with experts in the field.

CANDIDATE BACKGROUND

We seek a motivated postdoctoral fellow to join a dynamic research-led team within the School of Biological Sciences.

We are seeking to appoint an enthusiastic, motivated, and creative postdoctoral fellow Research Fellow who has a PhD (or near completion) in bioinformatics, genomics, ecology, evolution or microbiology. Applicants must have experience in genomics analysis, while knowledge of their application in microbial ecology would be desirable.

Applicants should have research interests in microbial ecology and evolution. We are particularly interested in individuals with evidence of a research strength in identifying the basis of ecologically relevant and adaptively important traits; population, species and community responses to environmental change, or interactions between ecological and evolutionary processes. We welcome applications from individuals, who are currently working with animal, plant or microbial systems.

The applicant will join a highly active research group (based in Aberdeen) which currently includes four post-doctoral researcher, eight PhD students, two research technicians and several MSc and undergraduate students.

The group in Aberdeen occupies purpose-built molecular biology laboratories and possesses all the necessary infrastructure and equipment for performing research at the forefront of molecular microbial ecology and environmental genomics. The group is embedded within a global collaborative network that will maximize both the impact of the work and the advancement opportunities to the postdoctoral researcher.
**TERMS OF APPOINTMENT**

Salary will be at the appropriate point on the Grade 6, £35,333 - £42,155 and negotiable with placement according to qualifications and experience.

Any appointment will be made subject to satisfactory references and probation period.

For further information on various staff benefits and policies please visit www.abdn.ac.uk/staffnet/working-here

This role is based in the UK and as such the successful candidate will be required to live and work in the UK.

Should you require a visa to undertake employment in the UK you will be required to fulfil the minimum points criteria to be granted a Certificate of Sponsorship under the requirements of the Skilled Worker visa. At the time an offer of appointment is made, you will be asked to demonstrate that you fulfil the criteria in respect of qualification and competency in English. For research and academic posts, we will consider eligibility under the Global Talent visa. Please do not hesitate to contact Lucy Redmayne, HR Adviser (e-mail: lucy.redmayne@abdn.ac.uk) for further information.

The candidate appointed to this post may be eligible for homeworking on an occasional or regular basis. For more information please refer to our [Homeworking Policy](#).
## Person Specification

### Education/Qualifications

**Academic, technical and professional education and training**

- PhD (or near completion) in bioinformatics, microbiology evolution or ecology.
- Undergraduate Degree in evolution, molecular biology, bioinformatics, microbiology, ecology or related subject.

### Work and Other Relevant Experience (including training)

**e.g. Specialist knowledge, levels of experience, supervisory experience, research**

- Expert knowledge of genomics approaches.
- Strong interest in ecology and evolution.
- Experience in genomics application in microbial ecology.
- Experience in bioinformatic analysis of high-throughput sequence data.
- Experience in genome assembly.
- Experience in comparative genomic.
- Experience in phylogenomic.
- Strong knowledge of statistical ecology approaches.

### Personal Qualities and Abilities

**e.g. initiative, leadership, ability to work on own or with others, communication skills**

- Ability to work on own and integrate with and contribute to an active research group.
- Excellent verbal communication skills.
- Excellent written communication skills, including a capacity to write up results in a publishable form.
- Good quantitative and bioinformatics skills.

### Other

**e.g. special circumstances (if any) appropriate to the role such as unsocial hours, travelling, Gaelic language requirements etc.**

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Updated October 2022
UNIVERSITY OF ABERDEEN

open to all and dedicated to the pursuit of truth in the service of others

The University of Aberdeen is a broad based, research intensive University, and we put students at the centre of everything we do. Outstanding in a wide range of discipline areas, Aberdeen is credited for its international reach and commercialisation of research ideas into spin out companies. The University has over 16,000 matriculated students and 3,600 staff representing 130 nationalities. We encourage bold thinking, creativity and innovation, and we nurture ambition with many opportunities for professional and personal development in an inclusive learning environment which challenges and inspires.

CURRENT CONTEXT

The University continues to uphold the principals of the foundational purpose. We remain committed to delivering positive change both locally and globally. We work together and with our partners in an interdisciplinary way, catalysing world-leading research in our areas of strength: Energy Transition; Social Inclusion and Cultural Diversity; Environment and Biodiversity; Data and Artificial Intelligence; and Health, Nutrition and Wellbeing. We are investing in our future and have committed £100m to upgrading our campus, including the new fully digitised Science Teaching Hub, the regeneration of the historic King’s Quarter and a new Business School building. Our commitment to our students, campus and community has led to us being named a Top 20 UK institution in two major league tables1 and 4th in the UK for overall student satisfaction2.

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1 The Times and Sunday Times Good University Guide 2023 and the Guardian University Guide 2023
2 National Student Survey (NSS) 2022

Updated October 2022
ABERDEEN 2040
On our 525th anniversary as a University we launched Aberdeen 2040, our strategic vision for the next 20 years. Four strategic themes will shape our learning and discovery, underlined by 20 commitments we have made against each theme:

- **Inclusive**
  We welcome students, staff and partners from all backgrounds, organisations and communities. We value diversity.

- **Interdisciplinary**
  We innovate in education and research by generating, sharing and applying new kinds of knowledge. We learn together.

- **International**
  We connect with others and extend our networks and partnerships around the world. We think across borders.

- **Sustainable**
  We understand and nurture our environment, and take care of our resources, including our people and finances.
  
  We work responsibly.

OUR EDUCATION
Recognised as the Scottish University of the Year in the Times and Sunday Times Good University Guide 2019, we remain true to our roots as an ancient Scottish university, combining breadth and depth in our degree programmes and drawing strength from the quality of our research. Our flexible curriculum encourages students to grow as independent learners and therefore to thrive as graduates in the diverse workplaces of the future. Our education is open to all and we are setting ambitious targets to further widen access.

OUR RESEARCH
Researchers at the University of Aberdeen have been at the forefront of innovation and excellence throughout the centuries, generating insights in medicine, science, engineering, law, social sciences, arts and humanities. This research has contributed to five Nobel prizes as well as other awards such as the Queen’s Anniversary prize. Our research is intellectually rigorous working within our established areas of excellence as well as new methods of enquiry. We will continue to generate new knowledge addressing economic and societal issues with ambition and imagination, ensuring that it is globally excellent and locally relevant.

INTERNATIONAL
Aberdeen is increasing its international presence, positioning the University as a global organisation and building on established global partnerships around the world, including Qatar, China, North America, Europe. We feature in the top 50 institutions worldwide for international students1.

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1 Times Higher Education World University Rankings 2021

Updated October 2022
IMPACT
In 2020 the University signed the United Nations Sustainable Development Goals accord, solidifying our commitment to developing the world in a sustainable way. In 2022 we were listed in the global Top 100 for 8 of these goals^4.

Our highly cited work in zero-carbon technology and global outlooks makes us Scotland’s best institution for environmental research^5.

THE SCHOOL OF BIOLOGICAL SCIENCES

The School of Biological Sciences at the University of Aberdeen has an internationally recognised reputation for leading edge research in ecological and functional genomics. The School has staff who focus on plants, animals and microbes, and use genomic, transcriptomic, proteomic and epigenomic tools to address a broad range of fundamental questions in ecology and evolution. These range from understanding evolution processes and adaptation, speciation genomics, identifying the genetic basis of functionally important traits using GWAS and QTL mapping, functional responses to environmental change, population genetic structure and dispersal, host-parasite interactions, relating diversity to ecosystem functioning and global biogeochemical cycling, immune functioning, and eco-evolutionary dynamics in natural populations.

The University of Aberdeen has state-of-the-art facilities for ‘omics research including the Centre for Genome Enabled Biology and Medicine (www.abdn.ac.uk/genomics) that houses Illumina MiSeq, Illumina NextSeq500, Ion Torrent Proton and Oxford Nanopore GridION DNA sequencing platforms, a dedicated High Performance Computing Server (https://www.abdn.ac.uk/staffnet/working-here/itservices/hpc.php), an ancient/low-copy DNA facility, marine and freshwater aquaria, extensive

\(^4\) Times Higher Education Impact Rankings 2022
\(^5\) QS World University Rankings 2022
greenhouse and growth chamber facilities, and experimental evolution facilities. Allied with these extensive lab facilities we have a team of dedicated bioinformaticians and biostatisticians with expertise both in analysis linked to model species genomes, and also the development of novel analytical pipelines for non-model species with limited genomic resources.

**ABERDEEN AND ABERDEENSHIRE**

Scotland’s third largest city, Aberdeen sits on the coast between the mountains of Aberdeenshire and the stunning North Sea coastline. The Aberdeen City region is a can-do place that is actively investing, at scale, in its future.

Renowned as a Global Energy Hub, Aberdeen is a vibrant, entrepreneurial region, home to a unique mix of business opportunities and specialist skills across various sectors including energy, technology, life sciences and food & drink. More than 20% of Scotland’s top businesses are located in this region which is taking great strides to ensure that it continues to compete on a world stage. Investments of more than £10 billion of public and private infrastructure is due to be delivered before 2030, marking an exciting time to be part of a genuine world-class location.

Built from sparkling local granite Aberdeen has earned the name of the Silver City. As the energy capital of Europe, Aberdeen nevertheless retains its old-fashioned charm and character making it an attractive place in which to live, work and study. Due to its global business and international energy industry credentials, Aberdeen is well served by local and national transport infrastructure with excellent rail networks that run both North and South of Scotland and the rest of the UK. It also acts as an international travel hub. Flying time to London is just over one hour with regular daily flights and serves international travel to European centres such as Amsterdam (Schiphol) and Paris (Charles de Gaulle) as well as flights to other European destinations.

The City and the surrounding countryside provide a variety of urban, seaside and country attractions. Aberdeen has first class amenities including His Majesty’s Theatre, Music Hall, Art Gallery, the P&J Arena, Museums, and Beach Leisure Centre. The City is framed by its accessible beach front which is within a short walk of the city centre and there are an array of activities available across the region such as hill walking; mountaineering; sailing; surfing; salmon, trout and sea fishing; golf; sailing; surfing and windsurfing. The surrounding countryside, known as Aberdeenshire, is also one of Scotland’s most appealing regions. Royal Deeside and the Cairngorms National Park are within easy access of the city, and there are a variety of towns and villages scattered along the coastline.

The city and the surrounding area have ranked consistently highly in nationally recognised quality of life surveys, coming out top 10 as one of the best places to live in Scotland in 2020 in the annual Bank of Scotland survey.

To find out more visit [www.visitabdn.com](http://www.visitabdn.com)
EQUALITY AND DIVERSITY

The University values a diverse working environment and recognises the benefits this can bring. The University is keen to receive applications from individuals from across all of the equality protected characteristics (age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, sexual orientation).

The University supports opportunities for flexible working for a range of reasons and has policies in place to facilitate this. The policies can be found at [https://www.abdn.ac.uk/staffnet/working-here/flexible-working--5607.php](https://www.abdn.ac.uk/staffnet/working-here/flexible-working--5607.php).

The University’s commitment to gender equality has been recognised through the achievement of an Athena SWAN Bronze award at an institutional level and across all its subject areas. The University is also a Stonewall Diversity Champion to further LGBT+ equality.

The University is signed up to Advance HE’s Race Equality Charter, affirming the University’s commitment to the charter’s aim of improving the representation, progression and success of minority ethnic staff and students within higher education.

Candidates who are British Sign Language (BSL) users can contact us directly by using contact SCOTLAND-BSL. 

The University is delighted to be accredited as a Disability Confident employer and strives to ensure that disabled staff and students have the opportunity to work and study in an inclusive, accessible and supportive environment. 

[www.abdn.ac.uk/staffnet/governance/equality-and-diversity-277](http://www.abdn.ac.uk/staffnet/governance/equality-and-diversity-277)

HOW TO APPLY

Online application forms are available at [www.abdn.ac.uk/jobs](http://www.abdn.ac.uk/jobs)

The closing date for receipt of applications is **07 January 2023**

Should you wish to make an informal enquiry please contact: Prof. Cecile Gubry-Rangin, email: c.rangin@abdn.ac.uk. Please do not send application forms or CVs to her.

Please quote reference number SBS127R on all correspondence