

THE UNIVERSITY OF MANCHESTER

PARTICULARS OF APPOINTMENT

FACULTY OF BIOLOGY, MEDICINE AND HEALTH

SCHOOL OF BIOLOGICAL SCIENCES

DIVISION OF EVOLUTION AND GENOMIC SCIENCES

RESEARCH ASSOCIATE (EVOLUTION OF ANTIMICROBIAL RESISTANCE IN HUMAN INFECTION)

VACANCY REFERENCE: BMH-015895

Salary: £32,816 - £33,797 per annum (according to relevant experience)

Hours: 1 FTE

Duration: Up to 3 years in the first instance

Location: Oxford Road, Manchester

Responsible to: Professor Michael Brockhurst

Enquiries about the vacancy, shortlisting and interviews:

Prof. Michael Brockhurst

Email: michael.brockhurst@manchester.ac.uk

Introduction to the University of Manchester and the Faculty of Biology, Medicine and Health

The University of Manchester is the largest single-site university in the UK with over 40,000 students and more than 12,000 staff.

We aim to become one of the top 25 research universities in the world by 2020 and are committed to: delivering an outstanding teaching and learning experience for our students; contributing to the social and economic success of local, national and international communities; producing the highest calibre graduates; and developing our staff to be amongst the very best of their peers.

To achieve our ambitious goals we aim to attract and retain the very best people to work across a range of academic disciplines and professional services.

The Faculty of Biology, Medicine and Health (FBMH)

The Faculty of Biology, Medicine and Health has an integrated structure to deliver a truly translational approach to the life sciences, ensuring smooth research pathways - from pure discovery science through to clinical application and patient care.

With a total annual income of over £300 million, and over 3,000 members of staff, the Faculty is comparable in size to a medium-sized UK university. Thirty undergraduate and 90 postgraduate programmes offer our 11,000 students opportunities to develop the skills and knowledge they need for a successful career.

The Faculty's matrix structure facilitates interdisciplinary working and enables us to interact, learn from each other and share best practice. Our eight, strategic Research Domains help to articulate our research strengths, drive large-scale, collaborative research activities and strengthen relationships with our research and healthcare partners.

The integration of discovery biology, clinical application and patient care within a single Faculty, particularly in a region with notable health inequality, provides us with a real opportunity to have a very significant and positive impact on people's lives.

Our strategic partnerships

The new Faculty inherits a number of key strategic partnerships that underpin its ambitions to develop ground-breaking research.

Working alongside six local NHS Trusts, the Faculty is a key member of the [Manchester Academic Health Science Centre \(MAHSC\)](#) - a federation of equal partners that unites leading healthcare providers with world-class academics and researchers. It aims to be a global centre for the delivery of applied health research and education and provide leadership for our local and regional health systems.

It also plays a leading role in [Health Innovation Manchester \(HInM\)](#), which was launched in September 2015, as part of the UK Government's decision to devolve health and social care responsibilities to Greater Manchester. HInM offers a unique opportunity to bring together health and social care, academic and life science related business resources across the region to deliver an innovative health ecosystem that can help accelerate innovation into our local health and social care systems, enhance our global scientific standing and act as a magnet for inward investment.

Key partnerships in the charitable sector include Cancer Research UK; Diabetes UK; and the Wellcome Trust; and the Faculty will also has research and funding links to a number of commercial organisations including Unilever, AstraZeneca, GlaxoSmithKline and Boots, who will help us to bring new drugs and products to the market.

Working for the University of Manchester

The University of Manchester strives to make our community a welcoming, caring and enthusiastic one, fuelling ambition with opportunities and support to help us all achieve our personal and professional goals.

Our diverse job opportunities include an attractive [benefits package](#) with family-friendly policies that provide for flexible working. We care deeply about career and personal development, offering a structured induction programme for new staff, an annual performance and development review, staff training for all career stages and mentoring opportunities to support your career development.

We have a genuine commitment to [equality of opportunity](#) for our staff and students, and are proud to employ a workforce that reflects the diverse community we serve.

As a global institution, situated at the heart of a lively, [culturally diverse city](#), we welcome applicants of all nationalities. To help international job applicants plan for life in the UK, we have put together some useful [information on passports and visas](#), travel to the UK, accommodation and a number of other practical considerations.

[Brockhurst Lab / Microbial Evolution Research Manchester Group \(MERMan\)](#)

The postdoctoral researcher will be based in the Brockhurst Lab led by Prof. Michael Brockhurst. They will be part of a dynamic team comprising postdoctoral researchers, research fellows, technicians and PhD students (group size approx. 6-10 people). All are working on related research topics in microbial evolution, providing a supportive and vibrant research environment. The Brockhurst lab is based in a newly-equipped state-of-the-art microbiology lab facility with access to a range of cutting-edge analytical instruments and robotic automation. We hold weekly lab meetings, journal clubs, and reading groups focused around developing skills in statistics and bioinformatics.

The Brockhurst Lab is part of a wider collective of evolutionary microbiology labs forming the [Microbial Evolution Research Manchester \(MERMan\)](#) grouping.

MERMan is one of the largest groups of evolutionary microbiologists in the UK, comprising 7 group leaders and >25 research staff all working on microbial ecology and evolution projects. Research topics include, antimicrobial resistance evolution (Dr. Danna Gifford; Dr. Mato Lagator), horizontal gene transfer and symbiosis (Prof. Michael Brockhurst), mutation rate evolution (Dr. Chris Knight; Dr. Rok Krasovec), and the ecology and evolution of host-associated microbiomes (Dr. Kat Coyte; Dr. Sophie Nixon). The group is co-located within shared laboratories and write-up spaces forming an exciting and cohesive community of likeminded scientists. We hold a weekly MERMan group meeting and a monthly external Zoom seminar.

[Overall Purpose of the Role](#)

The postdoctoral researcher position is funded by a 5-year Wellcome Trust Collaborative Award in Science grant led by Prof. Michael Brockhurst, together with his collaborators Prof. Steve Paterson at University of Liverpool, Prof James Chalmers at University of Dundee and Dr. Dylan Childs at University of Sheffield.

Overall, the project is aimed at understanding and predicting the evolution of antibiotic resistance in human respiratory infection

The project will perform evolutionary analysis of clinical isolates of *Pseudomonas aeruginosa* previously collected during a completed Phase-III randomised controlled clinical trial for a new antibiotic formulation. Using genomics and high-throughput phenotyping we will track the evolution of antibiotic resistance in patient infections to determine the evolutionary and molecular mechanisms of resistance emergence. Then, using experimental evolution, we will test how evolvability of antibiotic resistance varies between bacterial genomic lineages and why? In parallel, work at the other sites will focus on understanding the host- and microbiome-related

drivers of antibiotic resistance evolution in patients and on identifying and validating biomarkers that are predictive of resistance evolution.

The postdoctoral researcher at Manchester will work together with a full-time microbiology research technician, and will collaborate closely with postdoctoral researchers working at the other sites.

Due to the collaborative nature of the project the Manchester team (including the postholder) will be required to work for defined periods at Dundee and Liverpool during key stages of the project.

Main Responsibilities

- To take initiatives in the planning of research.
- To plan and manage the day-to-day lab research.
- To perform microbiological and evolutionary experiments.
- To identify and develop suitable techniques, and apparatus, for the collection and analysis of data.
- To conduct data analysis and visualisation.
- To ensure the validity and reliability of data at all times.
- To maintain accurate and complete records of all findings.
- To ensure all data are securely stored and remotely backed-up.
- To prepare regular internal reports (as agreed).
- To contribute to reports for submission to research sponsors.
- To prepare material for presentation in oral and poster formats.
- To present findings to colleagues and at conferences.
- To draft publications and prepare them for submission to refereed journals.
- To submit publications to refereed journals.
- To submit datasets and associated metadata to repositories.
- To contribute to writing bids for research grants.
- To provide guidance to staff and students.
- To supervise the research technician.
- To liaise with postdoctoral researchers at other sites to coordinate research.
- To organise regular meetings of the collaborative research team.
- To undertake instruction of PhD students as agreed.
- To supervise practical work and advise students on techniques.
- To take responsibility for organising resources and effective decision making in support of research.
- To attend relevant workshops and conferences as necessary.
- To be an active team-member and set positive examples by showing a commitment to achieving results, encouraging and supporting junior members of the team and raising suggestions for continuous improvement.
- To work alongside the PI and other colleagues in a collegiate manner and build rapport within the team and the wider Faculty.
- To develop contacts and research collaborations within the Faculty and the wider community.
- To promote the reputation of the laboratory, Faculty and wider University.

Other Duties

- To undertake appropriate administration tasks.
- To contribute to the organisation of the MERMan group.
- To organise and attend relevant meetings (e.g. lab meetings).
- To undertake any necessary training and/or development.
- Actively read the scientific literature relating to (and around) the project.
- To maintain safe workplace practice and procedures in accordance with the requirements of Health and Safety legislation.
- To maintain an up-to-date knowledge of relevant statutory Health and Safety legislation and recommendations and attend safety training as required.
- Any other duties commensurate with the grade of the post as directed by PI / supervisor.

Person Specification

Essential Skills, Knowledge and Experience

- Hold (or expect to hold shortly) a PhD (or equivalent) in Evolutionary Biology or Microbiology
- BSc / BA (hons) in Biology (or related science subject)
- Extensive and up-to-date theoretical and practical knowledge in evolutionary microbiology and / or microbial experimental evolution
- Excellent technical skills in lab microbiology (bacterial culturing, phenotyping etc.) and molecular biology (PCR, electrophoresis, DNA sequencing etc.)
- Extensive experience in experimental design and statistical analysis
- Experience of managing large datasets
- Experience of bioinformatics tools for genome analysis
- Proven ability to use initiative to efficiently plan, optimise and progress project and communicate findings
- Track record of peer-reviewed scientific publication(s)
- Track record of conference and / or workshop oral and / or poster presentation(s)
- Extensive IT skills, including experience with standard desktop software (e.g. office & graphics packages), research specific software (e.g. R stats) and online databases (e.g. European Nucleotide Archive, NCBI)
- Excellent organisational skills and time management
- Excellent interpersonal and communication skills and ability to work with colleagues at all levels
- Excellent written and spoken English
- Ability and willingness to contribute to the work of others by offering practical and intellectual help
- Ability and willingness to liaise with infrastructure, technical and IT support teams
- Ability and willingness to liaise with internal and external collaborators
- Ability and willingness to work at the other research sites (at University of Dundee and University of Liverpool) for defined periods

Desirable Skills, Knowledge and Experience

- Extensive and up-to-date theoretical and practical knowledge in antimicrobial resistance
- Extensive and up-to-date theoretical and practical knowledge in *Pseudomonas aeruginosa* biology
- Extensive and up-to-date theoretical and practical knowledge in bacterial genomics
- Excellent technical skills in molecular microbiology, including constructing allelic replacements and labelled strains
- Extensive experience in bioinformatics tools for analysing bacterial genome sequence data
- Experience of directing and supervising practical lab-based research of others (e.g. students, technicians)
- Experience of lab administration, including compliance with Health and Safety and GMO regulations and COSHH
- Willingness to work flexible hours including outside standard office hours (e.g. at weekends as required to maintain experiments)

The above particulars are intended as a general guide to the duties of the post and the conditions of service. They do not constitute a contract of employment between the University and the person appointed. The successful applicant will, however, receive a full set of conditions of service on appointment.
