

**THE UNIVERSITY OF MANCHESTER**  
**PARTICULARS OF APPOINTMENT**  
**FACULTY OF BIOLOGY, MEDICINE & HEALTH**  
**SCHOOL OF BIOLOGICAL SCIENCES**  
**DIVISION OF EVOLUTION, INFECTION & GENOMICS**  
**RESEARCH ASSOCIATE IN MICROBIAL EXPERIMENTAL EVOLUTION**  
**VACANCY REF: BMH-022595**

**Salary:** Grade 6 £35,308 to £43,155 per annum, depending on relevant experience

**Hours:** Full Time (1 FTE)

**Duration:** Fixed Term For 36 Months

**Location:** Oxford Road, Manchester

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**Enquiries about the vacancy, shortlisting and interviews:**

Name: Danna Gifford

Email: [danna.gifford@manchester.ac.uk](mailto:danna.gifford@manchester.ac.uk)

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**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 around 38,000 students and more than 11,000 staff. We aim to become one of the top 25 research universities in the world and are committed to delivering an outstanding teaching and learning experience; 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 support functions.

**The Faculty of Biology, Medicine and Health**

The integrated structure of our faculty enables a truly translational approach to biology, medicine and health - from pure discovery science through to clinical application and patient care. It also encourages collaborative working, enabling staff to deliver innovative, world-leading research that has a very real and positive impact on people's lives, as well as high-quality education and training to over 11,000 undergraduate and postgraduate students.

### **Our Strategic Partnerships**

The faculty has established 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 <https://mft.nhs.uk/withington/research/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.

We also play a leading role in <https://healthinnovationmanchester.com/>, 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 also has research and funding links to a number of commercial organisations including Unilever, AstraZeneca, GlaxoSmithKline and Boots, who 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 <https://www.staffnet.manchester.ac.uk/people-and-od/benefit/> 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 <http://www.manchester.ac.uk/connect/jobs/equality-diversity/awards/> 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, <http://www.manchester.ac.uk/study/experience/student-life/city/>, we welcome applicants of all nationalities. To help international job applicants plan for life in the UK, we have put together some useful <http://www.staffnet.manchester.ac.uk/employment/joining-the-university/international-staff/> travel to the UK, accommodation and a number of other practical considerations.

### **Gifford Lab / Microbial Evolution Research Manchester Group (MERMan)**

The postdoctoral researcher will be based in the group of Dr Danna Gifford. They will be part of a dynamic team comprising postdoctoral researchers, research fellows, technicians and PhD students (group size approx. 5-7 people). All are working on related research topics in microbial evolution, providing a supportive and vibrant research environment. The Gifford lab is based in a newly-equipped state-of-the-art microbiology lab facility with access to a range of cutting-edge

analytical instruments. We hold weekly lab meetings, journal clubs, and reading groups focused around developing skills in statistics and bioinformatics.

The Gifford Lab is part of two collectives of researchers, the microbial evolution labs forming Microbial Evolution Research Manchester (MERMan) and The University of Manchester's Antimicrobial Resistance Network (AMR Network).

- MERMan is one of the largest concentrations of microbial evolution researchers in the UK, comprising 10 group leaders and >50 research staff all working on microbial ecology and evolution projects. Research topics include antimicrobial resistance evolution (Dr. Danna Gifford; Prof. Mike Brockhurst; Dr. Mato Lagator; Dr. Michael Bottery), phage biology (Prof. Mike Brockhurst, Dr Claudia Igler) horizontal gene transfer, symbiosis (Dr. Danna Gifford; Prof. Michael Brockhurst), single-cell evolutionary biology (Dr. Rok Krasovec), and the ecology and evolution of microbiomes (Dr. Chris Knight; Dr. Kat Coyte; Dr. Sophie Nixon; Dr. William Smith). 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 with frequent external seminar visitors. <https://sites.manchester.ac.uk/merman/>.
- The AMR Network is a community of more than 100 clinical and academic researchers who work across The University of Manchester and Manchester University NHS Foundation Trust and are focused on combating antimicrobial resistance. The network brings together diverse expertise and technologies from across The University of Manchester with industrial partners and NHS clinicians to address the critical global challenge of AMR. <https://sites.manchester.ac.uk/antimicrobial-strategy-manchester/>

### **Overall Purpose of the Role**

The Postdoctoral Researcher position is funded by a 3-year BBSRC Responsive Mode grant led by Dr. Danna Gifford, together with her collaborator Dr Stineke van Houte at the University of Exeter.

Overall, the project is aimed at understanding how genomic diversity contributes to the 'evolvability' of antibiotic resistance. The project will perform an evolutionary analysis of resistance evolvability using multiple species from the bacterial genus *Pseudomonas*. We will first determine whether resistance evolvability differs between these species in a predictable manner using experimental evolution. Then, using comparative genomics, high-throughput sequencing and phenotype tracking, we will determine whether these differences are conferred by 'evolvability genes' present in some species but not others. Finally, we will investigate whether targeted disruption of evolvability genes (both novel ones here, and those previously identified; using CRISPR-Cas and/or CRISPRi) can constrain, or even reverse, antibiotic resistance evolution.

The postdoctoral researcher will work together with a full-time microbiology research technician specifically dedicated to 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 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 in Evolutionary Biology / Evolutionary Microbiology
- BSc / BA (Hons) in Biology or related science subject
- Extensive and up-to-date theoretical and practical knowledge in microbial evolution 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
- Evidence of peer-reviewed scientific publication(s) or preprint(s)
- Evidence 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 & communication skills, 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

### **Desirable Skills, Knowledge and Experience:**

- Extensive and up-to-date theoretical and practical knowledge in resistance research
- Extensive and up-to-date theoretical and practical knowledge in Pseudomonas 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 and/or CRISPR-Cas
- Extensive experience in bioinformatics tools for analysing 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 with time off-in-lieu understanding)

**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.**