

Job Description

Research Associate in Mucorales Adaptation

Salary:	Grade 7
Contract:	Full time, fixed term for 36 months
School/Department:	School of Natural Sciences
Location:	Canterbury/Medway Campus
Responsible to:	Dr Rebecca Hall

Job purpose

This is an exciting opportunity to join the Dr Hall's research team on a project funded by a Wellcome Trust Fungal Adaptation grant to address how adaptation to natural and host environments drives Mucorales pathogenicity, to deliver a step change in our understanding of Mucorales biology and to aid the identification of novel therapeutic targets. Mucormycosis is a devastating, yet poorly understood, human opportunistic disease, causing gross morbidity and over 59,000 deaths worldwide yearly. Initiated by fungal spores of the vast Mucorales order, Mucormycosis results in pleiotropic clinical presentations; species-specific associations with certain host risk factors or geographical locations are well documented. Notably, *Rhizopus* spp, causing over 70% of Mucormycosis cases globally, show an exceptional ability to withstand abiotic and biotic stress. Moreover, we and others have demonstrated that fungal invasion of human cells, a crucial step for pathogenicity, is reliant on Mucorales stress adaptation capabilities. Thus, we hypothesise that species-specific Mucorales adaptation to natural and in-host environments underpins Mucormycosis pleiotropic pathophysiology. Using our cutting-edge experimental workflows and unrivalled access to clinical and environmental isolates, we will determine how order-wide species-specific Mucorales stress adaptation effects fungal growth and pathogenesis. By identifying the regulatory pathways that mediate species-specific stress adaptation and their conservation across such a heterogeneous order, this all-encompassing programme of work will provide a step-change in our understanding of Mucorales biology. Such knowledge will expose therapeutic vulnerabilities to combat this emerging, yet lethal, human fungal disease, driving the development of novel strategies for its clinical management.

Overall Purpose of the Job

To perform original laboratory-based research under the academic supervision of Dr Rebecca Hall at the University of Kent working to address how adaptation to natural and host environments drives Mucorales pathogenicity using our cutting-edge experimental workflows and unrivalled access to clinical and environmental isolates. This role involves formulating and proposing individual and collaborative research objectives, conducting research projects, and disseminating findings including publishing in reputable journals. Staying current with advancements in the field is essential, as you will translate this knowledge into innovative research activities. This is a collaborative project with Dr Margherita Bertuzzi at the University of Manchester.

For further information about the project please contact Dr Rebecca Hall

Key accountabilities and Duties

- To take initiatives in the planning and delivering of high-quality research. This will require the design and implementation of an original programme of experimentation involving testing the impact of host-derived stressors in Mucorales gene regulation, germination, growth, host-pathogen interactions and virulence, the generation and screening of Mucorales fluorescent strains and knockout mutants.

- To identify and develop suitable techniques, and apparatus, for the collection and analysis of data with an emphasis on genetic manipulation of Mucorales, fungal phenotypic, genotypic and transcriptional profiling, *in vitro* infection of immortalised and primary human cells and model infection models.
- To participate in the activities of the Wellcome-funded interdisciplinary team of scientists working on this problem, including scientists at the University of Kent, Exeter and Manchester.
- To conduct data analysis and ensure the validity and reliability of data at all times.
- To maintain accurate records of research conducted and carry out analysis of results obtained using the most appropriate method
- To attend meetings and present regular written oral and/or written progress reports to local and national colleagues and collaborators.
- To produce written outputs as required and contribute to public engagement and the wider dissemination of the research findings.
- To prepare research findings for publication and presentation, and for inclusion in reports to grant governing bodies. To attract research funding through the development of innovative research proposals and contribute to the writing of research funding bids.
- To provide guidance to staff and students and assist in the laboratory supervision of PhD, postgraduate and undergraduate students.
- To take responsibility for organising resources and effective decision making in support of research.
- To attend relevant workshops, training, research placement 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.
- Carefully plan the research activity making sure the milestones of the project are achieved within the expected timeframe.
- Build and maintain professional relationships with colleagues, students, and external partners to foster collaboration and networking.
- Manage research-related administrative tasks, ensuring compliance with ethical and regulatory standards.
- Engage in continuous professional development to enhance research skills and knowledge in relevant areas, integrating new information into research activities where feasible.

Internal & external relationships

Internal: Wider research team, academic supervisor/principal investigator, support staff, students

External: External researchers/collaborators, funding bodies, project participants, external institutions/organisations where necessary

Health, safety & wellbeing considerations

This job involves undertaking duties which include the following health, safety and wellbeing considerations:

- Regular use of Screen Display Equipment
- Repetitive limb movements
- Working with chemicals (inc. requirement to wear latex gloves and inc. work with CO₂ or N₂ gasses)
- Biological Agents/Scientific Hazards (experiments/lasers etc, and waste/sewage)
- Prolonged physical/manual work/Manual handling (inc. human beings)
- Contact with Human fluids (blood, saliva etc)
- Conflict resolution
- Pressure to meet important deadlines such as might be inherent in high profile projects
- There may be a requirement to work evenings and weekends
- Overseas travel for conference attendance is a possibility

Person specification

The person specification details the necessary skills, qualifications, experience or other attributes needed to carry out the job. Applications will be measured against the criteria published below.

Selection panels will be looking for clear evidence and examples in an application, or cover letter (where applicable), which back-up any assertions made in relation to each criterion.

Essential Criteria:

- A relevant PhD or equivalent in a related field of study (e.g. Microbiology, immunology, cell biology) (A)
- Extensive and up-to-date theoretical and practical knowledge in your subject area as evidenced by:
 - A research portfolio in an area of Mycology (A/T)
 - A publication record in peer reviewed journals in an area of Mycology (A/I)
- Excellent technical skills in the study of fungi, e.g. using *in vitro* and/or *in vivo* infection models, genomic and transcriptomic analyses, high-throughput phenotypic characterisation, confocal and/or imaging flow cytometry-based experimentation. (A,I,T)
- Proven experience in conducting research projects, including data collection and analysis (A,I)
- Demonstrated ability to write and publish research findings in peer-reviewed journals (A,I)
- Experience working collaboratively in a research or academic setting, contributing to joint projects and initiatives (A,I,T)
- Familiarity with relevant research methodologies and tools specific to the field (A,I,T)
- Strong verbal and written communication skills, with the ability to convey complex information clearly to diverse audiences (I,T)
- Excellent organizational skills with the ability to manage multiple tasks and meet deadlines (I)
- Commitment to continually update knowledge and understanding in field or specialism (I)
- Firm commitment to achieving the University's vision and values, with a passion for a transformative student experience and multidisciplinary, impactful research (I)
- Commitment to deliver equality, diversity and inclusivity in the day-to-day work of the role (I)

Desirable Criteria:

- Have researched and published in the field of Medical Mycology and specifically filamentous fungi and Mucorales (A/I)
- Have knowledge and experience in the field of Medical Mycology and specifically filamentous fungi and Mucorales (A/I)
- Have a proven track record of presentation at external conferences/workshops (A/I)

Assessment stage: A - Application; I - Interview; T - Test/presentation at interview stage