

## Candidate Information

<b>Position:</b>	Research Assistant
<b>School/Department:</b>	School of Medicine, Dentistry and Biomedical Sciences
<b>Reference:</b>	24/111637
<b>Closing Date:</b>	Monday 4 March 2024
<b>Salary:</b>	£32,024 per annum.
<b>Anticipated Interview Date:</b>	Thursday 14 March 2024
<b>Duration:</b>	Fixed term available for 31 months

### JOB PURPOSE:

The Microbial Biochemistry and Pathogenesis group of Professor Valvano, in the Wellcome-Wolfson Institute for Experimental Medicine, is looking for an ambitious, highly productive individual with an interest and demonstrated research skills on developing cellular models of bacterial infection in macrophages and lung epithelial cells. The candidate will be involved in ongoing and planned research aiming to understand the molecular and cellular pathogenesis of lung opportunistic Gram-negative bacteria.

The post holder will apply specialized imaging, molecular microbiology, and cellular biology techniques to examine the course of infection in primary immune and non-immune (e.g., macrophages and epithelial) cells.

Applications are invited from individuals with combined expertise in microbiology, microbial genetics, molecular biology, and cell biology, and a strongly demonstrated commitment to research. Examples include recent research experience in cell culture, handling of fastidious Gram-negative pathogenic, single-cell transcriptomics, advanced confocal microscopy cellular imaging, and imaging modelling coupled to tri-dimensional cell image reconstruction techniques.

### MAJOR DUTIES:

1. Isolating and culturing primary human macrophages and primary epithelial cells.
2. Designing, developing, and refining bacterial infection experiments in primary human macrophages and primary epithelial cells.
3. Performing infection quantification in cells by bacterial colony counts and imaging methods, as applicable.
4. Identification by confocal fluorescence microscopy of intracellular compartments/organelles and associated bacteria.
5. Performing ELISA assays for cytokines, Western blot analyses to detect components of the inflammasome and/or specific cellular proteins.
6. Extracting mRNA and processing for single-cell transcriptomic analyses.
7. Performing molecular cloning/mutagenesis of bacterial genes using the latest molecular tools in the field (e.g., Gibson ligation, marker-less gene deletion approaches).
8. Conduct experimental procedures according to Standard Operating Procedures and obtain reliable and reproducible data of publication quality.
9. Demonstrate innovative approaches to improve experimental design upon analysis of results in consultation with Line Manager.
10. Present regular progress reports on research to members of the research group or to external audiences to disseminate and publicise research findings.
11. Maintaining a clean and organised laboratory workspace; assisting in the preparation and storage of reagents and experimental materials; supporting the upkeep and maintenance of laboratory equipment.
12. Responsible for accurate and detailed documentation of experimental procedures, data, and results; monitoring and advising on project costs and stock levels relating to the programme of work; collaborating with the research team to maintain organised records of the project's progress.
13. Providing help and guidance to research students and newly appointed staff on equipment use and laboratory procedures/techniques.

14. Attending training courses, as required, for professional development to enhance skills and knowledge relevant to the research project and personal growth.
15. Carrying out any other duties that are appropriate to the post as may be reasonably requested by the academic leadership team.

**ESSENTIAL CRITERIA:**

1. A Degree in Microbiology, Immunology, Genetics or Cell Biology.
2. Demonstrated experience in culturing primary human macrophages and primary epithelial cells, especially using the air-liquid interface techniques.
3. Recent experience with infection quantification in cells and confocal fluorescent imaging methods using live or fixed samples, relevant to the project.
4. Recent experience with identification by confocal fluorescence microscopy imaging of intracellular compartments/organelles and associated bacteria.
5. Demonstrated experience in in silico imaging modelling and tri-dimensional cell image reconstruction techniques.
6. Recent research experience in state-of-the-art molecular (e.g. cloning using Gibson ligation) and cellular (bacterial infections in eukaryotic cells) microbiology, cell culture, and cellular and molecular imaging techniques including super-resolution microscopy.
7. Prior experience in handling Gram-negative bacterial pathogens relevant to the project.
8. Prior experience in extracting mRNA and processing for single-cell transcriptomic analyses.
9. Demonstrated experience on detailed documentation of experimental procedures, data, and results.
10. Demonstrated strong initiative and independence in thought and work but also to work within a highly collaborative team to support/train other team members as appropriate.
11. Very good oral and written communication skills and excellent time management skills.

**DESIRABLE CRITERIA:**

1. A Master's Degree or working towards a PhD in a relevant discipline.
2. Experience in measuring electrical conductance in epithelial cells.
3. Experience in bacterial mutagenesis (e.g. making gene deletion mutants) in Gram-negative bacteria.
4. Experience in purification and Western blot analysis of bacterial proteins.
5. Experience in transmission or scanning electron microscopy of cells.
6. Proficient in the use of statistical/graphical software to represent experimental data.