Candidate Information

Position: Research Assistant
School/Department: Wellcome-Wolfson Inst for Experimental Medicine
Reference: 25/112730
Closing Date: Monday 4 August 2025
Salary: £35,136 per annum
Anticipated Interview Date: Friday 15 August 2025
Duration: 6 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 microbial and cellular biochemistry and cellular models of bacterial infection in macrophages. The candidate will be involved in ongoing and planned research aiming to elucidate a novel secretion system for protein export into bacterial membrane vesicles.

The post holder will apply specialized microbial biochemistry techniques for bacterial cell fractionation, purification of protein complexes, analysis of protein-protein interactions including electron microscopy, and cellular biology techniques to examine the effects of bacterial membrane vesicles in primary immune and non-immune (e.g. macrophages and epithelial) cells.

Applications are invited from individuals with combined expertise in microbiology and microbial genetics, molecular biology, microbial biochemistry, and cell biology, and strongly demonstrated commitment to research. Examples include relevant research experience in microbial culture, electron microscopy, protein cross-linking, isolation and purification of protein complexes, split nano-Luc and fluorescent protein tagging, etc.

MAJOR DUTIES:

1. Isolating and culturing human macrophages and epithelial cells.
2. Designing, developing, and refining bacterial infection experiments in human macrophages and primary epithelial cells.
3. Performing infection quantification in cells by bacterial colony counts.
4. Isolation and purification of membrane protein complexes.
5. Performing ELISA assays for cytokines.
6. Bacterial fractionation and western blot analyses to detect bacterial protein complexes components.
7. Performing molecular cloning/mutagenesis of bacterial genes using relevant and modern molecular tools in the field (e.g., Gibson ligation and site directed mutagenesis).
8. Crosslinking and bioluminescent analysis of membrane protein complexes.
9. Purification of bacterial membrane vesicles, fluorescent staining, and their analysis by super resolution and electron microscopy.
10. Conduct experimental procedures according to Standard Operating Procedures and obtain reliable and reproducible data of publication quality.
11. Demonstrate innovative approaches to improve experimental design upon analysis of results in consultation with Line Manager.
12. Present regular progress reports on research to members of the research group or to external audiences to disseminate and publicise research findings.
13. 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.
14. 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.

15. Providing help and guidance to research students and newly appointed staff on equipment use and laboratory procedures/techniques.
16. Attending training courses, as required, for professional development to enhance skills and knowledge relevant to the research project and personal growth.
17. Carrying out any other duties that are appropriate to the post as may be reasonably requested by the academic leadership team.

ESSENTIAL CRITERIA:

1. Degree level qualification or equivalent in a relevant subject.
2. Relevant research experience in state-of-the-art molecular (e.g. cloning suing Gibson ligation) and cellular (bacterial infections in eukaryotic cells) microbiology.
3. Relevant research experience in purification on membrane protein complexes.
4. Relevant experience in culturing human macrophages and epithelial cells.
5. Relevant experience in infection quantification in cells.
6. Relevant experience with subcellular fractionations of bacterial components.
7. Relevant experience in confocal and electron microscopy.
8. Relevant experience on detailed documentation of experimental procedures, data, and results.
9. 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.
10. Good communication and interpersonal skills.
11. Ability to develop proficiency in and demonstrate standard equipment and techniques.
12. Ability to prioritise own work within a general plan to meet deadlines.
13. Ability to carry out practical laboratory tasks to a consistently high standard.
14. Ability to keep accurate records and provide reports on project progress.
15. Ability to train junior staff and allocate work.
16. Analytical and problem solving skills.

DESIRABLE CRITERIA:

1. Dept of Health Personal License.
2. Relevant experience in bacterial mutagenesis (e.g. making gene deletion mutants and site-directed mutagenesis) in Gram-negative bacteria.
3. Relevant experience in purification, and Western blot analysis of bacterial proteins and protein complexes and use of ultracentrifuge.
4. Relevant experience in bioluminescence and fluorescent protein tagging.
5. Relevant Experience in transmission or scanning electron microscopy of cells.
6. Relevant experience in handling Gram-negative bacterial pathogens relevant to the project.
7. Relevant experience with biochemical and bioluminescent approaches to determining protein-protein interactions.
8. Experience in measurement bacterial membrane potential.
9. Experience with super resolution confocal imaging.
10. Proficient in the use of statistical/graphical software to represent experimental data.

ADDITIONAL INFORMATION:

Informal Enquiries to Dr. Hannah Parks; l h.parks@qub.ac.uk