

## Candidate Information

<b>Position:</b>	Research Fellow
<b>School/Department:</b>	School of Pharmacy
<b>Reference:</b>	24/111674
<b>Closing Date:</b>	Monday 18 March 2024
<b>Salary:</b>	£37,841 per annum
<b>Anticipated Interview Date:</b>	Thursday 28 March 2024
<b>Duration:</b>	Available for 12 months or until 31 March 2025, whichever is soonest

### JOB PURPOSE:

We invite applications for a Postdoctoral Researcher to conduct applied research and development of a novel type of a medicinal product intended to treat acne vulgaris – a bacteriophage-loaded microneedle patch. The feasibility of phage delivery with hollow solid microneedles was demonstrated by Prof Ryan Donnelly team back in 2012. Further research resulted in the development of a patch prototype containing dissolving microneedles that release bactericidal phage particles upon dissolution. Last year we demonstrated that dissolving microneedles containing phages are effective against acne-associated bacteria in vitro. In this project, we seek to further develop and optimise this prototype product to ensure its successful progression down the translational route.

This is an interdisciplinary research project that would require good theoretical and practical knowledge of microbiology (including phage biology), molecular biology, and bioinformatics. Previous experience with microneedle fabrication, antibacterial activity assays and working with anaerobic microorganisms would be beneficial.

The post holder will be based in the School of Pharmacy and will work under the supervision of Dr Timofey Skvortsov and Prof Ryan Donnelly.

Applications are invited from highly motivated, efficient, and organised individuals with a strong commitment to applied biomedical research. The successful candidate will have a strong background in molecular microbiology/biotechnology and will be seeking an ambitious research project in a well-supported environment.

### MAJOR DUTIES:

1. Conduct bacteriophage isolation, characterisation of growth rate, host range, thermal and chemical stability, genomic sequencing, and electron microscopy analysis; produce pure high-titre phage mixtures (phage cocktails); conduct bioinformatics analysis of phage genomes to include genome assembly, annotation and identification of genes of interest (endolysins).
2. Develop new combinations of polymeric substances to produce microneedle arrays with desirable mechanical properties, test phage loading and stability, and optimise phage-loaded microneedle arrays to improve shelf-life of the microneedle patch.
3. Design and carry out assays to test stability and activity of phages and/or phage endolysins in the presence of antibacterial compounds; test the activity of the phage-loaded microneedles in an infection model (infected porcine skin).
4. Assess the safety of the final product and its components using a combination of cytotoxicity and haemolytic activity testing.
5. Maintain up-to-date knowledge of phage- and microneedle-based treatments for skin infections and communicate important information to the group.
6. Present regular progress reports to members of the research group.
7. Assist grant holder in the preparation of project reports, publications, and funding applications.

### ESSENTIAL CRITERIA:

1. Hold or be about to obtain\* a PhD (or equivalent) in microbiology, molecular biology, biotechnology, pharmaceutical sciences, materials science, genomics, bioinformatics, computational biology, or a closely related discipline. (\* must be obtained within 6 months of commencement of employment)

2. Significant research experience to include microbiological techniques, bacteriophage isolation and handling, bacterial/bacteriophage genomic DNA isolation, sequencing, and bioinformatics analysis.
3. Demonstrable experience of robust data and resource management and accurate record keeping.
4. Evidence of excellent interpersonal skills, including the ability to communicate effectively both orally and in writing.
5. Excellent time management and organisational skills.
6. Strong initiative, proactivity and independence in thought and work but also to work within a highly collaborative team to support/train other team members as appropriate.
7. Due to the nature of this research project, irregular hours including evening, weekend and other out-of-hours working might be a component of the work at times to meet research deadlines.

**DESIRABLE CRITERIA:**

1. MSc in microbiology, molecular biology, biotechnology, bioinformatics, or a related subject.
2. Experience in designing and conducting antimicrobial susceptibility assays.
3. Experience in working with anaerobic microorganisms.
4. Experience with characterisation and optimisation of novel materials/formulations.
5. Previous experience of designing, planning, and delivery of teaching and/or effective demonstrating of complex techniques/methods.
6. Previous experience of team management/supervision.
7. Up-to-date knowledge in the fields of phage biology, microneedle fabrication and testing, and acne treatments.