Job Title: Research Associate in Pathogen Bioinformatics

Department/Division/Faculty: Infectious Diseases and Immunity

Campus location: Hammersmith campus

Job Family/Level: Research, Research Associate

Salary Range: £37,486 - £46,499 per annum

Responsible to: Professor Shiranee Sriskandan

Line Management responsibility for: N/A

Key Working Relationships (internal): Dr Elita Jauneikaite, Imperial Research Fellow, Drs Sally Zhi, and Ho Kwong Li and Sriskandan research group

Key Working Relationships (external): Prof Neil Woodford, Public Health England (PHE), PHE collaborators, WT Sanger Institute collaborators, Prof Julian Parkhill

Contract type: Full time, fixed term for up to one year

Research Programme

Imperial College London is one of the world’s leading research-intensive universities, and is distinguished by its focus on Science, Engineering, Medicine and Business. The College’s approach to research is to foster strength in core disciplines through academic departments and address major global challenges through multi-disciplinary research institutes and centres. The National Institute for Health Research (NIHR) has funded the development of a number of Health Protection Research Units (HPRUs) in key priority areas. These Research Units are collaborations between Universities, Public Health England (PHE) and other partner organisations and aim to provide centres of excellence in multi-disciplinary health protection research. The NIHR Health Protection Research Unit in Healthcare Associated Infections and Antimicrobial Resistance at Imperial College London is a collaboration between Imperial College London, Public Health England, the Wellcome Sanger Institute, The NWL Academic Health Sciences Network and Cambridge Veterinary School and its aim is to conduct a range of multidisciplinary research in the field of drug resistant infections.

Purpose of the Post

The person appointed to this post will investigate genomic data acquired by the Health Protection Research Unit (HPRU) team at Imperial pertaining to pathogens including *Escherichia coli*, *Streptococcus pyogenes*, *Staphylococcus aureus*, *Clostridium difficile* and others.

The main focus of work will involve identification of prevalent or novel genomic markers of resistance in clinical *E. coli* strains, focussing on those resistance phenotypes identified to be of increasing or future concern in the healthcare settings.

Notably there will be opportunity to be involved in a number of other projects, specifically the linkage of genomic markers to markers of disease severity or fitness within the population (*E. coli*, *C. difficile*, *S. pyogenes*) and spread of AMR among Gram negative bacteria. As part of the HPRU’s remit, responsiveness to events that are relevant to public health may on occasion necessitate flexibility to accommodate new or unforeseen research efforts, for example in the case of outbreaks occurring in the local healthcare system.

Central to the work are existing clinical isolate datasets of >2000 *E. coli* genomes, >700 *S. pyogenes* genomes, 400 *C. difficile* genomes, plus a planned set of 200 *S. aureus* genomes from Imperial’s Bioresource in Adult Infectious Disease. Specific phenotypic markers of resistance and bacterial fitness
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(including toxin production) are the focus of laboratory-based projects being conducted within the Unit and the candidate will be expected to work within the group collaboratively. The Wellcome Trust Sanger Institute is a key collaborator of the NIHR HPRU and has supported a significant amount of sequencing, in addition to sequencing undertaken within Imperial’s Biomedical Research Centre (BRC)-supported sequencing facility.

For those with interests supplementary to pathogen genomics, additional opportunities lie in datasets of human RNAseq and genomic data relating to Sepsis within the same Bioresource that will become available later this year.

The candidate appointed to this post will primarily be focused on analyses of pathogen genomic datasets and therefore must have prior experience in microbial genomics, handling large sequence datasets, phylogenetics, use of appropriate computational tools, and writing of bespoke scripts in a computer programming language such as Python, R, etc. They should ideally have strong scientific writing skills so they can take the lead on presentation and writing up the findings of work for publication in peer-reviewed journals.

The person appointed to this post will actively participate in Theme 1 Applied Molecular Bacteriology group research meetings, contribute to departmental research meetings and attend/contribute to a journal club run by students, research assistants and post-docs from multiple research groups in the section. In addition to academic support for participation in such events, there are many opportunities within the Faculty of Medicine for career development, including an active post doc community, courses and workshops run by the Postdoc and Fellows Development Centre, fellowship mentoring, and participation in outreach events.

### Key Responsibilities

**Research Duties**

- To conduct data analyses related to comparative genomics, phylogenetics and statistical analyses.
- To collaborate with HPRU and group members productively to yield meaningful outputs.
- To take initiatives in the planning of research and data analyses.
- To help maintain genome sequence data to a high standard.
- To provide guidance related to database management and computational analyses to other group members.
- To work with diligence and accuracy at all times.
- To maintain a system of checks and balances in their work to ensure the validity and reliability of data at all times.
- To maintain accurate and complete records of all findings.
- To write clear and accurate reports or data summaries for use within the research group.
- To present research findings to local colleagues via regular departmental meetings.
- To present research at national and international workshops and/or conferences.
- To write and submit manuscripts for publication in scientific journals.
- To collaborate with other scientists nationally and internationally as appropriate for the advancement of the research.
- To assist in the supervision of undergraduate and postgraduate research students and research assistants as required.
- To develop contacts and research collaborations within the College and the wider community.
- To promote the reputation of the Group, the Department and the College.
- To participate in Group/Unit research meetings and internal seminars.
- To comply with the College, Division, and Unit safety practices and to attend courses on safety when appropriate.
- Any other duties as may be deemed reasonable by Head of group as well as Head of Division/Department/Section.
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**Other Duties**

- To undertake appropriate administration tasks
- [For members of staff who have responsibility for collecting, inputting and maintaining data] To be responsible for ensuring that data is accurate, up-to-date and complete.
- To attend relevant meetings
- To undertake any necessary training and/or development
- Any other duties commensurate with the grade of the post as directed by line manager / supervisor

### Person Specification

**Requirements**
Candidates/post holders will be expected to demonstrate the following:

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<tr>
<th>Requirement</th>
<th>Essential (E)/Desirable (D)</th>
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<tr>
<td><strong>Education</strong></td>
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<tr>
<td>PhD and/or equivalent experience in computational biology and genomics (or related discipline)</td>
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<td><strong>Knowledge &amp; Experience</strong></td>
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<tr>
<td>Extensive experience using computational tools to analyse genome sequence data</td>
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<td>Experience working with large datasets</td>
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<td>Experience writing bespoke computer scripts in a programming language such as Python, R, etc.</td>
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<td>Experience in <em>E. coli</em> and streptococcal genomics and/or other bacterial genomics</td>
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<td>Experience with supervision of undergraduates, postgraduates and/or research assistants</td>
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<tr>
<td>Detailed knowledge of and expertise in analysing genome sequence data</td>
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<td>Practical experience using a broad range of computational tools to analyse data</td>
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<td>Knowledge of research methods and statistical procedures</td>
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<td>Practical experience within a research environment</td>
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<td>Publications in relevant and refereed journals, ideally with some as lead author</td>
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<tr>
<td>Expertise analysing streptococcal genomes or bacterial genomes in particular</td>
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<td>Knowledge and expertise specifically related to AMR and enterobacteriaceae</td>
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<td><strong>Skills &amp; Abilities</strong></td>
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<td>Ability to conduct a detailed review of recent literature</td>
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<td>Ability to develop and apply new concepts</td>
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<td>Creative approach to problem-solving</td>
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<td>Excellent verbal communication skills and the ability to deal with a wide range of people</td>
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<td>Excellent written communication skills and the ability to write clearly and succinctly for publication</td>
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<td>Ability to organise own work with minimal supervision</td>
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<td>Ability to prioritise own work in response to deadlines</td>
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<td>Advanced computer skills, including word-processing, spreadsheets and the Internet</td>
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<td><strong>Personal Attributes</strong></td>
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<td>Willingness to work as part of a team and to be open-minded and cooperative</td>
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<td>Flexible attitude towards work</td>
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<td>Discipline and regard for confidentiality and security at all times</td>
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<td>Willingness to work out of normal working hours (including weekends) if the requirements of the project demand</td>
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- Willingness to undertake any necessary training for the role
- Willingness to travel both within the United Kingdom and abroad to conduct research and attend conferences

Please note that job descriptions cannot be exhaustive and the post-holder may be required to undertake other duties, which are broadly in line with the above key responsibilities.

Imperial College is committed to equality of opportunity and to eliminating discrimination. All employees are expected to follow the 7 Imperial Expectations detailed below:

1) Champion a positive approach to change and opportunity
2) Communicate regularly and effectively within and across teams
3) Consider the thoughts and expectations of others
4) Deliver positive outcomes
5) Encourage inclusive participation and eliminate discrimination
6) Support and develop staff to optimise talent
7) Work in a planned and managed way

Employees are also required to comply with all College policies and regulations paying special attention to:

- Confidentiality
- Conflict of Interest
- Data Protection
- Equal Opportunities
- Financial Regulations
- Health and Safety
- Information Technology
- Smoking
- Private Engagements and Register of Interests

They must also undertake specific training and assume responsibility for safety relevant to specific roles, as set out on the College Website Health and Safety Structure and Responsibilities page.