**ROLE PROFILE**

**Job Title:** Research Associate/Fellow in Artificial Intelligence to predict bacterial infection and antibiotic resistance

**School/Department:** School of Veterinary Medicine and Science

**Job Family and Level:** Research & Teaching Level 4

**Contract Status:** Fixed-term until 31 July 2020

**Hours of Work:** 1.0FTE, Full-time

**Reporting to:** Dr Tania Dottorini

**Location:** Sutton Bonington Campus

**Purpose of the New Role:** Research

**Project:** CARE Bangladesh: Cholera Antibiotic REsistance in Bangladesh: big data mining and machine learning to improve diagnostics and treatment selection.

**Main duties and responsibilities:**

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<tr>
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<th>Description</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>1</td>
<td>To conduct research at the highest level in accordance with the aims and objectives of the project and produce useful outputs of impact that lead to peer-reviewed publications of international quality</td>
<td>80%</td>
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<td>2</td>
<td>To contribute to research supervision and training of undergraduates and postgraduates, and to contribute to the development of the research group and the School.</td>
<td>5%</td>
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<td>3</td>
<td>To operate as an effective team player within the group and to be accountable to the line manager on the progress and daily running of the project.</td>
<td>5%</td>
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<td>4</td>
<td>To contribute to administrative work related to the research group.</td>
<td>5%</td>
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<td>5</td>
<td>To update professional skills as appropriate and relevant in support of research excellence.</td>
<td>5%</td>
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**Knowledge, Skills, Qualifications & Experience:**

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<tr>
<th>Qualifications/ Education</th>
<th>Essential</th>
<th>Desirable</th>
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<tr>
<td><strong>Qualifications/ Education</strong></td>
<td>Award PhD (or very close to completion) in Machine Learning, Statistics, Mathematics, Computer Science, Engineering, Physics, Computational Biology or other relevant field</td>
<td>Covered post-doctoral position in data science preferably with applications in infectious diseases and/or antibiotic resistance</td>
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<td><strong>Skills/Training</strong></td>
<td>In-depth expertise in the use of advanced statistics, machine learning and data mining methods</td>
<td>Expertise in the development of diagnostics or forecasting tools</td>
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<td>Strong programming skills in Python, Matlab, R or other equivalent</td>
<td>Knowledge of the mechanisms underlying infectious diseases and antibiotic resistance</td>
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Expertise in the analysis of genome sequence data and geolocalised data (environmental, societal, demographic)

Expertise in the use of machine learning and advanced statistical modelling for the analysis of bacterial whole genome sequencing and metagenomic data

Experience with deep learning architectures

Evidence of publications in any of the essential or preferable listed subjects

Post-doctoral research experience

Experience of working in a multidisciplinary team

Experience of collaboration within research projects dealing with antibiotic resistance in humans

Commitment to delivering the aims of the project in the epidemiology of bacterial infections and antimicrobial resistance

Ability to work to deadlines and prioritise tasks

Highly motivated, able to work independently, as well as highly effectively in interdisciplinary teams.

Excellent written and oral communication and presentation skills in English

Interest in bacterial infections, antibiotic resistance

Experience

Personal Attributes

Project Summary:

The aim of the project is to develop a portable, real-time diagnostics solution for the detection of cholera (Vibrio cholerae) infections and Antibiotic Resistance (ABR) profiles using predictive modelling powered by machine learning and cloud computing.

The successful candidate will work closely with an interdisciplinary and international team with members and institutes in USA, UK and Bangladesh, including UNICEF, University of Maryland, University of Nottingham. The project requires a unique combination of expertise in machine learning, statistical and mathematical modelling, bioinformatics, Nanopore sequencing, cloud computing, microbiology.

The successful applicant will use machine learning and advanced statistical analysis to identify and validate, together with experts in epidemiology, machine learning, mathematical modelling, bioinformatics and cloud computing, new diagnostics biomarkers to diagnose infection, recognise specific Vibrio cholerae strains, detect ABR profiles and suggest targeted treatment. This will be done by developing diagnostic models powered by machine learning, created by data mining clinical, geo-localised data (environmental, societal, demographic) and DNA sequencing information.

The Applicant must have, or be very close to completing, a PhD in in Machine Learning, Statistics, Mathematics, Computer Science, Engineering, Physics, Computational Biology or other relevant field. The candidate must have knowledge and experience in statistical modeling, machine learning and data mining methods and algorithms for processing heterogeneous, complex large-data, including DNA sequencing, and biological data. Research experience in applying such methods in antibiotic resistance, bacterial infections would be desirable. Experience in Artificial Intelligence techniques such as deep learning is desir.

The Applicant must be able to demonstrate strong programming skills in Python, Matlab, R or other equivalent. Evidence of publications in any of the listed fields. The applicant must also be able to demonstrate research ambition through timely publication of research, coupled with commitment to the research project as part of their on-going career development. Excellent oral and written English language skills are essential.
Informal enquiries may be addressed to Dr. Tania Dottorini: tania.dottorini@nottingham.ac.uk. Please note that applications sent directly to this Email address will not be accepted.