

## JOB DESCRIPTION & PERSON SPECIFICATION

**1. Job title:** Postdoctoral researcher- Bacteriology    **Centre:** CCR 30    **Group:** Specialist  
**Location:** HQ

**Reports to (Job title):** Richard Harrison                      **Line Manages (Job titles):** Technician

### 2. Main purpose of role:

NIAB is the UK's fastest growing crop science organisation, with rapidly expanding research capabilities in plant genetics, agronomy, farming systems and data science, the largest national field trials capability, and strong research links with industry, Government and academia. With headquarters in Cambridge, and regional offices across the country, employing around 400 people across the UK, NIAB provides scientific research, technical services and practical advice to improve the yield, efficiency and resilience of crop production across the arable, forage and horticulture sectors. NIAB (Cambridge, UK) is an Independent Research Organisation eligible for competitive BBSRC funding calls. Research departments at NIAB's sites in Cambridge and East Malling have more than 40 current BBSRC grants.

Pathogens are a constant threat to society and in the past have led to profound changes to our civilisation. Despite many advances in disease control, plant pathogens remain of great concern to the security of our food production, but the predication of the host range and pathogenic 'potential' of microbes remains elusive.

Working within the data sciences department, NIAB is seeking a talented and motivated postdoctoral informatician to investigate machine-learning approaches to predict host range from genome sequence using the bacterial plant pathogen *Pseudomonas* as a model, building on previous work- e.g. Hulin et al. (<https://doi.org/10.1111/ppa.13189>, <https://doi.org/10.1111/nph.15182>, <https://doi.org/10.1111/ppa.12834>).

As part of this collaboration you will undertake longitudinal sampling of wild and cultivated populations of perennials (*Prunus*) and sample the diversity, heterogeneity and pathogenicity of *Pseudomonas* populations. Through genome sequencing of upto 1000 strains you will explore the genomic features within these populations and apply methods to understand gene flow and environmental reservoirs of plant pathogenic and epiphytic bacteria. Working collaboratively with colleagues at our East Malling site you will ask questions about how changing commercial practice alters epiphytic bacterial populations. Working with colleagues at the university of Birmingham you will assess whether there are key adaptations for epiphytic survival on the leaf surface and whether these are transmitted by mobile genetic elements as well as collaborating to understand adaptive potential through experimental evolution. Working with your colleagues in NIAB you will explore whether machine learning (AI) approaches can be used to identify host range.

The job will involve a diverse skill set which will set up an early career researcher interested in pursuing a career in molecular genetics and pathology.

Applicants with particular expertise in the following areas are encouraged apply:

- Molecular plant-microbe interactions using a bacterial system (population dynamics, pathogenicity tests)
- Molecular biology and bacteriology (conjugation, gene deletion, mutagenesis and gene expression)
- Effector cloning and functional characterisation, analysis of plant responses
- Genome sequencing using illumina and nanopore platforms
- Informatics skills (genome assembly, annotation and comparative genomics)

You will be expected to contribute their own innovative ideas, resulting in potential independent projects. The postholder will be expected to write scientific research papers and present results at conferences. You must be comfortable working at the interface of disciplines in a constructive and collaborative manner.

NIAB is committed to equal opportunity and gender balance and is also recognised by the commitment to work with international partners as evidenced by the number of Newton and GCRF current projects on global staple crops.

**3. Financial authority/responsibility** (e.g. delegated budget, authorisation level, approx value of contracts etc):

**4. Key relationships** (external and internal):

**Line manager, PDRA's (lab and informatics), collaborators, external stakeholders**

<b>Tasks/responsibilities</b> (in order of priority)	Approx % of time
Field sampling	20
Genome sequencing	20
Functional characterisation and molecular pathology	40
Basic informatics analysis	10
Publications and communications	10

**6. Working conditions :**

Role will include working in the office, lab and field. Flexible, agile working is required. Travelling where necessary to represent NIAB nationally and internationally is of great importance as is the requirement to work to short deadlines and with variable workloads.

**7. PERSON SPECIFICATION****Education/Qualifications:**

Essential:	Desirable:
<ul style="list-style-type: none"> <li>BSc in relevant discipline (2.1 or above).</li> <li>PhD in plant science or microbiology.</li> </ul>	Membership of professional bodies, evidence of recognition within research field through awards and committee membership.

**Experience:**

Essential:	Desirable:
<ul style="list-style-type: none"> <li>An established track record of high quality research output, with publications in high-impact factor journals.</li> <li>Supervision of undergraduate and postgraduate research projects.</li> </ul>	<ul style="list-style-type: none"> <li>Line management experience.</li> <li>PhD student supervision.</li> <li>Experience preparing successful and/or large bids for UK and EU funding bodies (e.g. BBSRC)</li> <li>Membership of boards and technical consulting experience.</li> </ul>

**Specialist Training:**

Essential:	Desirable:
<ul style="list-style-type: none"> <li>Full UK driving license (required for commuting to trial/sample sites)</li> <li>Molecular bacteriology and pathogenicity testing</li> <li>Cloning and gene disruption in bacterial systems</li> <li>General molecular biology techniques (western blotting, qPCR, in situ hybridisation etc.).</li> </ul>	<ul style="list-style-type: none"> <li>Effector characterisation</li> <li>Experience with bacteriophages</li> <li>Confocal microscopy experience</li> </ul>

**Personal Qualities (skills, behaviours and competencies)**

Essential:	Desirable:
<ul style="list-style-type: none"> <li>Excellent writing and communication skills evidenced through a substantial number of peer reviewed publications.</li> <li>A creative research vision for development, implementation and delivery of successful research projects.</li> <li>An ability to communicate complex</li> </ul>	<ul style="list-style-type: none"> <li>Experience in bacterial nitrogen fixation.</li> <li>Management and leadership experience.</li> <li>Budget control experience.</li> <li>Working in an open and transparent way, providing information and communicating effectively with colleagues.</li> <li>Evidence of continuous Professional</li> </ul>

<p>conceptual ideas to widely divergent audiences.</p> <ul style="list-style-type: none"><li>• A positive contribution to Institute activities and funded initiatives including open days, workshops etc. and expectation to undertake administrative activities.</li><li>• Collaborative working, particularly on interdisciplinary topics.</li><li>• Ability to respond quickly to externally imposed deadlines.</li><li>• Ability to travel at short notice and to occasionally work unsocial hours.</li></ul>	Development.
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**Date of description:** July 2020

**Compiled by:** Richard Harrison