



**Bioinformatician
BAND 7**

Job Summary

- Responsible for providing day-to-day running, monitoring, support, and maintenance of bioinformatics processes for all activities relevant to the pathogen genomics services run within the Unit.
- Develop advanced, service delivery-level bespoke bioinformatics analysis software and pipelines, particularly with a pathogen-agnostic, metagenomics focus, and work with the management team in the roll-out of new bioinformatic methods.
- Undertake research projects, primarily centred on the identification and characterisation of unknown microbial isolates, to understand infection processes and improve surveillance, leading towards reduction in the burden of disease.
- Our organisational values of **Working Together, with Trust and Respect, to Make a Difference**, underpinned by our [Being Our Best Framework](#) set out how we are expected to undertake our roles. The colleague group which applies to this role is Colleague.

Responsible to

Reporting:

Senior Bioinformaticians

Accountable:

Senior Bioinformaticians

Professionally:

Head of Pathogen Genomics Unit

Responsibilities and Duties

Specialist Bioinformatic Analysis and Routine Service Delivery

- Develop new bioinformatic pipelines, with a focus on pathogen-agnostic and metagenomics approaches, as requested by the Senior Bioinformaticians and Head of Unit, in support of service development/improvement.
- Develop bioinformatics approaches and undertake routine and specialist bioinformatic analyses, interpretation and reporting in the Unit.
- Use initiative and apply specialist knowledge of bioinformatics, statistical analysis, data mining and programming to make decisions on how to obtain required results in line with the Unit's procedures and protocols, ensuring timely delivery of high-quality information.
- Undertake specialist testing and evaluation requiring a higher level of professional expertise e.g. validation and assessment of bioinformatic tools, pipelines, and resources applicable to aid in the interpretation of results.
- Undertake more complex specimen processing, under specialised conditions e.g. processing of samples for next generation sequencing.
- Analyse molecular laboratory-generated data, including pathogen genomics data, and identify processes for assay improvement and development.

- Carry out, interpret, and report advanced bioinformatics procedures and investigations, including the molecular identification and characterisation of pathogens, in accordance with Unit policies and protocols.
- Responsible for leading on identifying how to use data innovatively but ethically to derive the most benefit for the patient.

Systems Management

- Lead the development, implementation, population, maintenance, and utilisation of NGS analysis software and databases.
- Develop databases and spreadsheets for the storage and analysis of results, and analyse large genomics datasets within these databases using general and specialist software.
- Initiate, develop, maintain, and support interfaces for external IT systems and databases.
- Ensure data accuracy when entering relevant information and analyses into the laboratory information system and project databases, and external databases e.g. NCBI databases in line with the Data Protection Act.
- Evaluate the technical requirements of new equipment and consumable items, leading on the design, troubleshooting and documentation of procedures for analysing various sources of IT issues when an NGS pipeline (e.g.) is not working as it should.
- Respect and safeguard confidentiality and sensitive information.

Communication

- Work collaboratively with other colleagues, both within the Unit/PHW and externally (e.g. other Public Health Agencies/UK government organisations or internationally), on bioinformatics development projects, taking initiative and co-ordinating efforts effectively across the group.
- Communicate complex data and information, including developments in bioinformatics, clearly and concisely to staff across the Department.
- Collaborate with senior bioinformatics colleagues to produce and present complex laboratory-generated data and information for publication in peer-reviewed scientific journals.
- Collaborate with senior bioinformatics colleagues to produce and present complex laboratory-generated data and information to others e.g. at consortium meetings, conferences and scientific meetings (large groups) both nationally and internationally.
- Take telephone messages, log accordingly, and either provide information or pass on to the appropriate member of staff in accordance with laboratory policies and protocols.
- Identify and communicate urgently to line manager / CS any results that may have a significant effect on patient management or the control of infection and disease.

Research and Evaluation

- Undertake specialist research projects, particularly those with a metagenomics focus, and report findings to stakeholders, including funders.
- Assist in writing grant applications for research projects to obtain further funding, and drafting reports for funding bodies.
- Jointly responsible for the scientific and technical evaluation of the performance and suitability of new laboratory/bioinformatic methods
- Participate in the development, evaluation, and implementation of new genomic methods in the Pathogen Genomics Unit
- Propose, evaluate, validate, and implement changes to existing bioinformatic methods.

Improvement and Monitoring

- Responsible for maintenance of consumables and equipment for research and development projects.
- Write and maintain documentation, including SOPs, on bioinformatic protocols, in collaboration with members of the local management team and external collaborators.
- Responsible for writing and maintaining accurate records of service improvements and their validation to comply with ISO15189 (UKAS) accreditation.
- Operate, monitor, and undertake routine daily maintenance of high value molecular laboratory equipment including computers/HPC infrastructure/cloud provisions.
- Collaborate with the Unit Head and Senior Bioinformaticians to maintain a Bioinformatics Quality Management System in compliance with external accredited regulatory bodies.
- Assist in the development of internal bioinformatic QC schemes, and assessment of internal and external QC assessments.
- Maintain high professional standards by continual professional development keeping up to date with advances in pathogen genomics and NGS technology.
- Maintain a safe environment and to ensure that procedures and competencies are compliant with relevant policies.
- Liaise with senior Bioinformatics colleagues and external contacts regarding the technical issues of new tests/procedures undertaken and equipment used, including obtaining quotes and specifications for new equipment as requested by the Head of Unit.

Training and Supervision

- Prioritise and organise own work through liaison with senior staff.
- Supervise day-to-day activities of junior bioinformatics team members and provide support and guidance for their professional development.
- Lead on the provision of basic and specialised training in bioinformatics to various staff groups or students (as required).
- Provide technical guidance and training to others (e.g. within Public Health Wales Microbiology on bioinformatic procedures).
- Supervise visiting scientists as required.

PERSON SPECIFICATION

Qualifications and Knowledge

Essential

- Honours degree in Medical Microbiology or Molecular Biology or equivalent experience
- Post graduate qualification (e.g. MSc) in a relevant subject or equivalent experience.
- Demonstrable knowledge and understanding of bioinformatics methods to analyse genomics data, including using metagenomic and pathogen-agnostic characterisation approaches.
- Demonstrable understanding of theoretical knowledge underpinning conventional DNA sequencing and genomics analysis approaches.
- Excellent understanding of microbiology of disease and disease processes, including molecular microbiology, metagenomics, molecular epidemiology and phylogenetic analysis.
- Understands and can apply the principles of good laboratory and clinical practice, and quality assurance.

Desirable

- Evidence of continuing professional development evidenced by Professional Portfolio developed within an appraisal framework.
- Comprehensive knowledge of PC, server, storage & networking hardware, ethernet TCP/IP networking and Active Directory.
- Thorough understanding of how pathogen genomics and microbiological principles can be applied within healthcare and public health surveillance settings

Experience

Essential

- Experience in analysing metagenomics data
- Current evidence-based practical experience in software/pipeline development to analyse DNA sequence data using at least one of C/C++, Python or Java.
- Evidence of project-based research work, analysing large and complex datasets (including high-throughput sequencing data) where material is conflicting and drawn from multiple sources
- Demonstrable experience of participating in and co-ordinating successful, collaborative, team projects in complex and challenging environments
- Application of bioinformatics tools to analyse genomics data using the UNIX command line
- Experience of using systems for versioning software (ideally git)

Desirable:

- Experience of implementing and querying SQL and NoSQL databases
- Experience working in a professional software development environment including procedures such as software versioning, generation of documentation and commenting of code
- Experience of developing pipelines using workflow manager languages, e.g. Nextflow
- Experience developing software within containers or virtual machines and configuration and software maintenance of UNIX servers

Skills and Attributes

Essential

- Ability to supervise junior colleagues and provide technical instructions and training on relevant aspects of bioinformatics.
- Ability to work reliably, effectively and efficiently, using own initiative to recognize problems and generate potential solutions, and making informed decisions in the absence of required information
- Ability to work calmly under pressure and to tight deadlines, correctly prioritising tasks and providing timely responses to urgent matters
- High level of literacy, numeracy, and attention to detail, particularly to communicate scientific/ clinical information to inform work colleagues or external contacts.
- Ability to demonstrate understanding and application of our workplace values, together with the underpinning behaviours identified for success in this role.

Desirable

- Welsh Language Skills are desirable at level 1 in understanding, speaking, reading, and writing in Welsh

Other

- Prepared to work flexibly throughout the laboratory to meet the needs of the service.