Informatics Fellowship Position Duties.

Rev. April 2024

Position Description:

Under the direction of the Medical Director, and in collaboration with public health laboratory scientists, epidemiologists, administrators and information technologists, the Informatics Fellows will envision solutions, opportunities and application of information technology in public health, define and design health data standards and transformation (i.e. HL7, ICD, SNOMED) and health domain integration (ELR, HER, CMS, HIE, surveillance, demographics, social media) and define and design methods for public health laboratory functions, data elements, data flow, case definitions and message mapping and health systems and data interoperability. The Informatics Fellows will oversee information technology functions related to design and implementation of databases, tables, columns, data formats and keys for linking tables and data to support defined health data standards and integration and implementation and enforcement of data systems and communications security, and information technology for data elements data flow and case definitions.

The successful candidates will have broad knowledge of public health practice, proficiency in information technology and capacity for innovation. The candidates will have expertise in health data standards, database design, and data linking integration across health systems, expertise in relational/SQL databases, and unstructured data design and management. The candidate will have knowledge of health data privacy, an understanding of IT security functions, and expertise in managing IT systems development.

Job Responsibilities:

- Gain an overall knowledge of PHEL operations in Foodborne/Enterics/Whole Genome Sequencing, Mycobacteriology, Biothreat Response Laboratory, STD, Special Bacteriology, Molecular Virology and Viral Serology laboratory units through shadowing, review of SOPs and mentoring from program managers and staff.

- Participate in programmatic conference calls with CDC as required.

- Construct pipelines and workflows for sequence analysis and building custom algorithms and tools for specific problems.

- Conduct genomic inquiry on the evolution of viruses, bacteria, and fungi to detect and assess the risk of new emerging strains/variants to current vaccines.

- Analyze next generation sequence data from routine and enhanced state, national and global surveillance using spatiotemporal, phylodynamic, and epidemiologic approaches to determine trends that can be used in making decisions about prevention, treatment and control of epidemics or pandemics.

- Use mathematical and computational approaches to understand the evolutionary and epidemiological patterns of bacteria, fungi, and viruses.

- Ensure the appropriate genomic analysis methods, procedures, techniques, and applicable quality controls are correctly conducted by referring to standard protocols.

- Prepare reports, summaries, presentations, and other documents to highlight findings, accomplishments, and surveillance data.

- Perform Genome assembly of next generation sequencing from Illumina and Minion (Oxford Nanopore)

- Create comparative analysis and visualization of microbial genomes with Integrative Genomics Viewer (IGV) and Sam tools;

- Implement analysis with Linux, command-line interfaces, and automation via Shell scripting.

- Maintain competence in programming (R, Python, Perl, etc.), version control (GIT) & best practices and current understanding of data management fundamentals (SQL, relational model, OLAP); Implementation of workflow management tools (e.g., Snakemake, Nextflow)

- Create and render data visualization with business intelligence tools (e.g., Tableau, PowerBI, R Shiny)

- Gain exposure and advancing literacy with distributed and parallel computing (Spark, Hadoop, AWS (Amazon web service), Grid Engine / HPC (High Performance Computing)