

Minimum Competencies for AMD Workforce Development Leads

ELC Project D: Advanced Molecular Detection | CK24-0002 Budget Period 3

Minimum Competencies for AMD Regional Training Leads (ALL)

- i. **Program Leadership:** Experience or skills managing the design of comprehensive training programs for pathogen genomic surveillance and outbreak response.
- ii. **Curriculum Development:** Experience overseeing the delivery of educational materials, such as modules and courses, to train public health professionals to analyze and interpret genomic data.
- iii. **Needs Assessment:** Ability to collaborate with Regional Co-Leads to conduct landscape analyses and other needs assessments to identify skills and knowledge gaps in the public health workforce, which will inform educational offerings.
- iv. **Delivery of Training:** Experience or knowledge of hosting training sessions on bioinformatics, next-generation sequencing (NGS), and genomic surveillance techniques.
- v. **Workforce Development:** Experience in building workforce capacity to handle complex genomic data and contribute to public health responses.
- vii. **Mentorship:** Ability to provide annual training or mentorship in sequencing and bioinformatics—either in-house or remotely—for novice, intermediate, and advanced staff.
- viii. **Professional Development:** Commitment to ongoing learning by attending conferences and workshops.
- viii. **Collaboration and Outreach:** Experience serving as a liaison between laboratory scientists, bioinformatics specialists, and health department staff, including maintaining communication channels. Additional experience recruiting speakers for training activities.

Minimum Competencies for AMD Genomic Epidemiology Training Leads (GETL)

- i. All competencies outlined under “AMD Regional Training Leads (ALL)”
- ii. **Data Management:** Advanced knowledge and skills in data quality assessment and management, data analysis and report generation.
- iii. **Genomic Data:** Advanced knowledge and application of genomic data for phylogenetic and phenotypic inferences for conducting surveillance and outbreak response; familiarity with bioinformatics pipelines.
- iv. **Data Linkage and Integration:** Experience linking genomic data with epidemiological and clinical metadata. Integration of genomic tools into disease surveillance and outbreak response.
- v. **Study Design & Data Analysis:** Experience analyzing linked genomic and epidemiologic data together using a variety of methods and visualizations. Familiarity with core principles of epidemiology and their application to genomic surveillance and outbreak response.
- vi. **Molecular Methods:** Experience in next-generation sequencing (NGS) and other molecular testing methodologies, bioinformatics software packages, and the analysis and interpretation of sequencing results.
- vii. **Delivery of Training:** Ability to train both general and AMD workforce on key concepts and applications of genomic epidemiology to aid integration into surveillance and infectious disease programs.
- viii. **Workforce Development:** Demonstrated experience with delivering highly technical training and communicating scientific information to general and AMD workforce.
- ix. **Evaluation:** Experience developing detailed work plans that highlight training goals, including impact and outcome measures, and identifying dedicated resources.
- x. **Collaboration:** Proven ability to work effectively with a multidisciplinary workforce, including past partnerships with lab scientists, epidemiologists, and bioinformatics staff.
- xi. **Written and Oral Communication:** Ability to summarize and present genomic data to technical and non-technical audiences.
- xii. **Consultation:** Ability to assess and advise on the use of sequencing and analytics to address state, local, and territorial investigations of various emerging infectious pathogens.

Minimum Competencies for AMD Bioinformatics & Laboratory Training Leads (BTL)

- i. All competencies outlined under “AMD Regional Training Leads (ALL)”.
- ii. **Technical Consultation:** Experience providing technical expertise related to laboratory methods, bioinformatics, data science, and other AMD technologies to both emerging and established public health laboratories and health departments.
- iii. **Mentorship:** Experience providing structured mentorship or cross-cutting training and/or consultations for a multidisciplinary workforce.
- iv. **Assessment and Evaluation:** Ability to assess training effectiveness, implement improvements, and evaluate competencies to enhance workforce development capacity.
- v. **Collaboration:** Proven ability to work collaboratively with multidisciplinary workforce including lab scientists, epidemiologists, and bioinformatics staff across public health organizations.
- vi. **Partnership Development:** Skills in building and maintaining partnerships with academic institutions and CDC/partner programs.
- vii. **Feedback Mechanisms:** Ability to establish processes to receive and incorporate feedback from training participants.
- viii. **Data Governance:** Experience in data sharing, storage, and training other groups on data use.
- ix. **Pipeline Development:** Experience in creating reproducible, scalable workflows.

Minimum Competencies for AMD Bioinformatics Regional Resource Lead (BRR)

- i. **Leadership:** Experienced in leadership, including time management, project management of multiple projects, self-motivation, teamwork across the organization and/or region, and interdisciplinary thinking.
- ii. **Bioinformatics:** Expert-level experience using sequence alignment tools, genome analysis tools, and an advanced understanding of data analysis. Advanced knowledge of biological concepts, genetic data, data storage, and analyzing large datasets.
- iii. **Computational:** Advanced knowledge and experience with programming languages, software engineering, system administration, machine learning, open-source software repositories, high-performance computing, data mining, and the ability to use scientific statistical analysis software.
- iv. **Technical Consultation:** Experience providing technical expertise related to bioinformatics, data science, and other AMD technologies to public health laboratories and health departments.
- v. **Needs Assessment:** Ability to collaborate with Regional Co-Leads to conduct landscape analyses and other needs assessments to identify skills and knowledge gaps in the public health workforce, which will inform educational offerings.
- vi. **Workforce Development:** Experience in building workforce capacity to handle complex genomic data and contribute to public health responses.
- vi. **Mentorship:** Ability to provide annual training or mentorship in sequencing and bioinformatics—either in-house or remotely—for novice, intermediate, and advanced staff.
- viii. **Outreach:** Experience serving as a liaison between laboratory scientists, bioinformatics specialists, and health department staff.
- ix. **Collaboration:** Proven ability to work collaboratively with multidisciplinary workforce including lab scientists, epidemiologists, and bioinformatics staff across public health organizations.
- x. **Written and Oral Communication:** Ability to communicate complex scientific concepts to multiple audiences.