Advanced Molecular Detection

National investment to advance genomic sequencing capacity

Western Region

California

Total Investment[1]: $53,584,514 *

State and Local Investment: $38,041,273

Research Awards: $15,543,241

CDC's Advanced Molecular Detection (AMD) program builds and integrates laboratory, bioinformatics, and epidemiology technologies across CDC and nationwide. Since 2014, AMD has received support from Congress through an annual appropriation of $30 million—which was raised to $35 million in 2022—to implement these technologies in public health programs. Through investments in AMD technologies, CDC is improving both public health outcomes and preparedness in dozens of areas including foodborne disease, influenza, antibiotic resistance, hepatitis, pneumonia, and meningitis.

With funding from the American Rescue Plan Act of 2021, the AMD program has developed a multi-year plan to expand its support to state, local, and territorial public health laboratories with more staff and resources to collect specimens for COVID-19 testing, sequence them to identify and track SARS-CoV-2 variants, and share data, now and future years. The investment above includes supplemental funding for facility construction and renovation needs.

Workforce Development

California is part of the Western region. In 2018, the AMD program established seven workforce development regions across the country. Each region has an AMD training lead and a bioinformatics lead. This provides a network of customized AMD support which helps develop skills and provides training assistance to public health labs across the country.

Through the Western region's training resources, California receives lab support on data analysis and how to interface with IT departments. They also receive both pathogen-specific training and cross-cutting instruction to help staff develop the critical skills necessary to extract, analyze, and interpret sequencing data.

* Investments listed above do not include Los Angeles County which receives direct financial support through the ELC Cooperative Agreement.

1 Funding to public health departments includes support from the American Rescue Plan of 2021, AMD annual appropriations, and NCEZID annual appropriations. Awards to university and research partners were funded through appropriations supporting the COVID-19 response.

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University and Research Partners in California

These awards are intended to fill knowledge gaps and promote innovation in the U.S. response to the COVID-19 pandemic. Funding awards are determined through a competitive selection process based on scientific needs and available funds.

Helix OpCo, LLC

Genomic surveillance of respiratory pathogens with an integrated clinical dataset across a multi-site network of health systems (2022—$5,000,000)

Helix OpCo, LLC (Helix), as part of efforts to create and support a national pandemic early warning system, will build a pan-respiratory virus surveillance program to standardize linkage of virus sequence data to key clinical and demographic data across a multi-site network. This project is jointly supported by the Center for Forecasting Analytics and the Office of Advanced Molecular Detection.

Identifying viral and host genetic determinants of vaccine efficacy (2022—$2,200,000)

Helix will study the impact of virus and host genetics on the level of immunity and protection that vaccines offer against SARS-CoV-2 infection, with the intention of better predicting poor outcomes after SARS-CoV-2 infection.

Scripps Research

Genomic sequencing of SARS-CoV-2 to investigate local and cross-border emergence and spread (2022—$2,545,376)

The San Diego Epidemiology and Research for COVID Health Alliance (SEARCH) was established in March 2020 to track the emergence, spread, and evolution of SARS-CoV-2 and develop analytical tools for genomic epidemiology. Via their extensive network of public health collaborations, SEARCH will expand the program to include sites in Mexico and conduct real-time analyses of the evolution and cross-border transmission of SARS-CoV-2, while continuing to develop pertinent software and tools.

Genomic sequencing of SARS-CoV-2 to investigate local and cross-border emergence and spread (2020—$2,477,409)

This project will expand collaboration with California laboratories to improve laboratory and bioinformatic methods for cost-effective, high-throughput sequencing. The project includes collaboration with the CDC SPHERES program, California COVIDNet, and county and local public health laboratories.

University of California, San Francisco

Characterization of host and immune responses to different SARS-CoV-2 variants and association with disease severity (2022—$789,188)

Researchers will combine SARS-CoV-2 genomic sequencing, host transcriptome, and antibody analyses to investigate differential host and immune responses to SARS-CoV-2 variants. This project aims to develop diagnostic and predictive models of clinical severity based on clinical, viral, host, and immune data in order to understand correlates of COVID-19 severity and breakthrough infection.

Actionable real-time genomic surveillance of SARS-CoV-2 in California (2021—$653,652)

This project will create an integrated network that combines rapid viral sequencing with epidemiologic and clinical data. It will use existing partnerships to establish a real-time network that can track and monitor the evolution and spread of SARS-CoV-2 in California.

University of California, Santa Cruz

Empowering comprehensive SARS-CoV-2 strain surveillance and transmission pattern inference for public health practitioners (2021—$1,877,616)

This project will create a platform to simplify interactions with genomic data, enabling users to rapidly cross-reference and identify genomic variation data sets in a unified setting. The platform will provide downloads of SARS-CoV-2 evolutionary maps in both scientific diagrams and in plain language to facilitate widespread use.