

# ADVANCED MOLECULAR DETECTION



**Ellie Click, MD, PhD (CAPT, USPHS),**  
Lead for Extramural Innovation,  
Advanced Molecular Detection Program

## AMD: Translating genomic data into public health action

When new variants of SARS-CoV-2 (the virus that causes COVID-19) were first detected in 2020, scientists across the world turned to genomic sequencing to discover how variants might affect COVID-19 and countermeasures—like vaccines and therapeutics—being developed to combat it. The efforts to control the pandemic coupled with the increasing demand for other innovative solutions made possible by sequencing have spurred renewed interest in the role of pathogen genomics in public health.

For the past several years, NCEZID’s innovative and modernizing initiative, the **Advanced Molecular Detection (AMD) program**, has worked closely with CDC programs and state and local health departments to bring genomic sequencing of pathogens into routine use, identify and implement new genomic technology innovations, and transform infectious disease detection.

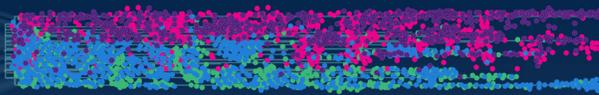
AMD has accelerated innovation and stakeholder partnerships in new ways—harnessing the collective efforts of public health and academic expertise to advance the application of genomics to better protect the health of all Americans.



*The collective response to COVID-19 fostered a huge amount of creativity and collaboration between academia and public health in pathogen genomics. The **Pathogen Genomics Centers of Excellence** will serve as a platform for ongoing partnership and innovation to inform how we tackle infectious disease threats.”*

### SARS-CoV-2 Sequencing Activity in U.S. Public Health Laboratories, 2020-2022

**2022**  
68 Labs



690,000 SARS-CoV-2 Sequences

**2021**  
62 Labs



521,658 SARS-CoV-2 Sequences

**2020**  
23 Labs



17,777 SARS-CoV-2 Sequences

National Center for  
Emerging and Zoonotic  
Infectious Diseases





In 2022, Rhode Island Gov. Dan McKee and state leaders broke ground for a state-of-the-art facility, which will include a dedicated genomics sequencing core laboratory. The facility is partially funded from CDC's AMD Program via the *Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases (ELC) Cooperative Agreement*.

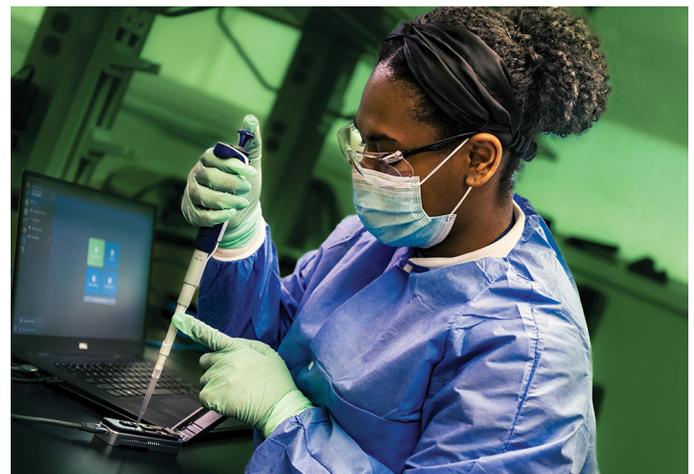
In 2022, CDC launched the Pathogen Genomics Centers of Excellence (PGCoE) network to build on AMD's foundational work translating genomic data into action. The PGCoE network expands and deepens collaboration between U.S. public health agencies and universities and will serve as an important model to foster innovation and technical capacity in pathogen genomics. Ultimately, this network will improve the nation's public health system so it can detect and respond to urgent infectious disease threats with flexibility and resilience. The PGCoE network will expand capacity and integrate practical advances in laboratory technologies, scientific computing, and applied research into public health agencies around the country.

The PGCoE network will develop useful new tools and practices to immediately address public health department priorities. The network will also provide much-needed support for developing a robust public health workforce with expertise in genomics applications, including bioinformaticians, microbiologists, and epidemiologists.

CDC and academic partners have mobilized scientific resources and built collaborative partnerships in other ways, too, such as supporting **Broad Agency Announcement innovation contracts** and developing the **Sequencing for Public Health Emergency Response, Epidemiology, and Surveillance (SPHERES) consortium**. These partnerships have already been leveraged for infectious disease response efforts beyond COVID-19, such as mpox. Looking ahead, the Pathogen Genomics network will build on collaborations to fuel cutting-edge innovations in genomic epidemiology for SARS-CoV-2 and other pathogens of public health concern.

**WHAT'S THE POINT?**

AMD supports state, local, and academic partners in the innovation and application of pathogen genomics to produce actionable sequence data and improve the health of all Americans.



**WHAT'S NEXT**

With accelerating interest in the role of pathogen genomics for infectious disease investigation and response, AMD is rapidly expanding education, innovation, and bioinformatics efforts to help the public health workforce meet these new demands.