Support Advanced Molecular Detection at the Centers for Disease Control and Prevention:

Invest in Precision Public Health

AMERICAN SOCIETY FOR MICROBIOLOGY

The Advanced Molecular Detection (AMD) program brings cutting edge technology to the front lines of public health by harnessing the power of next-generation sequencing and high performance computing with bioinformatics and epidemiology expertise to study pathogens.

To build and sustain the program in the coming years, the AMD program at the Centers for Disease Control and Prevention (CDC) needs $175 million in annual base funding. The program's ability to support the demand for its expertise and technology and to maximize existing partnerships is in jeopardy without a greater investment in the coming years.

The CDC's AMD program has transformed many areas of public health by enabling the agency to rapidly incorporate a novel and versatile technology into CDC operations—next-generation sequencing (NGS). Established in FY 2014 and now funded at $40 million/year, AMD helped close a widening technological gap in pathogen genomics through which the public health system was falling behind. Its success has demonstrated the critical importance to the nation's health security of staying abreast of technologies that are both new and relevant.

The program is rapidly growing as a result of its own success and much-needed expansions made during the pandemic that have value beyond the COVID-19 crisis. NGS-related technologies continue to advance at an astounding pace, giving us new and expanded tools to detect disease faster, identify outbreaks sooner and protect people from emerging and evolving disease threats. Current funding has become insufficient to meet the demand for equipment, training and expertise required to support state and local health departments with precision public health and expanded public-private partnerships and collaborations that have wide-ranging benefits for society.

With additional funds, the AMD program can:

Promote greater innovation

through improved metagenomics, data integration, and cross-cutting genomics infrastructure. Doing so will directly benefit states and localities.

Expand workforce development

to meet the demands from state and local health departments and streamline laboratory operations.

Sustain public-private partnerships

including the Pathogen Genomics Centers of Excellence

How do we use AMD?

Lessons Learned during COVID-19

AMD technology played a pivotal role in identifying, understanding, tracking and tracing SARS-CoV-2 and its variants as they have evolved. Thanks to short-term, supplemental investments made by Congress, the U.S. was able to stay on top of SARS-CoV-2 variants and ensure that tests, vaccines and therapeutics remained effective against an evolving threat. The AMD program also helped establish the SPHERES Consortium to bring public and private sectors together to enable viral sequencing, tracking and tracing. With supplemental funding, the AMD program has established Pathogen Genomics Centers of Excellence around the country that have enormous promise for tracking and understanding infectious disease threats.

Next-generation sequencing has allowed CDC to:

Improving Vaccines

Applying AMD to vaccine-preventable diseases, such as the flu, helps CDC monitor genetic changes and understand why vaccine effectiveness may decrease.

- Utilize next-generation sequencing data to forecast relative importance of emerging strains and assess risk, characterize viruses used in vaccine effectiveness studies and inform treatment for patients infected with viruses that have high-pandemic risk, such as COVID-19.

Improve Food Safety

State-of-the-art AMD methods help solve bacterial foodborne outbreaks faster by linking food sources to clusters of illness and removing contaminated food products from store shelves more quickly. This has led to the transformation of a national network, PulseNet, which includes more than 80 public health laboratories.

- Sequence pathogens directly from specimens without a need for culture, which is acutely needed when addressing bacterial foodborne illness.
- As of March 2019, 69 laboratories in 49 states were PulseNet Lab certified for whole genome sequencing of 4 major foodborne bacteria—*Salmonella, Listeria*, Shiga toxin-producing *E. Coli* and *Campylobacter.*

Monitor Antimicrobial Resistance

AMD technologies help CDC scientists study existing and emerging antibiotic-resistant organisms, including some of the biggest threats like *Clostridioides difficile* (*C. diff*), *carbapenem-resistant Enterobacteriaceae* (*CRE*), the fungus *Candida auris, Mycobacterium tuberculosis*, and *Neisseria gonorrhoeae*.

- *C. auris* is one of the biggest resistance threats in the U.S. today and is a potentially deadly pathogen. Deploying AMD technology allowed us to understand which *C. auris* strains were closely related to each other and understand how the fungus was spreading in healthcare settings. This in turn allows CDC to determine which antifungal medications are most effective against it.

ASM Calls on Congress to:

Increase the base investment in Advanced Molecular Detection (AMD) technologies to $175 million per year to both support its current successes and to expand its scope of innovation as technology continues to advance. This will facilitate the existing work in public health and keep pace with needs in all state and local public health laboratories, provide critical coordination with academic institutions to strengthen the public health workforce pipeline and ensure the U.S. stays ahead of the next potential deadly disease.