SPHERES

SARS-CoV-2 Sequencing for Public Health Emergency Response, Epidemiology, and Surveillance

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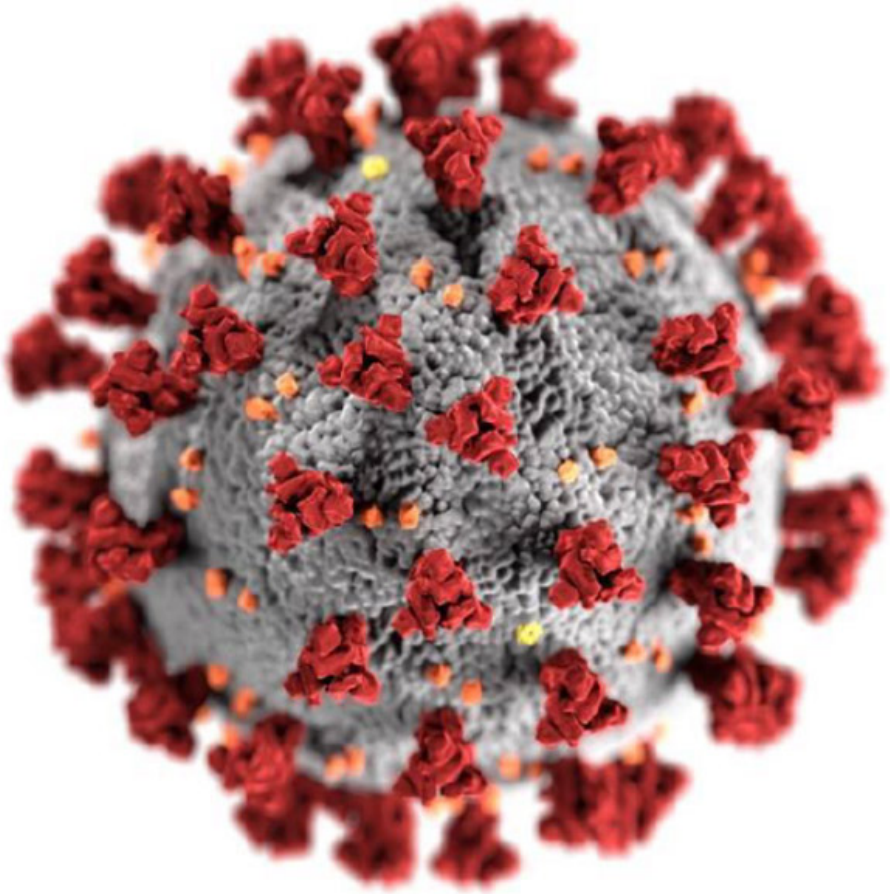
A National Open Genomics Consortium for the COVID-19 Response

The Advanced Molecular Detection (program established the **SARS-CoV-2 Sequencing for Public Health Emergency Response, Epidemiology and Surveillance (SPHERES)** to coordinate SARS-CoV-2 sequencing. The SPHERES collaboration includes scientists from clinical and public health laboratories, academic institutions, and the private sector. SPHERES will strengthen COVID-19 mitigation strategies. Large-scale, rapid genomic sequencing will allow public health experts to—

- Monitor important changes in the virus as it continues to circulate
- Gain important insights to support contact tracing efforts
- Provide crucial information to aid in identifying diagnostic and therapeutic targets
- Advance public health research in the areas about transmission dynamics, host response, and evolution of the virus

SPHERES Overview



The SPHERES consortium is being led by CDC's Advanced Molecular Detection (AMD) program, which over the past six years has invested in federal, state, and local public health laboratories to expand the use of pathogen genomics and other advanced laboratory technologies to strengthen infectious disease surveillance and outbreak response. SPHERES aims to—

- Accelerate the use of real-time pathogen sequence data and molecular epidemiology for the COVID-19 pandemic response
- Organize and manage public health sequencing and response efforts across the United States
- Coordinate and support sequencing at state and local public health laboratories across the country
- Improve communication and knowledge-sharing between US laboratories
- Develop consensus guidance on critical data and metadata standards
- Reduce barriers to bioinformatic analysis and data sharing
- Better align sequencing requirements and resource needs with different sources of funding, technology, expertise, and other means of support

The SPHERES consortium includes 37 state and local public health laboratories, several large regional and national clinical diagnostic corporations, and academic and non-profit leaders in pathogen genomics, bioinformatics, and public health from across the country.

The consortium aligns federal laboratories and public health agencies with international genomics efforts and engages the private sector in efforts to better understand the genomics and patterns of SARS-CoV-2 transmission across the United States.

SPHERES Objectives

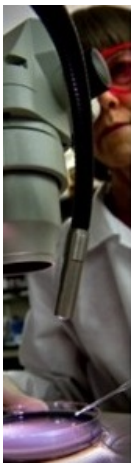
The SPHERES consortium's 8 core objectives are to

1. Bring together a network of sequencing laboratories, bioinformatics capacity and subject matter expertise under the umbrella of a massive and coordinated public health sequencing effort
2. Identify and prioritize capabilities and resource needs across the network and align sources of federal, non-governmental and private sector funding and support with areas of greatest impact and need
3. Improve coordination of genomic sequencing between institutions and jurisdictions and to enable more resilience across the network
4. Champion concepts of openness, standards-based analysis, and rapid data sharing throughout the United States and worldwide during the COVID-19 pandemic response
5. Accelerate data generation and sharing, including the rapid release of high-quality viral sequence data from clinical and public health laboratories into both the National Center for Biotechnology Information and Global Initiative on Sharing All Influenza Data repositories in near-real time
6. Provide a common forum for US public, private, and academic institutions to share protocols, methods, bioinformatics tools, standards, and best practices
7. Establish consistent data and metadata standards, including streamlined repository submission processes, sample prioritization criteria, and a framework for shared, privacy-compliant unique case identifiers

8. Align with other national sequencing and bioinformatics networks, and support global efforts to advance the use of standards and open data in public health

SPHERES is a consortium of the US public health and scientific community that includes

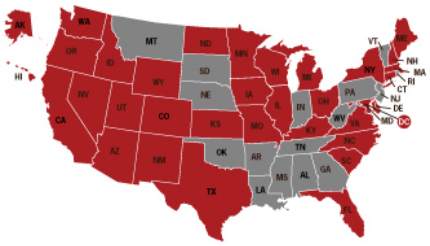
Federal Agencies and Laboratories



- Argonne National Laboratory
- Centers for Disease Control and Prevention
- Defense Threat Reduction Agency
- Defense Health Agency, Global Infectious Disease Surveillance
- Department of Health and Human Services, Biomedical Advanced Research and Development Authority
- Food and Drug Administration
- Lawrence Berkeley National Laboratory
- Los Alamos National Laboratory
- National Geospatial Intelligence Agency
- National Institutes of Health, Fogarty International Center
- National Institutes of Health, National Human Genome Research Institute
- National Institute of Standards and Technology
- National Library of Medicine
- National Center for Biotechnology Information
- Naval Health Research Center
- United States Army Medical Research Institute of Infectious Diseases
- Walter Reed Army Institute of Research

State Public Health Laboratories

- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Hawaii
- Idaho
- Illinois
- Iowa
- Kansas
- Kentucky
- Massachusetts
- Maine
- Maryland
- Michigan
- Minnesota
- Missouri
- Nevada
- New Hampshire
- New Mexico
- New York
- New York City
- North Carolina
- North Dakota
- Ohio
- Oregon
- South Carolina
- Texas
- Utah
- Virginia
- Washington
- Wisconsin
- Wyoming



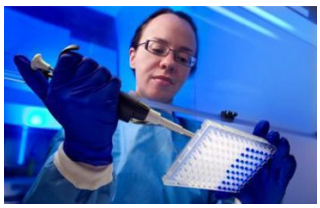
Academic Institutions

- Arizona State University
- Augusta University
- Baylor Esoteric and Molecular Laboratory
- Baylor University
- Columbia University
- Cornell University
- East Carolina University
- Emory University
- Georgia State University
- University of California, Irvine
- University of California, Los Angeles
- University of California, San Francisco
- University of California, Santa Cruz
- University of Chicago
- University of Florida
- University of Hawaii, Manoa
- University of Maryland

- Georgia Southern University
- Georgetown University
- Harvard Medical School
- Johns Hopkins University
- Louisiana State University Health Shreveport
- Mount Sinai School of Medicine
- New York University
- Northern Arizona University
- Northwestern University
- Oregon Health and Science University
- Princeton University
- Rush University
- Southern Illinois University
- Stanford University
- United States Air Force School of Aerospace Medicine
- University of Arizona
- University of Arkansas
- University of Buffalo
- University of California, Davis
- University of Massachusetts
- University of Michigan
- University of Minnesota
- University of Nebraska
- University of New Mexico
- University of Pennsylvania
- University of Pittsburgh
- University of South Carolina
- University of South Florida
- University of Washington
- University of Wisconsin, Madison
- University of Wisconsin, Milwaukee
- West Virginia University
- University of Virginia
- Yale University

Corporations

- Abbott Diagnostics
- Agilent
- AKESOgen
- ATCC
- Beckman Coulter Inc
- BioInfoExperts
- bioMérieux
- Booz Allen Hamilton
- Cincinnati Children's Hospital
- Color Genomics
- Diversigen
- DxTerity
- Fluidigm Corporation
- Ginkgo Bioworks
- Gundersen Health System
- IDbyDNA
- IHRC, Inc
- Illumina
- In-Q-Tel
- Integrated DNA Technologies
- Invitae Corporation
- LabCorp
- MicroGenDX
- Moderna
- New England BioLabs
- One Codex
- Oxford Nanopore Technologies
- Pacific Biosciences
- Qiagen
- Quest Diagnostics
- Roche Diagnostics
- Swift Biosciences
- Takara Bio (USA)
- Thermo Fisher Scientific
- Twist Biosciences
- Verily Life Sciences



Non-Profit Public Health and Research Laboratories

- Association of Public Health Laboratories
- Bill and Melinda Gates Foundation
- Broad Institute
- CDC Foundation
- Chan Zuckerberg BioHub
- Chan Zuckerberg Initiative
- Fred Hutchinson Cancer Research Center
- HudsonAlpha Institute for Biotechnology
- Innovative Genomics Institute
- Institute for Systems Biology
- J. Craig Venter Institute
- Johns Hopkins University Applied Physics Laboratory
- MRIGlobal
- Noblis
- Public Health Alliance for Genomic Epidemiology
- Scripps Research
- The Jackson Laboratory
- Translational Genomics Research Institute – North
- Walder Foundation

International Collaboration

- Genome Canada
- COVID-19 Genomics UK Consortium (COG-UK)

Additional Information

To request additional information about the SARS-CoV-2 SPHERES consortium, including how to join, please email CDC's Office of Advanced Molecular Detection at oamd@cdc.gov.

Information for Laboratories on COVID-19

COVID-19 Genomic Epidemiology Toolkit

Press Release: CDC launches national viral genomics consortium to better map SARS-CoV-2 transmission

SPHERES: Objectives Poster

Last Updated Apr. 9, 2021
Content source: National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), Office of Advanced Molecular Detection