Scientists sequence more than 1,000 COVID-19 genomes to aid pandemic response

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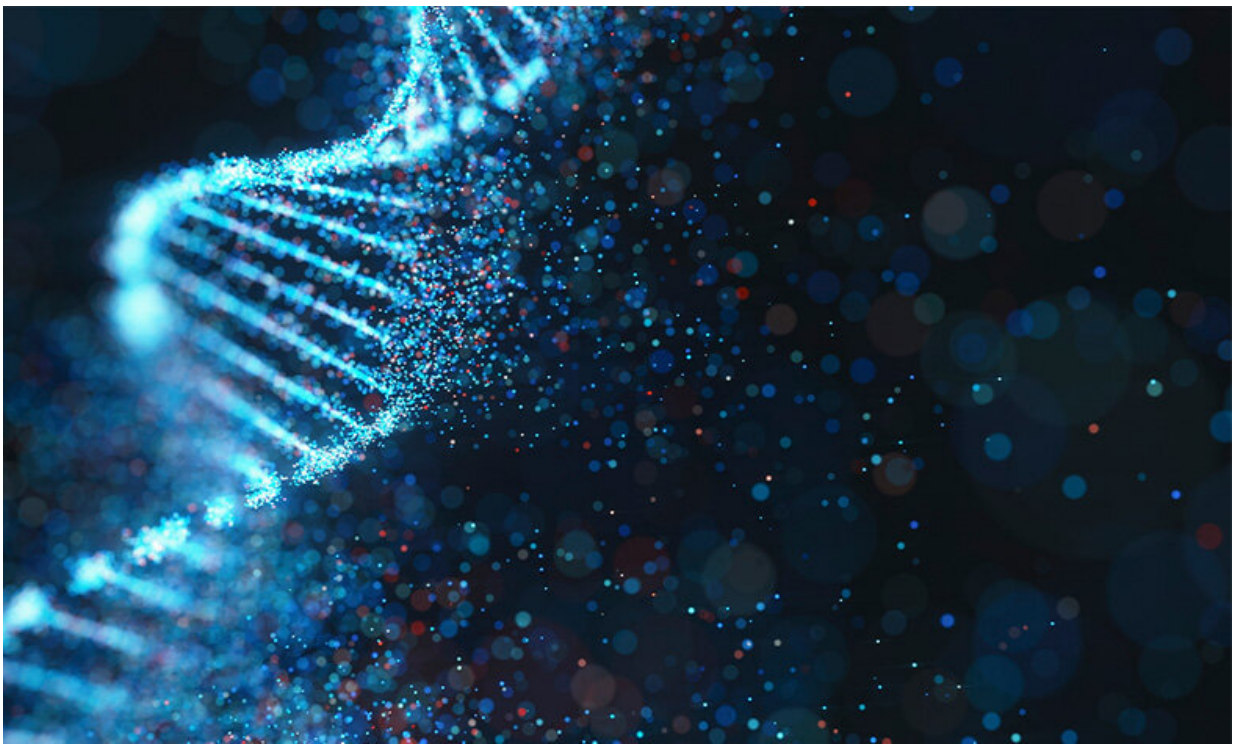

Credit: University of Sheffield

Over 1,000 sequences of the coronavirus genome have now been produced as part of work done by scientists and clinicians from the University of Sheffield and Sheffield Teaching Hospitals NHS

Foundation Trust.

The data is a major milestone for their work as part of a UK consortium to map how COVID-19 spreads, behaves and mutates. It will be published in full on a public database used by researchers and scientists working on solutions to the coronavirus outbreak worldwide.

Backed by the UK government, the £20 million investment allowed expert groups across the UK to work together to rapidly analyze the genetic code of coronavirus samples circulating in the UK. The work is creating intelligence to share with public health agencies, hospitals, regional NHS centers and the government to help combat the virus.

By mapping the COVID-19 genome, the scientists can monitor changes in the virus at a national and global scale, furthering understanding of how it is spreading and mutating—informing clinical care of patients and even saving lives.

The COVID-19 Genomics UK Consortium includes the NHS, public health agencies, Wellcome Sanger Institute, and numerous academic institutions including the University of Sheffield.

Dr. Thushan de Silva, Senior Clinical Lecturer and Honorary Consultant Physician in Infectious Diseases from the University of Sheffield, is leading the collaborative Sheffield COVID-19 Genomics Group. Members include specialists from the University's Florey Institute for Host Pathogen Interactions, Sheffield Institute for Translational Neuroscience (SITraN), Department of Animal and Plant Sciences, Department of Molecular Biology and Biotechnology, and Department of Computer Science.

Dr. Matthew Parker and Dr. Dennis Wang have been leading the bioinformatics analysis for the project in the National Institute of Health

Research (NIHR) Sheffield Biomedical Research Centre and the Department of Computer Science.

Dr. Parker said: "Using expertise in the Sheffield Bioinformatics Core, we have built a robust pipeline which takes the genomic data from viral cases in our region and compares it to those from around the world to identify new mutations. By collaborating with our national and international partners, we will be able to track the spread of the virus and the facilities and expertise we have here in Sheffield are key to a successful project like this.

"Our collaborative team has rapidly expanded its capacity and formulated new processes to be able to sequence genomes on a scale we have not done before. The laboratory staff are now sequencing genomes from samples taken from patients with confirmed cases of COVID-19 at a rate of over 100 a week."

Dr. de Silva said: "By looking at the whole virus genome in people who have had confirmed cases of coronavirus, we can monitor changes in the virus at a national and global scale to understand how it is spreading.

"The work is helping to coordinate agile responses to new infectious diseases as they spread and mutate in local populations. This is critical for the health research community to be able to contribute to our understanding of outbreaks of new infectious diseases, informing clinical care of patients and even saving lives."

The team is working in partnership with Consultant Virologists Dr. Cariad Evans, Dr. Mohammad Raza, Dr. Alison Cope and Consultant Microbiologist Dr. Dave Partridge, from the Sheffield Teaching Hospitals NHS Foundation Trust's regional NHS virology laboratory based at the Northern General Hospital; to respond to the rapidly evolving outbreak of the virus in the Yorkshire region.

Dr. Cariad Evans said: "We have national and international experts in Virology working in our laboratories and we are very proud to be involved in this important work to determine how this new virus behaves and how that knowledge could then inform future care or treatment."

More information: The COG Consortium database can be accessed at www.cogconsortium.uk/data/

Provided by University of Sheffield