



SCIENCE & TECHNOLOGY

Human Genome Project Helps Drive COVID-19 Research

July 01, 2020

Until this March, machines at the Broad Institute in Massachusetts were busy **sequencing** enough information for a complete human genome every 10 minutes.

The **DNA** sequencing center is among the world's largest genomics labs. Genomics is an area of molecular biology concerned with the structure and mapping of genetic material of living organisms.

When the disease COVID-19 started spreading in the United States, scientists at the institute had an idea. What if their genome-reading machines could be repurposed and used to test patient **samples** for the coronavirus?

Over a period of two weeks in March, the laboratory reinvented itself. It went from sequencing the 3 billion **letters** of a human genome to sequencing the 30,000-letter genome of the virus.

Today, the Broad Institute has the ability to carry out 35,000 tests each day.

Broad is one of several genomics labs across the United States now being used as COVID-19 testing centers.

Eric Green is director of the National Human Genome Research Institute, which provides money for many of these labs. He told VOA that preparing genome labs for COVID testing only required "tweaking" -- or small changes.

It has been 20 years since the Human Genome Project produced its first working **draft**. In a White House ceremony on June 26, 2000, President Bill Clinton called the document "the most important, most wondrous map ever produced by humankind."

The full genome was published three years later.

That first map took scientists on three continents 13 years and nearly \$3 billion to put together. Now, one lab can do it in a day or two for less than \$1,000.

Because of technology that made the Human Genome Project possible, "it's actually quite trivial to sequence a given virus," Green said. In other words, sequencing something like the coronavirus is not especially hard to do.

The virus was unknown until late last year. Chinese scientists had learned its complete genetic sequence by January 12.

The computing power developed to map the complete human genome is now being used to follow small changes in the virus' genome as it spreads.

"This gives us an **enormous** ability to **track** the virus," said Lee Hood, a co-founder of the nonprofit Institute for Systems Biology research center. Hood is also one of the inventors of automated DNA sequencing.

Scientists are also studying coronavirus patients' genomes to learn why one patient might die while another does not experience any signs of sickness at all.

Green noted that the human genome project created a change in the culture of science. That change can be seen in the actions taken to fight the coronavirus.

When the genome project began in 1990, he said, "team science in biology was not very popular. It was actually...almost looked down upon," Green said. "And sharing data before you publish your paper was almost unheard of. That's completely changed."

COVID-19 research, Green added, is all about data sharing and open science.

I'm Ashley Thompson.

Steve Baragona reported this story for VOA News. Ashley Thompson adapted it for Learning English. George Grow was the editor.

Words in This Story

sequence - v. to determine the order of chemical constituents (such as amino-acid residues or nucleic-acid bases)

DNA - n. short for deoxyribonucleic acid -- a substance that carries genetic information in the cells of plants and animals

sample - n. a group of people or things that are taken from a larger group and studied, tested, or questioned to get information

draft - n. a version of something (such as a document) that you make before you make the final version

enormous - adj. very great in size or amount

track - v. to follow and find (someone or something) especially by looking at evidence
