**Human Genome Project Helps Drive COVID-19 Research**

**人类基因组计划有助于推动新冠肺炎研究**

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

直到今年3月，马萨诸塞州博德研究所的机器一直在忙碌地为一个完整的人类基因组每十分钟进行一次复杂的信息排序。

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.

基因测序中心周围是全球最大的基因组学实验室之一。基因组学是分子生物学的一个领域，研究生物体遗传物质的结构和图谱。

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?

当新冠肺炎病毒开始在美国传播时，该研究所的科学家们生出了一个想法。假设他们的基因组读取器可以被重新改写用来测试病人样本中的冠状病毒将会怎样?

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.

在三月份的两个星期里，这个实验室对自己进行了彻底改造。原本对人类基因组的30亿个因子测序的实验室开始转型为新冠病毒基因组的3万个因子测序。

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

如今，博德研究所每天能够进行35000次测试。

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

博德研究所是当下美国用以作为新冠肺炎测试中心的几个基因组学实验室之一。

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.

埃里克·格林是美国人类基因组研究所主任，该研究所为这些实验室提供资金。他告诉美国之音，为新冠肺炎测试准备基因组实验室只需要“稍作调整”——或是叫微调。

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."

自人类基因组计划做出第一份工作草案以来已经过去20年了。在2000年6月26日白宫举行的一次典礼上，克林顿总统称这份文件为“人类有史以来最重要、最奇妙的图谱”。

The full genome was published three years later.

三年后，完整的基因组得以发表。

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.

科学家们为了第一张图谱跨越三大洲耗费13年时间和将近30亿美元资金才将其拼凑完成。现在，完成这项工作只需要一个实验室耗费不到1000美元资金就可以在一两天内完成。

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.

科技使人类基因组计划成为可能，“对一个给定的病毒进行测序实际上是非常微不足道的，”格林说。换句话说，对冠状病毒这类物质进行测序并没有特别困难。

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

这种病毒直到去年年底才为人所知。1月12日，中国科学家就已经掌握了它的完整基因序列。

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.

为绘制完整人类基因组而开发的计算能力目前正被用以跟踪病毒传播过程中其基因组的微小变化。

"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.

“这给了我们极大的追踪病毒的能力，”非营利机构系统生物学研究中心的一位联合创始人李·胡德说道。胡德也是自动基因测序的发明者之一。

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.

科学家们也在研究冠状病毒患者的基因组，试图了解为何有些患者可能会因此而死，而其他患者却没有任何疾病症状。

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.

格林指出，人类基因组计划改变了科学文化。这种变化可以从抗击冠状病毒的行动中看出来。

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."

1990年当基因组计划起步时，他说：“生物学中的团队科学当时并不怎么受欢迎。实际上……几乎被人看不起。发表论文前就分享数据在当时几乎是闻所未闻的。现在完全不同了。”

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

格林补充道，新冠肺炎的研究就是一次数据共享和开放科研活动。

I’m Ashley Thompson.

阿什利·汤普森报道。

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