COVID-19 and CRISPR Test

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INTRODUCTION

As COVID shakes the world, the world looks forward to (Clustered Regularly Interspaced Short Palindromic Repeats) CRISPR's research. This is because of the fact that there is a lot of research going on with CRISPR, an innovative gene-editing technology that goes beyond science fiction. The United States Food and Drug Administration (USFDA) has approved the first CRISPR-based coronavirus test in the United States. The Sherlock CRISPR Severe acute respiratory syndrome coronavirus-2 (SARS CoV-2) kit is subject to emergency medical conditions. It can be used to quickly and accurately determine the presence of the SARS-CoV-2 virus, which causes the COVID-19 virus. Researchers led by Dr. Feng Zhong, a researcher at the Broad Institute at the Massachusetts Institute of Technology, are behind the breakthrough. Based on this, Sherlock Biosciences, a Cambridge-based biotechnology company, has developed test kits that deliver results in just over an hour.

CRISPR Cas-9 is an innovative gene-editing technology that can be described as one of this century's most amazing achievements. CRISPR stands for Clustered Regularly Interspaced Short Palindromic Repeats. Using this technique, which works like a molecular scissor, it is possible to accurately cut deoxyribonucleic acid (DNA) strands at a specific location and perform gene editing. Here the Cas-9 enzyme breaks down the DNA strands. It also uses a guide ribonucleic acid (RNA) as a guide to get it to its destination. The CRISPR technology was born out of the discovery of techniques used to prevent bacteria from infecting a virus. In 2012, a team of women scientists led by Jennifer Doudna and Emmanuelle Charpentier of the University of California, Berkeley, proved that gene editing was possible through the CRISPR Cas-9 technique, opening the door to infinite possibilities. Research is advancing to develop effective treatments for cancer and genetic diseases through CRISPR gene editing. The initial results of many are very promising. At the same time, a team of researchers led by Chinese scientist He Jianqui created gene twins in embryos that led to controversy.

However, the RAA-based CRISPR technique, the genetic material of the virus, is used to determine the COVID virus's presence. The Cas-13 enzyme is replacing the Cas-13 enzyme. MIT researchers Feng Zhang and James Collins made the initial findings of the RNA-based CRISPR Test in 2017. In 2018, it was demonstrated that even the slightest presence of Zika virus and dengue virus can be determined using this.

The CRISPR-based Sherlock SARS CoV-2 test kit is unique in that it provides test results in just over an hour. Sherlock stands for Specific High Sensitivity Enzymatic Reporter unLocking. The first experiments were performed using synthetic RNA components of the COVID-19 virus. In this experiment, it was possible to effectively determine the presence of COVID-19 RNA even in a microliter sample. The Sherlock Biosciences diagnostic kit works by especially programming CRISPR Machinery.

It is designed to detect the presence of genetic material for the SARS CoV-2 virus in a sample taken from a person's mouth, nose, throat, or lungs. This test has three stages. First, the nucleic acid extracted from the sample must be amplified. It uses the currently available recombinant polymerase amplification technology. This will take about 25 minutes. The second step is to determine the virus's RNA presence using the Cas-13 enzyme in the amplified sample. Once the RNA sequence of the virus is identified, the Cas-13 enzyme will cut it into smaller pieces. Then the fluorescent indicators used in it will glow. It only takes about thirty minutes. After that, in the third step, you can see the result with a paper dipstick. It only takes about two minutes. Thus, an effective COVID diagnosis can be made within an hour!

Although COVID-19 can be diagnosed using the RT-PCR (Real-Time Reverse Transcription Polymerase Chain Reaction) test currently in use, the availability of the necessary reagents and equipment, the high cost, and the limited number of labs that can perform the test are major problems. As the COVID-19 pandemic spreads rapidly, more and more tests are needed to accurately diagnose and isolate those in-

fects with the virus. Only then can the spread of the disease be stopped. This is where the importance of their diagnostic kit comes in, says Sherlock Biosciences. Now the U.S. Sherlock Biosciences is currently working on developing a single-cartridge test kit that can easily diagnose the disease at home, although it does not require much effort to perform the FDA-approved CRISPR Test. It will be as easy to use as a pregnancy test kit. Sherlock Biosciences is in the process of

reaffirming its effectiveness and subsequently seeking FDA approval.

REFERENCE

1. Zhang F, Abudayyeh OO, Gootenberg JS. A protocol for detection of COVID-19 using CRISPR diagnostics. A protocol for detection of COVID-19 using CRISPR diagnostics. 2020;8:1-8.