

## 【2021 全國科學探究競賽-這樣教我就懂】

### 社會組 科學文章表單

文章題目： 新冠病毒及其影響

文章內容： ( 限 500 字~1,500 字 )

Corona virus (COVID-19), which Taiwanese people call it the Wuhan virus, was first found in December 2019, the South China Seafood Market in Wuhan city, Hubei Province, China, which the first infected person (patient zero) had been found, is the most important source of infection. Up to now (April 2021), there are more than 130 million people been infected by COVID-19 all around the world, what's worse, more than 2.8 million of people been killed due to it. Unfortunately, the United States is the most serious country under this pandemic virus. In addition to the death of a great deal of people, COVID-19 has forced many industries, especially tourism, to stop their business or to work remotely. At the same time, many international and domestic sports events were suspended or postponed because of COVID-19. For example, the 2020 Tokyo Olympics, the National Basketball Association (NBA), Major League Baseball (MLB) in the United States.

However, we are still unable to determine the reason why the virus outbreak. The most likely cause is the wild animal traded in the South China Seafood Market, which has made the virus in animals to infect humans. Some people have mentioned whether there are other potential sources or not, including is it possible to be an artificial virus made by Wuhan Virus Research Institute. Nevertheless, this statement was immediately shot down. The research report of the international journal 《Nature》 pointed out that, due to the recombinant receptor binding domain (RBD) and polybasic cleavage site of the virus, the virus was deemed "definitely impossible to be made artificially." Based on the above two points, it is more certain that COVID-19 is a virus that has evolved into humans by animals. 《Nature》 published an article in February pointed out that the genetic sequence of COVID-19 is 96% similarity with the Yunnan bat virus strain (RaTG13), it is believed that bats may be the original host of the virus, nevertheless, because the S protein receptors between the two viruses are different, it is speculated that the virus should have other intermediate hosts in the process of evolution. Several days later, South China Agricultural University found that the virus in the pangolin is similar to COVID-19, and the S protein receptor is almost the same. Therefore, it would be possible that the virus in the bat is transmitted to the pangolin and then recombined into the human body to form COVID-19.

Lin, Qing Yong, CEO of Graphen company, said "there are about 250 strains of sequenced viruses all around the world, on the genetic evolution tree." He used artificial intelligence to draw COVID-19 gene evolution tree, which made him found that there are two strains of super infectious virus. One strain mutated into another virus one month after it was widely spread in Asian countries and was finally spread in Washington State. Lin explained that the source of infection in each US state were all very close, which they would probably come from the same prototype virus strain. When the prototype virus caused cluster infection in the local area, it began to produce mutations,

and finally, a variety of mutations appeared. The other virus strain was infected from Asia to Germany. After outbreaking in Western European countries, it evolved into three major virus groups and multiple small branches, and finally spread throughout Europe.

Coronavirus disease mainly infects the patient's respiratory tract by droplet infection and contact infection. The symptoms of it are similar to those of influenza, so it is difficult for even doctors to detect the difference between them, moreover, the incubation period of COVID-19 can be as long as 14 days. The course of the disease may be sustained for several weeks or more than a few months, which caused that when some people infected COVID-19, because of the incubation period or the asymptomatic relationship after being infected, they did not aware of it and infected others unconsciously. In the early stage of infection, coronavirus disease will first invade the lung cells of the patient. Next, the virus will find the compatible receptors such as the small intestine, just like SARS, it causes diarrhea. after the virus has spread to the whole body, it will cause various degrees of damage to different organs such as liver and kidney. Finally, coronavirus disease also has sequelae, which loss of taste and pulmonary fibrosis are its two main sequelae. In the process of loss of taste, the virus adsorbed on the ACE2 cells (in the human olfactory part, roughly extending from the first type of brain nerve to the top of the nasal cavity) of the human body. After the virus invades the olfactory nerve, it will cause the patient to have abnormal olfactory sense. They may even temporarily lose the sense of taste. In addition, unlike bacteria, pneumonia caused by viruses can easily cause lung sequelae. Pulmonary fibrosis is one of the most serious sequelae of coronavirus disease. After some patients injured their lungs, during the healing process, the surface of the lungs is like scabs on the skin, which will produce scleroderma, then evolves into "pulmonary fibrosis." Even after "healing", the function of lung may be reduced by 20 to 30%, and it can no longer be the same as it was in the past, what's worse, if the lung is injured again in the future, even just as a cold, lung function will deteriorate more rapidly.

Although COVID-19 is a fatal virus, it is not entirely impossible to prevent him. Washing hands, wearing masks when going out, and maintaining a safe social distance are all good ways to prevent coronavirus disease during epidemic prevention. Thanks to our minister of health and welfare Chen Shih-Chung, when we are in the most difficult time, through his successful policy, the virus is not easily to spread in Taiwan. At the same time, by telling other countries "Taiwan can help." all countries in the world can be faster and more efficiently to leave this epidemic behind.

參考資料