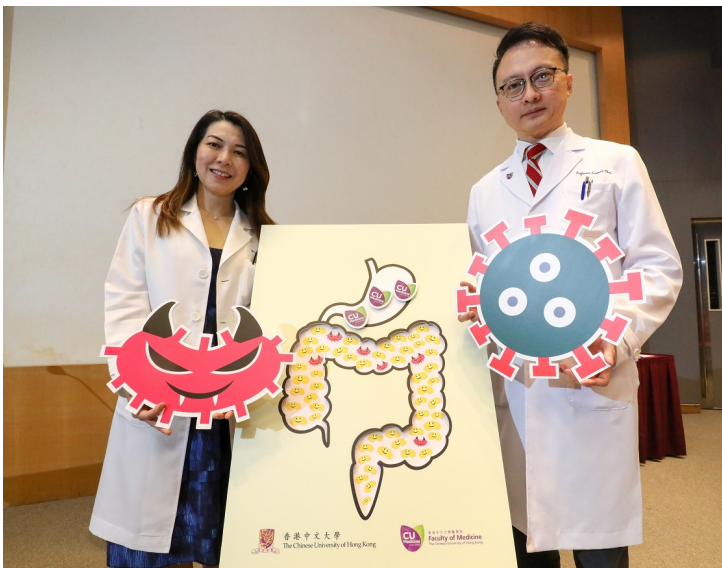


China develops novel probiotic formula

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CU Medicine develops a probiotic formula using big data analysis and machine learning to boost immunity against COVID-19

The Faculty of Medicine of The Chinese University of Hong Kong (CU Medicine) is the first to discover a series of good bacteria missing in the gut of COVID-19 patients. The research team recently confirmed this discovery with a large number of healthy subjects and COVID-19 patients.

Using big data analysis and machine learning, CU Medicine has successfully developed a probiotic formula that aims to target gut dysbiosis, thereby offering hope to boost immunity against COVID-19 and other emerging viral infections. They anticipate that the formula will soon be turned into a probiotic supplement to go with our daily diet to improve our defence against infection.

Gut microbiota, which is a fine balance between good and bad bacteria, regulates our immune system. Imbalance of gut microbiota (dysbiosis) will make people susceptible to infections, which makes some people more vulnerable to catching a virus, and some get a more severe infection than others.

Before the role of gut microbiota in COVID-19 was identified, the National Health Commission of the People's Republic of China had already included the use of probiotics for the treatment of COVID-19 in January 2020. To date, there is an urgent unmet need of defining the role of gut microbiota in COVID-19.

Professor Francis KL CHAN, Dean of CU Medicine and Director of the Centre for Gut Microbiota Research at CUHK, remarked, "Gut health rules over the immune system of our bodies. We must identify the composition of intestinal bacteria that helps maintain our defense. From there on, we can modulate the gut microbiota to boost our immunity against viral and bacterial infections. This will be a novel approach in the combat of COVID-19."

In a latest research published in the international medical journal *Gastroenterology*, CU Medicine investigated the alteration of gut microbiota in COVID-19 patients from Hong Kong. From February to March this year, stool specimens were collected from 15 COVID-19 patients whose conditions ranged from mild to critically ill from time of hospitalisation until discharge. The research team studied the microorganisms present in the patients' gut and compared with those from healthy individuals.

Professor Paul Kay Sheung CHAN, Chairman of the Department of Microbiology at CU Medicine and Associate Director of the Centre for Gut Microbiota Research at CUHK, said, "This is the first study in the world to realize that severe gut dysbiosis exists in COVID-19 patients. Some commensal symbionts, generally good bacteria, were missing while other pathogens were increasing in the patients' gut. The condition prevailed even after patients had been discharged."

Research team further expanded the research scope and collected data on gut microbiome of 150 COVID-19 patients and 1,500 healthy individuals. With the use of big data analysis, the team managed to come up a probiotic formula which targets at gut dysbiosis derived from COVID-19 infections. The CU Medicine team carefully calculated the proportion of good bacteria and came up with a processing protocol which helps enhance the stability and quantity of live bacteria.

Patents Applied for the Innovation and More Researches for Further Scientific Reference

Professor Siew NG, Associate Director of the Centre for Gut Microbiota Research at CUHK, explained, "This study provides a whole new perspective in the fight against COVID-19. Our probiotic formula is derived from data of the Chinese population. We are studying good bacteria that are closely linked to our immune system and looking for solutions to limit the threat of the novel coronavirus to our health."

CU Medicine has applied patents for the probiotic innovation in China and the U.S. and is now collaborating with innovation and technology companies and food companies to turn the formula into a probiotic supplement that can be added into the daily diet. The team is hopeful that innovation can soon reach the public to enhance gut health. They are now working on large-scale clinical trials to provide further scientific evidence on the importance of gut health for preventing any novel infectious diseases. One of the research projects is supported by the Health and Medical Research Fund of the HKSAR government.