ADVERTISEMENT FEATURE

AHCC, a mushroom culture extract to boost immune defence

One company's innovation has attracted interest in THE HEALTH POTENTIAL of a common food.

Dr Kohei Homma, executive senior director of business development (left) and president and COO, Kentaro Kitadate in front of the AHCC culture tank.

Based in Sapporo, AminoUp develops and manufactures bioactive substances derived from natural products.

A mushroom culture extract, AHCC works as a 'modulator' of the human immune system.

For thousands of years, societies around the world have used mushrooms for their perceived beneficial effects on the human immune system. The famous Greek physician Hippocrates was among those that identified the mushroom also called hoof fungus or *Fomes fomentarius* as a species that could reduce inflammation.

Today, there is intense interest in using food to support the immune system, particularly to address the public health imperative of Japan's rapidly ageing society. And foods that are purported to have specific physiological benefits are under scrutiny as researchers seek to confirm their efficacy through clinical trials.

SCIENTISTS AROUND THE WORLD ARE WORKING ON WAYS TO ENHANCE HUMAN IMMUNITY

One supplement being scrutinised is produced by AminoUp, a biotech company in Sapporo, Japan, that has shown its proprietary mushroom culture extract, trademarked as AHCC, gives the immune system a natural boost. AHCC has now been investigated for a variety of applications in more than 100 scientific publications.

Kentaro Kitadate, president and chief operating officer of AminoUp believes AHCC has the potential to support the health of an ageing population.

"Our approach is to explore new possibilities from the power of nature, to induce the natural potential that we have in our body and to bring out the innate strength in all living things," says Kitadate.

INNOVATING FOR IMMUNITY

Our immune system is central to our health, shielding us from pathogens, such as viruses, bacteria, and toxins. As we become older, our immune system becomes weaker. To help ageing populations, scientists around the world are working on ways to enhance human immunity.

AminoUp has worked to improve human immunity for more than 35 years. Its approach is simple: to enhance the natural ability of foods that positively affect human health.

"In traditional Chinese medicine, mushrooms have been used to modify immunity," says Dr Kohei Homma, AminoUp's executive senior director of business development. "Our research scientists were motivated to understand the immunological benefit of mushrooms."

AminoUp's leading supplement, AHCC, was launched in 1987, following an evaluation of more than 100 different mushroom species, and systematically tested for optimized manufacturing.

Derived from the cells of shiitake mushroom mycelia, and slowly cultured with a unique mix of nutrients for nearly two months, AHCC consists of a mix of mostly polysaccharides, large sugar polymers. These polysaccharides, researchers at AminoUp reported in the *European Journal of Nutrition*, stimulate specific receptors that are located on human immune cells in the gut that recognize foreign pathogens such as viruses and bacteria.

"AHCC is able to modulate and improve the non-specific immune functions in our body to a range of risk factors," says Homma.

SEEKING OPTIONS FOR TREATMENT OF HPV

One of the promising applications of AHCC is its potential as a nutritional supplement to help the immune system to fight human papillomavirus (HPV) infection. HPV infection is common, but persistent infection with specific, high-risk types of HPV can lead to cervical cancer, one of the most common cancers affecting women worldwide today; in Japan, rates of cervical cancer incidence and mortality have been rising since the 1990s.

"While we have vaccines for HPV, there are fewer treatments for existing high-risk cases," says Homma. The research led by Judith A. Smith at the University of Texas Health Science Center at Houston McGovern Medical School, and funded by AminoUp, revealed that AHCC could help clear HPV virus infection in cervical cancer cell lines and mouse models.

The same team undertook a preliminary clinical study of 10 women, persistently infected with high-risk HPV, that was encouraging enough to lead to a larger clinical trial. Smith is now undertaking a NIH-funded, double-blinded, placebo-controlled study of 50 women with persistent high-risk HPV infection with results expected to be published by 2021.

A GLOBAL VISION

AminoUp has funded laboratory studies on mice that have further revealed that AHCC is effective at activating immune cells against West Nile virus, influenza, and avian flu. A clinical study in *Nutrition Research* suggests that supplemental AHCC may boost the antibody titre when given at the time of vaccination for influenza B.

Now, AminoUp has begun a collaboration with the University of Texas Medical Branch, to assess whether AHCC could assist with global efforts to fight the SARS-CoV-2 virus through supporting the immune system.

In the absence of an available vaccine against coronavirus, there is broad interest in alternative approaches to immune system maintenance.

"It is a mouse-model study. Mice are going to be infected with SARS-CoV-2 virus and we will examine the mortality change and other parameters with and without AHCC administration," says Homma.

He believes AHCC is also worth investigating for its potential to help with some of the world's other significant health challenges, including the growing problem of antibiotic resistance.

For example, 'superbugs', bacteria that are resistant to all available antibiotics, are expected to be responsible for more deaths than cancer by 2050, according to a review commissioned by the UK Government. Homma says that AHCC may help to support the immune system to enable the body to better fight infection, and potentially to reduce the use of strong antibiotics.

"AHCC induces our natural defence, so does not go through the same mechanism as an antibiotic. Therefore, resistance should not be a problem," says Homma.

AminoUp's vision is to see AHCC become a household name as a daily nutritional supplement for immune maintenance. Currently, AHCC is shipped to an estimated 150,000 people in 40 countries worldwide, and demand is growing.

"We may just be a small company in Japan," says Homma. "But we're serious about innovation." ■

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