

USING BIOTECHNOLOGY TO ENHANCE THE POWER OF NATURE

The Development and Manufacture of AHCC[®], a Novel Nutraceutical

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The pharmaceutical and nutritional supplement industries are often seen as being at odds. Adjectives such as “scientific,” “modern,” “direct,” and “targeted” are typically associated with pharmaceutical drugs, while “natural,” “traditional,” “subtle,” and “holistic” are the domain of vitamins, minerals, and botanicals. But need these two worlds exist separate from one another? Increasingly, nutraceuticals — dietary supplements that provide medicinal benefits — are blurring the once-distinct lines. One example is AHCC, a unique, highly potent medicinal mushroom extract created through the advances of modern biotechnology.

SUBSPECIES IDENTIFICATION OPTIMIZES NK CELL ACTIVITY

The medicinal properties of certain species of mushrooms are well known. Their activity is attributed to naturally occurring polysaccharides — particularly alpha glucan — that have been shown to increase natural killer (NK) cell activity in test tube models. These cells represent the body’s first line of defense against infected and aberrant cells, so any substance that can increase their activity will significantly improve the immune response.

Over two decades ago, the Japanese biotechnology company Amino Up Chemical, in collaboration with a group of scientists at the University of Tokyo, started testing hundreds of subspecies of medicinal mushrooms looking for those with the greatest potential for increasing NK cell activity. Based on the results of their research, the most potent mushroom subspecies was identified, and the scientists knew they had to protect its genetic integrity. Since then, this particular mushroom subspecies has been stored in a deep freezer inside an ISO-certified laboratory.

CELL-CULTURING PROTECTS DNA INTEGRITY

Most commercial medicinal mushroom products are created through spore formation, a method of asexual reproduction. In nature, spores grow underneath the mushroom cap and are dispersed through the wind. When they land in favorable conditions, they take root and grow. Spores are akin to seeds, in that one spore can create a new mushroom, just the way that an apple tree can develop from a single apple seed.

AHCC is not developed through spore formation but through cell culturing. To produce a batch of AHCC, a small cell culture is removed from the original super-mushroom mycelia in the deep freezer and grown in a Petri dish using a nutrient-dense liquid medium that provides optimal growing conditions for the new cells.

As the mushroom mycelia culture grows, it is transferred to increasingly larger containers. The volume of liquid culture medium is gradually increased to ensure that the identity of the cells remains the same from the original Petri dish to the final 15,000-liter main culture tank.

ENZYMATIC PROCESS DESIGNED TO IMPROVE ABSORPTION

At a molecular weight of 500,000 Daltons, mushroom polysaccharides are too large to be absorbed efficiently by the human body. Therefore, the researchers who created AHCC developed one last innovation to overcome this problem.

In order to reduce the molecular weight of AHCC and make it more absorbable, one more step in the production process was added. Cultured cells and media were transferred to a separate incubation tank, where enzymes from the mushroom’s cells could be utilized to significantly reduce the molecular weight

of the polysaccharides. The presence of acylated alpha glucans with a peak molecular weight of just 5,000 Daltons is considered one of the attributes of AHCC that provides it with superior absorption and strong clinical efficacy.

DNA PATTERN TESTING CONFIRMS GENETIC IDENTITY

Because each batch of AHCC is grown from the same super-mushroom mycelia developed more than 20 years ago, it is genetically identical to the original mother mushroom culture. In fact, Amino Up routinely subjects the AHCC it manufactures to DNA pattern testing to verify its identity.

The manufacturing of AHCC is therefore characterized by four innovations:

- 1 Identification of the specific mushroom subspecies that creates an extract with superior NK cell activating power
- 2 The cell culturing of mycelia to ensure each batch is genetically identical to the original mother super-mushroom
- 3 The patented culturing process to improve absorption and clinical efficacy
- 4 The confirmation of mushroom identity through DNA pattern testing

These innovations result in a uniquely effective, naturally derived nutraceutical product, which is evidenced by the fact that AHCC is supported by over 20 human clinical trials demonstrating its powerful immune-potentiating properties. 🍄

For more information and a free book on AHCC, please contact the **AHCC Research Association** at info@ahccresearch.org or visit www.AHCCresearch.org.