

AHCC[®] and Influenza in Senior Citizens

Synergistic Use of AHCC[®] With the Flu Vaccine

~Applications in modulating weakened immunity~

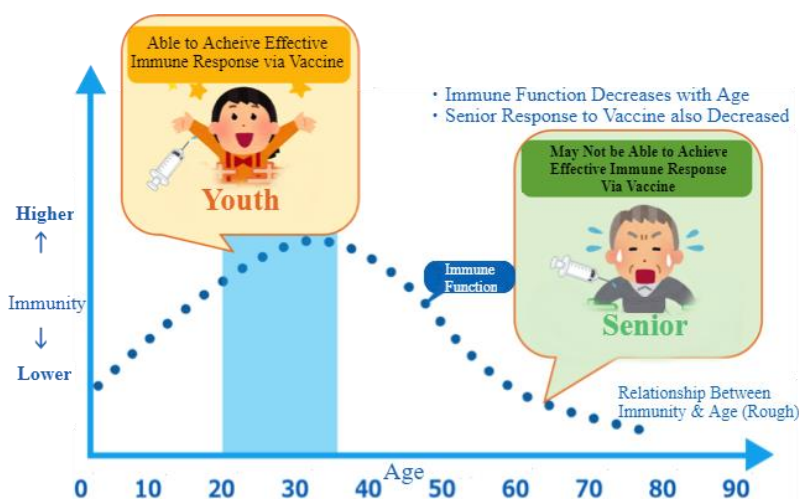
At Amino Up Chemical Co., Ltd. (Sapporo City, Japan. President – Hajime Fujii) whilst we manufacture functional ingredients, we have also been supporting research into the relationships between functional foods and health maintenance, health improvement, and disease prevention for many years. In this news letter, we shall cover health information hot topics, and also introduce some of the latest research results and related evidence behind some of our products.

<Bitesize News>

- (1) **Since senior citizens often face weakened immunity, they are recommended the flu vaccine as it is easier for flu to lead to serious complications.**
- (2) **However, even if vaccine is received, immune response in those with weakened immunity can be poor.**
- (3) **Research into the synergistic use of AHCC[®] with the influenza vaccine showed an improved immune response, and improved resistance against the influenza virus was hypothesized.**

■ Is the flu vaccine alone sufficient to defend against influenza in senior citizens?

Our immunity is what protects us from infectious diseases such as influenza. However, immune function peaks between the ages of 20 and 30, and unfortunately decreases with age after that. As influenza in senior citizens carries a risk of serious complications, the flu vaccine is commonly recommended by physicians. Yet on the other hand, recent research indicates that senior citizens find it harder to achieve stable flu immunity than younger generations, even after



vaccination^{※1}. In short, even if one is vaccinated, it does not necessarily guarantee complete immunity against influenza.

■ AHCC® Intake Increases Antibody Count

In a human clinical trial conducted at Michigan State University, **an increased immune response towards the flu vaccine was observed when AHCC® was taken for a set period immediately after vaccination**. In particular, participants over the age of 60 who took AHCC after vaccination showed an increase in the number of the two kinds of lymphocyte shown below (Fig. 1). The increased number was roughly twice that of those that did not take AHCC, regardless of age. In summary, AHCC® intake in conjunction with the flu vaccine improved immune response in senior citizens who have decreased immunity due to advancing age.

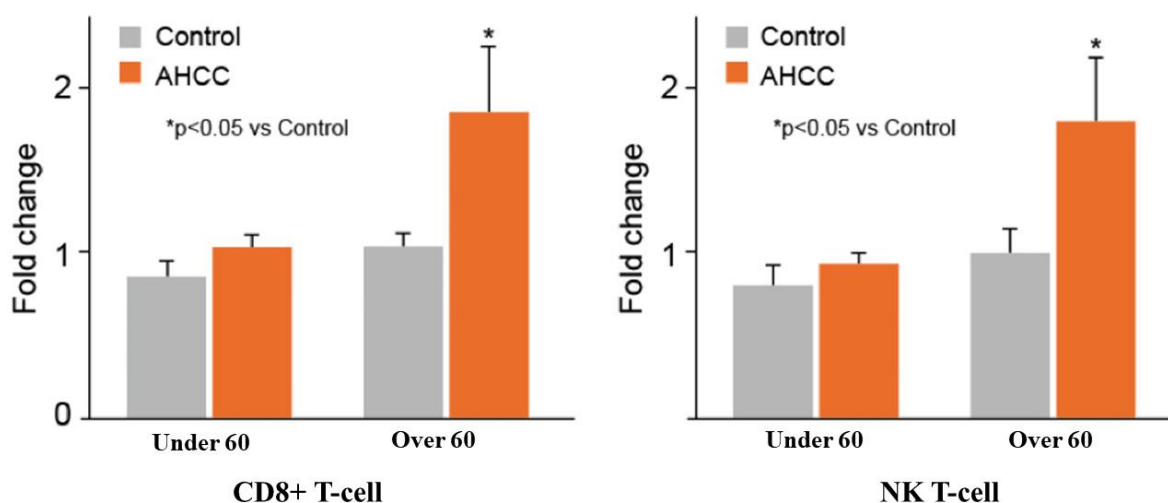


Fig. 1. – Comparative immune cell count after influenza vaccination

Elizabeth M. Gardner et al.(2013) Graph made by Amino Up Chemical based on published data

- **CD8⁺ T-cell**...Eradicates virus cells. Acts as a control tower within the immune system.
- **NK T-cell**...Eradicates various kinds of abnormal cell. Indispensable for defense of the body.

【Research Outline】

Randomized comparative study on the effects of AHCC® upon immune response to the influenza vaccine in 30 healthy individuals. Participants took AHCC® 3 g/day immediately after receiving the flu vaccine. Blood samples were collected prior to vaccination, and 3 weeks post-vaccination, and changes in CD8⁺ T-cells and NK T-cells were analyzed. The results of this trial can be read in more detail in **Nutrition Research, Elizabeth M. Gardner et al., 33(1), 12-17 (2013)**.

■The Immune Modulation Mechanisms of AHCC®

Explained by Dr. Jun Takanari, Science Division Chief, Amino Up Chemical Co., Ltd.

It is thought that AHCC® mainly acts upon cellular immunity within the body, and modulates the function of associated cells. T-cells play a large role in cellular immunity, and are known to differentiate and mature in response to cytokine, an important cell signaling protein. In people taking AHCC®, thriving production of the cytokines IL-12 and IFN- γ has been observed, and the data outlined in this news release can be believed to be linked to this mechanism of action.



In recent years, preliminary research indicates that AHCC® may also modulate both the number and activity/function of macrophages, white blood cells, and NK T-cells (Natural Killer cells).

■AHCC®

AHCC® is extracted from cultured *Lentinula edodes* mycelia. It was developed in 1989, and has been the subject of extensive research at universities and medical facilities worldwide. It is rich in α -glucans, and has been widely used as a supplement for immune modulation. It is marketed not only within Japan, but also in Europe, America, Asia, and Oceania. It currently sees use within the field of integrative medicine.

■Amino Up Chemical Co., Ltd.

The company was founded in 1984, and it states its mission as to 'bring smiles to the people of the world with the blessings of nature'. The company develops and produces supplements and functional foods, and maintains a strong focus on gathering powerful and trustworthy scientific evidence for all of its products. In September of 2011, the factory and main office building underwent reconstruction, and the building called 'eco house' in which the offices are located utilizes over 70 technologies aimed at reducing CO2 emissions and its effect on the environment. For example, Solar energy generation, Geothermal heat pumps, and a cooling system using snow collected in winter are just a few of the technologies introduced, and the company achieved a 50% reduction in the amount of CO2 it produces.



Company Name: Amino Up Chemical Co., Ltd.

Company Address: 363-32 Shin-ei, Kiyota-Ku, Sapporo, Hokkaido, 004-0839 Japan

President: Hajime Fujii

Capital: 369 million yen

Company activities:

- Biotechnology (cultures produced in large tanks), manufacture of basidiomycete-derived botanical and biological ingredients.
- The development, manufacture, and sales of naturally-derived physiologically active ingredients.
- Test-manufacture runs of physiologically active substances using large tank cultures.
- The production of naturally-derived agricultural products, food additives, health foods, and medicinal ingredients.

• ISO-9001:2015 certified • ISO 22000:2005 • Certified GMP for manufacture of dietary supplements.

[Contact Information for Enquires Concerning this Article:]

Amino Up Chemical Co., Ltd., Business Development Division. PR representatives:
Todo, Iwamatsu, Miura

TEL: 011-889-2555 FAX: 011-889-2375 E-mail: au_pr@aminoup.co.jp