

October 5, 2011
SBI ALA promo Co., Ltd.

ALA Study Results Presented at Japanese Cancer Association, 70th Annual Meeting (2)
- Finding of ALA's effect of enhancing hyperthermia therapy -

SBI ALA promo Co., Ltd. (Head Office: Minato-ku, Tokyo; Representative Director and CEO: Yoshitaka Kitao; "SBI ALA promo"), a subsidiary of SBI Holdings, Inc. which conducts research and development of cosmetics, health foods, and pharmaceuticals using 5-aminolevulinic acid (ALA)^{*1}, has discovered that ALA has the effect of enhancing hyperthermia therapy, in joint research with Tokyo University of Agriculture and Tokyo Institute of Technology.

The study results were presented at the 70th Annual Meeting of the Japanese Cancer Association held on October 4, 2011.

This study examined the death rates of various cancer cell lines, such as HepG2, Caco-2, and KATOIII, under thermal conditions and found that ALA added to culture medium^{*2} increased the mortality rates of the cancer cells in dose dependent manner. Among these cancer cell lines, there were some in which ALA-induced protoporphyrin IX (PPIX) notably accumulated. In contrast, administration of ALA caused no death rate increase or PPIX accumulation in the normal cell line, WI-38.

The novel effect of ALA which increase the death rate of cancer cells under thermal conditions differed depending on the type of cell: The most sensitive type was KATOIII (derived from stomach cancer), in which the addition of ALA had a 1.8-fold enhanced cell-death effect.

Hyperthermia therapy is a cancer treatment which Japan put into practice for the first time in the world. It is an excellent therapy that is minimally invasive and is also covered by health insurance, but it has not been widely used because of its slow effect.

On the other hand, ALA is attracting attention as a sensitizer for photodynamic therapy (PDT)^{*3} since administration of the compound followed by light irradiation can generate active oxygen to treat cancer. While it has already been put to practical use in Europe and the U.S. to treat skin cancer in particular, where light irradiation is easily performed, applying it to inner cancers, which are difficult to irradiate with light, has remained an unmet challenge.

While the application of ALA to human treatment is a challenge for the future, SBI ALA promo will make further efforts to pursue ALA research so that it may lead to the development of a minimally invasive and

highly effective therapy that compensates for the shortcomings of both hyperthermia and PDT.

Research outcomes and up-to-date information about ALA will be available also from ALAplus Lab (URL: <http://www.ala-plus.jp/>).

Glossary:

***1: 5-aminolevulinic acid (ALA)**

An amino acid created by mitochondria in the body. It is an important substance that serves as protein material related to energy production in the form of hemes and cytochromes, and its productivity is known to decrease with age. ALA is contained in shochu distillation remnants, red wine and foods such as radish sprout. In addition, it is known as a material forming chloroplasts in plants, and fertilizers and health foods containing ALA are among its practical applications.

***2: Medium**

Medium is fluid that supplies appropriate growth environment to cultured bacteria and tissues. Medium is the source for carbon and nutrients such as vitamins and minerals.

***3: Photodynamic Treatment (PDT)**

When ALA is applied to skin and exposed to red light, radical oxide is induced inside cancer cells and lead them suicide. PDT is approved as a treatment for skin cancer in Europe, and attracts attention for its cosmetic advantage that it leaves no scars.