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SBI ALApromo Co., Ltd.

ALA Study Results Presented at Japanese Cancer Association, 70th Annual Meeting (3)

- Identification of sensitivity determinant in photodynamic therapy using ALA -

SBI ALApromo Co., Ltd. (Head Office: Minato-ku, Tokyo; Representative Director and CEO: Yoshitaka Kitao; "SBI ALApromo"), a subsidiary of SBI Holdings, Inc. that conducts research and development of cosmetics, health foods, and pharmaceuticals using 5-aminolevulinic acid (ALA)[*1] has identified a factor that determines sensitivity to photodynamic therapy using ALA, with Tokyo Institute of Technology, Kanazawa University, NPO Organization to Support Peritoneal Dissemination Treatment, and RIKEN.

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

Photodynamic therapy with ALA (ALA-PDT)[*2] for cancer generates active oxygen. As a result, it causes selective apoptosis (suicidal destruction) of the cells by applying or orally administering ALA. Protoporphyrin IX (PPIX) selectively accumulated in cancer cells by irradiating light. As the therapy is minimally invasive and leaves no scar, it is already practically used for skin cancer etc. in the West. It is known ALA-PDT differs in effectiveness depending on the type of cancer cell. Therefore, research has been pursued to find a factor that determines sensitivity to ALA-PDT.

The joint study classified various cancer cells by sensitivity to ALA-PDT and found that ALA-PDT effects depended on the quantity of accumulation of PPIX. Examination of various cancer cell lines showed that the higher the level of the human oligopeptide transporter (PEPT1) that takes in ALA, the higher the accumulation of PPIX and that the higher the level of the ABCG2 transporter that excretes PPIX extracellularly, the lower the accumulation of PPIX. Further experiments revealed that over-expression of PEPT1 in the stomach-cancer-derived KKLS cell line which poorly expresses PEPT1 caused accumulation of PPIX and thus raised sensitivity to ALA-PDT. Furthermore, application of fumitremogin C, an ABCG2 inhibitor, to human fibrosarcoma-derived HT-1080 cells which have a high expression of both PEPT1 and ABCG2 and show resistance to ALA-PDT resulted in the reversal of resistance to ALA-PDT.

Based on these study results, it is expected that drugs that enhance the expression of PEPT1 or inhibit ABCG2 will increase sensitivity to ALA-PDT.

SBI ALApromo will make further efforts to pursue research on ALA-PDT so that it may help the many patients who are struggling with cancer. 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 food such as radish sprouts. 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: Photodynamic Diagnosis (PDD) and Photodynamic Treatment (PDT)**

Photodynamic Diagnosis (PDD): When cancer cells uptake ALA and absorb blue light, they emit red fluorescent light. SBI ALApromo introduced ALA as intraoperative diagnostic agent from German company and currently Phase III trial is proceeding in Japan.

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.