March 14, 2016
SBI Pharmaceuticals Co., Ltd.

Registration of a Patent for Photodynamic Diagnosis and Photobleaching-Prevention Agent through Joint Application with Tokyo Institute of Technology

SBI Pharmaceuticals Co., Ltd., (Head office: Minato-ku, Tokyo; Representative Director and CEO: Yoshitaka Kitao; "SBI Pharmaceuticals"), a subsidiary of SBI Holdings, Inc., engaged in research and development of pharmaceuticals, health foods and cosmetics using 5-aminolevulinic acid ("5-ALA")[*1], hereby announces that a patent has recently been registered in Japan for a photodynamic diagnosis and photobleaching-prevention agent. This patent was filed jointly with Tokyo Institute of Technology (main campus: Meguro-ku, Tokyo; President: Yoshinao Mishima).

Patent number:	5883889
Title of invention:	Photodynamic diagnosis agent and photobleaching-prevention agent
Assignee:	SBI Pharmaceuticals Co., Ltd. and Tokyo Institute of Technology
Filing date:	January 22, 2013

Porphyrin, a substance used as a photosensitizer, gives rise to a phenomenon called photobleaching (*2) during a fluorescence measuring process. This causes the fluorescence intensity to weaken with the passage of time, bringing about a problem of the diagnosis time being shortened. Consequently, there has been a need to prevent porphyrin photobleaching and find a diagnosis that uses a photobleaching-prevention agent.

5-ALA is a substance known to be taken into tumor cells before being accumulated in the form of protoporphyrin IX, a type of porphyrin. Thus, 5-ALA is already used as an intraoperative diagnostic agent for brain tumors. It was recently discovered that gallic acid(*3) had the effect of preventing the photobleaching of protoporphyrin IX, and further that administering a combination of 5-ALA and gallic acid would potentially be used to diagnose tumor cells where protoporphyrin IX is accumulated, which discoveries have resulted in the registration of the above-mentioned patent.

SBI Pharmaceuticals will continue to pursue various potential applications of 5-ALA, and focus on research and development to provide pharmaceuticals that satisfy the unmet medical needs of as many people as possible around the world.

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

An amino acid produced in mitochondria. It is an important substance that serves as a functional molecule related to energy production in the form of heme and cytochromes, and its productivity is known to decrease with age. 5-ALA is contained in food such as shochu lees, red wine and Asian ginseng. It is also known as a material forming chloroplasts in plants.

*2: Photobleaching

A phenomenon in which, after being exposed to strong light, fluorescent molecules lose fluorescence as a result of irreversible change in the molecules. For example, in the case of protoporphyrin IX, the fluorescence intensity is known to decline to one-tenth

or less of the original level after 60 seconds.

*3: Gallic acid

A type of organic compound. It is contained in tea leaves and other various plants. A kind of gallic acid is used in food additives as an antioxidant for oil and fats.

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For further information, please contact:
SBI Pharmaceuticals Co., Ltd.: Corporate Planning Dept., Tel: +81 3 6229 0095