

Press Release



Conclusion of a basic agreement between Pixie Dust Technologies and Shionogi for joint research for improvement of cognitive function and brain activation by sound stimulation ~ With the vision of offering continual care for dementia patient in everyday life~

OSAKA, Japan, June 21, 2022 - Shionogi & Co., Ltd. (Headquarters: Osaka, Japan; President and CEO: Isao Teshirogi, Ph.D.; hereafter "Shionogi") and Pixie Dust Technologies, Inc. (Head Office: Chiyoda-ku, Tokyo, Representative Director: Yoichi Ochiai, Taiichiro Murakami, hereinafter "PxDT") announce their entry into a basic agreement (hereinafter, the "Agreement") to pursue brain activation and improvement of cognitive function by sound stimulation, with the aim of providing continual pervasive care for dementia patient in everyday life by sensory stimulus, based on the output of joint research conducted thereunder.

In Japan, the elderly population is continuing to increase, reaching 28.4% of the overall population, which is the highest fraction in the world (*1). The prevalence of dementia in Japan's elderly is estimated to be around 15%, and it is expected to increase further (*2). Dementia lowers the patients' QOLs (Quality of Life) by disturbing cognitive functions such as memory, learning, language, and reasoning ability, which also results in physical, mental, and economic burden for caregivers. Furthermore, satisfaction with current therapeutic approaches is low (*3), and a new solution is required.

In cognitive function disorders, a certain rhythmic activity (gamma waves) necessary to fulfill the cognitive function of the brain is found to decrease (*4). Since December 2021, PxDT and Shionogi have been conducting joint research on ways to activate cerebral rhythmic activities through sensory stimulus, with the concept that long-term intervention by sensory stimulation in everyday life may ameliorate the progress of dementia. In this effort, we have jointly developed a sonic technology that may enhance cerebral gamma wave rhythmic activity. The conclusion of this Agreement will allow us to accumulate further evidence and to develop a practical approach into incorporate this sonic stimulation into daily life, for example, through processing of TV sound and music.

By leveraging our respective strengths, PxDT and Shionogi plan to develop products and services that support dementia care in everyday life through stimulating senses such as sight and hearing, aiming to offer new solutions for people with dementia and society at large.

About Shionogi & Co., Ltd.

Shionogi has identified "improving social productivity" as a material issue (materiality) we should address. We will continue to strive to deliver innovative treatments for cognitive function disorders with high unmet

Press Release



medical needs and to thereby contribute to improving the quality of life and productivity of people suffering from mental / neurological disease and those who support them.

URL : <https://www.shionogi.com/global/en/>

About Pixie Dust Technologies, Inc.

Pixie Dust Technologies, Inc., headquartered in Tokyo, have world-leading expertise in digital ultrasonic wave control, led by two expert Ph.D. founders.

We are seeking to deliver a new options to address unmet health needs throughout the world, going beyond traditional approaches such as drugs, starting with dementia care through sensory stimulation. Our core “wave control technology” allows manipulate not only ultrasonic waves but also light and electromagnetic waves. Using this technology, we seek to improve quality of life, supplement and enhance physical abilities, and to address the challenges of aging, with a focus on the development of non-contact / non-invasive devices in the field of health care.

URL : <https://pixiedusttech.com/>

References:

1. Annual Report on the Aging Society 2020
2. Report of Research Supported by HLSRG (Health and Labor Sciences Research Grant) “Research on Future Changes in the Elderly Population with Dementia in Japan”
3. Domestic Basic Technology Survey Report 2020 "Survey on Medical Needs for 60 Diseases (6th)" Analysis
4. McDermott, B. et al. Gamma Band Neural Stimulation in Humans and the Promise of a New Modality to Prevent and Treat Alzheimer’s Disease. *Journal of Alzheimer’s Disease* 65, 363–392 (2018)

Forward-Looking Statements

This announcement contains forward-looking statements. These statements are based on expectations in light of the information currently available, assumptions that are subject to risks and uncertainties which could cause actual results to differ materially from these statements. Risks and uncertainties include general domestic and international economic conditions such as general industry and market conditions, and changes of interest rate and currency exchange rate. These risks and uncertainties particularly apply with respect to product-related forward-looking statements. Product risks and uncertainties include, but are not limited to, completion and discontinuation of clinical trials; obtaining regulatory approvals; claims and concerns about product safety and efficacy; technological advances; adverse outcome of important litigation; domestic and foreign healthcare reforms and changes of laws and regulations. Also for existing products, there are manufacturing and marketing risks, which include, but are not limited to, inability to build production capacity to meet demand, lack of availability of raw materials and entry of competitive

Press Release



SHIONOGI

 Pixie Dust Technologies, Inc.

products. The company disclaims any intention or obligation to update or revise any forward-looking statements whether as a result of new information, future events or otherwise.

For Further Information, Contact:

Shionogi Website Inquiry Form:

<https://www.shionogi.com/global/en/contact.html>

Pixie Dust Technologies Website Inquiry Form:

<https://pixiedusttech.com/contact/>