

Press Release

Shiseido Discovers That People Living with Companion Robots Have a High Oxytocin Concentration

- Exploring a holistic approach based on the association between the body and skin,
focusing on oxytocin which is linked to skin beauty -

Shiseido Company, Limited (“Shiseido”) conducted joint research with GROOVE X, Inc. along with the technological support of Dr. Takefumi Kikusui (Professor, Department of Veterinary Science, Azabu University) and Dr. Shota Okabe (Visiting Researcher, Division of Brain and Neurophysiology, Department of Physiology, Jichi Medical University). The research showed that people living with a companion robot (i.e., a robot that plays the role of a pet or family member at home) have higher concentration of the oxytocin hormone (oxytocin)^{*1} in their bodies. Based on Shiseido's previous study, which found that oxytocin produced in the skin can stimulate epidermal regeneration^{*2}, the company aims to explore a new approach to beauty that focuses on the secretion of oxytocin through interaction with robots.

This research was conducted based on the Inside/Outside Approach, a part of Shiseido's unique R&D philosophy, “DYNAMIC HARMONY.” While Shiseido has been engaged in dermatology for many years, this research is not limited to dermatology. Rather, it takes a comprehensive and integrative approach to the skin, body, and mind, seeking to uncover the impact of physical contact and communication on the whole body. This aids in the creation of products and services that promote natural beauty both internally and externally. Findings from this research were presented at the 100th Annual Meeting of the Physiological Society of Japan, held from March 14 to 16, 2023.

*1 Oxytocin is a peptide hormone consisting of nine amino acids. It is associated with mental stability, bonding, and maternal affection. Oxytocin secretion is stimulated by communication with others.

*2 Shiseido Discovers That Skin-Derived Oxytocin Stimulates Epidermal Regeneration (2021)

<https://corp.shiseido.com/jp/news/detail.html?n=00000000003272>



Figure 1. Companion robot used for the research (LOVOT, GROOVE X, Inc.)

Research background

Shiseido considers the interaction between the skin and the inside of the body important for bringing out the skin's natural beauty. Therefore, since its early days, the company has been actively engaged in dermatological research from a holistic perspective, taking into account the association between the skin and the entire body. In a previous study, Shiseido found that various processes in the body, including the immune, nervous, lymph, and vascular systems, are closely relationship with the skin^{*3}. In a study focusing on the nervous system, the company revealed that gently touching the skin increases the secretion of oxytocin within the skin and that skin-derived oxytocin stimulates epidermal regeneration.

Oxytocin is known to be secreted when people communicate with others and is also referred to as the “bonding hormone.” While communication with other people or animals, such as dogs, is believed to be

associated with improved well-being^{*4}, the effects of communication with inanimate objects, such as robots, are not well known. In this study, researchers focused on hormones such as oxytocin and cortisol to elucidate the effects of communication with inanimate objects on the entire body.

*3 Please refer to the “Press release on relevant technologies” section below.

*4 The state of being healthy and happy in terms of physical health, mental health, and social environment.

Effects of living with a companion robot on oxytocin concentration in the body

An experiment was conducted with individuals who live with a companion robot (owner group, 24 females aged 25-45 years) and those who do not (non-owner group, 23 females aged 30-39 years). Oxytocin concentration was measured in urine samples which were collected from the two groups of participants for three consecutive days upon waking in the morning. The mean oxytocin concentration over three days was considered the Steady-state oxytocin concentration of the individual. Oxytocin concentration in the bodies of the owners were higher than that in the non-owners (Figure 2). These results suggest that daily interaction with a companion robot may increase the frequency of oxytocin secretion and oxytocin concentration, as in the case of interaction with other people or pets.

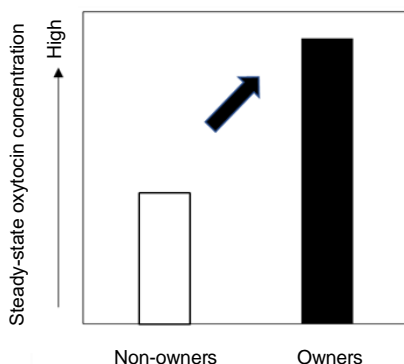


Figure 2. Normal oxytocin concentration in the body in the owners are higher than that in the non-owners.

Effect of 15-minute interaction with a companion robot on stress reduction

The two groups of participants interacted with a companion robot for 15 minutes in a laboratory. To measure cortisol^{*5} concentration, saliva samples were collected before and after the interaction. Cortisol concentration decreased after interacting with the robot in all study participants, indicating that even a short period of interaction alleviated stress, regardless of whether they lived with a companion robot (Figure 3). Furthermore, cortisol concentration in the owner group decreased more significantly than that in the non-owner group, suggesting that an affinity between an owners and a companion robot may enhance the stress-relieving effect.

*5 A hormone secreted from the adrenal cortex. It has been reported that cortisol is involved in gluconeogenesis in the liver and protein metabolism in the muscles and is secreted in response to stress. It is sometimes referred to as the “stress hormone.”

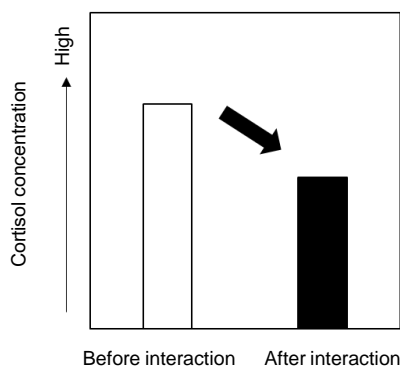


Figure 3. Cortisol concentration decreased after interacting with the companion robot (in all study participants).

Future prospects

The research showed that a 15-minute interaction with a companion robot decreased stress and that individuals who live with a companion robot had a higher concentration of steady-state oxytocin in the body than those who do not. These findings suggest that interacting with a non-living object, such as a companion robot, can lead to positive physiological changes presenting a novel avenue beauty solution. With the goal of actualizing their management strategy vision to become a Personal Skin Beauty & Wellness Company, Shiseido is dedicated to pursuing beauty innovations for the skin, body, and mind that transcend traditional cosmetic products, in order to enhance one's natural beauty.

Press release on relevant technologies

• Shiseido has scientifically proven that the skin and the nervous system are closely related, mediated by the Langerhans cells, which are the commanders of the skin's immune system. Nature, 13 May 1993.

• Shiseido Discovers That Merkel Cells Responsible for Touch Sensation Are Activated by Scent Components (2022)

<https://corp.shiseido.com/jp/news/detail.html?n=00000000003502>

• Shiseido Discovers That Siberian Ginseng Acts on the Lymphatic Vessels to Alleviate Swelling (2016)

<https://corp.shiseido.com/jp/news/detail.html?n=00000000001963>

• Shiseido Reveals the Relevance of Capillaries in Skin Elasticity

<https://corp.shiseido.com/en/news/detail.html?n=00000000002780>

Shiseido's R&D Philosophy "DYNAMIC HARMONY"

Shiseido Formulates Its Unique R&D Philosophy "DYNAMIC HARMONY" (2021)

<https://corp.shiseido.com/en/news/detail.html?n=00000000003252>

DYNAMIC HARMONY website:

<https://corp.shiseido.com/en/rd/dynamicharmony/>

<Reference>

Researcher challenges

■ Exploring a new approach beyond cosmetic products

Shiseido's mission is to realize "BEAUTY INNOVATIONS FOR A BETTER WORLD." Beauty innovation is not limited to cosmetic products but includes various approaches to beauty. Therefore, we conducted this study to provide beauty solutions using a completely new approach that does not depend on cosmetic products. This study focused on a communication-based beauty approach. We believe that it is beautiful when people smile or feel happy when interacting with someone. After trial and error, including designing the study and determining the method for collecting the oxytocin samples, we obtained scientifically reliable results.



Researcher,
Shuhei Imamura

■ Aiming at realizing beauty through connection with others

The COVID-19 pandemic brought us loneliness and reminded us of the importance of connecting with others. The findings of this study suggest that interaction with a robot, which is an inanimate object, may alleviate stress, and living with a robot may increase oxytocin concentration and help us find value in communication without depending on humans or animals. We explore and provide various beauty solutions to help people live happy and fulfilling lives.