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## Kao and Kirin Holdings Begin Joint Research On The Relationship Between Visceral Fat and Immunology

**TOKYO, November 11, 2022** - Kao Corporation (Kao) and Kirin Holdings Company, Limited (Kirin Holdings) will participate in the "Wakayama Health Promotion Study" cohort study\*<sup>1</sup> led by Wakayama Medical University and compiled by the Health Promotion Research Center (HPRC), a non-profit organization, from this month. Kirin Holdings and Kao will jointly conduct research to investigate the relationship between visceral fat and the activity of plasmacytoid dendritic cells\*<sup>2</sup> (pDCs), a key leader of the immune system, among others.

\*1 One of the observational research methods used to examine the association between disease factors and disease onset. A group of people involved in a specific disease factor and a group of people not involved in a specific disease factor are created, and the association between factors and disease onset can be examined by calculating the incidence of the target disease in each group.

\*2 Immune cells that play an important role as a key leader when bacteria or viruses enter the body. pDC activation activates various immune cells such as NK cells, T cells, and B cells to protect against viral infections.

### ● Research Outline

#### (1) Research theme

Research on genetic and environmental factors related to the development of lifestyle-related diseases among local residents in Wakayama Prefecture

#### (2) Research Structure

R&D-Health & Wellness Products Research, R&D-Biological Science Research, Kao Corporation  
Wakayama Medical University

Kirin Central Research Institute, Kirin Holdings Company, Limited

#### (3) Targets

300 male and female adults residing in Wakayama Prefecture (planned)

### ● Background

Obesity is defined by the World Health Organization (WHO) as "abnormal or excessive fat accumulation that may impair health," leading to an increased risk of chronic diseases. The effects of obesity on health are being studied around the world; and in recent years, the link between obesity and immunity has been attracting attention, as obesity has been linked to more severe viral infections\*<sup>3</sup>.

### ● Objective

This research aims to elucidate the relationship between visceral fat and pDC activity by combining Kirin Holdings' more than 35 years of research capabilities in the field of immunology with Kao's research capabilities in improving visceral fat accumulation, which is at the root of lifestyle-related diseases. The research will be conducted as an additional study to the "Wakayama Health Promotion Study," which has been conducted on residents of Wakayama Prefecture since 2011.

This month, a specific health checkup will be conducted in Wakayama Prefecture for residents aged 40-55. Kao will collect data on lifestyle habits and the amount of visceral fat, while Kirin Holdings will collect data on the activity of dendritic cells, including pDCs, in the blood. These data will be mutually shared, and the relationship between visceral fat and pDC activity will be jointly studied and analyzed.

\*3 Int J Epidemiol. 2019;48(6):1783-1794. <https://doi.org/10.1093/ije/dyz129>  
Obes Rev. 2020;21(11):e13128. <https://doi.org/10.1111/obr.13128>

### ● What is the Wakayama Health Promotion Study?

This is a cohort study led by Wakayama Medical University since 2011 and currently being conducted in collaboration with HPRC, with the aim of identifying genetic and environmental factors involved in the development of various diseases among local residents in Wakayama Prefecture.

So far, research has been conducted on lifestyle and muscle mass, and a number of original papers on the relationship between muscle mass loss and the onset of arteriosclerosis have been published, as well as the relationship between a history of falling down and the amount of voluntary physical activity.

By clarifying the relationship between visceral fat mass and pDC activity through the HPRC study, Kirin and Kao will promote initiatives aimed at reducing health risks for consumers in the future.

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## **About Kirin Holdings**

Kirin Holdings Company, Limited is an international company that operates in the Food & Beverages domain (Food & Beverages businesses), Pharmaceuticals domain (Pharmaceuticals businesses), and Health Science domain (Health Science business), both in Japan and across the globe.

Kirin Holdings can trace its roots to Japan Brewery which was established in 1885. Japan Brewery became Kirin Brewery in 1907. Since then, the company expanded its business with fermentation and biotechnology as its core technologies, and entered the pharmaceutical business in the 1980s, all of which continue to be global growth centers. In 2007, Kirin Holdings was established as a pure holding company and is currently focusing on boosting its Health Science domain.

Under the [Kirin Group Vision 2027](#) (KV 2027), a long-term management plan launched in 2019, the Kirin Group aims to become A global leader in CSV\*, creating value across our world of Food & Beverages to Pharmaceuticals. Going forward, the Kirin Group will continue to leverage its strengths to create both social and economic value through its businesses, with the aim of achieving sustainable growth in corporate value.

\* Creating Shared Value: combined added value for consumers as well as for society at large.

## **About Kao Corporation**

Kao creates high-value-added products and services that provide care and enrichment for the life of all people and the planet. Through its portfolio of over 20 leading brands such as Attack, Bioré, Goldwell, Jergens, John Frieda, Kanebo, Laurier, Merries, and Molton Brown, Kao is part of the everyday lives of people in Asia, Oceania, North America, and Europe. Combined with its chemical business, which contributes to a wide range of industries, Kao generates about 1,420 billion yen in annual sales. Kao employs about 33,500 people worldwide and has 135 years of history in innovation. Please visit the Kao Group website for updated information. <https://www.kao.com/global/en/>

The Kao Group established its ESG strategy, the Kirei Lifestyle Plan, in April 2019. In 2021, Kao launched its Mid-term Plan 2025 (K25), which declares "protecting future lives" and promoting "sustainability as the only path" as its vision. The Kao Group will continue to integrate its ESG strategy into its management practices. It will also develop its business, provide better products and services for consumers and society, and work toward its purpose, "To Realize a Kirei World in Which All Life Lives in Harmony."

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