June 20, 2025

Announces Immune-Boosting Effects of Rice-Derived Glucosylceramide at the Japanese Society of Anti-Aging Medicine

We presented the results of its research on the **immune effects** of **glucosylceramide**, a standard component of its moisturizing and whitening ingredient **"Oryza Ceramide™"**, at the **Japanese Society of Anti-Aging Medicine** Annual Meeting held from June 13th to 15th.

The poster presentation, titled **"Immune-Activating Effects of Rice-Derived Glucosylceramide, Its Mechanism of Action, and Bioactive Components,"** summarized comprehensive findings, including clinical trials conducted by an external Contract Research Organization (CRO). This research was conducted in collaboration with Saga University, Kindai University, Osaka University's Research Institute for Microbial Diseases, and Hokkaido University, with support from the Ministry of Economy, Trade and Industry's Go-Tech Project.

While it was previously known that non-plant-derived glucosylceramides induce innate immunity in antigen-presenting cells[*1], there was no existing knowledge regarding plant-derived glucosylceramides. To address this, we conducted clinical trials and researched the active components and their mechanisms of action, aiming to develop rice-derived glucosylceramide as a food ingredient for immune maintenance.

Two types of clinical trials were reported. Healthy subjects consumed glucosylceramide (1.8 mg/day) for 8 weeks, with primary outcomes evaluated as common cold symptom scores[*2] (UMIN45523) and activation of blood dendritic cells (DCs) [*3] (UMIN55614). **In the former, the glucosylceramide group showed significant improvements in total common cold symptoms, sore throat/hoarseness, cough, headache, muscle pain, and diarrhea scores compared to the placebo group. In the latter, stratified analysis of cDCs[*4] revealed a significant increase in the expression of HLA-DR[*6], a key molecule in antigen presentation[*5].** These results suggest that glucosylceramide exhibits immune-activating effects by enhancing the information transfer capabilities of immune cells.

Regarding the active components and mechanisms of action, among 13 types of rice-derived glucosylceramide, **glucosylceramide [d18:2(4E,8Z)/18:0)] was found to bind to the immune receptors TLR-2 and -4[*7], which recognize bacteria, and strongly induce IL-6[*9] production accompanied by the expression of CD40 and 80[*8]**. Furthermore, **five types of glucosylceramide [d18:2(4E,8Z)] and four types of glucosylceramide [t18:1(8Z)] were found to bind to Mincle[*10], which recognizes fungi and Mycobacterium tuberculosis**. These findings clarify that glucosylceramide acts on different immune receptors than Lactobacillus plantarum Plasma.

In addition to these results, Oryza Oil & Fat Chemical plans to conduct further clinical trials to continue advancing research on the immune-activating effects of rice-derived glucosylceramide.

Glossary

*1 Antigen-presenting cells :
Cells that convey information about pathogens to other immune cells, such as dendritic cells and macrophages.

*2 Common cold symptom score :
A scoring system used to quantify the severity of cold symptoms, employed as a standard evaluation criterion in clinical trials.

*3 Blood Dendritic Cells (DCs) :
A type of immune cell found in the bloodstream. They circulate in the blood and play a role in detecting pathogens.

*4 cDC :
Conventional Dendritic Cell. The most common type of dendritic cell, proficient at transmitting pathogen information.

*5 Antigen presentation :
The process of conveying information about pathogens to other immune cells.

*6 HLA-DR :
Human Leukocyte Antigen-DR, a type of Human Leukocyte Antigen (HLA). Its most crucial role is to present foreign antigens to white blood cells (T cells).

*7 TLR-2, -4 :
Toll-like Receptors. Proteins on the cell surface that act as immune sensors, recognizing pathogens and triggering an alarm. Different types recognize different targets; TLR-2 recognizes Staphylococcus aureus and fungi, while TLR-4 recognizes E. coli and Salmonella.

*8 CD40, 80 :
Cluster of Differentiation antigens. They act as bridges for communication between immune cells. Their roles vary by type; CD40 promotes dendritic cell maturation, and CD80 activates white blood cells.

*9 IL-6 :
Interleukin-6, a type of physiologically active substance produced by immune cells. It controls many immune responses as a crucial regulator of immunity and inflammation.

*10 Mincle :
Macrophage-inducible C-type lectin. A highly specialized immune sensor expressed on macrophages, among other cells, that specifically monitors certain pathogens and tissue damage, recognizing fungi and Mycobacterium tuberculosis.

Sincerely,
Oryza Oil & Fat Chemical Co., Ltd.