



Kyowa Hakko Recognized for

2021

New Product Innovation

North American

Immune Health Ingredient Industry

Excellence in Best Practices

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each Award category before determining the final Award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Kyowa Hakko USA excels in many of the criteria in the immune health ingredients space.

AWARD CRITERIA	
<i>New Product Attributes</i>	<i>Customer Impact</i>
Match to Needs	Price/Performance Value
Reliability	Customer Purchase Experience
Quality	Customer Ownership Experience
Positioning	Customer Service Experience
Design	Brand Equity

Well-Positioned to Match Customer Needs

As consumer awareness of the need to maintain a healthy immune system rises amid the COVID-19 pandemic, the demand for immune-supporting ingredients and products has increased significantly. Many ingredients, including vitamins, herbal extracts, and probiotics, are now sought-after for their direct or indirect association with immune health. Frost & Sullivan projects the North American immune-supporting vitamin and dietary supplement market to record strong growth in 2021.

“IMMUSE™ is a clinically backed, patent-protected, non-GMO, allergen-free, GRAS, and heat-stable paraprobiotic. It is a broad-range immune support ingredient used in various finished products, providing formulation ease to supplement and functional food manufacturers. Studies show that it activates pDCs, which activate other immune cell types involved in innate and adaptive immunity. The comprehensive immune support offered by IMMUSE™ makes it stand out among other immune health ingredients.”

- Smriti Sharma, Senior Industry Analyst

Given the increase in demand, supplement and functional food formulators seek novel ingredients to boost consumers’ immunity and health and offer ease of use. Probiotics support immune health, but challenges remain in terms of their stability in end-product formulations. Probiotics are also sensitive to the high temperature and water activity of food products, presenting application challenges. Frost & Sullivan analysts observe how safety problems associated with live microbial cells led the industry to look toward alternatives such as paraprobiotics and postbiotics.

Paraprobiotics are defined as non-viable probiotics or inactivated probiotics, which provide benefits to the host when given in sufficient quantities. A growing scientific literature demonstrates that specific clinically tested paraprobiotic strains confer benefits to the immune system. However, few participants offer clinically backed paraprobiotics. Strains that can provide more comprehensive immune support are also likely to gain higher customer penetration.

Kyowa Hakko USA (Kyowa Hakko) is the American branch of Kyowa Hakko Bio Co. Ltd., a leading biotechnology and fermentation technology firm that offers various amino acids. Kyowa Hakko Bio Co. Ltd.'s parent firm is Kirin Holdings Co., Ltd., one of the largest Japanese beverage and pharmaceutical group companies. Kyowa Hakko provides an extensive range of highly functional branded ingredients for various industries, including pharmaceutical, dietary supplements, food/beverage, biotechnology, and cosmetics.

The company launched a novel paraprobiotic, IMMUSE™ (LC-Plasma), in 2020 in the United States to support immune health. IMMUSE™ is a clinically researched lactic acid bacteria developed by Kirin Holdings Company, Limited and offered by Kyowa Hakko USA (a wholly owned subsidiary of Kyowa Hakko Bio Co., Ltd). The heat-killed form of *Lactococcus lactis* strain Plasma has been clinically shown to directly activate immune cells to provide comprehensive innate and adaptive immune support. Kirin Holdings started to use the ingredient in Japan in 2012. Since then, numerous products in the form of tablets, gummies, functional beverages, and yogurt have used the ingredient. Frost & Sullivan notes that this indicates ease of formulation, potential application versatility, and heat stability compared to probiotics and other immune health ingredients.

There is also an increasing demand for functional ingredients that can offer additional value and health benefits to daily food products. IMMUSE™ has self-affirmed Generally Recognized as Safe (GRAS) status in the United States, positioning it quite well to cater to the growing consumer demand for functional food and beverages. As the ingredient is vegetarian, non-genetically modified (GM), and allergen-free, it can match evolving trends in the United States market, such as the rising demand for clean-label products.

IMMUSE™ provides comprehensive immune support by activating plasmacytoid dendritic cells (pDCs). This rare immune cell subset activates other immune cells, such as natural killer (NK), killer T, helper T, and B cells, responsible for innate and adaptive immunity. Studies show that IMMUSE™ is the only lactobacillus strain that can activate pDCs, which activates other immune cell types upon sensing viral DNA or RNA through toll-like receptors 7 and 9.¹ pDCs also secrete other proinflammatory cytokines and chemokines, such as type I interferon and interleukin 6 (IL-6), offering multifaceted and broad immune support.

Other immune support ingredients (including probiotics and beta-glucan) activate specific immune cell types compared to IMMUSE, imparting only partial immune support. Frost & Sullivan's analysis indicates that IMMUSE™ is well-positioned to cater to changing consumer demand as the industry seeks ingredients that offer comprehensive immune support benefits with ease of usability.

Ingredients backed by clinical and scientific studies are expected to gain wider consumer adoption as demand for evidence-based ingredients rises. Twenty-six studies, including 11 human clinical trials that

¹ <https://pubmed.ncbi.nlm.nih.gov/24239838/>

comprise nine efficacy studies and two safety studies, back IMMUSE™, making it one of the most comprehensively studied and clinically validated paraprobiotics ingredients. Frost & Sullivan identifies Kirin Holdings' commitment and investment toward clinically validating the ingredient's efficacy and safety as a best practice in the industry.

Unlike competing paraprobiotics, which researchers primarily studied for their role in immune health, clinical research indicates IMMUSE™ can improve respiratory health and, in turn, reduce fatigue, enhancing sports performance.² Kirin Holdings also conducted clinical studies to test IMMUSE™ in office settings. Results indicate it can improve office productivity by strengthening immune health.³ As such, the ingredient offers many scientifically backed health benefits that position it firmly in the competitive immune support ingredients space. Research shows IMMUSE™ to effectively reduce the incidence rate of flu-like symptoms among children, indicating further application potential.⁴

Kirin Holdings holds a global patent on IMMUSE™ ([US9549956B2](https://patents.google.com/patent/US9549956B2)) that claims the bacterial strain and the mechanism of action, providing the company a competitive edge and first-mover advantage (particularly in the United States market).

Reliability and Quality

Frost & Sullivan recognizes that Kyowa Hakko has a distinct edge over other competitors as it is a part of Kirin Holdings, a fermentation technology leader. It can leverage years of experience and expertise in R&D and understanding consumer demand. The company has high standards that drive its activity across processes, including product development, manufacturing, marketing, and sales. Kyowa Hakko employs the quality-first approach, evident from its Kyowa Quality® logo that guarantees the ingredients meet the highest purity, quality, science, and reliability standards. It launched the KyowaQuality website in 2017 to create awareness among consumers on Kyowa Quality ingredients and products that hold the KQ Logo globally.

Koiwai Dairy Products, a Kirin Holdings subsidiary, manufactures IMMUSE™ in Japan and Kyowa Hakko distributes it in the United States. The company does not use any organic solvents in the upstream and downstream fermentation processes, making the whole process sustainable. IMMUSE™ is also Proposition 65 compliant, a proposition that requires businesses to warn Californians about significant exposures to chemicals that cause cancer, congenital disabilities, or other reproductive harm.

The *Lactococcus lactis* strain has a long-established use case history as cheese and yogurt production commonly use the bacteria. Safety studies conducted by Kirin Holdings indicate that the strain is well tolerated even at a high dosage (250 mg/day). Thus, IMMUSE™ is a safe and reliable immune health ingredient.

In collaboration with Kirin Beverages, Kirin Holdings launched six new products containing the IMMUSE™ *Lactococcus lactis* strain Plasma in 2020 after receiving the Foods with Function Claims status from Japan's Consumer Affairs Agency (CAA). Frost & Sullivan's analysis shows none of its other competitors has received this status, making IMMUSE™-based products the first and only products in

² <https://pubmed.ncbi.nlm.nih.gov/30071871/>

³ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7333011/>

⁴ <https://www.scirp.org/journal/paperabs.aspx?paperid=75999>

Japan that can claim immune support on labels. As consumers become highly conscious of product claim reliability, such registrations indicate high quality and reassure them, helping product selection.

Enhancing Customer Satisfaction by Focusing on Customer Service Experience & Brand Equity

Since paraprobiotics is a new concept and niche segment even in the United States, there is a vast opportunity in educating consumers of its benefits to enhance penetration. Kyowa Hakko collaborates with customers to carry out consumer awareness programs to create brand awareness. These programs can create differentiation for the ingredient and end products. As part of client education, Kyowa Hakko conducts healthcare practitioner training or healthcare education programs to create awareness of different customer products and the science behind different ingredients. The company also promotes its ingredients and features finished products that contain its ingredients on the www.Immusehealth.com website to make them more accessible to end consumers.

In addition to formulation advisory, Kyowa Hakko provides regulatory guidance on labeling functional claims on finished products and uses consumer research to help customers position their products in the market to target the right audience. Strong science, regulatory, and marketing support are the unique selling propositions that create differentiation for Kyowa Hakko in an otherwise competitive health ingredient industry.

The company conducts regular customer surveys and obtains one-to-one feedbacks to ensure it is aware of customer concerns and can deliver per changing requirements. IMMUSE™ has received highly positive feedback. One main feedback states it is easy to work with, unlike some conventional immune health ingredients, which may not be stable in different food and beverage matrices. According to Kyowa Hakko's Vice President of Marketing, customers tend to work with some ingredients and eventually use all the other products in the portfolio due to the company's support at different levels.

IMMUSE™ has been part of numerous products such as drinks, yogurt, and other functional food and beverage since its launch, supporting both health and business case for the ingredient. The ingredient is also present in the official sports drink of Japan's national soccer team, which further indicates it is an effective and highly sought-after immune health ingredient.

Conclusion

The demand for supplements and functional foods that can offer comprehensive immune support has increased as immune health takes center stage amid the COVID-19 pandemic.

Although there are many immune health ingredients in the market, Frost & Sullivan points out that Kyowa Hakko's patented, non-GMO, allergen-free paraprobiotics, IMMUSE™, provides a novel broad-range immune support solution to supplement and functional food manufactures. The strong research associated with the ingredient, application versatility, and stringent quality standards followed by the company and its parent group are vital differentiators, positioning IMMUSE™ firmly in the competitive immune health space.

With its strong overall performance, Kyowa Hakko USA earns the 2021 Frost & Sullivan New Product Innovation Award.

What You Need to Know about the New Product Innovation Recognition

Frost & Sullivan's New Product Innovation Award recognizes the company that offers a new product or solution that uniquely addresses key customer challenges.

Best Practices Award Analysis

For the New Product Innovation Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

New Product Attributes

Match to Needs: Customer needs directly influence and inspire product design and positioning

Reliability: Product consistently meets or exceeds customer performance expectations

Quality: Product offers best-in-class quality with a full complement of features and functionality

Positioning: Product serves a unique, unmet need that competitors cannot easily replicate

Design: Product features an innovative design that enhances both visual appeal and ease of use

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

