



KYOWA HAKKO BIO CO., LTD.

| | |
|-------------------------|---|
| Corporate name | KYOWA HAKKO BIO CO., LTD. |
| Established | October 1, 2008 |
| Capitalization | 10,000 million Japanese yen |
| Number of employees | 1,894 (consolidated) |
| President | Takeshi Minakata, President and Chief Executive Officer |
| Address of head office | 1-9-2 Otemachi, Chiyoda-ku, Tokyo 100-0004 (Otemachi Financial City Grand Cube) TEL: 03-5205-7300 URL: http://www.kyowahakko-bio.co.jp/ |
| Description of business | Manufacture and sale of pharmaceutical raw materials, amino acids, and health foods |
| Parent company | Kirin Holdings Company, Limited |

Businesses bridging Pharma and Food

KYOWA HAKKO BIO CORPORATE GUIDE

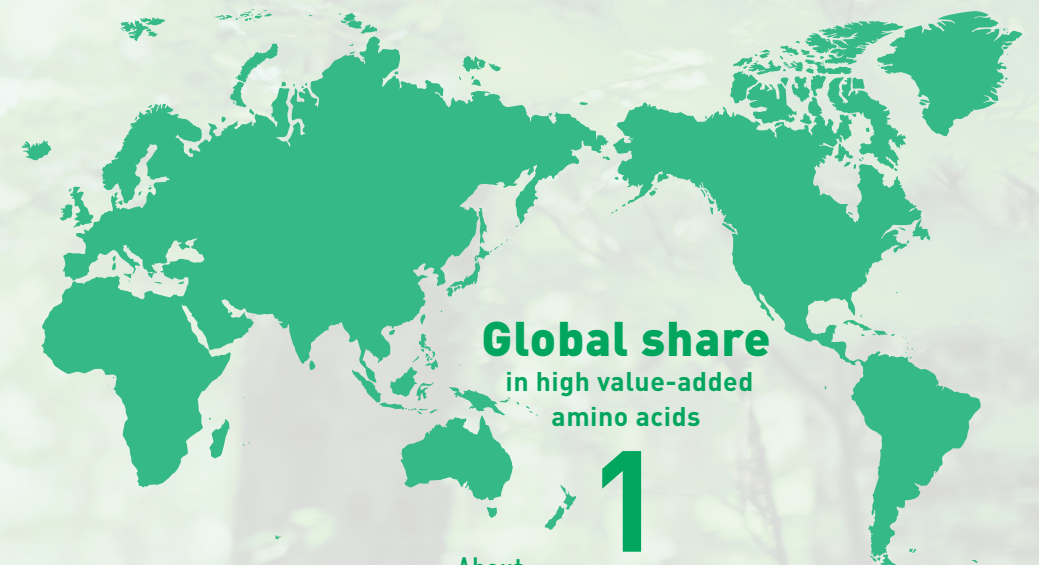
KYOWA HAKKO BIO

Businesses bridging Pharma and Food

To move from the present age of treatment to a future age of prevention,
we will contribute to the health and well-being of people around the world
through our naturally-derived fermentation technologies,
developed through years of research.



KYOWA HAKKO BIO BY THE NUMBERS



About **1/3**

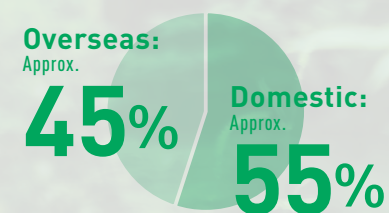
Income

Approx. **¥8.1 billion**

Net sales

Approx. **¥78.2 billion**

Composition of domestic and
overseas sales



Number of employees

Number of foreign
employees:

607

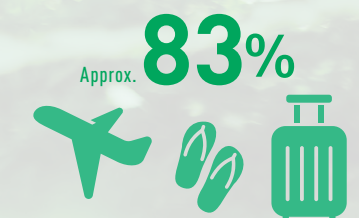


Number of Japanese
employees:

1,287



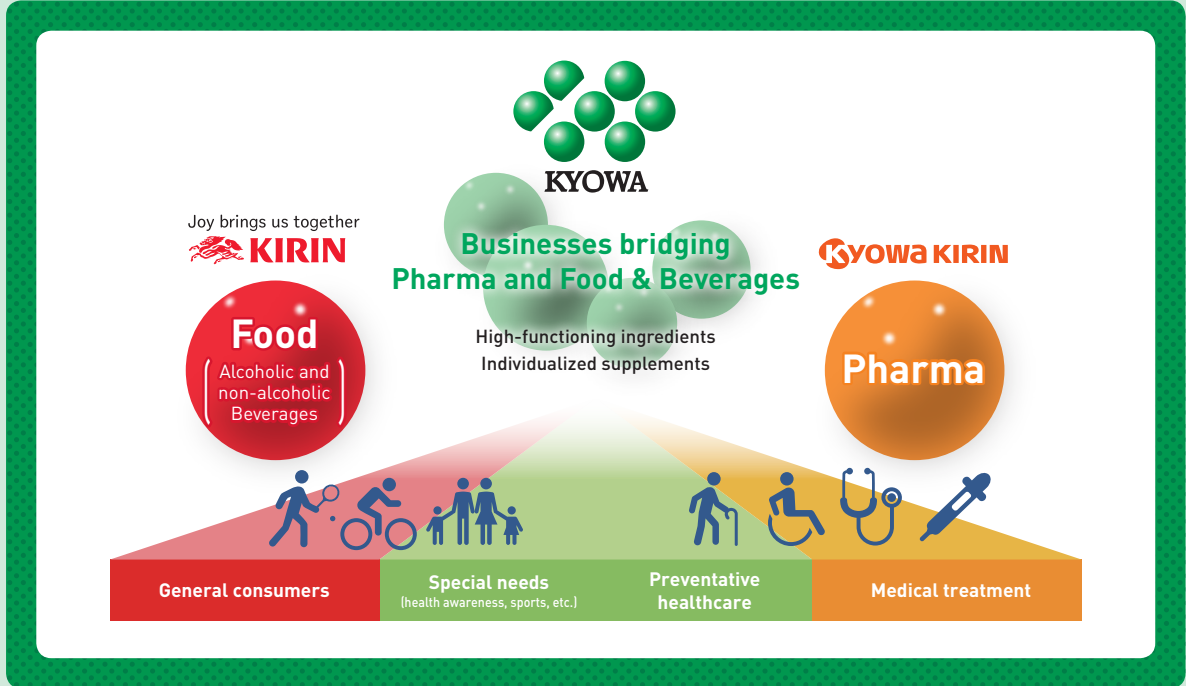
Utilization rate of paid leave



Businesses bridging Pharma and Food

at the center of the Kirin Group

The business domains of Kyowa Hakko Bio, which nurtures businesses bridging Pharma and Food



MESSAGE

With its strengths in both pharmaceuticals and food & beverages, the Kirin Group is establishing a unique business model that contributes to the wishes of people everywhere for solutions to health issues. Kyowa Hakko Bio will increase the number of healthy people, decrease the number of people who fall ill, and make contributions to all people in the areas of prevention and treatment. At the center of this undertaking is Kyowa Hakko Bio, which nurtures Businesses bridging Pharma and Food through fermentation technologies.

Takeshi Minakata, President and Chief Executive Officer, Kyowa Hakko Bio Co., Ltd.

We have set forth two visions in our long-term planning through 2027. Specifically, under the three business strategies of our Fine Chemicals business, Consumer Products business, and new businesses, we will aim for further development and growth, will improve our corporate value, and will achieve both social contribution and high profitability as we head into an exciting future.

Long-term vision

Leverage our advanced biochemical technologies to resolve global social issues

Contribute to the achievement of health and a sustainable society



Businesses bridging Pharma and Food

through products that bear closely on the needs of society

We will continue to support the health of people through our B-to-B Fine Chemicals business, which provides high-quality ingredients in fields including medical products and infant foods, and our B-to-C Consumer Products business, which delivers health foods and other products directly to customers.

Fine Chemicals business



We manufacture and supply functional amino acids, nucleic acids, and other fine chemical products. The wide-ranging uses for these products span bulk pharmaceuticals for pharmaceutical products, intermediates, cell culture media, cosmetics, health foods, and more. By developing functional ingredients that meet market needs and supplying them to every sector, we aim to contribute to the health and well-being of people around the world.

In addition, we are focusing on not only the provision of raw materials but also the creation of high-value-added products. From raw material development to product manufacturing, we provide total support for the creation of our customers' products.

[Examples of products]



Infusions



Pharmaceuticals



Medical foods



Cell culture media



Powdered milk



Health foods



Sports drinks



Cosmetics

Product Outline

- Active Pharmaceuticals Ingredients
 - Citicoline
 - Alanyl-glutamine
 - Pravastatin
- Pharmaceutical and industrial grade amino acids, nucleic acids, organic acids, and sugar-related substances
 - Amino acids
(L-arginine, L-isoleucine, L-ornithine, etc.)
 - Nucleic acids
(ATP, citicoline, etc.)
 - Organic acids (malic acid, etc.)
 - Sugar-related substances
(sialic acid, etc.)
- Branded ingredients for overseas market
 - Cognizin®
 - Setria®
 - SUSTAMINE®



Pick up!

Cognizin

From November 6 to 10, 2018, in Las Vegas, Nevada, KYOWA HAKKO USA., INC. (New York, USA) exhibited Cognizin (generic name Citicoline) as one of its key nutraceuticals ingredients at Supply Side West, the largest health supplement, sports nutrition, and functional foods exhibition in the Americas. Used as a pharmaceutical in Japan, Citicoline is marketed in the US as a functional food, beverage, and nutraceutical for the purpose of improving brain function.



Businesses bridging Pharma and Food

through products that bear closely on the needs of society

Consumer Products business



Our consumer products business delivers Kyowa Hakko Bio branded health foods to individual customers through mail order. Being the leading company in the amino acid market, we utilize development and manufacturing capabilities and offer amino acid formulated health foods that meet the various needs of our customers.

[Examples of products]



Product Outline

- Mail order
 - Ornithine
 - Ornithine Drink
 - VELOX Charge
 - Citrulline Zn
 - Arginine EX
 - Hakko Coenzyme Q 10 EX
 - iMUSE
 - Amino Premier
 - Hakko Glucosamine
 - Mainichi Collagen
 - etc.



Pick up!

VELOX Charge

Arginine and citrulline are essential for the production of nitric oxide (NO). Our research team discovered that combining these two amino acids, each of which has sufficient efficacy on its own, has a synergistic effect on sustainable energy. Based on this scientific evidence, we formulate VELOX Charge with 1,500 mg each of arginine and citrulline, an original balance that has been awarded patents in Japan and the United States.



Initiatives that contribute to a recycling-oriented society

We have set specific evaluation criteria to address and achieve the following global objectives of the SDGs.



| | | | | | |
|--|--|---|--|--|---|
| 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE | 12 RESPONSIBLE CONSUMPTION AND PRODUCTION | Development of solutions for the depletion and shortages of limited natural resources Item for evaluation Development of new solutions | 12 RESPONSIBLE CONSUMPTION AND PRODUCTION | 15 LIFE ON LAND | Reduction of wastes generated by business activities Item for evaluation Improvement of waste reduction rate |
| 7 AFFORDABLE AND CLEAN ENERGY | 13 CLIMATE ACTION | Reduction of energy consumption through production efficiency improvements Item for evaluation Improvement of per-unit energy consumption Reduction of greenhouse gas emissions in business activities overall Item for evaluation Improvement of per-unit emissions of greenhouse gases | 6 CLEAN WATER AND SANITATION | Reduction of water consumption in production activities Item for evaluation Reduction of water consumption per production volume of factories | |

[Water Source Forest Conservation Activities and equipment to reduce sludge volume]

We make use of water, a valuable resource, to produce amino acids through fermentation. With gratitude toward this blessing of nature, we conduct our Water Source Forest Conservation Activities every year. We have also introduced a sludge volume reduction process at our wastewater treatment facility, halving the volume of excess sludge generated and contributing to the reduction of waste. Furthermore, we have built a facility to recover phosphoric acid from fermentation effluent, and are contributing to the recycling of phosphorus resources by making effective use of recovered materials with high phosphorus content as fertilizer.

*Reduction of volume: A term used in the context of reducing volumes of sludge generated at sewage treatment plants, etc.

*Phosphoric acid: Along with nitrogen and potassium, one of the three major nutrients of plants.

Wastewater treatment equipment (settling tank)



Businesses bridging Pharma and Food

through the diversity of human resources

Under the philosophy of “Contributing to health and well-being for people around the world by creating new value through the pursuit of advances of life sciences and technologies,” human resources with diverse skills interact with each other and engage in daily work at Kyowa Hakko Bio.



Yamaguchi Production Center, Production 3rd Division

Kyowa Hakko Bio produces a variety of amino acids through metabolic regulatory fermentation. We combine various ion exchange resins to remove impurities, and extract absolute pure amino acid simple substances in the form of crystals. We then use driers to remove remaining moisture, completing the raw material powder. What is foremost in my mind is sharing information with colleagues. The culture and purification groups are also connected by the idea of everyone creating good things. I think that we can routinely deliver products that impress people with the quality of Kyowa Hakko Bio.



Fine Chemicals Department

I gained experience through about three years in domestic sales, and was stationed overseas as well. Currently, I support the sales activities of our US sales office, as a part of the Americas Regional Supervisory Group. That includes sales management, and supports daily inquiries from customers. In fact, the support covers a wide range, from regulatory compliance in the Americas to future sales strategies. In my work every day, I always remind myself if I am drawing up the best possible scenarios for our customers.

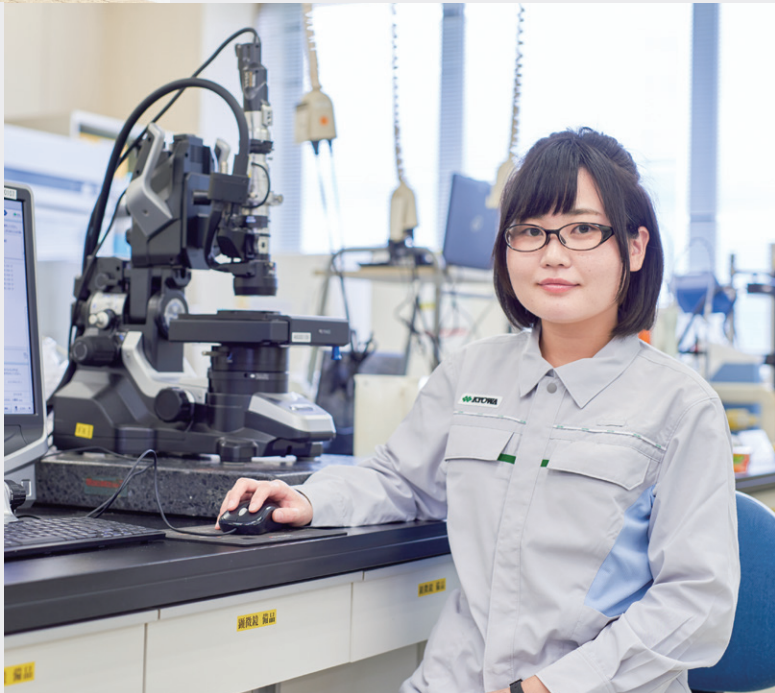
BIOKYOWA, INC. Technical Department

I gained experience as a research and analysis staff in the Quality Assurance Department, and am currently in charge of process testing, final product analysis, and culture management in the Technical Department. The Technology Division is responsible for creating and implementing process improvement proposals for plants overall. Improvement proposals must be formulated with consideration of not only production volume and quality improvements, but also impacts on production costs and the environment. Responding quickly to ever-changing circumstances to control fermentation is more challenging and exciting than I imagined.



R&I Center Innovation Hofu Unit Refining Process Development Group

Placing excessive emphasis on quality and incorporating numerous refining processes raises manufacturing costs. The result is that customers are saddled with the heavy burden of purchasing at high prices; our company, too, may become unable to achieve expected profits. Placing too high a focus on manufacturing expenses for that reason, though, can lead to falling short of sufficient quality. Ensuring safety is a very important matter in the determination of corporate value.



Businesses bridging Pharma and Food

for a future built on achievement


Kyowa Hakko Kogyo, the predecessor of Kyowa Hakko Bio, was founded in 1949. Now, 70 years after establishment, we are part of the Kirin Group at the forefront of domains that bridge pharmaceuticals with foods & beverages.

1949

Establishment of Kyowa Hakko Kogyo Co., Ltd. as second company of Kyowa Sangyo Co., Ltd.

1951

Introduced production technology of Streptomycin and succeeded in its mass production.



Introduction of Streptomycin production technology
This contributed to the eradication of tuberculosis, once feared in Japan as untreatable disease.

1956

Emperor Hirohito and Empress Nagako visited our factory

Invention of the world's first fermentation-based production technology for L-glutamic acid

1960

Awarded the Prime Minister's Invention Award for the invention of a production method for L-glutamic acid

1966

Received the Japan Academy Prize for "research about generation of amino acids through fermentation"

1977

Received Japan's first Director General of the Environment Agency Prize for achievements in the recycling of fermentation waste liquid and improvement of water quality

2004

Announcement of amino acids including the functional amino acid ornithine

2008

Succession of the Bio-Chemical business from Kyowa Hakko Kogyo Co., Ltd. and establishment of Kyowa Hakko Bio Co., Ltd.

2017

Launch of iMUSE plasma lactobacilli

2019

Kyowa Hakko Kirin transferred the shares of Kyowa Hakko Bio to Kirin Holdings



1956

Invention of the world's first fermentation-based production technology for L-glutamic acid

"Even if we could make a lot of proteins, it would not be profitable. Instead, mass production of amino acids, the constituent component of proteins, could be possible!" Researcher Shukuo Kinoshita had the idea of producing amino acids from microorganisms. In 1956, he discovered bacteria that create the amino acid called glutamic acid through the fermentation process. This marked the world's first success at mass production of amino acids.



2004

Announcement of Ornithine and other functional amino acids

We launched a mail-order business to supply individual customers that have diverse needs with in-house manufactured amino acids products.

What is ornithine?

Amino acids make up approximately 20% of our bodies, and are essential components in sustaining biological activity. Ornithine is a special amino acid that supports the health of modern people who are concerned with disordered lifestyle and diet. Recent research has found that ornithine is the chemical that explains the beneficial health effects of fresh water clams. Ornithine is known to support liver functions via the conversion of harmful ammonia into urea.



2008

Succession of the Bio-Chemical business from Kyowa Hakko Kogyo Co., Ltd. and establishment of Kyowa Hakko Bio Co., Ltd.

Kyowa Hakko Kogyo Co., Ltd. and Kirin Holdings Company, Limited announced a strategic business alliance to leverage the mutual strengths of both groups. The alliance is aimed at strengthening competitiveness, improving management efficiency, maximizing synergies, and further raising corporate value. Through it, Kyowa Hakko Bio Co., Ltd. was created.



2019

Became a direct subsidiary of Kirin Holdings Company, Limited through transfer of shares

GLOBAL NETWORK

* As of April 2019



Kyowa Hakko Bio's global network

Overseas sales offices

- ① **KYOWA HAKKO U.S.A., INC.**
New York, U.S.A.
- ② **KYOWA HAKKO Europe GMBH**
Düsseldorf, Germany
- ③ **KYOWA HAKKO BIO ITALIA S.R.L.**
Milan, Italy
- ④ **KYOWA HAKKO BIO SINGAPORE PTE LTD.**
Singapore
- ⑤ **KYOWA HAKKO BIO INDIA PRIVATE LIMITED**
Mumbai, India

- ⑥ **KYOWA HAKKO (GUANGDONG) PHARMACEUTICAL CO., LTD.**
Guangzhou, China
- ⑦ **KYOWA HAKKO (GUANGDONG) PHARMACEUTICAL CO., LTD. BEIJING BRANCH**
Beijing, China
- ⑧ **KYOWA HAKKO (GUANGDONG) PHARMACEUTICAL CO., LTD. SHANGHAI BRANCH**
Shanghai, China

Production plants

- ⑨ **BIOKYOWA, INC.**
Cape Girardeau, U.S.A.
- ⑩ **SHANGHAI KYOWA AMINO ACID CO., LTD.**
Shanghai, China
- ⑪ **THAI KYOWA BIOTECHNOLOGIES CO., LTD.**
Rayong, Thailand
- ⑫ **KYOWA PHARMA CHEMICAL CO., LTD.**
Toyama, Japan
- ⑬ **YAMAGUCHI PRODUCTION CENTER**
Yamaguchi, Japan

Domestic sales branches

Kyowa Hakko Bio Co., Ltd.

Head office

Address: 1 - 9 - 2 Otemachi, Chiyoda-ku,
Tokyo 100 - 0004
(Otemachi Financial City Grand Cube)
TEL: 03 - 5205 - 7300
Inquiries on mail order sales of health foods
TEL: 0120 - 80 - 7733

Sales offices

Tokyo Branch

Address: 36 - 2 Hakozaichicho, Nihonbashi,
Chuo-ku, Tokyo 103 - 8503
(Daiwa River Gate)
TEL: 03 - 5641 - 8636

Osaka Branch

Address: 1 - 6 - 20 Dojima, Kita-ku, Osaka-shi,
Osaka 530 - 8280
(DOJIMA AVANZA)
TEL: 06 - 6346 - 6988

R&D centers

R&I Center

(Value Creation Unit/Innovation Unit)
Address: 2 Miyukigaoka, Tsukuba-shi,
Ibaraki 305 - 0841
TEL: 029 - 856 - 4121

Production technologies laboratory

R&I Center (Innovation Hofu Unit)

Address: 1 - 1 Kyowa-cho, Hofu-shi,
Yamaguchi 747 - 8522
TEL: 0835 - 22 - 2518

Production plants

Yamaguchi Production Center

Address: 1 - 1 Kyowa-cho, Hofu-shi,
Yamaguchi 747 - 8522
TEL: 0835 - 22 - 2511

Healthcare Tsuchiura Plant

Address: 4041 Ami, Ami-machi, Inashiki-gun,
Ibaraki 300 - 0331
TEL: 029 - 888 - 8035

Kyowa Pharma Chemical Co., Ltd.

Address: 530 Chokeiji, Takaoka-shi,
Toyama 933 - 8511
TEL: 0766 - 21 - 3456