

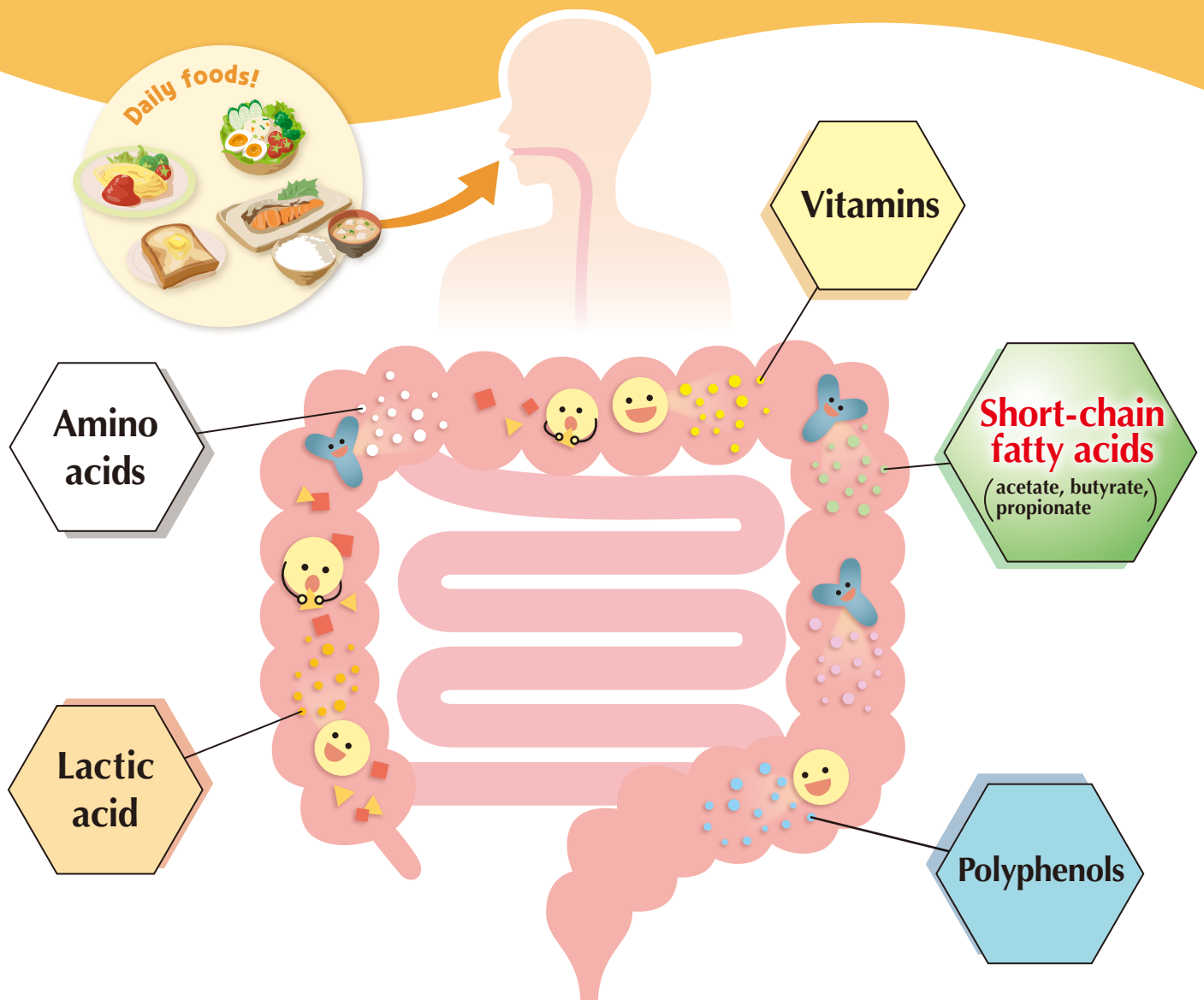
# Lactic Acid Bacteria Metabolic Products “PS-B1”<sup>®</sup>





**BIOGENOMICS CO.,LTD**

# "Lactic acid bacteria metabolic products" are produced every day in your intestines!?

Intestinal bacteria produce "Lactic acid bacteria metabolic products" which are metabolized from our daily foods. Beneficial bacteria for human health in the intestines produce short-chain fatty acids, which are now in the spotlight, as well as amino acids, vitamins, polyphenols, and other important components for health. These metabolites are absorbed into our bodies and affect our health.



## Intestinal bacteria and their metabolites

	Metabolites	Influences on host
 <b>Good bacteria</b> (usu. intestinal bacteria that have beneficial effects on human health)	Lactic acid, Acetate, Butyrate, etc.	Intestinal pH stabilization, Peristalsis activation, Infection prevention, etc.
 <b>Bad bacteria</b> (usu. intestinal bacteria that have adverse effects on human health)	Ammonium, Hydrogen sulfide, Phenols, etc.	Cancer induction, Toxicity, Rough skin, etc.

## The Ultimate Fermentation Ingredient

# Lactic Acid Bacteria “PS-B1” Metabolic Products

Japanese Patent No. 5918290, Japanese Patent No. 6626869

“PS-B1®” is manufactured by unique fermentation methods using 21 strains of Lactic acid bacteria/Bifidobacteria and the original medium prepared from Japanese soybean. This product is classified as “postbiotics”.



21 strains of  
lactic acid bacterium  
Bifidobacterium



Japanese-quality  
soybean



## The categorization of lactic acid bacteria-related products

<b>“Postbiotics”</b> (Lactic Acid Bacteria Metabolic Products “PS-B1®”)		Direct taking metabolic components of intestinal bacteria without host microflora, inducing beneficial effects for hosts and also improving intestinal microflora.
<b>“Probiotics”</b> (e.g., yogurt)		Intake of beneficial bacteria to human health and intestinal microflora.
<b>“Prebiotics”</b> (e.g., dietary fiber)		Act as food for human microflora, improving the balance of these microorganisms.

## The 409 components produced from our strains

Metabolome Analysis Result

Lactic acid bacteria metabolic products “PS-B1®” contain 409 ingredients produced by our co-fermentation system of lactic acid bacteria and Bifidobacteria derived from human intestines.

### 20 types of Amino acids

valine, leucine, isoleucine, lysine, etc.

### 5 types of Vitamins

vitamin B1, vitamin B5, vitamin B6, vitamin E, and etc.

### 10 types of Polyphenols

apigenin, naringenin, myricetin, quercetin, etc.

### 181 types of Peptides

glutamyl serine, lysyl glutamine, lysyl lysine, etc.

### 3 types of Short-chain fatty acids

acetate, butyrate, propionate

### Other 190 components

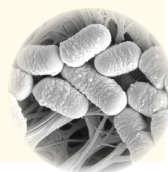
lactic acid, inosinic acid, ornithine, oleic acid, citric acid, gluconic acid, etc.

# Our manufacturing commitment

## The 21 strains of lactic acid bacterium/Bifidobacterium

### Lactic acid bacteria (16 strains)

- |                                       |  |
|---------------------------------------|--|
| 01 <i>L.acidophilus</i>               | 09 <i>L.delbrueckii subsp.bulgaricus</i> |
| 02 <i>L.gasseri</i>                   | 10 <i>L.salivarius</i>                   |
| 03 <i>L.rhamnosus</i>                 | 11 <i>L.delbrueckii</i>                  |
| 04 <i>L.plantarum</i>                 | 12 <i>L. lactis subsp. lactis</i>        |
| 05 <i>L.casei</i>                     | 13 <i>P.pentosaceus</i>                  |
| 06 <i>L.brevis</i>                    | 14 <i>E.faecalis</i>                     |
| 07 <i>L.paracasei subsp.paracasei</i> | 15 <i>E.durans</i>                       |
| 08 <i>L.helveticus</i>                | 16 <i>E.faecium</i>                      |



### Bifidobacteria (5 strains)

- |                                   |
|-----------------------------------|
| 01 <i>B.longum</i>                |
| 02 <i>B.bifidum</i>               |
| 03 <i>B.adolescentis</i>          |
| 04 <i>B.brevis</i>                |
| 05 <i>B.longum subsp.infantis</i> |



## High-quality culture medium

### The Japanese-quality soybean

- 1 Organic JAS Certification in Japan
- 2 National Organic Program (NOP) certification accepted in the US and EU

### Maintaining organic soybean quality with "Ice temperature system"

The quality of soybeans rapidly deteriorates after harvest and it is difficult to produce a quality stable medium for bacteria. To avoid this problem, we use the "Ice temperature system" for the storage of soybeans.

Using the "Ice temperature system", soybeans can be stored in high-quality conditions as the germination rate remains at 90% even one year after harvest.



**Normal refrigerated**  
Germination ratio 66.7%



**Ice temperature system**  
Germination ratio 94.0%



## Manufacturing process [Patented manufacturing process]

### Medium preparation



High-quality Japanese soybean is processed into the medium for 21 strains of bacteria.

### Monoculture



Individual cultivation of 21 strains selected from our human intestinal strain library.

### Co-culture



Combined culture of 21 strains from monoculture by combining several mutually compatible strains.

### Starter for "PS-B1"



Cultivate all 21 strains from co-culture as the starter for "PS-B1".

### Co-fermentation



Our original soy milk medium is placed in an automatically controlled fermentation tank and the starter is added. The co-fermentation is performed under temperature, pH, and DO control.

### Filtration



The crude extract "PS-B1" is obtained by removing the residues from the ferment using a filter press.

### Sterilization



The intermediate extract is sterilized by the ceramic filtration system (pore size: 0.20 μm) to remove cell bodies and residues completely.

### Completion



"PS-B1" is capable of processing into various forms such as powders, granules, tablets, and capsules.

# Major evidence through collaborative research with academic and public institutions

The beneficial effects of “PS-B1®” have been shown through collaborative research with academic and public institutions. Based on these findings and results, “PS-B1®” has been patented for “Manufacturing method”, “Lactic acid bacterial production substance”, “Allergic dermatitis suppressant”, and “Systemic allergic response suppressant”.

## Patents

Japanese Patent No. 5918290

Japanese Patent No. 6626869



## Collaborative research institutions

- Nagasaki International University
- RIKEN (Institute of Physical and Chemical Research)
- Tokyo University of Technology
- Vocational School of Tokyo Biotechnology
- Kurume University
- Industrial Technology Center of Nagasaki

## Major evidence



### Immunity

Inhibitory effect of “PS-B1®” on cancer cell growth and its application

The effect of “PS-B1®” intake on allergic dermatitis-induced mice



### Improvement of the intestinal environment

The potential effect of “PS-B1®” on intestinal bacteria growth

The potential effect of “PS-B1®” on the reduction of colon cancer risk



### Improvement of skin structure

Clinical trial on the effect of “PS-B1®” application in skin structure improvement

Influence on bowel movements, stool properties, and skin structure by taking “PS-B1®”



### Improvement of bowel movements

Influence on bowel movements, stool properties, and skin structure by taking “PS-B1®”



### Diabetes

Suppression of blood glucose elevation by “PS-B1®” intake in non-obese type II diabetes model rats



### Metabolism

Clinical trial on the effect of “PS-B1®” intake on the improvement of liver function and lipid metabolism



### Halitosis

Clinical trial using the mouthwash containing PS-B1® to suppress halitosis



### Liver function


Clinical trial on the effect of “PS-B1®” intake on the improvement of liver function and lipid metabolism



### Osteoporosis

The potential osteoporosis prevention effect of PS-B1® intake in mice

## Raw Material Specifications

Name	Minimum order quantity	Recommended daily intake	Raw material indication
Lactic acid bacteria metabolic products PS-B1® liquid	≥1.0kg	1 to 3mL	Lactic acid bacteria metabolic products 
Lactic acid bacteria metabolic products PS-B1® SD100% powder (no granulation/unseasoned)	≥1.0kg	1 to 3g	Lactic acid bacteria metabolic products/ Cyclodextrin 
Lactic acid bacteria metabolic products PS-B1® SD100% powder (with granulation/seasoned)	≥30kg	1 to 3g	Lactic acid bacteria metabolic products/ Cyclodextrin 



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