



**ENZAMIN**  
FOR NATURAL HEALTH & BEAUTY

365 days

Fermented  
Power

The fermented power we stick with

The fermented power we stick with for 365 days





Useful bacterial products

# ENZAMIN

Useful bacterial products

# FERMENTATION

## ENZAMIN and Fermentation

Fermented foods abound in our daily life. Fermentation is a widely applied technology in the production of miso, soy sauce, and other foods, as well as medicines and beverages. What is fermentation? Fermentation is the process by which materials are degraded and transformed into substances that are beneficial to humans by microorganisms. ENZAMIN is produced by fermentation.

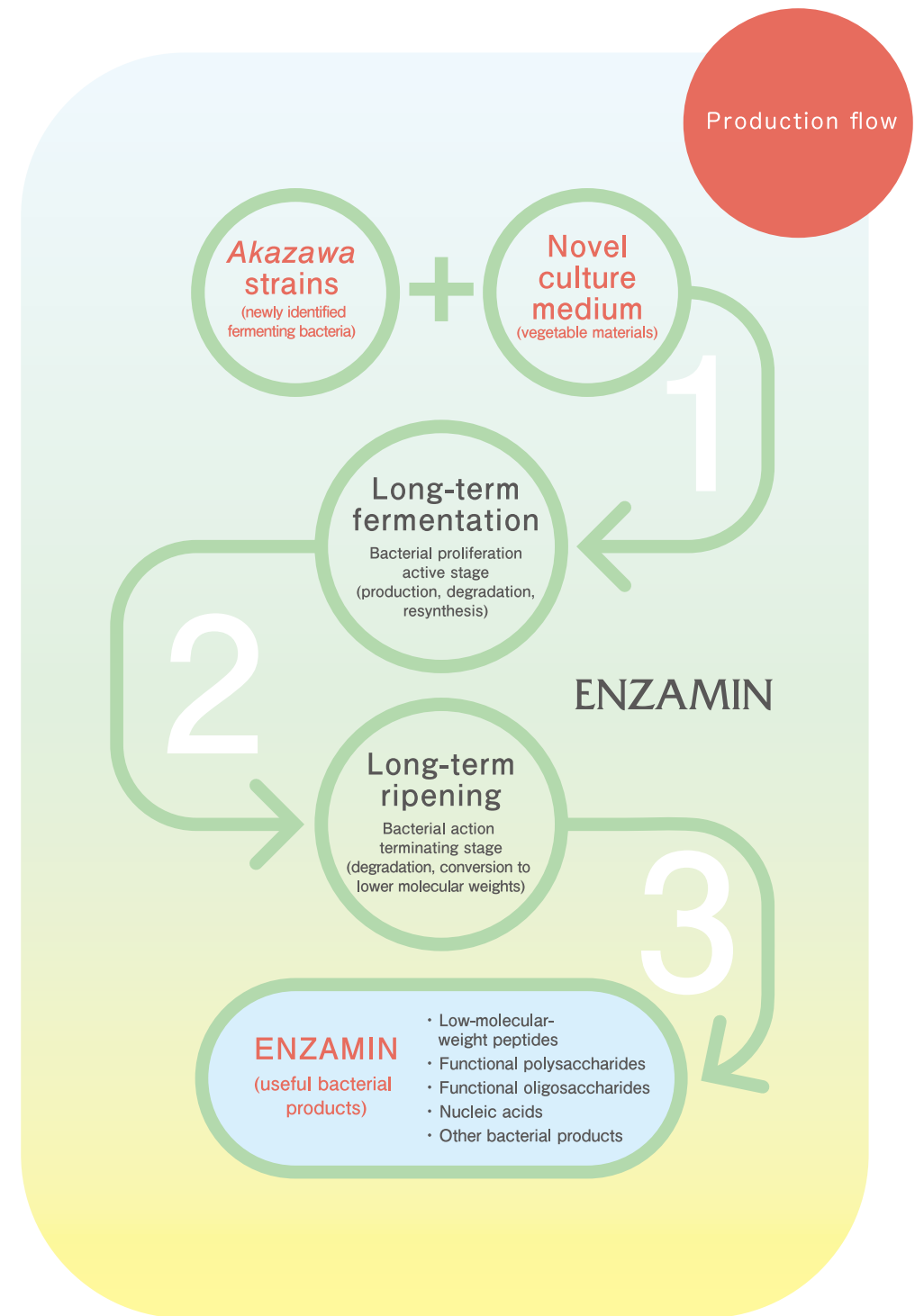


## ABOUT ENZAMIN

### What Is ENZAMIN?

ENZAMIN are useful bacterial products by fermenting and ripening vegetable materials using the *Akazawa* strains, developed by Hitomi Akazawa Ph.D., for 6 months.

Various materials ( polysaccharides, oligosaccharides, and bacterial components including enzymes ) produced by *Akazawa* strain during the fermentation process are degraded by means of enzymes during ripening process, resulting in low molecular weight peptides, functional polysaccharides, functional oligosaccharides, nucleic acids and other bacterial products. By using high fermentation techniques, ENZAMIN has been developed so that these functional materials act with each other.





## ABOUT THE AKAZAWA STRAINS

### What are the *Akazawa* strains?

The developer of the *Akazawa* strains, Hitomi Akazawa, Ph.D., focused on the "bacterial products" rather than the microorganism themselves.

While conducting research on bacteria that would produce better products, he discovered a highly functional fermenting bacterium. Through further research, he succeeded in creating the *Akazawa* strains, which are capable of producing enzymes, polysaccharides, oligosaccharides, and other products more efficiently.



Developer : Hitomi Akazawa  
Ph.D.Kyoto University

## ABOUT ENZAMIN

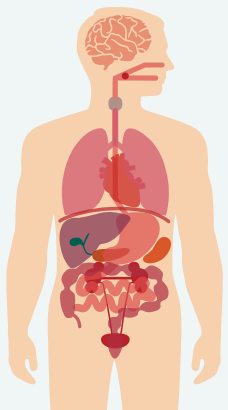
### ENZAMIN, A Metabolic Regulator

#### The metabolism

Metabolism is the function of the body that digests and absorbs nutrients taken in meals and others, produces ingredients necessary for energy and growth, and discharges unnecessary substances.

#### The metabolic-regulation

It is a mechanism that regulates the amount of enzymes involved in metabolism, coenzymes, hormones, etc., and controls metabolism.



#### 【Metabolism】

digestion  
↓  
absorption  
↓  
production  
↓  
discharge

If the metabolism is disturbed due to disorder of eating habits, fatigue, stress, aging, etc., it will have an adverse effect on the body.

- Nutrition is not absorbed.
- Toxins would accumulate in the body.
- Can not replace cells.
- It will make a cause of illness.



Health is maintained by adjusting metabolism, such as regulation of enzymes and hormones and cytokines.

ENZAMIN acts as a "metabolic regulator" such as enzyme activation and cytokine regulation.

※Confirmed by some test data.



#### The enzyme

One of the substances that supports metabolism such as digestion and energy production. For example, there are amylase which degrades starch, and plasmin having the function of dissolving thrombus. Coenzyme is a component that supports the function of the enzyme, and vitamins, minerals, etc. are working as coenzymes.

#### The hormone

A substance that transmits information to specific organs such as lung, heart, kidney, nerve, muscle, and skeleton. Each organ transmitted information by the hormone acts as given and keeps the body constant at all times, such as body temperature, blood glucose level and blood pH balance. For example, there are insulin that regulates blood glucose level, and growth hormone involved in body growth.

#### The cytokine

It is a substance that regulates information transmission between cells and regulates the proliferation / differentiation of cells, and it is involved in biological defense such as immune and inflammatory reactions. For example, there are interferons that inhibit the proliferation of viruses, and interleukins that are involved in the regulation of immunity.

## ABOUT ENZAMIN

### Three Features of ENZAMIN

#### 1. Highly tolerance to heat and acids.

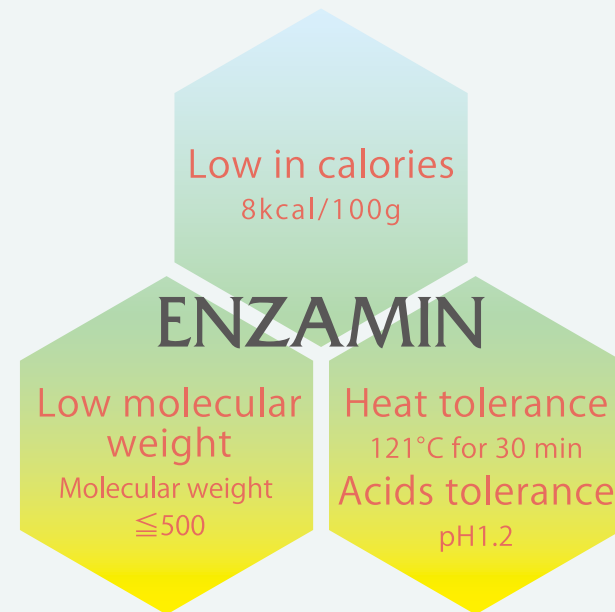
Heat tolerance test (121°C for 30 min) cleared / Acids tolerance test (pH 1.2) cleared  
※ENZAMIN is insusceptible to heat treatment during processing and to gastric acid.

#### 2. Low molecular weight

Molecular weight  $\leq 500$   
※ENZAMIN can be absorbed easily in the intestine and works in the body because its components are low molecular weights.

#### 3. Low in calories

8 kcal/100 g  
※Can be consumed without worrying about the number of calories.





## PROCESS

### Manufacturing Process for ENZAMIN



STEP  
1

#### Preparation of culture medium

A novel culture medium is prepared with raw materials composed mainly of vegetable materials.

STEP  
2

#### Inoculation

The *Akazawa* strains are inoculated to the culture medium

STEP  
3

#### Fermentation

Fermentation in a chamber kept at 30°C for 2 months.

STEP  
4

#### Ripening

Ripening in a chamber kept at 10°C for 4 months. (Ripening completion check)

STEP  
5

#### Purification

After various tests, the supernatant is collected using continuous centrifugation.

STEP  
6

#### Sterilization

The supernatant is sterilized by autoclaving.

STEP  
7

#### Check

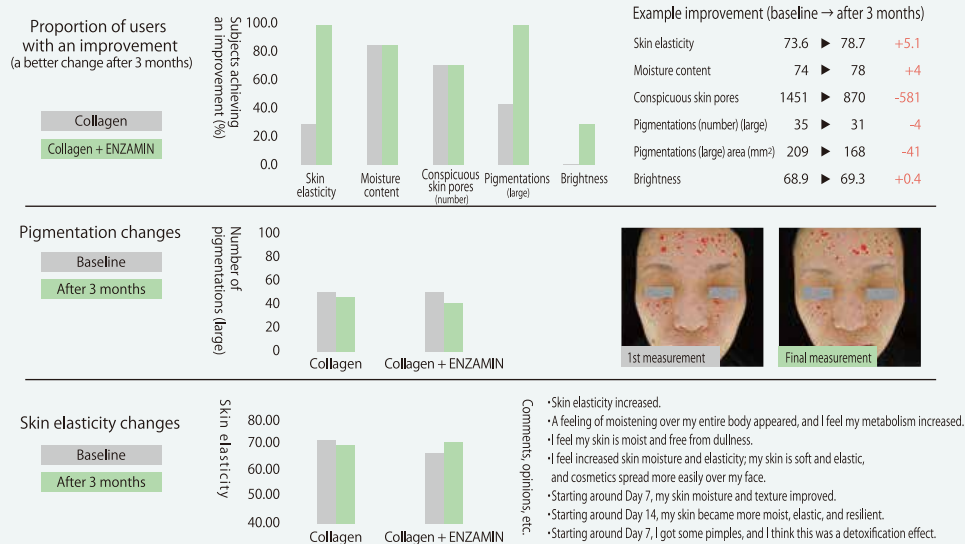
ENZAMIN is subjected to rigorous assessments prior to commercial shipment.

# EVIDENCE

## Aesthetics

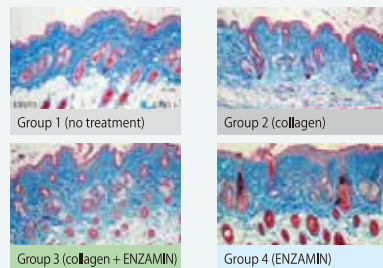
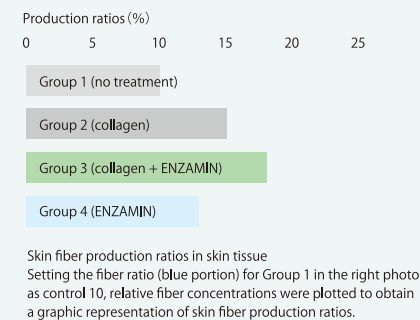
### Enhancement action of skin beautification effect by ENZAMIN.

Subjects took either collagen alone or in combination with ENZAMIN, and resulting skin conditions (skin elasticity, moisture content, number of conspicuous skin pores, pigmentation, brightness) were compared. Better results (particularly for pigmentations and skin elasticity) were obtained from the group taking a combination of collagen and ENZAMIN than the group taking collagen alone; It was suggested that the skin-beautifying effect by ingesting collagen further improved by ingesting ENZAMIN.



### Activation effects of collagen and ENZAMIN on skin collagen cells

The influence on Collagen activity of skin tissue was compared between collagen and ENZAMIN. Group of collagen or ENZAMIN led to favorable effects on the layer of skin fibers (collagen fibers and elastic fibers), and marked activation effects of collagen cells were observed in the collagen + ENZAMIN combination group. This finding suggested that ENZAMIN exhibited synergistic effect to collagen synthesis in skin tissue.



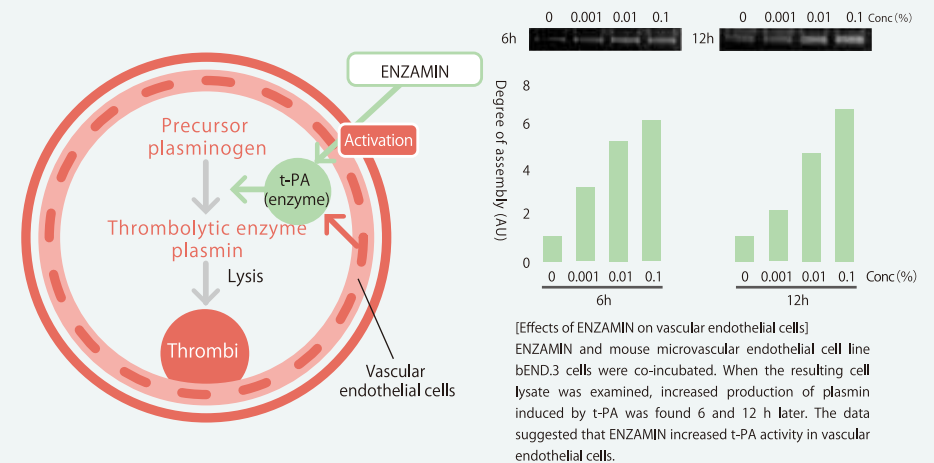
Masson's trichrome staining of skin tissue

※ Skin fiber stained blue (Collagen accounts for 90% of skin fibers)

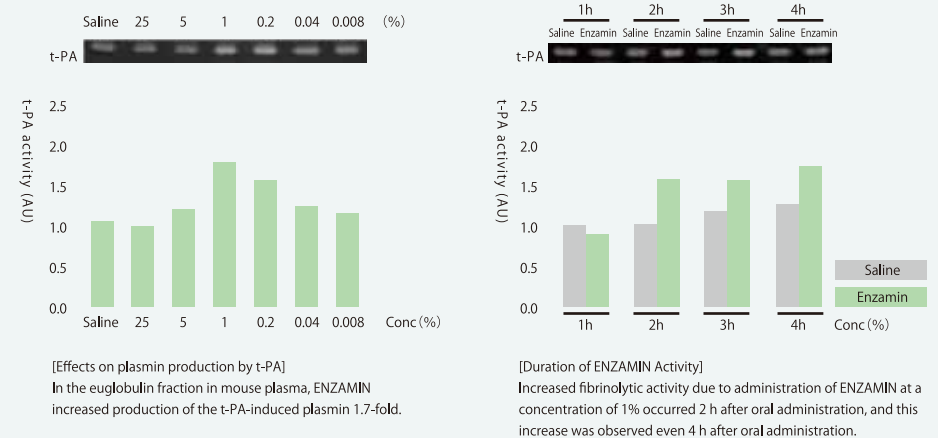
## Thrombus

### The enzyme ( t-PA ) activation of ENZAMIN

In healthy conditions, plasmin, a thrombolytic enzyme, will dissolve the thrombus and return the blood vessel to normal state, but when the function of dissolving the thrombus is diminished due to aging, stress, or eating habit etc., thrombus remains in the blood vessel and causes thrombosis. ENZAMIN enhances t-PA (tissue plasminogen activator) secreted from vascular endothelial cells to promote the conversion of (plasma) plasminogen to the thrombolytic enzyme plasmin (plasmin lyses trapped thrombi).



ENZAMIN was proven to have enhancement effects on fibrinolytic activity, including increased plasmin production by t-PA.

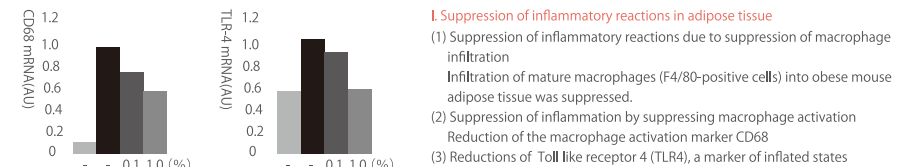
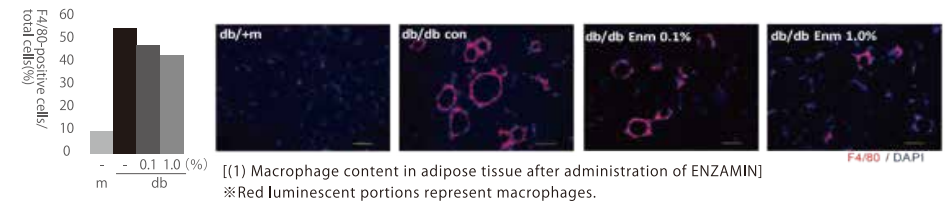
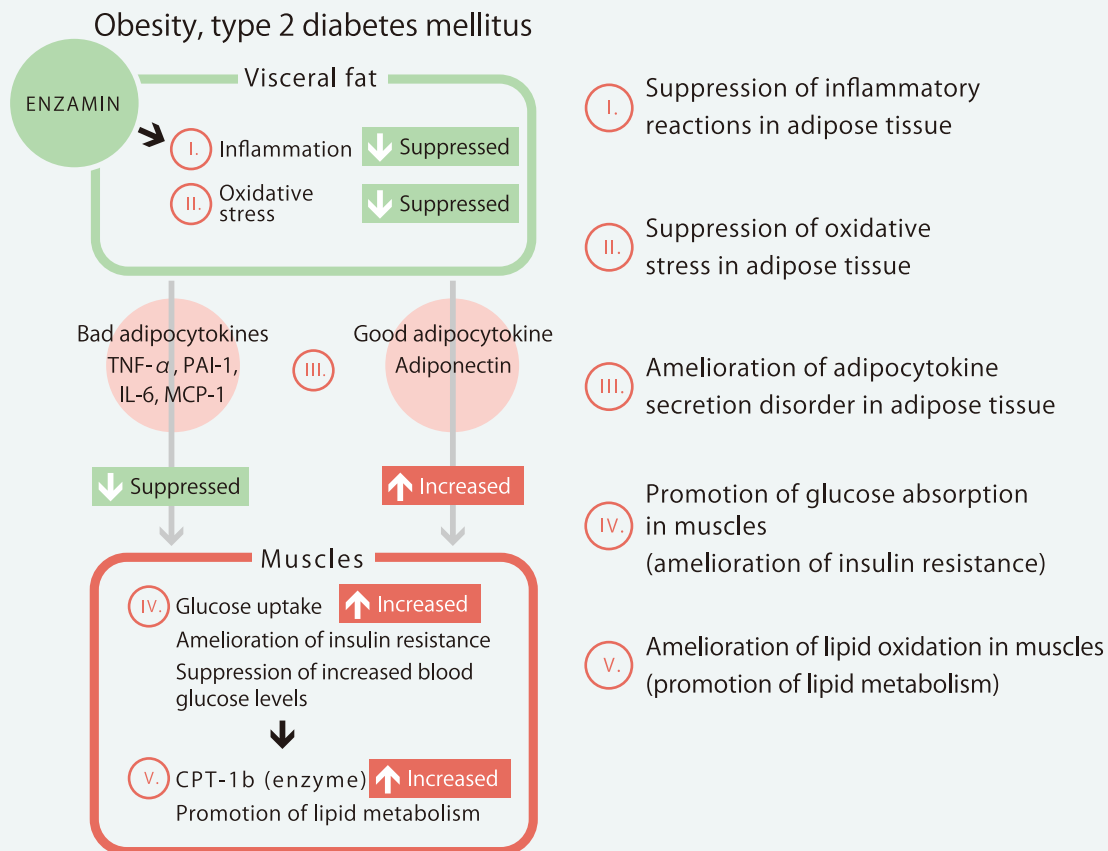


# EVIDENCE

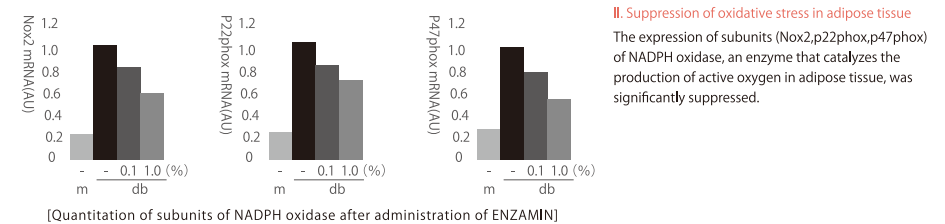
## Metabolic Syndrome

### Cytokine regulatory action by ENZAMIN

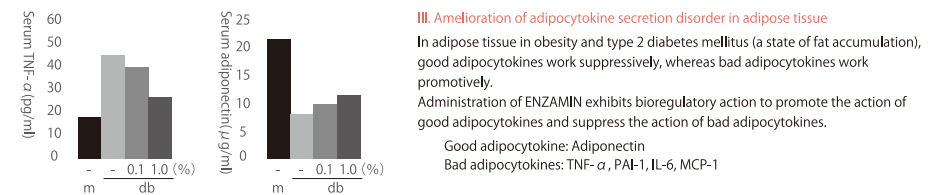
Metabolic syndrome is a state in which at least two of hyperglycemia, hypertension, and dyslipidemia are concurrently present. Intake of ENZAMIN was suggested to improve glucose uptake in muscles (amelioration of insulin resistance) and ameliorate fatty acid oxidation (promotion of lipid metabolism) by suppressing inflammation and oxidative stress in obese state to ameliorate adipocytokine secretion disorders. Since amelioration of hyperglycemic state due to amelioration of insulin resistance and amelioration of dyslipidemia due to promoted lipid metabolism were demonstrated, ENZAMIN is expected to be useful in the prevention of metabolic syndrome.



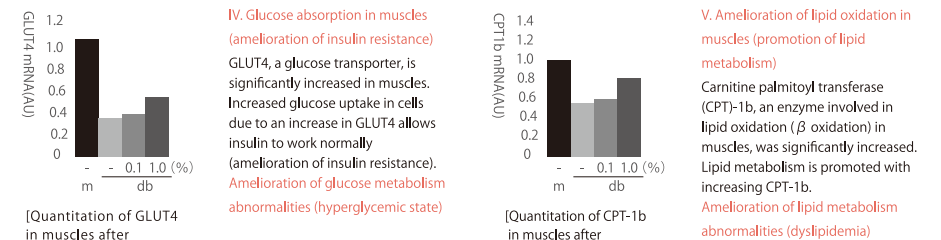
[Quantitation of (2) CD68 and (3) TLR4 in adipose tissue after administration of ENZAMIN]



[Quantitation of subunits of NADPH oxidase after administration of ENZAMIN]



[Quantitation of serum adipocytokines after administration of ENZAMIN]



[Quantitation of GLUT4 in muscles after administration of ENZAMIN]

[Quantitation of CPT-1b in muscles after administration of ENZAMIN]



# TOPICS

## Patents Granted

April 2015

Patent granted for a "food for preventing thrombotic diseases. "

ENZAMIN was recognized as a food that can be conveniently taken in daily living and that prevents the onset of thrombotic diseases by t-PA activity.

(Patent also granted in Korea and Taiwan.)



Mar 2018

Metabolic syndrome prevention effect

In March 2018, acquired a patent as "adipocytokine production balance regulator and inflammation / oxidative stress suppressor of adipose tissue and macrophage infiltration inhibitor of adipose tissue".

A preventive effect against metabolic syndrome including visceral obesity, insulin resistance and type 2 diabetes mellitus was confirmed.



## Also Appreciated Outside Japan

January 2011

An original article on the thrombolytic effect of ENZAMIN published in the British medical periodical Journal of Thrombosis and Thrombolysis.

A presentation was made on the thrombolytic effect of ENZAMIN at the International Conference on Food Factors 2011(ICoFF 2011).



December 2013

Published a paper on Enzamin's preventive effect on metabolic syndrome in Journal of Nutritional Science published by the University of Cambridge, England



April 2014

In "Experimental Biology 2014" held in San Diego, USA, the preventive effect of ENZAMIN on metabolic syndrome ranked first in "Diabetes and insulin resistance I (Diabetes session)"!



## Makes Topics in the Media.



Newsweek January 24, 2017 issue and February 14, 2017 issue.

# BIOGENICS

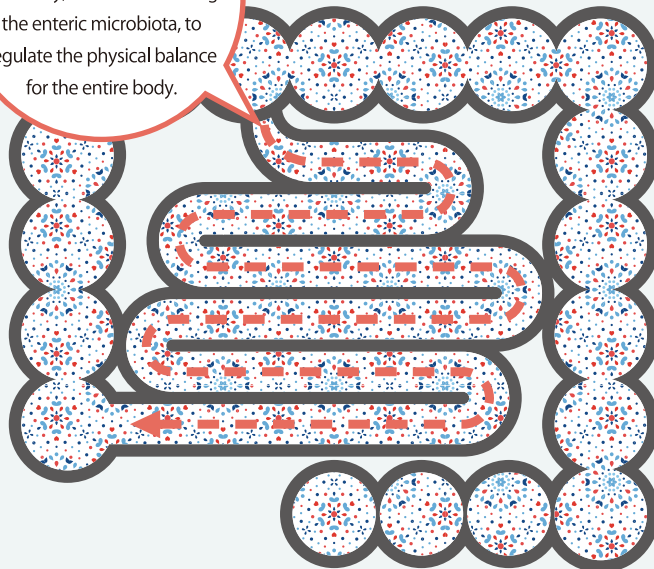
## ENZAMIN as Biogenics

Produced by the *Akazawa* strains, ENZAMIN has been found to act not only as a "prebiotics," helping to control the intestinal enteric microbiota, but also as a "biogenics."

What are biogenics?

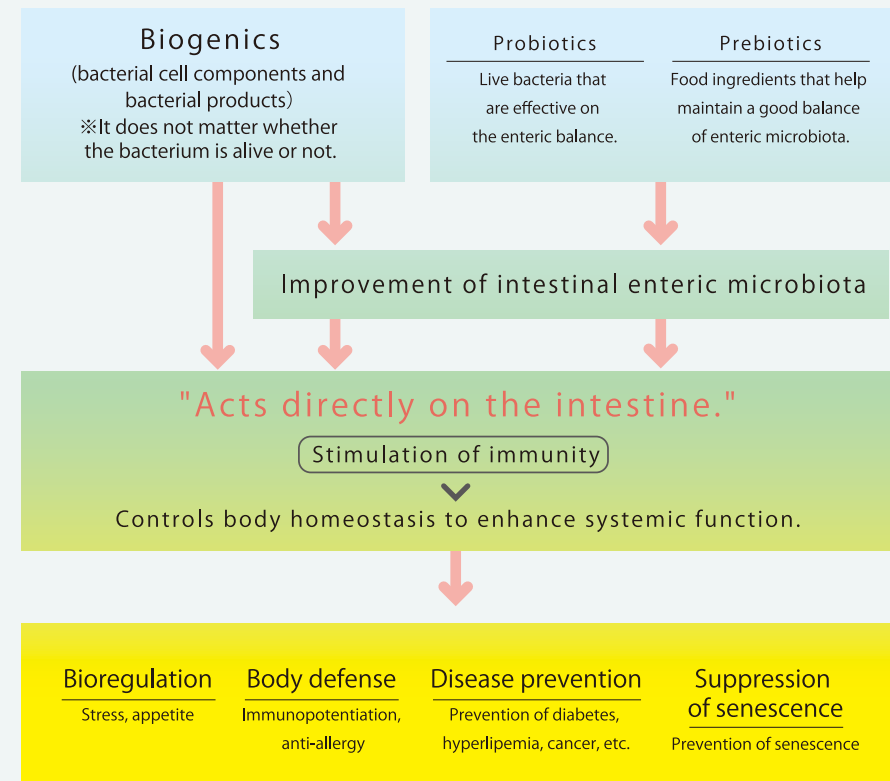
Biogenics generically refer to bacterial cell components and products that are beneficial to the human body. These substances act directly on the intestine and enhance immunity without mediating the intestinal enteric microbiota to regulate biological functions, thus preventing and relieving disease and suppressing senescence

Biogenics act directly on the intestine and enhance immunity, without mediating the enteric microbiota, to regulate the physical balance for the entire body.



### Activity of biogenics

Probiotics and prebiotics indirectly exhibit bioactivity by improving the enteric microbiota. Although biogenics also improve the enteric microbiota, they exhibit bioactivity mainly by stimulating intestinal immunity to control bioregulatory action (body homeostasis).



NEXT

## From Transmission to Tradition

Mass production of ENZAMIN was successfully achieved by our own proprietary technology.

Long-term research has been demonstrating that ENZAMIN activates the body's metabolism to increase vitality, hence enhancing the power of immunity (spontaneous cure). In addition, ENZAMIN has been found to serve as biogenics during recent years. Around 40 years after the founding of our company, there will be new discoveries with the progress of research: ENZAMIN can be described as a raw material of unknown potential.

“Transmission” means keeping old good things in their original forms.

“Tradition” means evolving over time, i.e., “ a sequence of innovations ” .

We will continue to create and provide new value by accelerating innovation with the times by our high applied technology, without staying with the heritage of fermentation technology.





# OEM

## Total Support for OEM Business

A full support system covering a wide range, from planning, development, production, and design proposals to responding to Japan's Pharmaceutical and Medical Device Act.

Based on our high levels of planning and technical resources that have been nurtured since our founding in 1977, we can offer tailor-made OEM programs that befit your needs.

<Small-sized lots support>

There is no worry about risk of overstock.

The product can be supplied in small-sized lots.

### ■Examples of drinkable preparations

50 mL and 100 mL, ≥5,000 bottles

350 mL and 300 mL, ≥1,000 bottles

500 mL, ≥500 bottles

600 mL, 720 mL, and 900 mL, ≥400 bottles

※The minimum lot size is variable depending on the formulation.

For other styles, contact us for separate inquiries.



STEP  
1

### Hearing

We offer a wide variety of plans and proposals, including drinkable preparations, granules, powders, tablets, capsules (hard, soft), chewables, jellies, and cosmetics.



STEP  
2

### Support for product package design

In cooperation with a design company and a printing company, we are able to propose customized design plans for labels, outer packages, etc., exclusively for your company. ※Optional.



STEP  
3

### Trial production and evaluation

To conceptualize our products in a specific way, and to examine manufacturing stability and other aspects, we conduct trial production and evaluation.

STEP  
4

### Production processes

Kyoto Fushimi, where our facility is located, is blessed with abundant clear water from the old days and has many sake brewers. We provide products of higher safety and high quality with our technical resources.



STEP  
5

### Quality control

The finished product is checked on a lot-to-lot basis according to our in-house check criteria.



STEP  
6

### Packaging and shipment

We release only products that have passed rigorous checks, and assume responsibility.

## LINE UP

### ENZAMIN Line Up

Raw material	Intended use	Recommended amount (mg)/day	Concentration rate
EN M-5 L	Foods (beverages)	3000~10000	–
EN M-H L	Foods (beverages, soft capsules)	150~500	x20 concentration
EN M-20 S D	Foods (beverages, tablets, powders, capsules)	750 ~ 2500	x4 concentration
EN M-50 S D	Foods (beverages, tablets, powders, capsules)	300~1000	x10 concentration
EN M-CO	Cosmetics		–



# The fermented power we stick with for 365 days

## Research History

Around 1922, A. Besredka at the Pasteur Institute in France reported on an antiviral (a bacterial culture filtrate that was highly effective in the treatment of infections), and Soviet scientist Dr. V. Filatov succeeded in a similar experiment. In those days, when antibiotics remained to be discovered, antiviruses were commonly used to treat inflammatory diseases, and began to be studied all over the world. In Japan, Hitomi Akazawa Ph.D., a famous bacteriologist in microbiology, conducted many studies by applying antiviruses, including developing the Staphylococcus-Streptococcus combined vaccine for external use (Senatizol ointment) at Dainippon Pharmaceutical Co., Ltd. After World War II. However, he abandoned manufacture in compliance with an order of the US General Headquarters to ban the production of bacterial preparations and biological products. At the time, only the first approved antibiotic, penicillin, was in the spotlight and drawing attention. While such research was in a state of pause, he still more actively conducted research on microbial cultures, developing ENZAMIN, a microbial metabolite capable of regulating metabolism in the body in a way different from that of antibiotics. Thereafter, infections decreased and lifestyle-related diseases increased; in this situation, people's awareness of health was raised, and ENZAMIN attracted further attention. Since then, it has been helping improve people's beauty and health for more than 40 years.

## Corporate History

October 1977	Akazawa Ph.D. and colleagues founded ENZAMIN Laboratory Inc.
December 1977	Began constructing a manufacturing plant and started production of ENZAMIN (Useful Bacterial Products) in a portion of the plant still under construction.
1978	After much effort in research and improvement, we succeeded in developing products incorporating "ENZAMIN" .
May 1978	The plant was completed.
June 1978	Marketing was started.
January 2011	A research article on ENZAMIN by Dr. Osamu Matsuo, Professor-Emeritus of Kindai University Faculty of Medicine, et al. was published in the British medical periodical Journal of Thrombosis and Thrombolysis.
March 2013	The Head Office was moved to Higashitemma, Kita-ku, Osaka, Japan.
December 2013	A research paper on the preventive effect of ENZAMIN on metabolic syndrome by Dr. Osamu Matsuo, Professor-Emeritus of Kinki University and Advisor for the Kindai University Faculty of Medicine, et al. was published in the Journal of Nutritional Science, an academic journal of the University of Cambridge, UK.
June 2014	The Tokyo office was opened.
April 2015	Patent granted for a "food for preventing thrombotic diseases " in Japan.
July 2015	Patent granted for a "food for preventing thrombotic diseases " in Korea.
July 2017	Patent granted for a "food for preventing thrombotic diseases " in Taiwan.
March 2018	Patent granted for a "adipocytokine production balance regulator and inflammation of adipose tissue, oxidative stress inhibitor and macrophage infiltration inhibitor of adipose tissue" in Japan.

365 days

The fermented power  
we stick with

Fermented  
Power



## Corporate Profile

Company name	ENZAMIN LABORATORY Co., Ltd.
Head Office	1-6-8-11F, Higashitemma, Kita-ku, Osaka 530-0044, Japan TEL:06-6353-5588 FAX:06-6353-8839
Tokyo Office	2-16-2-28F, Konan, Minato-ku, Tokyo 108-0075, Japan TEL:03-6433-3588 FAX:03-6433-3580
Kyoto Plant	55-8, Yokooji Rokutanhata, Fushimi-ku, Kyoto 612-8255, Japan TEL:075-622-2039 FAX:075-602-1835
Capital	10.00 million JPY
Founded	October 12, 1977
CEO	Kenji Goto
Business areas	Planning, development, manufacture, and marketing of healthful foods, healthful beverages, and cosmetics Research and development of ENZAMIN (Useful bacterial products)
Main Banks	The Bank of Kyoto, Ltd. , MUFG Bank, Ltd.
Website	<a href="http://www.enzamin.com/">http://www.enzamin.com/</a>
Contact address	<a href="mailto:info@enzamin.com">info@enzamin.com</a>



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ENZAMIN LABORATORY Co.,Ltd.

by ENZAMIN FOR NATURAL HEALTH & BEAUTY