Preparation of GABA and low molecular weight oligosaccharides by fermenting with Marine Algae

Marine Bioprocess Co., Ltd.

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Industry Sector	Biotechnology, Pharmaceutical
Therapeutic Area	Immune related diseases
Stage of Development	Clinical Trials

1. Summary

- The technology of GABA conversion from glutamate through glutamic acid decarboxylation (GAD) with specialized Lactic Acid in case of algae (Seal Kelp) fermentation
- Contains 5 % of high purity natural GABA from innovative fermentation method , and manufacture algae(sea kelp) extract powder.
- The isolated Gram + Fungus from Jot-gal(Korean traditional salted sea food), International recognition of the deposits of microorganisms for the purposes of patent procedures with optimized lactic acid for GABA creation
- Completion of clinical trials on Anti Oxidation effect and improvement for liver function against alcoholic damage, Approved to Individual Health Functional Food material by KFDA
- Simple clinical trials regarding memory enhancing completion, additional clinical trials on going

2. Applications

Health Functional Food and general food (food and beverages **)**

1) Health Functional Food : Liver function improvement against alcoholic damage
2) Liver function recovery, recovery from fatigue
3) Removal of hangover, Ant oxidation effect

   Betterment of memory enhancing

4) Food : Food , Beverage contained GABA

3. Market Feasibility

- International health functional food market volume is 300 billion US$
  Health functional food market volume in Korean 2.3 trillion Korean won
- GABA demanding market in Japan @ 10 billion japanese yen, Single item contains GABA @26 billion Japanese yen
- Beverage for hangover removal market 230 billion Korean won in Korea.
  Energy drink market 300 billion Korean won in Korea
- Functional energy drink beverage market 7.5 billion RMB in china

4. Type of Business Relationship Sought (include licensing availability)

5. Technical Advantages

Excellence compared to competitive technology

1) Natural raw material –Algae (Sea Kelp)- The other competitors uses MSG and artificial material.
2) Natural GAB 5% containing
3) The purpose of fermentation technology is contents of algae oligosaccharide, algae mineral besides natural GABA and establishment of Green Technology using eco-bio technology
4) Efficacy verification by clinical trials – anti oxidation, removal of hangover, liver damage enhancing against alcoholic , improvement of memory enhancing
5) Utilization of specialized fermentation strain, maximum contents of natural GABA through algae(sea kelp) fermentation..
6) Health Functional Food approval by KFDA
7) Completion safety test by US.FDA.

6. Technical Highlighted Summary

○ The world's first health functional food contains algae (Sea Kelp) fermented natural GABA

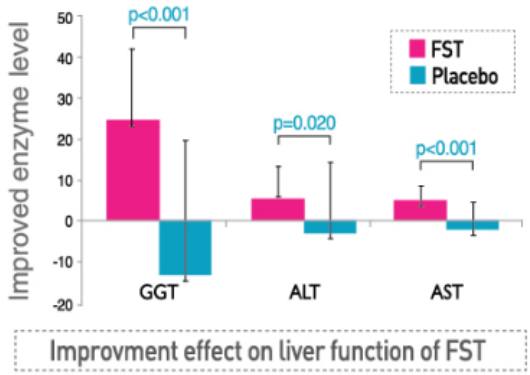
○ Guarantee fermented strain by algae fermentation e - International Association of strains deposit (KCTC 1377BP)

○ The efficacy of alcoholic liver damage improvement , Anti oxidation effect, Improvement of memory enhancing , Completion clinical trials on alcoholic liver damage improvement

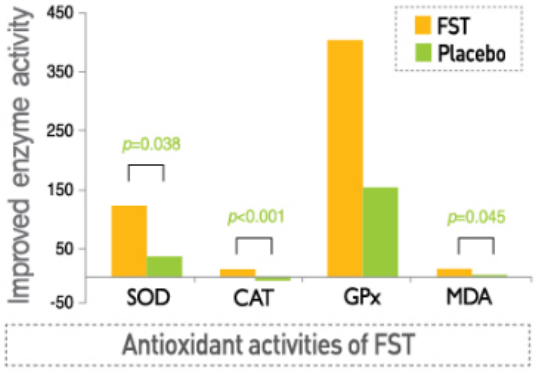
○ Green technology process establishment - Reducing carbon dioxide production process technology (GT-12-00034)

Data for Clinical Trials

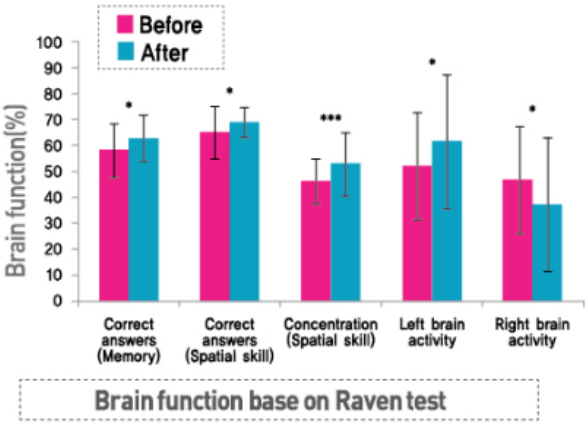
1) Improvement against Alcoholic damage of Liver

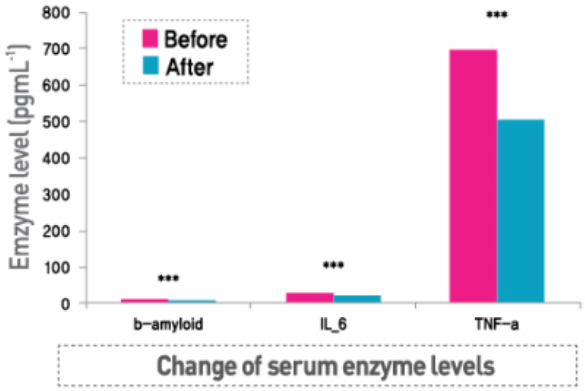


2)Anti Oxidation effect

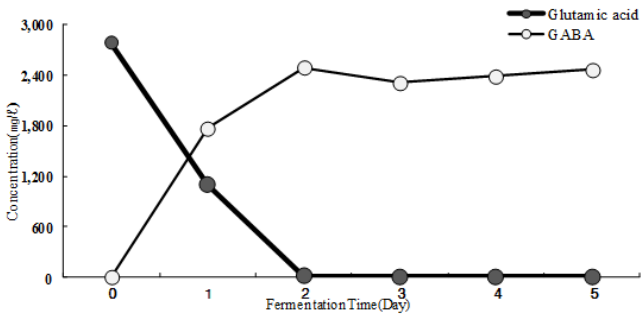


3)Improvement for memory enhancing

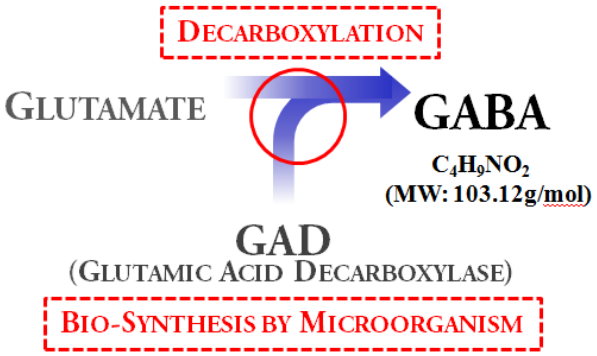




7. Mechanism (MOA)



Changes in Glutamic acid and GABA level during fermentation procedure of FST.



Mechanism of GABA Synthesis: Glutamate acid can convert to GABA (Gamma Aminobutyric Acid)

In accordance with Glutamic Acid Decarboxylase (GAD) and Decarboxylation through Algae (Sea Kelp) ferm entation process.

8. Patent Information and Status

- PATENT REGISTRATION : DOMESTIC 5CASE , INTERNATIONAL pct 1case, Japanese 1case

Patent application : 2 cases ongoing.

9. Patent Number(s)

submission/registration	No	Title	Submission No	submission/registration date	submission /registration country
REGISTRATION	1	Method for producing the fermented liquid and powder extracted from microphytes	10-2008-0043928 (No 10-0893350)	A:08.05.13 R:09.04.07	KOREA
	2	Micro algae and microorganism separating and concentrating system	10-2007-0097738 (No 10-0888897)	A:07.09.28 A:09.03.10	KOREA
	3	Method for preparing functional natural fermentation condiment and sea tangle fermentation powder containing GABA using fermentation of sea tangle	10-2008-0087205 (No 10-1025286)	A:08.09.04 R:11.03.21	KOREA

10. Key Words

Algae, Fermentation, Lactic acid ,Natural GABA, Sea kelp. Seaweed, Sea tangle, algae oligosaccharide, low molecular oligosaccharide, algae mineral, marine plants, freezing drying, health functional food, food, alcoholic liver damage, anti-oxidation, anti -oxidant, memory improvement, clinical trials

11. Company Description

As the leader of developing natural and initiating high-functional materials using marine plants, we are steadily making progress with natural and new materials by fermentation of marine plants.

We are specialized in fermentation engineering with marine biology raw materials.