●Starting Stage

(Fiscal Year 2005-2007)

Miyazaki Prefecture Northern Coastal Area

Creation of Marine Biomass Application Technology to Contribute to Improvement of the Elderly QOL

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Life Sciences
IT
Environment
Nanotech Materials
Others

Project Promotion

Project Director··· ·····Norio Yoshitama
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Science and Technology Coordinator···Hideki Simizu Yasuo Takahashi
Science and Technology Advisor···Tatsushi Saeki

Core Research Organizations

Kyushu University of Health and Welfare, University of Miyazaki

Major Participating Research Organizations

Industry···Nippon Pure food Inc, Minami Nippon Ham Co., Ltd.,
Sato Shochu Factory, Asahi Kasei Chemicals Corporation,
Asahi Organic Chemicals Industry CO., LTD.,
Yoshitama Surface Finishing Co., Ltd., Fuji Silysia Chemical LTD.
Academia···Kyushu University of Health and Welfare, University of Miyazaki
Government···Miyazaki Prefectural Fisheries Experimental Station,
Miyazaki Prefectural Food Research and Development Center

Aim of research and development

This project aims to identify an effective and functional material in the senior citizen disease prevention by primarily using the original screening technique of Kyushu University of Health and Welfare, school of Pharmaceutical Sciences oceanic biomass. We aim to develop functional foods and specially designated health foods through functional analysis and the product design. The eventual goal is to achieve a model system to retrieve and use effective material through absorption technologies that integrate Miyazaki University's seeds. These efforts are based on development of molecular imprint chitosan, film absorption chemical modification, and bacterial cellulose through extremely selective high adsorption technology. Asahi Kasei Corporation has developed a technology to recover and use functional materials in biomass at a high efficiency and low cost in the region by combining the existing separation and recovery systems possessed by companies in the region and Asahi's multi-function film separation technology to establish a model recovery system for fish ilium in the future.

Contents of research

1. Development of new functional food for senior citizen disease prevention

The target sample that has the physiological activity is found by establishing the primary evaluation system to search for functional materials, and screening it for regional biomass such as oceanic biomasses. Improvements and upgrades to the screening method are conducted as necessary. Benefits applicable to the target group include prevention of ischemic heart failure, improvement in anti-stress operation enhancement, and control of piercing pain, sleep disorders, arteriosclerosis, diabetic, high blood pressure, and dementia. The candidate sample would be clarified for the effectiveness through the second evaluation and the safety testing with the purification and the identification of the active ingredient.

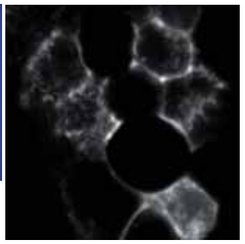
2. Development of retrieval and application technology of functionality material from oceanic biomass

The component technology for the element found by screening the active ingredient that is a functional ingredient already-known in an oceanic biomass and the above-mentioned research contents to purify separation highly effective is developed.
In specific, a new adhesive will be developed using suspension in fish stock, the bacterial cellulose, tannin, and chitinous.
To prepare novel phosphatidylserine molecules containing DHA, the revolutionary production process is developed.
Bioactivity of the novel phospholipids is examined, and the practicability of the phospholipids is evaluated.
Moreover, the removal technology of the heavy metal from a fish ilium is developed. It aims to establish a high polymerization genus removal method using the fish ilium as a biomass resource.

The main study results

1. Development of new functional foods for senior citizen disease prevention and improvement
   - The primary evaluation system concerning seven physiological activity areas were established
     The mechanism from the collection of various fish and shellfish system resources to the preparation of sample supply for the primary evaluation was established.
   - The first screening was executed, and based on seven evaluation systems, a total of 22 samples were found to be active.
   - The carnosine including the histidine was found to be active as a component in the search process of material that contributes to the improvement of dementia. Different activity for carnosine is also found in the other two evaluation systems.

Confirmed sleep prolongation caused by loss of righting reflex



Visualized serotonin receptor

2. Development of recovery and application technology of functionality material from oceanic biomass
   - It was determined that coagulation precipitation in the suspension of broth can effectively be obtained with persimmon tannin and ferrous ion.
   - The material was shown to adjust the phosphoric acid derivative impregnated resin of bacteria origin cellulose to function as an adsorbent of biologically active substances.
   - Fatty acid, such as DHA, in the culture of Euglena incorporated into cellular phospholipids fraction. The phospholipids in Euglena cells were converted to phosphatidyserine by phospholipase D. Then, acylmoieties of phosphatidyserine molecules were desirably controllable.