

# Miyazaki Oceanfront Area

Creation of Technology for the Application of Ocean Resources that Supports a Healthy and Safe Long-living Society

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## Framework for Project Promotion

- Project Director.....Norio Yoshitama (President, Yoshitama Surface Finishing Co., Ltd.)
- Chief Scientist.....Ikuo Yamamoto (Vice President, Kyushu University of Health and Welfare)
- Science and Technology Coordinator.....Yasuo Takahashi, Kimihiko Takeo

## Major Participating Research Organizations

- Industry.....Yoshitama Surface Finishing Co., Ltd., Asahi Kasei Finechem Co., Ltd., Ogurayakonbu Shokuhin Co., Ltd., Sato Shochu Manufacturing Co., Ltd., Tsuno Wine Ltd., Nippon Pure Food Inc., Fuji Silysia Chemical Ltd., Minami Nippon Ham Co., Ltd., Ikoioie Co., Ltd., Itimal Suisan Co., Ltd., Ookubo Shop, Ohyama Foods Company, Ohmoritansui Co., Ltd., Kiyomoto Techichi Inc., Kirishima Foods Corporation, Kurose Suisan Co., Ltd., Sentoku Syuzou Co., Ltd., Nippon Suisan Kaisha, Ltd., Hayakawa Soyoy Miso Company, Himuka Syokuhin Co., Ltd., Mizunaga Suisan Co., Ltd., Minami Nihon Rakuno Kyodo Co., Ltd., Miyazaki Human Service Co., Ltd., Maple Welfare Service Ltd., Watanabe Miso Syoyu Zyouzou Ltd., Hamari Chemicals, Ltd.
- Academia.....Kyushu University of Health and Welfare, University of Miyazaki, Hoshi University
- Government.....Miyazaki Prefectural Fisheries Experimental Station

## Core Research Organizations

- Kyushu University of Health and Welfare, University of Miyazaki,
- Miyazaki Prefectural Fisheries Experimental Station

## Aims of Project

We aim to create new industries with a focus on food and health in an aging society by utilizing the industry-academia-government cooperation fostered in the Starting Stage project and by utilizing (i) verification technologies for a wide range of specific diseases, as possessed by Kyushu University of Health and Welfare; (ii) technologies for the separation, collection, and manufacture of functional materials, as possessed by the University of Miyazaki; and (iii) cultivation technologies and marine product-processing technologies possessed by the Miyazaki Prefectural Fisheries Experimental Station. In Research Theme 1, we will conduct a functionality evaluation, determine the active mechanisms, perform a safety evaluation, and develop collection and cultivation technologies for the provision of raw materials, and functional-food processing technologies for carnosines identified as being effective in the Starting Stage project. In Research Theme 2, we will focus on (i) the identification, functionality evaluation, and elucidation of active mechanisms, (ii) the development of functional phospholipids, (iii) the separation and collection of useful protein ingredients, (iv) an in vivo model for the evaluation of antioxidant potency, and (v) functional-food processing technologies for other marine biomass-derived functional materials with identified effectiveness.

## Contents of Project

### 1. Elucidation of carnosine functions and development of collection technologies

We focus on carnosines, representing marine resource-derived dipeptides identified in the Starting Stage research as candidate substances expected to demonstrate prevention and improvement effects against specific diseases (cerebral vascular dementia, insomnia, pain, anxiety), and seek to elucidate the active mechanisms of carnosine against each of the studied diseases. We will seek technologies for separating and refining carnosines from marine resources, obtain operation data from a pilot facility, and perform profitability calculations and a comprehensive evaluation of the physical properties of a prototype. In addition, acute and subchronic toxicity data will be obtained using rats and mice, and we will prepare for the next phase of project development. We will also search for fish species that contain an abundance of carnosines, create a database and prepare for application of the findings to processed marine products, and establish a method of cultivating carnosine-rich cultured fish. We also aim to develop carnosine-rich processed marine products.

### 2. Development of marine-biomass utilization technologies

- 1) In vitro testing of marine biomass during Starting Stage research revealed the capability to reduce the occurrence of ischemic heart disease, a hypoglycemic effect, and an immune-function activation effect. We shall determine the structure after isolation and refining of the functional ingredients and then evaluate the functionality, active mechanisms, and safety for in vivo testing.
- 2) As functional phospholipids incorporating DHA have been successfully prepared, we will further elucidate the functionality and evaluate safety.
- 3) Given that a method of separating and refining highly functional protein from unused fish bones has been discovered, we will develop more efficient implementation technologies.
- 4) Given the development of a method of evaluating the radical-scavenging ability that exists in the human body, we will further develop the evaluation method, establish an in vivo model for the evaluation of antioxidant potency, and search for antioxidant substances.
- 5) Finally, we will develop food-processing technologies that reinforce these capabilities and contribute to the growth of regional industries.

