# Chair Marine Bio-production

# 2.4.16 Laboratory : Marine Biological Function

Member:	Associate Professor	Toyohara, Haruhiko, Ph.D
	Assistant Professor	Masato, Kinoshita, Ph.D
	Doctor's program	3
	Master's Program	8
	Undergraduate	4
	Other	1

### A. Research Activities (2010.4-2011.3)

### A-1. Main Subjects

a) Production of a marine extract library and development of its application

Due to the difficulties in the collection and species identification, marine organisms remain undeveloped as seeds for pharmaceutical use. We are now attempting to establish a chemical compounds library of marine organisms that have been collected by scuba diving or with cooperation of fishermen and marine stations for the purpose of screening of pharmaceutically active compounds useful for human health. We collected more than 500 species of marine organisms including mainly algae and invertebrates. After alcohol extraction and following hexane, etylacetate, n-butanol and water, we screened the anti-allergy activity by using extracts. We successfully identified the anti-allergy substances, enzyme inhibitors and antagonists through the collaborations b) Ecological and biochemical studies on benthes in estuaries and coestal area

b) Ecological and biochemical studies on benthos in estuaries and coastal area

Estuaries and coastal areas play important roles in degrading man-made and natural substances eluted from rivers. Marine organisms mainly benthos living these areas are possibly involved in the degrading process, but the biochemical mechanism of it still remains unknown. Particularly, cellulose is the most abundant biomass on the earth and is suggested to contribute to the carbon circulation at the global level.

c) Studies on the biomineralization of marine organisms

To evalulate the effecs of nano-particles on medaka (small freshwater teleost), we tested permiability of latex nano-particle. It was found that the particle reached brain throught blood-brain barrier. We also investigate the function of MATP gene, which is thought to concern in development of melanophore, with transgenic technology.

d) Development of transgenic medaka as a vertebrate model

To evalulate the effecs of nano-particles on medaka (small freshwater teleost), we tested permiability of latex nano-particle. It was found that the particle reached brain throught blood-brain barrier. We found that latex-nano-particle expressed toxity to medaka larva when the other stress was combined. We started to generate transgenic medaka line as human desease model.

#### **A-2.Publications and presentations**

a) Publications

Original Papers(including book-reviews)

- Masato KINOSHITA, Mohamad Pauzi ZAKARIA, Ahmad ISMAIL, Shahrizad YUSOF, Chuta BOONPHAKDEE, Thanomsak BOONPHAKDEE and Koji INOUE. An attempt to detect contamination with estrogenic compounds in river water of urban area in Thailand and Malaysia using transgenic medaka. Coastal Marine Science, 34(1): 216–222 (2010)

- SuehiroY, Kinoshita M, Okuyama T, Shimada A, Naruse K, Takeda H, Kubo T, Hashimoto M, Takeuchi H. Transient and permanent gene transfer into the brain of the teleost fish medaka (Oryzias latipes) using human adenovirus and the Cre-loxP system. FEBS Letters, 584, 3545-3549 (2010)

- H. Sawada, H. Saito, K. Adachi, H. Toyohara. Seasonal variation of bivalve larvae on an exposed sandy beach on Kashima-nada: Tips for the sandy beach recruitment process. J. Sea Res. 65. 275-283 (2010)

- T. Koito, S. Morimoto, H. Toyohara, T. Yoshida, M. Jimbo, T. Maruyama, N. Miyazaki, and K. Inoue. Decline in taurine transporter mRNA and thioautotrophic bacterial 16S rDNA levels after transplantation of the hydrothermal-vent mussel Bathymodiolus septemdierum to a non-vent position. Cah. Biol. Mar., 51: 429-433(2010).

- E. S. Antonio, M. UENO, A. Kasai, Y. Kuriyama, K. Tsuchiya, H. Toyohara, Y. Ishui, H. Yokoyama, Y. Yamashita(査読あり). Consumption of terrestrial organic matter by estuarine molluscs determined by analysis of their stable isotopes and cellulase activity. Estuarine, Coastal and Shelf Science, 86, 401-407(2010).

# Reviews

- "Manufacture mimicming nature", Sekisui Kagaku, "Artificial shell constructed by spider silk" pp.87

- "Library of kamaobo ingridients", Functional studies on Kamaboko, pp. 120

- b) Conference and seminar papers presented
  - Autumn meeting of Japan Fisheries Science spring (2)
  - Annual meeting of the Zoological Society of Japan (1)
  - Annual meeting of Small fish (1)
  - Horiba International Conference (2)
  - Autumn meeting of Japan Fisheries Science autumn(7)
  - International Marine Biotechnology Conference (2)
  - International Symposium China-Japan Food Industry(1)
  - Biomineralization workshop(1)
  - Pan Pacific conference on chemstry (1)
  - International synposium on natural rresources of Southeast Asia
  - Blue Earth sunposium(1)
  - Tokyo university ocean reseach center symposium (1)
  - Annual meeting of Japan wood science (1)

## A-3.Off-campus activities 1

#### Membership in academic societies

- Haruhiko Toyohara : The Japanese Society of Fisheries Science (editorial board), Society of Japan marine biotechnologye (committee), Society of Japan traditinal food science (committee)

#### A-3.Off-campus activities 2

Research grants

1. Grants-in-aid for Scientific Research(KAKENHI)

- Scientific Research (B) : Kinoshita Masato : Detection of sex differntiation factor with female germ cell labbeled transgenic fish

- Scientific Research (B) : Haruhiko Toyohara : Molecular ecological studies on meiobenthos in wetlands

- Challenging Scientific Research : Haruhiko Toyohara : Ultra red light perticipation of deep sea animals

- Scientific Research (B) Foreign study : Katushisa Tanaka (Partially responsibility : Haruhiko Toyohara) : Utiliztion of mangrove organic materials by fisheries animals in tropical area

#### A-4.International cooperation and overseas activities 2

Visiting Research Scholars

- Master student 1 (China)
- Research Fellow 1 (China)

#### **B.Educational Activities**(2010.4-2011.3)

#### **B-1.On-campus teaching**

a) Courses given

- Undergraduate level	Fundamentals for the laboratory course in bioresourse science (Toyohara,
	Kinoshita), Practical course in marine bioscience and technology II
	(Toyohara, Kinoshita), Laboratory course in bioresource science I. II
	(Toyohara, Kinoshita), Seminor in marine bio-production (Toyohara,
	Kinoshita), Graduation thesis (Toyohara, Kinoshita), Biotechnology-New
	Strategy in Agriculture- (Toyohara), Cell Technology of Marine Organisms
	(Toyohara), Cell Biology II (Toyohara), Cell Biology I (Toyohara), Marine
- Graduate level :	Biology (Tovohara) Seminor in marine biological function (Toyohara, Kinoshita), Laboratory course in marine biological function (Toyohara, Kinoshita)

# Part-time lecturer

- Haruhiko Toyohara: Fukui Prefectural University

Open lectures, etc.

- Kinoshita Masato: Zeze High School

# **B-3.Overseas teaching 1**

International students

- International students : Master 1 (China) Research Students 1 (China)