R&D of Bioelectronics Technologies for Safety and Security and Its Applications for Sensing

<Program for Fostering Regional Innovation (Global Type) >

Project Team

Project Manager Kiyoshi Toko (Professor, Faculty of Information Science and Electrical Engineering, Kyushu University)

Technology development → Consideration of business → Construction of business

[Research core] Kyushu University Kyushu Institute of Technology

[Projects related to odor] [Projects related to food poisoning/ virus sensor] IBC Co., Ltd. Kyushu Keisokki Co.,Ltd.

[Projects related to taste sensor] Intelligent Sensor Technology, Inc.. Taste & Aroma Strategic Research Institute Co.,Ltd.

Project Manager
Faculty of Agriculture, Kyushu University

Professor	Kiyoshi Matsumoto
Professor	Takahisa Miyamoto
Associate Professor	Toshiro Matsui
Assistant Professor	Hiroya Ishikawa

Faculty of Information Science and Electrical Engineering, Kyushu University

Associate Professor	Kenshi Hayashi
Visiting Associate Professor	Masaaki Habara
Assistant Professor	Takeshi Onodera
Visiting Assistant Professor	Youichi Mori

Faculty of Engineering, Kyushu Institute of Technology

Associate Professor	Kenichi Nakashi

(Knowledge Cluster Initiative Researcher, Fukuoka Industry, Science & Technology Foundation
Hiroshi Kobayashi

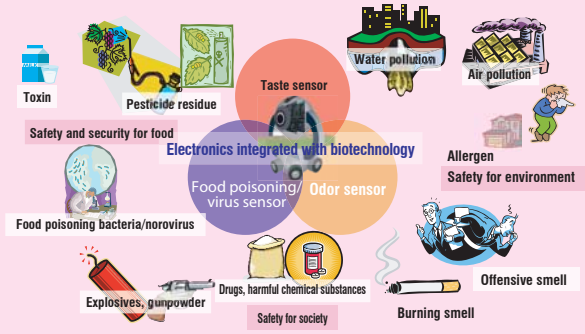
Safety for society Detection of explosives, drugs, and hazardous materials
Safety for food Virus, toxin, pesticide residue
Safety for environment Offensive odor, various hazardous substances

Odor sensor (cSPI: cyclic Surface Polarity Impedance)
Taste sensor
Ultra super-sensitive SPR sensor using antigen-antibody interaction for odor compounds

Enterprises manufacturer: IBC, OK 九州計測器株式会社
manufacturer: Insent
database: 味香り戦略研究所

Purpose of the Research

In a multipolar world, construction of a safe and secure society, such as dealing with the fear of terrorism and ensuring safety for food and environment, is an urgent issue.
On the other hand, various methods to detect dangerous objects were developed in order to address the issues above, but there are problems such as the method is still in a laboratory level or it requires a large-sized equipment and takes a long time to detect.
Therefore, the theme for this research is to develop a safe and secure bioelectronics sensor which is small-sized and quick to detect by integrating the advanced electronic technology and biotechnology



Summary of the Research: Development of a portable sensor utilizing a system LSI technology

Example of products and projects

- Taste sensor
  - From the year 2010 forward, we will be providing products to government agencies, food manufacturers, restaurant chain stores, and others.
  - We will cooperate with the Intelligent Sensor Technology, Inc. which is a venture originated from Kyushu University.
- Food poisoning/virus sensor
  - From the fiscal year 2011 forward, they will be commercialized. The targets will be quarantine stations, institutes of public health, food manufacturers, and hospitals.
  - We will cooperate with the IBC Co., Ltd., which is a venture originated from Kyushu University, and Kyushu Keisokki Co.,Ltd..
- Odor sensor
  - From the fiscal year 2013 forward, they will be commercialized by improving the prototype produced in the fiscal year 2011.
  - We will cooperate with the IBC Co., Ltd. and Kyushu Keisokki Co.,Ltd.

Efforts put forth for commercialization

- We have been working with a system in which the corporations, which will be the core in researching and developing the food poisoning/virus sensor and odor sensor, are invited to join right from the beginning.
- We are trying to unite the academy, industry, and government in the project by reconsidering the research and schedule in a timely manner.
- Furthermore, we will develop products which are acceptable in the market by inviting end users to demonstration experiment of prototypes and reflecting their opinions.

Exit (Applied technology)

Example of prototypes

- Pesticide residues detection taste sensor
  - Stationary type: Fiscal year 2009
  - Portable type: Fiscal year 2011
- Food poisoning/virus sensor
  - Fiscal year 2009: Demonstration experiment of prototype
- Odor sensor
  - Fiscal year 2011: Produce a prototype of a unusual/offensive odor sensor system based on the cSPI method

Expected results

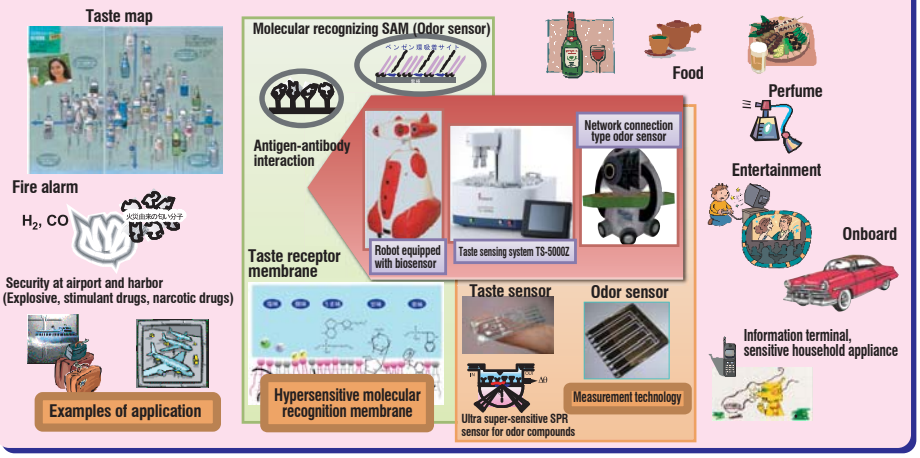
- Taste sensor
  - We will develop a method and prototype which is able to detect pesticide residues at the site quickly by connecting to an agricultural chemical database.
  - We will develop a new type of taste sensor which makes full use of the strong points of a portable taste sensor.
- Food poisoning/virus sensor
  - We will develop a supersensitive, speedy, and easy-to-use simultaneous detection and screening system for food poisoning bacterium, pathogenic bacteria including virus, and toxin.
- Odor sensor
  - Fiscal year 2011: We will develop a method and prototype which is able to detect easily and quickly the unusual odor, offensive odor, explosives, and drugs.

Reserved technology seeds

■Taste sensor which quantifies taste ■18 patents ■Speedy and supersensitive detection method for food poisoning causative substance ■4 patents ■Odor sensor (cSPI method, antigen-antibody reaction SPR sensor) ■2 patents

Entrance (Fundamental technology)

Results of the Research: Japanese technology will protect the world



Prospective Fields of Application

Taste sensor

By connecting to an agricultural chemical database, detect pesticide residues at the site quickly

Odor sensor

With a CCD camera connected to an odor sensor, it will be possible to monitor unusual odor, offensive odor, explosive, and drug inside and outside of the house in real time.
And by connecting it to a network, it will be possible to construct a monitoring system.

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Information

Office
System LSI Division
FUKUOKA INDUSTRY, SCIENCE & TECHNOLOGY FOUNDATION
〒814-0001 3-8-33, Momochihama, Sawara-ku, Fukuoka City
Fukuoka Institute of System LSI Design Industry
TEL :+81 (92) 832 7155 FAX :+81 (92) 832 1700 http://www2.lab-ist.jp/

FAIS
Information

Cooperative support organization
Knowledge Cluster Division, Industry-Academia Cooperation Department,
Industry-Academia Cooperation Center
Kitakyushu Foundation for the Advancement of Industry, Science and Technology
〒808-0135 2F, Industry-Academia Cooperation Center
Kitakyushu Science and Research Park
2-1, Hibikino, Wakamatsu-ku, Kitakyushu City, Fukuoka
TEL :+81 (93) 695 3440 FAX :+81 (93) 695 3439 http://www.ksrp.or.jp/fais/