

**Industrial Technology Center of Saga**  
**Aiming at Developing New Functional Foods**  
**Using a Cell Sorter and the KOACH**



Industrial Technology Center of Saga's Food Engineering Division has introduced a cell sorter to analyze functional foods and study yeast. It was necessary to create a highly clean environment in which contamination risk is reduced in order to analyze and sort cells more accurately. To this end, it has installed a Table KOACH T500-F.

\*Cell sorting involves encapsulating cells or cell nuclei into small liquid droplets which move on a continuous basis. Based on the amount and wavelength of reflected light and fluorescence emitted by each cell when the laser beam is applied on the cells, cells of particular types are identified from a heterogeneous mixture of different cell types and sorted (Refer to Fig.2).

**An Industrial Technology Center that Supports Local Industries with Specialized Knowledge and Technology**

Industrial Technology Center of Saga (ITCS) is supporting local corporations in Saga prefecture with industrial technical support in order to develop the local industry. It is not easy for small and medium-sized enterprises (SMEs) to conduct R&D activities individually due to not only cost problems but also knowledge and technical limitations. To reduce the burdens and uncertainties of these local corporations, ITCS is engaged in a wide variety of businesses

such as a study on joint studies and contracted researches, technical consultation, on-site instructions and facility/equipment rental.

ITCS consists of three divisions: Food Engineering, Materials/Environment and Production Technology. Specialists in each division provides technical supports. Food Engineering Division, who has installed the KOACH, is supporting corporations with technical services particularly in functional foods, food processing, brewing and food preservation etc.

Recently it is focusing on the research and development of cosmetics in addition to food.



Mr. IWAMOTO Akira, Doctor of Agriculture and Deputy Manager of Food Engineering Division

### **Interview with**

Mr. IWAMOTO Akira, Doctor of Agriculture and Deputy Manager of Food Engineering Division

### **The KOACH Left a Strong Impression on Me at a Glance**

Mr. IWAMOTO learned about the KOACH only when he happened to sit in a presentation meeting to introduce the KOACH in the Materials/Environment Division who was troubled with high maintenance cost of the existing cleanroom.

The KOACH left a strong impression on him. When he was asked how he felt when he first saw it, he said, “I thought it was cool when I saw it for the first time. I was also surprised to know that it could provide ISO Class 1 cleanliness. Unlike a conventional clean bench where 10,000 to 20,000 particles are normally permitted to float in the air, no particles exist in the KOACH. It was amazing that despite this high level of performance, it came as cheap as the standard price of 2 million yen.”

## Food and Cosmetics Research and Development Requires Cutting-Edge Equipment

Mr. IWAMOTO specializes in the research and development of functional foods. To investigate the effect of developed functional materials, it is necessary to examine the changes in the cultured cells at the cellular level after adding the functional materials to them.

Then, a sorter is used to sort the particular cells that have changed among a large number of cells as a pretreatment before cultivating cells. The KOACH is installed to provide a clean environment where the sorting takes place.

Although people tend to associate a cell sorter with the cutting-edge research such as life science research, the use of it becomes a standard practice in the food and cosmetics development, too. It is necessary to positively utilize a high-quality equipment like a cell sorter in a research and development activity to produce advanced new products. And as the performance of the equipment is enhanced, the environment in which it is operated should be reviewed accordingly.

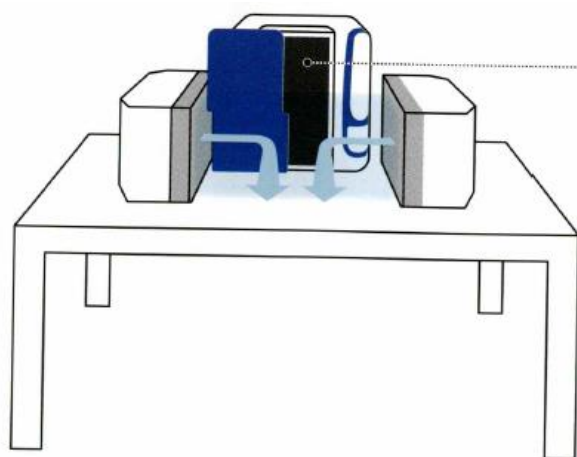


Fig. 1 Contamination control is required when loading and unloading samples.

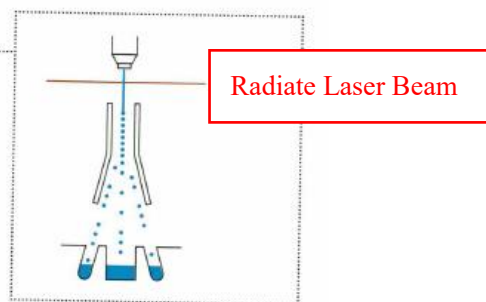


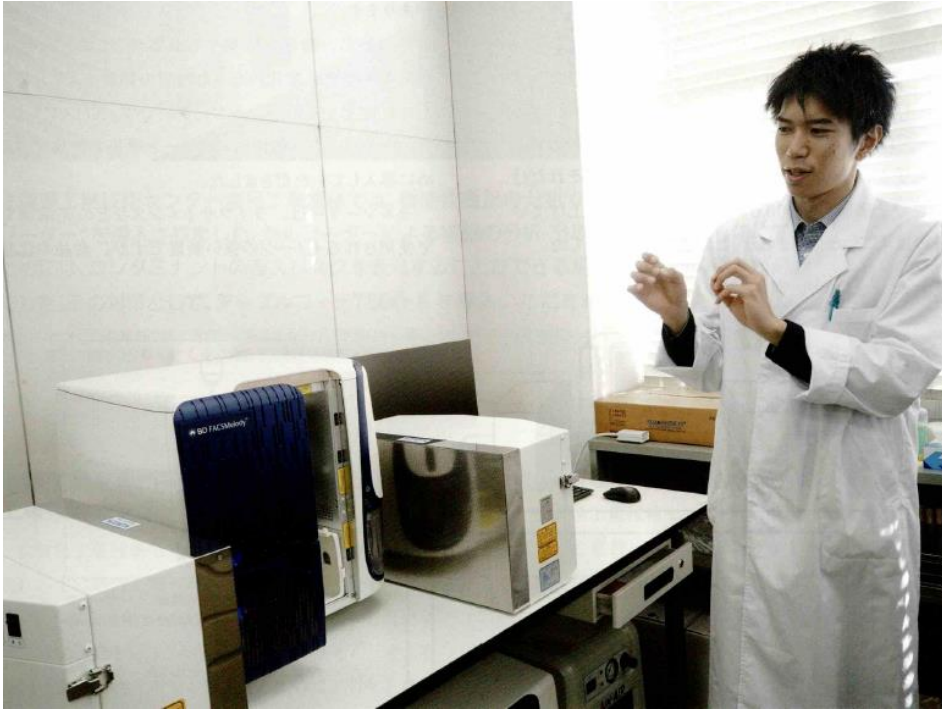
Fig.2 How a cell sorter works.  
Radiate a laser beam to liquid droplets which contain cells and nuclei. Based on the size and wavelength of reflected light and fluorescence emitted by each cell, particular cells are identified and sorted.

## Contamination-Free Aseptic Sorting is Realized by Combining a cell sorter with the KOACH

When asked about the necessity of a clean environment where a cell sorter is in use, Mr. IWAMOTO said, “If those cells that were obtained at last through various kinds of treatments for a long time were contaminated when sorting them, it would be a great waste of time and effort used for development. To reduce such risk, I think it indispensable to create a clean environment.” Because his R&D involves the incubation of extremely rare cells, he pays a special attention to his working environment.

He adopted the KOACH to seek for a more secure risk control. He told us that there were occasions where a contamination delayed a testing for a month before the installation of the KOACH. But there is none after the installation.

ITCS is planning to add the cell sorter to a list of those facilities and equipment that are open to the local corporations in the prefecture. In that case, persons who are not familiar with the protocol required for the incubation of cells may come to our office to operate the sorter. Even for these people, contamination risk can be reduced to a minimum as a clean contamination-free working environment is ensured by the KOACH. This is one reason why ITCS introduced the KOACH.



“A high-performance instrument like a cell sorter is prone to frequent malfunction. Therefore, we are very mindful of maintaining a clean environment and handling it carefully,” said Mr. IWAMOTO.

#### **Portability of the KOACH Permits Use as Clean Bench Elsewhere**

When the sorter is not in use, the KOACH is moved to the cultivation room and used as a clean bench. He said that this portability is an advantage of the KOACH that you cannot expect from other clean devices.

Another clean bench is already installed in the cultivation room. But the work table in the clean bench may be contaminated with some specimens. To avoid this from happening, he uses the work space enclosed by the KOACH for a particular job depending on the content of that job since the air flow is not blocked there.

**We are Committed to Providing Supports to More Local Corporations by Renting Out a Cell Sorter and the KOACH.**

Mr. IWAMOTO said that it is necessary for corporations in food and cosmetics industries to take advantage of sophisticated equipment like a cell sorter in order to produce advanced products that are anticipated by the market.

In order to use sophisticated equipment properly, he said, by admitting the usefulness of the KOACH, “You have to pay a close attention to the operating environment. In order to do this, cutting-edge equipment like the KOACH that can create a high level of clean environment is needed.”

He talked about his desire to help more local corporations in the future through renting out of the cell sorter and the KOACH and technical assistance in addition to using them for his own research and development.



The KOACH is used where contamination generated by grinding mouse tissues in the work bench may be a concern.

**Profile of Industrial Technology Center of Saga**

Address: Saga City, Saga Prefecture, Japan

Line of Business: Technical Assistance to Local Corporations

- Research and Development and Technical Development
- Technical Consultation and On-site Guidance
- Human Resource Development
- Testing, Analysis, and Measurement
- Renting of Facilities and Equipment
- Collection and Provision of Information