



At its five research centers (Life BEANS Center, Life BEANS Center Kyushu, 3D BEANS Center, 3D BEANS Center Shiga, and Macro BEANS Center) and its head office, the BEANS Laboratory has been conducting R&D on process technologies for integrating biomaterials, integrating organic matter, fabricating 3D nanostructures, fabricating 3D nanostructures for space applications, and large-area continuous manufacturing of micro/nanostructures, and has been developing a knowledge database for next-generation device fabrication technologies integrating heterogeneous fields. We have presented our research achievements at twenty-two academic conferences worldwide, including Transducers 2009, and have applied for five patents. In order to further publicize the achievements of the BEANS Project, we exhibited at the 20th Exhibition Micromachine/MEMS held at MicroNano 2009 on July 29–31, and organized the 3rd BEANS Project Seminar. Moreover, we did press releases and the *rosuH* was published in the newspapers and journal articles and was telecasted on the television coverage. This article describes the contents of MicroNano 2009 and the press release held on June 19 as a part of the activities of the BEANS Project.

1. MicroNano 2009

(1) 20th Exhibition Micromachine/MEMS

The Exhibition Micromachine/MEMS provided an opportunity for us to show the R&D achievements of each BEANS research center through posters and actual demonstrations. Models were made to simplify explanations on such difficult topics as neutral beam etching and supercritical film deposition by visually illustrating the theory and principles of these technologies. We also demonstrated functional vests equipped with organic devices, and cloth-like touch sensors formed of woven functional fibers to provide simple illustrations of some developments in BEANS technology. Posters on the exterior of the booth facing the walkway provided an overall description of the BEANS head quarters, while posters on interior area illustrated the location of each research center in Kyushu, Shiga, Tsukuba, and Tokyo (Komaba Campus) and profiles of all researchers participating in the project. Set off in a conspicuous green hue adorned with the bean logo that symbolizes the project, the booth attracted large crowds on every day of the conference and elicited enthusiastic discussion.



BEANS Project booth



Demonstration of functional vests

(2) 3rd BEANS Project Seminar

The seminar was held in conference area B on July 30 (Thursday) at 13:10–17:00. Following greetings by Akira Uehara, executive director of NEDO, and Atsushi Yusa, the BEANS project leader, Professor Masayoshi Esashi of Tohoku University gave a guest lecture entitled “Prospects for MEMS and expectations for the BEANS Project” and Deputy Editor Tsuneyuki Miyake of Nikkei Microdevices gave a guest lecture on “The MEMS market and recent technical trends.” Then, Sub Project Leader Hiroyuki Fujita, a professor at the University of Tokyo, introduced “The structure and significance of the BEANS Project.” After that the center director or other principal researcher for each research center (Associate Professor Masaharu Takeuchi, Professor Chihaya Adachi, Associate Professor Masakazu Sugiyama, Professor Seiji Samukawa, Professor Masaaki Kimata, and Group Leader Toshihiro Ito) gave clear and concise presentations on the core research and achievements of their respective projects. While the presentations continued for a long time with no break, the 200-capacity conference area remained overcapacity, with many of the audience standing throughout.



Project Leader Atsushi Yusa giving the opening remarks at the seminar

2. Press Release

Is Your Ear Glowing?! Developing a Blood Sugar Sensor that Glows under the Skin

A press release was held from the Life BEANS Center on June 19, 2009. Twelve mass communication companies participated. The TV coverage was done at the same time in NHK and Fuji Television, and it was delivered on news and the Internet at that night.

The press release announced that the Center had succeeded in manufacturing beads with a uniform diameter of about 100 microns through microfabrication of a hydrogel whose light emission varies in intensity according to the level of blood sugar. By embedding these beads in a mouse's ear, fluorescent light could be observed externally, as shown in the photo. The Center was able to measure the brightness of the beads externally as the brightness fluctuated in response to changes in the surrounding glucose concentration. This technology may lead to the future development of an embedded blood sugar sensor for humans.



A mouse's ear glows from embedded fluorescent gel beads