New Bio Growth Strategy by Japan

Boosting Open Innovation & Investment

Japan Bioindustry Association (JBA)

***BioJapan 2011* Interview with Tsukamoto Yoshiaki, JBA Executive Director**

Japan's bioindustry is starting to produce results along with the progress in joint research as well as development efforts involving research institutes, attached to academia and government as well as the private sector. One event which is playing a central role in pushing forward this trend is BioJapan, held under the auspices of the Japan Bioindustry Association (JBA). In an interview with the *Japan Journal*, JBA Executive Director Tsukamoto Yoshiaki expressed his hopes that the participants this year in particular will "turn this annual BioJapan event into a focal point for monitoring industry trends upon promoting Open Innovation."

***The Japan Journal*: The BioJapan 2011 event being held from October 5 through 7 at the Pacifico Yokohama Convention Center will be the thirteenth time such an event will be held. Upon considering further development of bioindustry in Japan, how would you describe this event's role?**

JBA Executive Director Tsukamoto Yoshiaki: There are two aims set for BioJapan. First is the holding of seminars and the like, providing a "Forum" in the bigger sense of the word. Issues to be covered include Life Innovation (encompassing not only the biomedical field but also items such as medical devices and functional foodstuff), Green Innovation (with most environment-related aspects being covered), plus Clusters/Ventures (as related to government, industry, academia and political circles).

Second is business matching/partnering—innovation in actual business, an "Arena of Open Innovation" allowing businesses large and small to network with each other as well as academic researchers and others concerned. In the past it was enough just to publicize the results of research but now it is essential that the results are utilized in a practical manner.

Japan's bioindustry has been able to successfully produce results based upon promoting joint R&D between the various players involved therein. These players comprise academic institutions that carry out research activities, venture businesses and major corporations such as pharmaceutical companies and the like; for them, the annual venue provided by BioJapan is filled with opportunities to meet up with a variety of entities. It is hoped that this will enable the participants there to discuss and converse widely with potential partners. Indeed it can be said that the BioJapan event will help improve the chances that the joint endeavors or alliances formed succeed, yet furthermore BioJapan enables, for example, venture businesses to learn of

Japan Bioindustry Association Executive Director Tsukamoto Yoshiaki is a former professor at the Tokyo Institute of Technology and a former director-general of the Shikoku Bureau of METI.

Figure 1: Ratio of Visitors to BioJapan 2010 by Industry
(Total No. Visitors: 15,175)

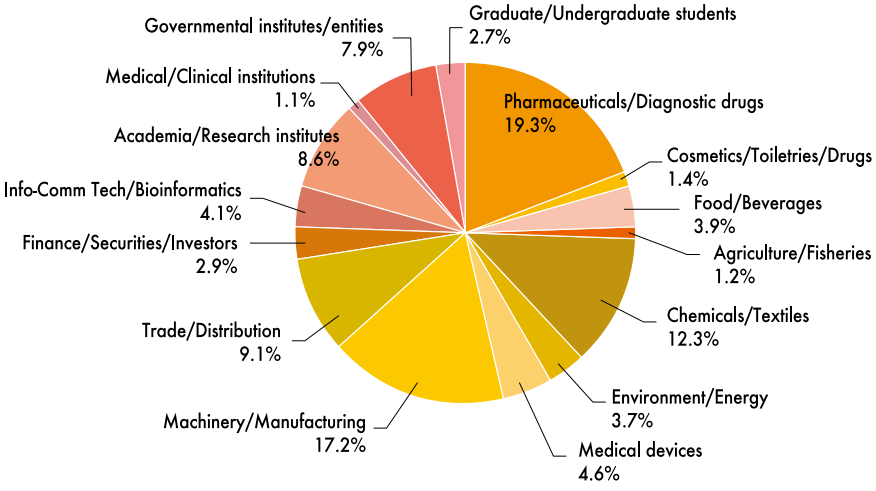
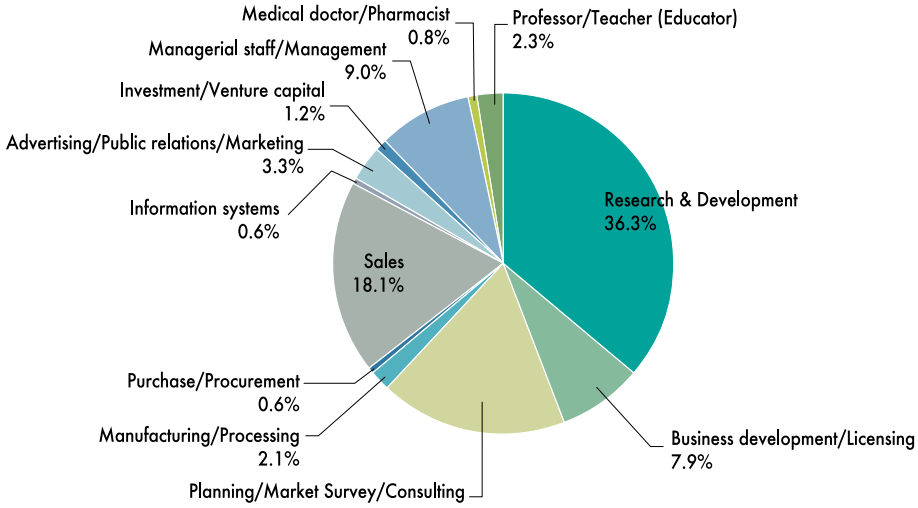


Figure 2: Ratio of Visitors to BioJapan 2010 by Job Category
(Total No. Visitors: 15,175)



the needs of pharmaceutical majors while allowing big corporations to find out what kind of progress has taken place on the venture business side. In many cases, regardless of the respective participant's stance it becomes possible for the participants to clarify the directions being taken by the research activities that will help further development upon which future alliances can be formed. As such, I should think that BioJapan affords a place where the trends can be monitored and scrutinized. It is therefore important for BioJapan to fulfill and heighten its function in becoming an "arena" that will power the social phenomenon known as "Open Innovation"—and likewise, as its sponsor, JBA also has a crucial role to fill.

Upon considering "Open Innovation" as a concept, is this not an avenue for enhancing biocluster as well?

Yes, of course! Since almost all those involved in the biocluster efforts around the world will be exhibiting at BioJapan, this will indeed be the case. Although there had been some adverse impact due to the occurrences of March 11, a multitude of participants will gather from around Asia as well as Europe and the Americas.

Until now, the number of those linked up as a result of the business partnering efforts at BioJapan has grown over the past several years, starting at 450 such cases, then growing to 860 followed by 1,160 cases until last year this figure reached the 2,000 mark. This year we hope to expand the number even further.

What reasons do you attribute to business partnering becoming ever so popular?

The truth is, the exhibitors' booths at BioJapan are not just booths but also double as meeting rooms, and this function is becoming even more important of late. In particular at the pharmaceutical firms' booths, all types of dialogue have been taking place in advance of joint R&D and alliance formation. As frontline researchers and mid-level managerial staff are involved in such dialogue, together with decision-makers, BioJapan underpins the fact that the "Open Innovation" has become a social phenomenon.

The expansion of business partnering efforts and of the number of exhibitors simultaneously indicates that the future of bioindustry in Japan could be bright...?

True, since it is said that Japan has hit a ceiling in terms of industrial competitiveness and while starting to slip in its standing internationally, upon pushing forward with "Open Innovation" Japan has an advantage. That is, the potential strength which Japan's academia possesses is very high. But the transformation of such potential of academia into realizing an actual system was difficult. What needs to be done by Japan is to channel the academic potential, a major sticking point. The role here of BioJapan must become one of a conduit for both Japanese and non-Japanese in becoming a center for Open Innovation in Asia.

Fulfilling the role of Asia's "Open Innovation" hub is within purview then?

Correct, as there are limits as to what Japan can do alone, we cannot handle everything so we ask neighboring nations—such as Korea and China—to consider linking up with us for innovation. I think it is possible to help Asia and Japan lead

in this field at the same time.

What are the features of BioJapan 2011?

First, not only will there be people from the pharmaceuticals and biotech industries, but as a prominent business leader, Takeda Pharmaceutical Co. President Hasegawa Yasuchika is scheduled to deliver the keynote speech, where he is to talk about the growth strategy of Japan's bioindustry. Another keynote speaker is the chairman of EuropaBio and proponent of the biotech-based economy Stephan B. Tanda, who is a member of the Managing Board at Royal DSM N.V. (popularly recognized by the Royal Dutch/Shell name). As both these speakers are people who are standard bearers for Open Innovation, it is hoped that their words will stimulate activities related to Japan's bio-based strategy as well as bioindustry in Japan in addition to Asia.

Other than the keynotes, what are the focal points for the variety of seminars and sessions being held?

First there is the Life Innovation Summit. This is a seminar that has as its central theme the alliance-building between pharmaceutical companies and venture businesses/universities. This seminar will be moderated by Dr. Teshirogi Isao who is president of the Japan Pharmaceutical Manufacturers Association (JPMA), who will enhance the interactions between large pharmaceutical corporations and academia.

Then there is the Green Innovation Summit, with participants discussing the promotion of Green Innovation. Japan Chemical Industry Association (JCIA) Chairman Fujiyoshi Kenji will top the list of this Summit's participants. In addition there is the seminar concerning global networking of bioclusters; seminars as well as sessions with the input of people from bioclusters around the globe will gather, with presentations being made by representatives of entities ranging from academia to pharmaceutical majors.

Recent years have seen various "key persons" talking at the event, but who are slated to speak this year?

As was the case last year, we will have Professor Yamanaka Shinya of Kyoto University giving us a presentation on the current status of induced pluripotent stem (iPS) cell research.

Furthermore, since the Okinawa Institute of Science and Technology School Corporation is planning to open the Okinawa Institute of Science and Technology as a higher institute of learning from September of 2012, we are asking its president-designate, Dr. Jonathan Dorfan, to speak to us while he visits Japan so he can tell us about the vision he has for the graduate school being opened in the near future, on the opening day of BioJapan 2011.

This graduate school is being established for promotion of interdisciplinary research covering natural sciences from biology, physics, chemistry, mathematics and computational science, but it has already started employing researchers in the aforementioned fields, with the main concepts being threshed out in detail.

Since Dr. Dorfan is director emeritus of the SLAC National Accelerator Laboratory at Stanford, the expectations are that he will provide leadership as he has headed up many top-level international joint projects.

Moreover, as something that should be highlighted there is the idea of a "Special International Strategic Administrative District for Life Sciences" that is being sponsored by the cities of Yokahama and Kawasaki, in addition to Kanagawa Prefecture which is the seat of these two cities. This idea is being unveiled in details at BioJapan 2011.

Speaking of Professor Yamanaka's presentation, what other medicine-oriented activities will there be this year?

The Regenerative Medicine Innovation Forum which was established just this June will be holding a large-scale seminar at BioJapan 2011. Along with Professor Yamanaka's event, the exhibit scale for medicine-oriented entities has been expanding, as regenerative medicine is a topic that cannot be missed.

Additionally, the medU-net, which is an alliance of medical schools established in June of 2010, will be taking part in this year's BioJapan as well. Comprising some 111 entities centering on non-profit organizations, businesses and prominent individuals, the organization was established with the objective of simulating industry-academia-government alliances that have come to play such prominent roles in promoting international research and education for "Life Innovation" (that is, the biomedical field), enhancing international competitiveness and realizing international contributions. It is believed that participation by such groups will lead to a larger goal in the future.

So, BioJapan is to become the comprehensive "arena" for bioindustry including the biomedical field?

Exactly! We have been able to gain new momentum from the many recent success stories as related to partnership-building. And overall, the quality has begun to improve, and we are ready to ride the mounting wave of "Open Innovation." It is my fervent wish that visitors make the greatest use of the "Open Innovation" provided by BioJapan 2011.

Japan Bioindustry Association (JBA)

JBA is a nonprofit organization dedicated to the promotion of bioscience, biotechnology and bioindustry in both Japan and the rest of the world. Established through the support and cooperation of industry, academia and government, JBA is the only organization of its kind in Japan. JBA's roots date back more than fifty years to the establishment of the Japanese Association of Industrial Fermentation. Today, like its predecessor organization, the JBA functions as a think tank and platform for communication between scientists, technologists, policymakers and managers.

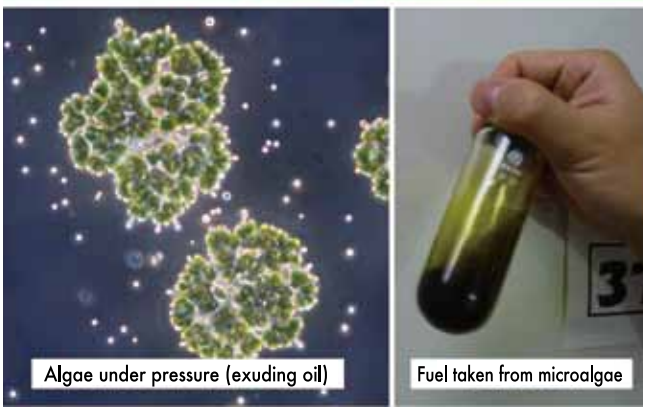
Japanese Businesses Looking To Fuel Business Using Biotech

In August, Japanese heavy industry firm IHI Corp. along with two biotech venture firms, Neo Morgan Laboratory and Gene & Gene Technology, will be setting up a joint company to research and develop biofuels made from algae. They will combine plant technology and biotechnology in the new vessel, named IHI NeoG Algae Joint Corp., based in the city of Kawasaki in Kanagawa Prefecture. IHI, formerly known as Ishikawajima-Harima Heavy Industries, is known as a major constructor of petrochemical plants around the world. Its partners this time are Neo Morgan Laboratory based in Kawasaki, involved in development of biological stocks with some fifty firms around the world, while Gene & Gene Technology is a Kobe University spin-off venture business based in Osaka. The Osaka bioventure is known for its prowess in handling microalgae.

Marine microalgae, namely oceanic photosynthetic organisms, have contributed to changes in the global environment from prehistoric times. And such change has been the motive force for the evolution of microalgae during three billion years. For example, focusing on the "coccolithophorids," they are able to produce fuel oil in addition to carrying out CO_2 fixation. Biotech researchers in Japan are attempting to unravel their mechanisms for CO_2 fixation and bio-oil production. But the microalgae coccolithophorids are unicellular calcifying algae and although large blooms have been found on the oceans using satellite observations, they are difficult to handle. What is known now is that they have contributed to the production of petroleum and limestone during the Cretaceous era.

Now, returning to IHI NeoG Algae J.C., it is capitalized at 26 million yen, with IHI planning over the next two years to invest a total of 40 million yen in order to conduct basic research as well as experiments for producing biofuels that can later be used practically in fueling automobiles and the like. Unlike the abovementioned "coccolithophorids" the algae being research will be the type which exudes oil. The new company is targeting commencing sample shipment of the fuel product, which is to be much less expensive than conventional biofuels that use grain and the like while using easy-to-culture algae, from around year 2014.

Microscopic photo of biofuel algae and extracted biofuel



COURTESY OF IHI, G&GT AND NEO MORGAN LABORATORY

Professor Yamanaka to Offer Progress Report on iPS Cell at BioJapan 2011

The induced Pluripotent Stem (iPS) cells have been at the center of worldwide attention since 2007, when Professor Yamanaka Shinya of Kyoto University succeeded in producing said iPS cells from adult skin cells, through introduction of four genetic factors into those skin cells.

Professor Yamanaka will make a presentation during the BioJapan 2011 event as to iPS cells, adult cells that can be genetically reprogrammed to turn into cells like those of the nerves and of organs such as the heart and the kidney in addition to body tissues; the cells are applicable for pathogenesis research, not to mention drug discovery/development and regenerative organ transplantation.

This biotechnological breakthrough, despite issues such as carcinogenesis resulting from the facilitated differentiation of these cells, has since led to adult cells being differentiated into iPS cells around the globe. Professor Yamanaka has now also been granted a patent by the European Patent Office (based in Munich, Germany) for the production method he had discovered.

Kyoto University had gained some iPS cell production patents from the bioventure iPerian Inc. of California earlier. The U.S. company had European as well as Japanese and U.S. patents held by Germany's Bayer Schering Pharma AG, based on work by a scientist working at their Bayer Yakuhin subsidiary's former Kobe Research Center.

BioJapan 2011 - World Business Forum

From October 5 (Wednesday) to 7 (Friday)

On the basis of "Life Innovation" (ranging the gamut from cosmetics, drug discovery and functional foods to healthcare, medical devices and supportive equipment) and "Green Innovation" (biorefinery, biomass, environment and general foodstuff provided by agriculture/fisheries) having been selected as priority policies for the science and technology area by the Japanese government, Japan's biotechnology industry has continued to grow exponentially.

Despite the current economic stagnation, biotechnology industry continues to grow. It is also firmly incorporated into Japan's growth strategy. BioJapan was started in 1986, and has been developing smoothly since then, now having become the most influential event in Asia's biotechnology market. In addition it also has expanded into biotechnology-related fields comprehensively, not only just to cover drug discovery but also nutraceutical food, medical devices and the environment. In 2011 BioJapan is held based upon the three major topics of **Life, Green** and **Bio-clusters & Ventures**.

A variety of concept-based exhibition zones and organizer's seminars are planned as well. By participating in BioJapan, which provides the opportunity to exploit "Open Innovation" as a platform, it will offer you the best selection of prospective business partners from all over the world. An original web-based business-matching tool called the "Business Partnering Matching System" will assist those who have made appointments and conduct business meetings efficiently.