

# BioJapan 2011: Boosting Open Innovation

BioJapan has developed over the last two decades into the most influential event in Asia's biotechnology market. **Ames Pomeroy** explains the event's function and looks at some recent developments in the domestic biotechnology industry.

Japan's biotechnology industry has continued to expand, based upon "Life Innovation" which ranges from cosmetics and functional foods to medicine and supportive equipment and "Green Innovation" covering biorefinery and biomass, ecology and general foodstuff from the field and the seas, the two categories having been selected as priority policies for the science and technology area by the Japanese government. In addition Japan has revamped its biotechnology-related fields comprehensively, not only just to cover drug discovery but also "nutraceutical" food, medical devices plus equipment (think "X-ray") and the environment.

With such a backdrop, BioJapan 2011 was held based upon the three major topics of Life, Green, and Bio-clusters & Ventures. More than 20,000 people visited, just as this same level was surpassed during the past three years that the event has been held. A variety of concept-based exhibition zones and organizer's seminars were held, including those from the disaster-stricken regions, providing the opportunity to exploit "Open Innovation" via best selection of prospective business partners from all over the world. An original web-based business-matching tool called the "Business Partnering Matching System" assisted those who made appointments and helped business meetings to be conducted efficiently.

BioJapan has been held under the auspices of the Japan Bioindustry Association (JBA) from the onset, this year having been held at the Pacifico Yokohama waterfront venue from October 5 through 7, 2011. This was



Booth for the Fukuoka Biocluster Project at BioJapan 2011. The Fukuoka Prefectural Bio Industry Center Promotion Conference has been nurturing bio-related industries through collaboration with Asian countries and Australia.

the thirteenth time for this event to take place, showcasing the fact that Japan's bioindustry is producing results in the biomedical field as well. Along with promotion of joint research and development efforts by research institutes, attached to academia and government not to mention the private sector in line with Open Innovation, the event plays a central role in pushing forward such endeavors as science parks in addition to enabling a close monitoring of industry trends.

The Japan Bioindustry Association (JBA) is a non-profit organization dedi-

cated 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 half a century to the establishment of the Japanese Association of Industrial Fermentation, which among other things published the *Fermentation and Industry* journal. Renowned for its imaginative use of soy sauce, bean products like miso paste and *natto*, Japanese-style pickles on occasion and vinegar as well as sake, Japanese cuisine has always had a major reliance on items resulting from fermentation, grounded in a long history.

When biotechnology was officially targeted as a new industry to be fostered in Japan, this association was transformed into the current successor organization. Now, as was the case with its predecessor, JBA functions as a think tank and platform for communication between scientists, technologists, policymakers and managers. JBA has held the BioJapan event, which was started in 1986, and has today developed into the most influential event in Asia's biotechnology market.

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 activ-

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ities, 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 was hoped that this would enable the participants



Opening Ceremony for BioJapan 2011—World Business Forum

there to discuss and converse widely with potential partners. The BioJapan event can be said to be of great help in improving the chances of the joint endeavors or alliances that have been formed to succeed.

But furthermore BioJapan enables, for example, venture businesses to learn of 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. 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.

**Links**

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 the hope is to expand the number even further. 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 "Open Innovation" has become a social phenomenon. Japan is said to have hit a ceiling in terms of industrial competitiveness while starting to slip in its standing internationally. Yet, upon pushing forward with "Open Innovation" Japan has an advantage, the potential strength which Japan's academia possesses being 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 potentials, a major sticking point. The role here of BioJapan must become one conduit for both Japanese and non-Japanese in becoming a center for Open Innovation in Asia.

iPS cells are reaching the clinical application stages after a full five years since Professor Yamanaka Shinya found that the cells from the skin and elsewhere can be induced into transformation as pluripotent stem cells. For example, TakaraBio Corp. will be offering Kyoto University, which is leading the research into iPS cells, the nucleic acid (DNA) produced using safety standards that are applied for producing clinical-use pharmaceutical products, in order to ensure the Human iPS cell produced at Kyoto University is usable at the clinical level.

To be supplied by TakaraBio is the plasmid vector; DNA vector will be manufactured by TakaraBio's Kusatsu facilities near Kyoto, in Shiga

Prefecture. The supply will be delivered to Kyoto University during this fiscal year (that is, before the end of March in 2012). Since the initial research phase, there has been new research for keeping down carcinogenesis that was originally concomitant to the use of vectors to turn the ordinary cells into iPS cells.

In actuality there has been no case of clinical use upon treating patients yet. However, Professor Yamanaka is pushing for the establishment of an "iPS cell bank" so that, unlike conventional cell banks that maintain a cell bank containing specific-use cells from the patient's own body, the cell(s) from the iPS can be "tailored" into the cells needed to treat the patient. There have been patents gained in the United States as well as Europe though so the "platform" has been set so that clinical use can be commenced at any time. There is also joint work being promoted based upon the technology, including at the "science park" level such as that at Saito Life Science Park—indeed some refer to this area as a northern Osaka "biocluster" due to the presence of many a biotech institute—where Osaka University and the National Institute of Biomedical Innovation (NIBIO) are conducting work in line with Kyoto University.

**Bioclusters, from Kyushu to Hokkaido**

In terms of bioclusters for example, there are many to be found across the Japanese archipelago. An example, with a major booth at BioJapan this year, was the Fukuoka Bio Cluster Project from Kyushu, the southernmost major island of mainland Japan.



The Okinawa booth at BioJapan 2011

Moreover, located on the island is Kurume Research Park (Bio Project Division), which has inked a Memorandum of Understanding with a Chinese biocluster, to commence full collaboration in the years to come. A unique effort here involves use of the persimmon as a “bioresource”; the biocluster here is also linked with a counterpart effort in Queensland, in Australia (quickly recovering from the recent flooding and regaining its position as Japan’s favorite golf destination). Other bioclusters, like the Okinawa islands further to the south of Kyushu, were prominent as it seems enlivened by the opening of the new science and technology graduate school there.

Referring back to Kyushu, it is also



Panelists during the IT Drug Development/Design session ruminate a difficult topic regarding use of information technology as applied to creation of new drugs.

home to its semi-namesake city of Kitakyushu, which is renowned for its “green” technology concentration. Speaking of “green” and again linking to golf, for Korean businesspeople (and in Korea and Japan, successful as exemplified by Lotte Co., well-known in Japan for its “Green” peppermint gum) it is understood that Kyushu is a favorite golf destination but at BioJapan Korean biocluster endeavors as exemplified by activities of Chuncheon Bioindustry Foundation, the Chungcheongbuk-Do BioValley Development Bureau and Jeonnam Bioindustry Foundation were looking at other locations to cooperate with various other bioclusters in Japan as well.

As an aside, in the same province as Jeonnam the World Expo focusing

Professor Yamanaka Shinya offers a progress report on induced pluripotent stem (iPS) cells five years after successfully producing such cells from adult skin cells for the first time in the world. Kyoto University also had gained iPS cell production patents in Japan and elsewhere from U.S. bioventure firm iPerian Inc. which along with the patents Professor Yamanaka obtained from the European Patent Office and the U.S. Patent and Trademark Office this summer will pave the way for full utilization of the technology at the clinical level.



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on the oceans will be held next year. Of course, covering the oceans would mean an in-depth look at the marine environ including life forms to be found therein. There were many marine biotech-related exhibits to be found at the Yokohama event. Looking to research at science parks to the north, on the northernmost island of Hokkaido can be found those mostly centered at universities. Hakodate is one where the marine science division of Hokkaido University is located, where endeavors like use of the *kagome* kelp which has been found to contain very healthy ingredients are being promoted, are ongoing. Worth noting is that the “Kitamaebune” Japan Sea trading route of yore commenced at Hokkaido and reached all the way over to Kyushu.

Another university, Chitose Institute of Science and Technology, specializes in photonics but has in addition to the Opto-electronic System Engineering and Global System Design departments a Bio- and Material Photonics department. Interestingly, the Optoelectronics Industry and Technology Development Association has a “Medical Photonics and Light Business” research thrust in place as well. NIBIO also has a research center on medicinal plants in Hokkaido. The use of light to grow (as with the “plant factory” concept as well) and modify—not just for curing but actually using light to alter material composition—is at the lead-

ing edge of research related to biotech these days.

Speaking of light, the world’s brightest synchrotron radiation source, SPring-8, is located at RIKEN Harima Institute in Hyogo Prefecture. A Center of Excellence (COE) of high-energy photon science was set up at this Harima campus, encompassing from SPring-8 to the newly opened next-generation sources, of which the most promising is the X-ray Free Electron Laser (XFEL) facility. The XFEL system that has been nicknamed “SACLA” enables protein analysis to take place without the need for crystallization, and the genomics endeavor like drug discovery and design being pushed by RIKEN, which in tandem with the RIKEN-operated K super-computer in Kobe, promises to advance further through use of this new photonic wonder.

In the wake of BioJapan there have been other activities such as the holding in November of the Japan-China Biotechnology High-tech Forum 2011 by the High-tech Industry Innovation Agency, in cooperation with its Chinese counterpart. As for BioJapan, the 2012 World Business Forum (the BioJapan “sub-title”) will be held again at the same venue in Japan, at Pacifico Yokohama, from October 10 to 12, 2012, with the hope of recording visitors at over the 30,000 mark, by expanding the areas covered in terms of energy and foodstuff to further advanced areas of medicine and nanotechnology. ■

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