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In solving global problems, such as an increasing population, food shortages, environmental pollution, and running out of oil, biotechnology has been an effective means of addressing the issues and is arousing great expectations for the future.

For example, in the field of pharmaceutical products, interferon as therapeutic agents for hepatitis C, erythropoietin as a therapeutic agent for nephrogenic anemia, and actemra, which is the first antibody drug in Japan for rheumatoid arthritis, have been launched in the market as epoch-making pharmaceutical products that bring blessings to many patients.

In the field of the environment and energy, enzymes for compact detergent have been used by many households and plastics made from biomass have been more widely used as parts for automobiles.

In the field of agriculture and food, transgenic crops have been contributing to a steady supply of food and transgenic blue roses are now on the market. The size of the domestic market for bioindustry, i.e. the industry to which such biotechnology has been applied, is said to have exceeded 2 trillion yen. In the years ahead, bioindustry will contribute to innovations in every aspect of society, lead the Japanese economy as a knowledge-intensive growing industry, and play an important role in achieving safe and affluent lives.

### About JBA

JBA's roots date back to Shusei Kyokai (the Distilled Spirits Institute) established in 1942.

Its name, after being changed to the Japanese Association of Industrial Fermentation, was renamed to Japan Bioindustry Association: JBA in 1987.

Members : Corporate members—193 companies (pharmaceutical, food, chemical cosmetic and machinery companies)

Public members —95 organizations

Individual members — 818 (universities and corporate researchers)

Budget : 610 million yen (2011)

## JBA Activity Report 2011

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# Mission

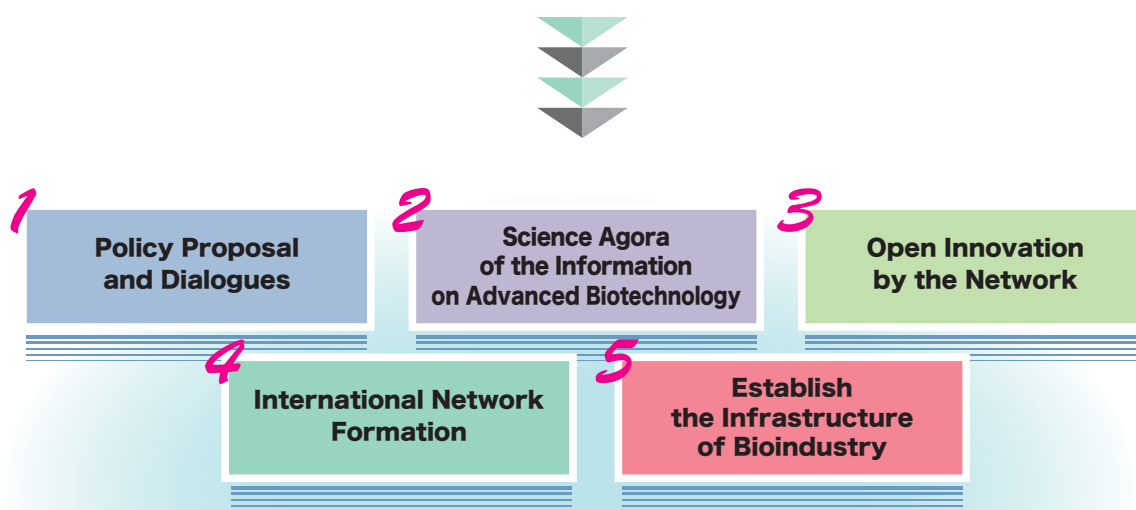
**JBA contributes to bioindustry and related industries  
in the fields of health, environment and food.**

To solve the common problems of humans, it is necessary to implement measures that rapidly apply the outstanding results of Japan's fundamental bioscience researches. Therefore, for the purpose of promoting the use of such results, one of the important tasks is making policy recommendations for the science-based review of regulations and the promotion of the strategy through collaboration among industry, academia, and the government.

Furthermore, a system of collaboration is also important with regard to bioindustry organizations in different countries of the world in order to solve global problems related to climate change and biodiversity.

Scientific development should be accelerated and open innovations are essential for industrialization. JBA holds BioJapan in order to nurture bio-venture companies and promote the formation of bio-clusters.

In addition to these activities, JBA contributes to people's lives by establishing the infrastructure for the growth of the bioindustry.



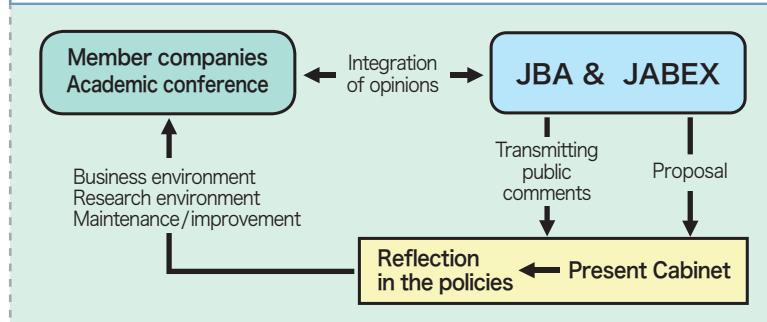
*5 actions of* **JBA**



## Policy Proposal and Dialogues

JBA has offered a variety of policy proposals and dialogs for the sound development of biotechnology and bioindustry in cooperation with member companies, universities and government bodies.

JBA cooperates in the activities of the Japan Association of Bioindustry Executives\* as an organization for integrating opinions and to make effective proposals for national policies. In addition, JBA endeavors to integrate opinions from the standpoint of science by transmitting public comments, planning and sponsoring the Life Science Summit, and planning seminars in Bio Japan.



\* Japan Association of Bioindustry Executives (JABEX) established in June 1999. The current number of members is 56. It is an extensive congregation of representatives of Japanese bioindustry-related organizations and is addressing the problems of the bioindustry, making proposals and taking action for the sound development of bioindustry.

## Accomplishment

### Policy Proposal

"Growth Strategy for Bio-technology" (August 30, 2010)

(I) "New comprehensive science and technology strategy" to survive the global competition

- Formulation of "New comprehensive science and technology strategy" to promote open innovation
- Established the infrastructure for the realization of open innovation

(II) Growth strategy based on the strengths of biotechnology (speedy creation of new industries)

- Live (Life)  
Promotion of growth of health / medical care industries by establishing the infrastructure to accelerate the creation of Life Innovation.
- Lead a life (Green)  
Technological development for resource-poor countries, innovative technological development to lead the world and creation of new industries in order to achieve a resources and carbon recycling-oriented society
- Eat (Green & Life)  
Contribution to the food production in Japan and in the world through the utilization of the results of genome research etc.,

and revitalization of the economy of local society through establishing brands of special local products.

Technological development and growth promotion of such health/functional foods that serve to promote health and reduce disease risks.

### Dialogues

Met with Prime Minister Hatoyama in December 2009. "Growth strategy for biotechnology"/"New science and technology strategy"



Met with Mr. Kawabata, Minister of Education, Culture, Sports, Science and Technology, Minister of State for Science and Technology Policy in February 2010.

Met with Mr. Naoshima, Minister of Economy, Trade and Industry in April 2010.



## Science Agora of the Information on Advanced Biotechnology

JBA is addressing the provision of biotechnology and new technical information of the industry, discovery of seeds and industrialization in cooperation with member companies, universities and government bodies.

JBA collects advanced biotechnology information in Japan and overseas, conducts research on the latest development trends and discovers technical seeds that may lead to new industries. JBA has those results shared in common among the members through lectures and seminars. Furthermore, JBA takes into consideration the project concept that should be deployed in cooperation with industry, government and academia.

### Accomplishment

#### Sponsored lectures, seminars and study meetings : 46 times in total during FY 2010.

The total number of subjects of lectures was 189, the contents of which consist of pharmaceuticals, environment, and food + basic R&D, and the activities were very active with the number of participants being 3408.

Subjects of lectures were selected on the condition that they should be opportune, take into consideration the proposal of each member, and efforts were made to have the task recognition shared in common among the members by requesting lectures not only from academia but also from industry.

Presenter		
Academy		55.0%
Public agency		24.3%
Company		20.6%

#### Subject : 189

Medicals & Care	42.3%
Environment & Production	34.9%
Technical platform	16.9%
Food & Supplement	5.8%

#### Symposium on new resource bioconversion

■ "Bioindustry in 2020"  
Lecture & Panel discussion  
(June 17, 2010)



#### Study meeting on biotechnology toward the future

- No. 21 (January 8, 2010) in Osaka  
How far has nucleic acid drug DDS come?
- No. 22 (February 16, 2010)  
Struggle against pollinosis
- No. 24 (April 20, 2010)  
Energy-saving biological carbon fixation—Green Innovation for mitigation of greenhouse gas emissions and increase of biomass production—
- No. 25 (May 10, 2010)  
Future drug discovery through administration of non-invasive drug.

#### Open Seminar "e-Bio" (Electron-oriented Biotechnology) (August 24, 2010)

"Development of electron-oriented biotechnology (e-Bio)"  
Masaharu Ishii, Associate Professor, University of Tokyo

#### Research Meeting on biologicals

- No. 19 (June 11, 2010)  
Report on Overseas Trend : "Cell Culture Engineering XII/ Biomanufacturing & Single-use Systems Asia"  
"2nd Annual International Congress of Antibodies"  
Lecture : "Search of human antibody specific affinity peptide and detection of antibody through phage library and application to purification technology" "Creation of thiazole derivative low-molecular ligand for antibody purification"

#### Joint interactive meeting on biomass

- "—Research on alcohol and biomass toward the post-resource exhaustive civilization—" (October 26, 2009)

#### Research Meeting on bioengineering RTD

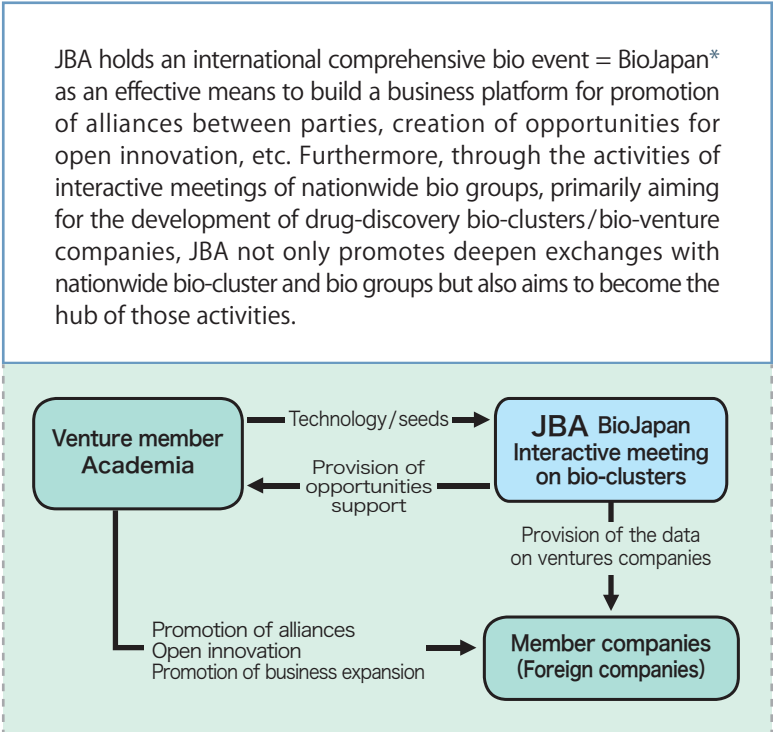
- "Regenerative medicine / iPS cells (induced pluripotent stem cell) (June 2, 2010)





# Open Innovation by the Network

In alliance with member companies, universities and the government, JBA provides opportunities to help development of Biotechnology and industry



\* **BioJapan** International comprehensive bio event that contributes to the publicity of biotechnology as a whole, starting in 1986 and having the longest history in Japan. It has been held every year since 2004. It offers exhibitions, business partnering meetings, technological presentations by universities / venture companies and theme seminars

## Accomplishment

# BioJapan2011 World Business Forum New Bio Growth Strategy by Japan

BioJapan 2011 World Business Forum was held at Pacifico Yokohama from Oct. 5<sup>th</sup> to 7<sup>th</sup>.

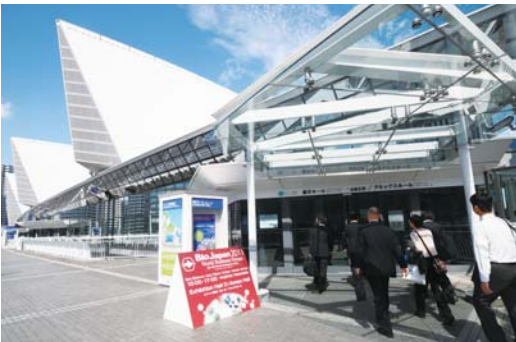
**[Subjects]** 1) Life, 2) Green, 3) Bio-cluster & Venture

**[Organizer]** BioJapan organizing Committee (JBA and the other 7 organizations) and Nikkei BP Inc.

**[Participants]** Total number of visitors was 20,600.

**[Exhibition]** 327 companies and organizations from all over the world presented their products and technologies at exhibition floor.

**[Business partnering]** Using the unique business-matching



system, participants in the event could get many chance to meet their technological seeds to needs each other. There were more than 2,000 one-to-one meetings during the event.  
**[Academic workshop]** This offers opportunities for planning joint research with corporations through result presentations by 20 universities / public research institutes.



## Opening Ceremony

### Welcome Address

**Michio Oishi**  
Cairman JBA

With a network of national and international biotechnology participants gathered in BioJapan, we hope that further development of the industry.



### Congratulatory Address



**Keiro Kitagami**  
Parliamentary Secretary for  
Economy, Trade and Industry



**Yuji Kuroiwa**  
Governor of Kanagawa Prefecture

## Keynote Speech



### The Growth Strategy in Japan

**Yasuchika Hasegawa**  
Takeda Pharmaceutical Co.  
Ltd. President & CEO

Urgent need to build a  
national vision focusing on  
economic reconstruction.

### Building a Bio-Based Economy with Life Sciences and Material Sciences

**Stephan Tanda**  
Royal DSM  
Managing Board of Directors

DSM's mission is to brighten  
the lives of future generations  
as well as people who are here.



## Exhibition



## Business partnering & Academic Seeds Presentation

20 universities & research institutes and 33 organizations & companies in total made 109 impressive presentations in the Forum. Throughout the three-day period, the Forum was well attended and recorded a total number of participants of 2,785.







## Seminar

### Life innovation Summit

The cooperation between the pharmaceutical companies, biotech companies venture and academia in Asia



#### Moderator

**Isao Teshirogi**  
Japan pharmaceutical Manufacturers Association President

In recent globalization, instead of partnering between companies, the alliance has been done in academia and venture. This time I would like to discuss cooperation on drug discovery, especially in Asia.

#### Speaker & Panelist



**Tatsumi Yamazaki**  
JBA Chairman of Steering Committee



**Hao Yan**  
EPS Co., Ltd President & CEO



**Greg Wiederrecht**  
Merck & Co., Inc. Vice president & Head



**Jonghoon Choi**  
Korea Bio-Economy Research Center Chief Researcher



### Green Innovation Summit



#### Moderator

**Hideaki Yukawa**  
RITE Director, Chief Researcher

Biofuels are already into the commercialization phase. Concern for the future world is moving to bio-chemicals, rather.

#### Speaker & Panelist

**Kenji Fukuyoshi**  
Japan Chemical Industry Association Chairman

**Shigeki Suzuki**  
TOYOTA MOTOR CORPORATION Managing Officer

**Colin Michinson**  
Genencor Biomass Application Director



**Mr. Steen Riisgaard**

**Steen Riisgaard**  
Novozymes A/S President & CEO

### Cluster Summit

Global collaboration among bioclusters



#### Moderator

**Tsuneaki Sakata**  
Osaka University Visiting Professor

Current status and issues were presented in collaboration with Japanese industry and each of the foreign biotech cluster.



**Mr. Mario Pennisi**

**Yoshifumi Ikeda**  
Kurume Research Park Co., Ltd. Bio Project Producer

**Andy Gearing**  
Biocomm Suard CEO

**Ulf Åberg**  
Invest in skåne Senior Business Development Manager

#### Speaker & Panelist

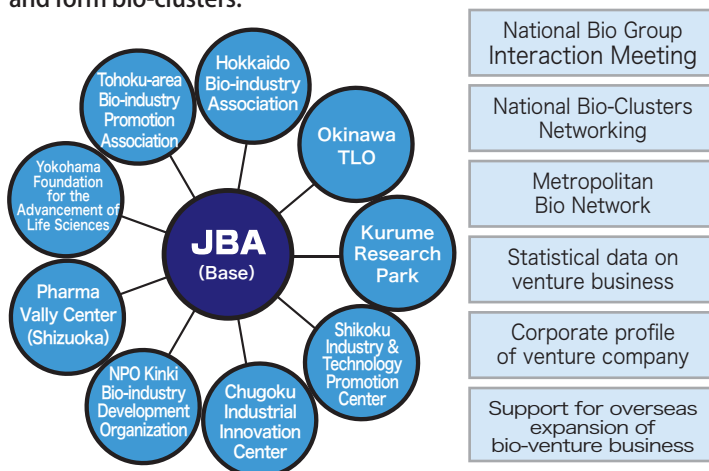
**Karimah es Sabar**  
Center for Drug Research and Development SVP Business & Strategic Affairs

**Mario Pennisi**  
Life Science Queensland Limited Chief Executive officer

**Takashi Miki**  
CITY OF KOBE Medical Industry Development Promotion Headquarters Planning and Coordination Bureau Director General

## Support for bio-venture companies and bio-clusters

Through the network with nationwide bio groups and clusters, JBA actively promotes interaction among industry, academia, and government to support and foster bio-venture companies and form bio-clusters.



As part of the operations to form bioindustry network that serves for local revitalization, JBA has been convening the National Bio Group Interaction Meeting. The network has been formed with nationwide bio groups as a means for consultation of "All Japan," and JBA has been playing a role in activity reports and information exchange and a facilitator for bio-clusters of blocks around Japan. JBA, whose activities are diversified, works out new bio-related projects and enhances the relationships between the blocks. In addition, JBA has also been promoting interactive activities with overseas bio-organizations in recent years and continuously sponsoring the cluster summit as a means to exchange opinions and promote interactions with worldwide bio-clusters in BioJapan.

### Accomplishment

#### The 7th Bio-Cluster Interaction Meeting (Cosponsor : JBA) (2011.2.3 ~ 4)

JBA held the National Bio Cluster Interactive Meeting to promote industrialization of research results and business seeds of each region that are taking a progressive approach nationwide.

**[Venue]** Mie-Prefecture (Education and Cluster Hall)

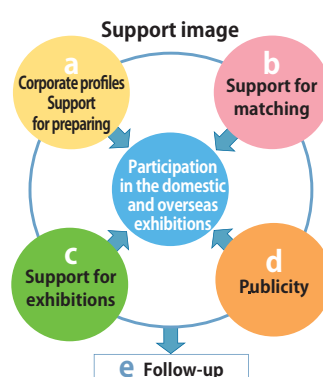
**[Subject]** "How to face the rapidly growing bio-clusters in Asia? "Expectations about the bio policies of the new government"

**[Participants]** Approximately 120 bio-cluster-related parties from throughout Japan



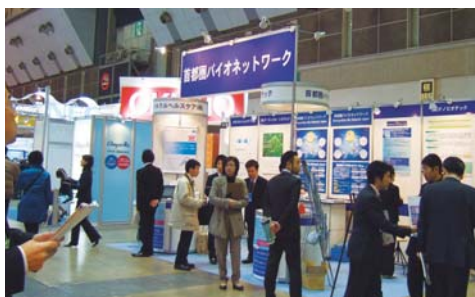
#### Support for overseas expansion of bio-venture business and cooperation with JETRO

The exchange of opinions and opportunities for interaction with worldwide bio-clusters can be an effective means to break through the bio-venture business environment that tends to be occluded. Therefore, by endeavoring to promote cooperation with overseas major bio-clusters, JBA supported the matching between bio-venture companies and foreign corporations. Furthermore, in order to multilaterally and effectively lead the activities to the results, JBA has promoted further cooperation in terms of its activities with JETRO. JBA has a close relationship with JETRO and supported bio-venture companies by participating in



Bio-Europe Spring etc. In addition, the tie-up of the activity in the JETRO BIOLINK held concurrently with BioJapan is also an example, where a complementary relationship is being established through mutual activities.





Information service



Bio business salon



Research Meeting and Seminar

### Management system of the Metropolitan Bio Network

JBA sponsored the activities under the cooperation with the members in charge of business promotion consisting of member venture companies, pharmaceutical companies, support organizations (National Institute of Advanced Industrial Science, JETRO, Tokyo Small and Medium Business Investment & Consultation CO., LTD. Organization for Small & Medium Enterprises and Regional Innovation, Japan., KPMG AZSA LLC and Japan Pharmaceutical Manufacturers Association) and also with the members of the operating committee consisting of the representatives of member companies (15 to 18 persons).

**Information service** JBA enhanced the contents and functions of the website database of the members. JBA, also, provided the information about the details of various events held by the Metropolitan Bio Network, the information about public assistance measures or various kinds of domestic bio-related information.

**Bio business salon** Lectures and interactive meeting by special speaker for participants from bio-venture companies, major pharmaceutical companies, servicing companies, etc.

**Research Meeting and Seminar** JBA, inviting the groups of members highly interested in specific subjects, holds research meetings and/or seminars. Through these activities, JBA provided support for promoting cooperation between bio-venture companies or between bio-venture companies, forming human networks and solving problems of bio-venture companies.

## Preparation of statistical data on bio-venture business and directories

### Statistical research on bio-venture business

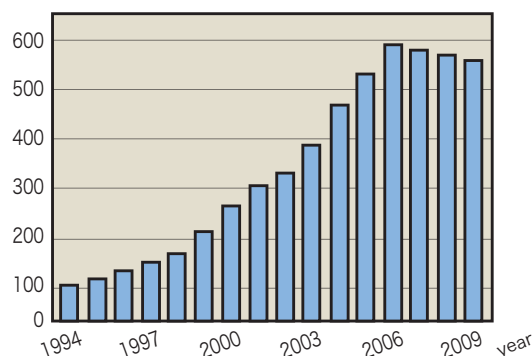
JBA conducted questionnaire-based research on nationwide bio-venture companies and carried out classification and statistical analysis of bio-venture companies by prefecture and category. As a result, the number of bio-venture companies in Japan as of the end of 2009 was 558.

In addition, JBA conducted joint research with Hitotsubashi University and published the results of analysis under the title "Initiation and growth of bio-venture companies" based on JBA's "Statistical research on bio-venture companies (2008)."

### Preparation of directories

Directories on the organization and latest information of the bio-venture companies would be an important means to share the information and promote open innovation. JBA will continue to not only update the Metropolitan Bio information but also prepare directories on nationwide bio-venture companies effectively capitalizing on its own

### Number of bio-venture companies



function as a base of activities. For the time being, JBA is going to organize the drug discovery-related bio-venture information as soon as practicable

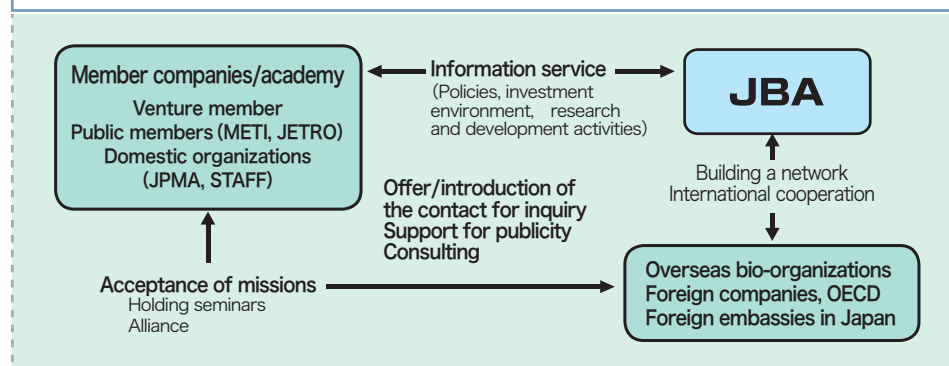


## International Network

JBA provides international information on biotechnology and bioindustry in cooperation with member companies, universities and the government.

International activities of JBA include,

- (i) Introduction/transmission of overseas bio-related information and events to the members
- (ii) Transmission of information on Japanese bioindustry.
- (iii) Transmission of opinions on international issues as Japanese bio-organization.
- (iv) Interaction with overseas bio-organizations through participation in international bio-events.
- (v) Making requests for participation in Bio Japan, and taking into consideration the wishes of member companies, JBA carries out the operations that seem hard for a single individual or corporation to accomplish.



## Accomplishment

### International Comments

Statement of bioindustry organizations and the United Nations on the Conference of the Parties to the Framework Convention on Climate Change (COP15) and the Kyoto Protocol (COP/MOP5)

#### 【Main points】

“The negotiation document of the Special Working Group (AWG-LCA) for long-term cooperation action contains such descriptions that would bring about obstacles to industrial development in that it regards intellectual property as an obstacle to technology transfer, proposing that the patent for climate-friendly technology be void and proposing that the access to the patent-pursuing technology be royalty-free and that it recommends the exercise of compulsory licensing against climate-friendly technology. JBA joined the statement by the bio-industry organizations around the world to the member states of the convention.

### Support for Seminar Promoted by Foreign embassies in Japan

French Embassy : Colloid Seminar Tokyo (2010.6)

Japan-French Seminar (2010.10)

British Embassy : UK Clinical Trial Seminar (2010.11)

HealthcareSeminar TOKYO (2011.2)

Mood Disorder Research : Science and Policy Seminar (2011.2)

Embassies and regional clusters with which JBA cooperates. (20 countries, 36 organizations)

[Overseas public organization]

American State Offices Association, the State of Colorado, the State of Georgia, the State of Massachusetts

[Overseas embassy]

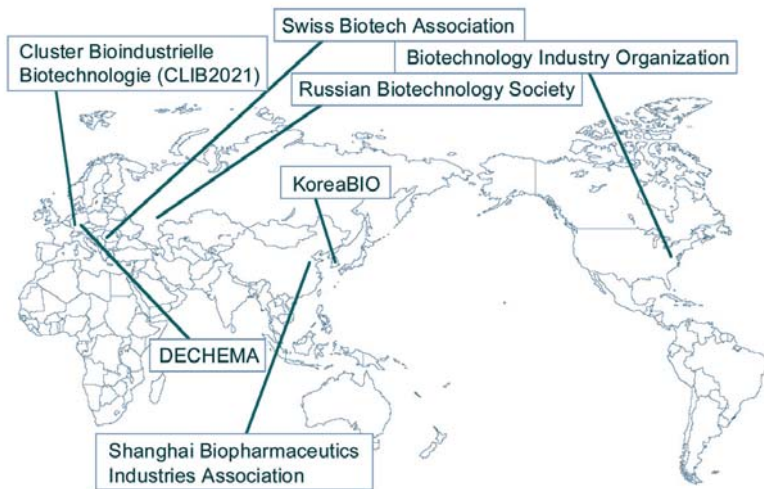
U.S.A, Canada, U.K., France. Switzerland, Netherlands, Sweden, China, Hungary, etc.

[Regional cluster] Germany, Singapore, etc.

[Overseas bio-organization] U.S.A. (BIO), Europe (Europa-Bio), France, Germany, Sweden, Taiwan, etc.

Written agreement  
with overseas bio organizations

- KoreaBIO  
Mutual cooperation with no obligation (since 2010)



The Working Party on Biotechnology (WPB) under the Committee for Scientific and Technological Policy of the OECD (Organization for Economic Cooperation and Development) examines policy issues relating to research and development to industrialization through life science and biotechnology applied to a wide range of areas from medical care and pharmaceutical products to the industries, environment, energy, agriculture and food.

JBA has participated in WPB's regular meetings and the related conferences to support the Government, and provides the status of discussions on wide-range of policy issues to its members. Recently, JBA helped to disseminate its provisional translation "OECD Guidelines on Human Biobanks and Genetic Research Databases" which was adopted as an OECD council recommendation (March 2010).

Collection and provision of overseas bio-information in cooperation with embassies, regional clusters, etc.

Transmission of overseas policies and industrial trend through the Japanese "Doi"



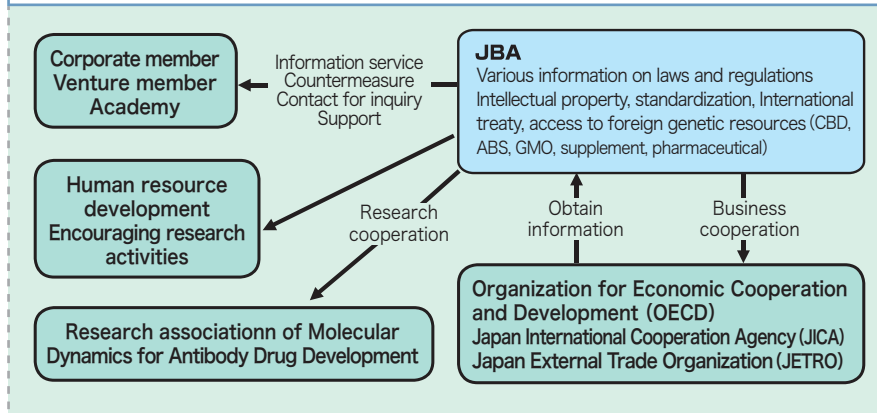


## Establish the Infrastructure of Bioindustry

JBA is addressing the improvement of infrastructure for biotechnology and industrial development in cooperation with member companies, universities and the government.

With regard to the enactment process and management of various laws and regulations on bioindustry in the fields of food and environment, JBA collects and provides related information, and also holds explanatory meetings to collect and submit opinions from the industry.

In addition, JBA establishes various infrastructures for the development of bioindustry such as support for human resource development in developing countries through JICA, promotion of national research projects through the management of research association, fosterage of promising young human resources and awarding research prizes.



### I Provision of information on laws and regulations

JBA held an explanatory meeting on the utilization of the type 2 (confined use) of the Cartagena Law and a seminar on the negotiation on "Liability and Redress" of Cartagena Protocol (March 8)

The latest trend in the regulations on experiments on living modified organisms (LMO)

Toshiki Inoue, Ministry of Education, Culture, Sports, Science and Technology, Research Promotion Bureau, Life Science Division, Office for Bioethics and Biosafety Ministry of Education, Culture, Sports, Science and Technology

Cartagena Law : Matters to note for industrial use

Midori Kosugi, Ministry of Economy, Trade and Industry, Manufacturing Industries Bureau, Bio-Industry Division, Bio-Business Promotion Office

Summary of the Cartagena Protocol "Meeting of the Group of

the Friends of Co-chairs on Liability and Redress (February 8 to February 12, Malaysia)

Takashi Ishikawa, Ministry of Economy, Trade and Industry, Manufacturing Industries Bureau, Bio-Industry Division, Bio-Business Promotion Office

"JBA held a seminar / hearing on "The current situation of the negotiation of the Cartagena Protocol' Liability and Redress" and the impact of the remaining issues (points at issue) on industry" (July 27)

Prof. Akiho Shibata of Kobe University, who has been participating in the above negotiations as a member of the Japanese delegation since 2007, gave a lecture on the results of the negotiations on "Liability and Redress" at the 3rd Meeting of the Group of the Friends of Co-chairs and the remaining issues and their possible impact on bioindustry and the significance thereof. Furthermore, also in the presence of Mr. Masataka Okada, Head of the Office of the Ministry of Economy, Trade and Industry who is a member of the delegation, an opportunity was arranged so that concrete opinions from the industry might be given with regard to products made by using LMO.

## General Meeting of the Committee for Safe and the Environment and special lecture meeting

JBA integrated opinions on the 5th Conference of the Parties to the Cartagena Protocol (MOP5 : October 2010, Nagoya City)

One of the remaining points in dispute at present in terms of "Liability and Redress" is the Products Thereof made by using LMO. The object of discussion of the Cartagena Protocol should have originally been limited to LMO. "The Product Thereof" should be excluded. In addition, it was confirmed that so far as the use of LMO completely undermines the system of science-based, advance safety/environmental impact

evaluation, the current discussion of "The Product Thereof" should be demolished and that this fact should be conveyed as the opinion of bioindustry to the government.

### [Lecture] "International trend of nutrition / health claims and the way food labeling should be in the future"

Hiroaki Hamano, Secretary-general, International Life Sciences Institute (ILSI)

With regard to nutrition/health claims, it is required that the functionality, effectiveness and safety should be evaluated based on the scientific evidence and fact and properly labeled. The lecture was plainly made explaining the discussion trend of highlighting as the global strategy of Japan, Asia, U.S., EU (EFSA) and WHO and the importance etc. of the standardization of Codex.

## II

### Biological resources measures/Cooperation for developing countries

#### Support for international negotiations of CBD and ABS

JBA continuously has participated as a member of the government delegation in international negotiation such as the Conference of the Parties to the Convention on Biological Diversity (CBD) and the meetings of working groups on access and benefit sharing (ABS) in order to support the government.

#### Help Desk for inquiry about ABS

JBA set up the Help Desk in April 2005 where the issues and problems relating to access to foreign resources can be consulted. Consultations are conducted in a confidential manner and the number of consultations conducted as of the end of 2010 exceeded 300.

#### Preparation of "Guidelines on Access to Genetic Resources"

Based on the CBD and the principles of Bonn Guidelines, JBA published guidelines in March 2005 for Japan's overseas genetic resource users. JBA has held open seminars in major cities throughout Japan on a continuous basis to enhance public awareness and understanding CBD-ABS.

#### Support for human resource development in developing countries

JBA has been conducting JICA bioindustry group training since FY 1988 to help nurture bio-related researchers, administrative officers and others in developing countries. JBA has so far brought in 200 trainees from 30 countries. Most of them are playing an active role in the development of bioindustry in their countries and also acting as a mediator with Japan.



Preparation and discussion of action plans in their home country



Plant genetic engineering  
Riken, Plant Science Center



Microbial isolation  
Kitasato University

## III

### Intellectual property

In cooperating with bio-related organizations such as Japan Pharmaceutical Manufacturers Association and Japan Foods & Biotechnology Intellectual Property Rights Center, JBA offers its opinions to the Intellectual Property Strategy Headquarters, Industrial Structure Council, Council for Science and Technology Policy and Japan Patent Office. In addition, under the co-sponsorship with Japan Pharmaceutical Manufacturers Association, JBA organizes

the "Life Science Intellectual Property Forum" every year and hold a discussion on the issues of intellectual property related to life science and bioindustry.

- Integration of opinions on the formulation of the "Intellectual Property Promotion Plan" (2010.1)
- Submitted its opinion about "What patent protection should be in the field of advanced medical technology" (2010.5)
- Cooperated in the survey of the Japan Patent Office as to the necessity etc. to know the "Use Invention of Functional Food" and recognize the novelty (2009.5)
- Survey of the "Patent application of the research results of the university" (2010.6)





## IV

### Human resource development

#### JBA Bio-Leaders course

Three-day intensive courses for graduate students and young company employees across the country, was held at Makuhari from Aug. 1.

##### Top lecture

"R & D strategy through the global network and required human resources"

Tatsumi Yamazaki

Excutive Vice President of Chugai Pharmaceutical Co., Ltd



Mr. Tatsumi Yamazaki



Discussion in groups about the assigned subjects



Completion Certificate

## V

### Award and Grants

JBA promotes scientific research that contributes to the growth and development of bioindustry by offering award and grants.

#### The Grant for Researches on Chemical and Biological Materials in 2011

"Development of highly sensitive detection system for C-reactive protein based on nano-structural change of enzyme-aptamer complex"

Kazunori Ikebukuro Professor, Tokyo University of Agriculture and Technology

"Development of a platform technology for the preparation of highly efficient biocatalysts using thermostable enzymes"

Ryuichi Hirota Assistant Professor, Hiroshima University

"Protein crystallization in semi-solid agarose gel for the development of medicines"

Hiroyoshi Matsumura Associate Prof. Osaka University

"Cell sorting on photo-cleavable PEG-lipid surfaces"

Satoshi Yamaguchi Assistant Professor, The University of Tokyo



#### JBA Award in 2011

"ASPEX technology (Fission yeast based protein expression system) and its business development"

Hiromichi Kumagai

Asahi Glass Co., Ltd. ASPEX Division

Mr. Hiromichi Kumagai



#### Fermentation and Metabolism Research Grant in 2011

"Actinomycetes secondary metabolism for innovation in natural medicines"

Shigeru Kitani Assistant professor, Osaka university

"Rapid construction of unusual peptide libraries by integrating in vitro translation system and post-translational enzymes"

Yuki Goto Assistant Professor, The University of Tokyo

"Clarification of tolerance mechanisms to environmental stress in industry yeast and application to food and environmental industries"

Jun Shima Professor, Kyoto University

