JABEX

Japan Association of Bioindustries Executives

Proposal on “The Comprehensive Strategy for Bioinnovation”

~ The global bio growth strategy through collaboration of the bioindustry, academia, and the government in Japan~

Outline

March 2013

Japan Association of Bioindustries Executives

Proposal on "The Comprehensive Strategy for Bioinnovation" (Outline)

~ The global bio-strategy through collaboration of the bioindustry, academia, and the government in Japan ~

- **Establish the goal of becoming one of the top countries in the bioindustry in the world by creating a powerful presence and leading the Asian countries through collaboration of industries, academia, and the government in Japan**
- **Promote innovation with global scientific and technological strategy**
- **Contribute to the economic and earthquake recoveries with biotechnology**

I. Promotion of innovation with scientific and technological strategy

1. Enhance the function as a "headquarter" to promote scientific and technological innovation

- Draw up a comprehensive plan on Japan's scientific and technological policy (medical services, energy/environment, agriculture/food production, health promotion), and enhance its function as a "playmaker" to integrate and adjust budget regarding priority policies.

2. Promote regulatory reform

- Organize regulation that shall be a global standard on regenerative medicine with pluripotent stem cells (cells that can become any type of cell in the living body), primary iPS cells.
- Revise the Pharmaceutical Affairs Act by separating medical equipment.
- Improve efficiencies on examination, notification of regulations, and guidance on diagnostic products (drugs used to diagnose disease and examine organ function).
- Reform regulations to allow commercial cultivation of genetically modified crops in Japan.

3. Establish Bio-venture support system

1) Establish a supporting system to form alliances between Bio-ventures, or with pharmaceutical companies
   - Provide places as bases for technical development and business support where Bio-ventures can gather and exchange.
2) Secure funds for bio ventures
   - Make high-risk investments by introducing a drastic reform of national research funding system.

3) Reform tax system and organize a fund to support bio ventures
   - Implement corporate version of "angel taxation" system and enhance investments to Bio-ventures.

4. Nurture professionals to support growth of bioindustries

1) Further enhance education on science and business
   - In primary and secondary educations, introduce the excitement of science with experiments, and nurture curiosity and interest in science.
   - In universities and graduate schools, combine science and technology to business.
2) Raise national scientific and technological literacy
   - Establish "the Science Communication Center" to evaluate and study science communication and risk communication.
   - Support regional activities for science communication by researchers or citizens' groups.
   - Provide accurate information on food situation in Japan, such as the massive use of genetically modified crops in the ingredients of processed food (cooking oil, additives, etc.) and animal fodder.

II. Comprehensive strategy for innovation on biotechnology

1. Promote medical-related innovation

1) Fulfill basic research on pluripotent stem cells, including iPS cells, and promote its practical applications
   - Lead the world with the basic study of regenerative medicine, including iPS cells and its practical applications
2) Promote preemptive medicine
   - Implement basic research and experimental study of preemptive medicine (predict vulnerability to disease or diagnose the disease in advance to prevent its onset by performing therapeutic intervention before the symptoms and serious tissue damage occur.)
   - Promote preemptive medicine by the use of the comprehensive special zone for international strategy.
3) Promote bioinformatics and personalized medicine using health/medical information
   - Launch a national campaign to promote a cohort study for the practical use of personalized medicine and preemptive medicine, and build a medical network with a biobank, such as personal genome information and an integrated database.
   - Establish a basic law for drawing up a comprehensive plan on medical database and introduce a law on handling personal information.
   - Promote bioinformatics using IT systems to control, analyze, and use big data (data with high amount of volume, variety, and changing frequency) attained from genome analysis, etc.

4) Reinforce drug discovery support system
   - Build Clinical Research Central Hospital to raise the level of clinical research, which is the basis of clinical trial.
   - Launch a national campaign to build drug discovery support system that creates revolutionary drugs and strengthen alliance with the Asian countries.
5) Facilitate the practical application of bio drug discovery
   - Build biopharmaceuticals development/manufacturing facilities and promptly nurture professionals to utilize the facilities.

2. Energy/environment-related matters

1) Secure biomass resources and develop technology for its effective use and practical application
   - Organize small-scale local biomass systems in various regions
   - Develop technology to use biomass as bioenergy
   - Nurture professionals on the development of plants for biomass resource, and also promote exchanges with and contribution to the Asian countries.
2) Develop technology on regenerative biofuel for its practical application
   - Lay the foundation for promotion of regenerative biofuel's practical application
   - Work toward practical application of biodiesel jet fuel and generating electricity by biogas.
   - Develop technology on cultivation of algae, which produces hydrocarbons regenerative for biofuel, and work toward its practical application
3) Develop technology on biochemistry for its practical application
   - Develop technology to convert biomass into energy that will increase resource options for petrochemical products.
   - Expand the use of biomass-based plastics and conduct basic research on new biomaterial for practical application
4) Develop technology to preserve and purify the environment with biotechnology
   - Reform domestic relevant laws and strengthen partnerships with Asian countries to revitalize the domestic purifying market by promoting the building of water and sewage systems there.
   - Prevail technology to clean contaminated environment using biological organisms under "Bioremediation* Utilization Guidelines"
   - Expand overseas business with the original technology and effectively use leading-edge technology

     * Bioremediation means to use biological organisms to solve an environmental problem, such as contaminated soil or groundwater, by breaking down the organic pollutant.

3. Agriculture/Food Production

1) Establish strong Japanese agriculture by developing leading-edge food production technology for practical application
   - Respond to the decreasing and aging population of farmers by establishing production technology that is laborsaving and heavy labor reducing.
   - Grow crops for overseas, mainly in the Asian countries, develop cultivation and processing technology, and develop an intellectual property strategy.
2) Promote agribusiness innovation with leading-edge breeding technology
   - Create a new industry by promoting the practical application of breeding technology to grow crops.
   - Promote research and development on genetically modified products with new functions, prepare isolation fields for practical application and safety evaluations of genetically modified products, and speed up approval of type 1 use (usage of genetically modified products without preventing the spread of such plants to the environment).
   - Develop new genetically modified products using New Plant Bleeding Techniques*.
     *A breeding technology that enables to efficiently alter certain gene.

4. Health promotion

1) Reform regulations and labeling system on food for healthy functions
   - Standardize the approval of food for specified health use, and increase its range of efficacy
   - Establish food labeling system that shall be the global standard on health functionality under the comprehensive special zone for international strategy.
2) Conduct research and education on food functionality
   - Promote research on health functionality of crops and food (including cohort study) and educate the consumers
   - Develop crops and food with new function through scientific analysis on local traditional food

Publication: March 29, 2013
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