JAPAN ROUNDUP

Kirin Brewery (Tokyo) intends to use yeast-derived RNA as a food additive, a market that is growing rapidly. Kirin will import this product from its Brazilian corporate partner, Companhia Industrial E Agricola Ometto (CIAO, Sao Paulo), to which it has licensed its yeast-related technologies. CIAO has a yeast manufacturing facility in-house, where it also extracts the RNA.

Kirin chose CIAO because it has access to abundant supplies of sugar cane, a raw material for yeast culture medium. CIAO's facility can produce 1,500–2,000 metric tons of yeast annually.

Yamasa Shoyu (Choshi) and other Japanese food companies have already agreed to purchase the RNA from Kirin; Kirin expects revenues of 120 million yen this year from this product.

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Dr. Inaga and her colleagues at Tottori University Medical School have used an ultra-high-resolution scanning electron microscope—designed by Prof. Tanaka in 1985—to observe directly the three-dimensional structure of DNA. The microscope's resolution is 0.5 nm, with approximately one-million-fold magnification.

To observe three-dimensional structures, scientists generally stain their preparations with a thick coating of electron-dense gold or platinum. To minimize the structural changes associated with staining, and to obtain high-resolution images, Inaga's group substituted uranyl acetate as the staining agent. This resulted in clear three-dimensional images of the double helix and its associated histones.

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A large comprehensive R&D program on oligosaccharides will be launched in the next fiscal year, integrating research efforts of four Japanese ministries and agencies: Science and Technology; International Trade and Industry; Health and Welfare; and Agriculture, Forestry, and Fisheries.

This 15-year project, which will require tens of billions of yen, will focus on basic and applied research on glycoproteins, glycolipids, and proteoglycans, as well as oligosaccharides *per se*. Long-term basic research will focus on the role of the sugar chain in controlling biological activities, while analytical technology will be developed short- to medium-term.

The Science and Technology Agency is responsible for the 15-year basic research agenda; each of the other three ministries will launch 10-year projects on commercial and industrial applications in relevant areas.

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Shimadzu (Kyoto) is marketing an automated cell fusion instrument it developed for research use. The instrument, "SSH-10," uses the electric pulse cell fusion method, which is much more efficient than conventional cell fusion techniques that use chemical agents such as polyethylene glycol (PEG). A microprocessor allows the programming and control of 14 fusion parameters, including amplitude and duration of electric pulse; up to 100 fusion programs can be stored. Furthermore, it provides a database of optimal fusion conditions for each cell class, enabling cell fusion and gene introduction for nearly all cells, including animal and plant cells, eggs, and microbes. The company expects sales of 100 instruments (3.9 million yen each) in the first fiscal year.

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The Fishery Agency will launch a five-year research effort on preventing red tide (Akashio) blooms—during which there is an explosive proliferation of at least 40 species of plankton. Akashio often causes the mass extinction of commercially important marine organisms in heavily laden areas; anaerobic conditions prevail, due to the degradation of large amounts of dead plankton and/or the presence of toxic substances produced by specific plankton, such as Gymnodinium.

The project will focus on three research areas: screening bloom organisms and analyzing outbreak mechanisms in natural waters; monoclonal antibody based screening and "missile therapy" for Akashio plankton; and classification of Akashio plankton using DNA restriction patterns.

Six universities will conduct the research, and the Fishery Agency's Marine Biotechnology Board will coordinate and evaluate the project. Cooperation with the private sector will be encouraged when practical applications of the research become evident.

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Researchers at Tokyo's Plant Research Institute, a joint venture of Mitsubishi and Mitsubishi Kasei, have successfully introduced a foreign gene into rape using electroporation. They prepared rape protoplasts from germ-free hypocotyl cells and introduced an exogenous glucuronidase gene together with a hygromycin-tolerance marker gene. Then the protoplasts were "nurse-cultured" on cultured tobacco cells and screened by hygromycin, resulting in three fertile individuals with the foreign gene.

Although electroporation has been widely adopted for plant transformation as a highly efficient gene introduction method, the present result is the first success in rape, establishing a practical method for developing genetically engineered rape variants. The company is searching for target genes for transformation; researchers expect to develop F1 progeny with higher fat content or improved lipid constituents within three years.

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