

ANALYSIS

Biotechnology venture capital booms in Japan

Japan is in the throes of a biotech venture boom, as institutional investors and venture capitalists—previously unknown in the industry—have begun to focus on biotechnology. However, some analysts and investors in Japan doubt whether the country has the infrastructure to sustain substantial growth of its biotechnology market, particularly in areas already dominated by the US and Europe.

Up until last year, funds specifically aimed at biotechnology start-ups did not exist in Japan, except for those operated by JAFCO (Tokyo), Japan's largest venture capital firm, which has been investing in biotechnology-related companies for the past decade. Now, five new funds specifically targeting biotechnology have been created, and more are planned. Established venture capital houses have also started to shift away from information technology to biotechnology, which is seen as the next major growth area.

For example, CSK Venture Capital (Tokyo), a leading venture capital firm that has focused on IT in the past, last November launched a ¥2 billion (US \$19 million) fund for biotech ventures, including an investment of ¥0.5 billion (US \$4.7 million) each from Tanabe Pharmaceuticals (Osaka) and from Fuyo Yakuhi Kogyo (Osaka).

In January of this year, Medical and Biological Laboratory (MBL; Nagoya), a company that develops diagnostic techniques for autoimmune diseases, launched a fully owned venture fund to support new biotech start-ups in post-genome sequencing research. MBL, together with Recmed (Tokyo), a consultancy firm specializing in research, development, and licensing of pharmaceutical products, now plans to launch a ¥3–5 billion fund for new ventures in pharmacogenomics, regeneration medicine, and new analytical techniques.

In addition, Kinki Bioindustry Development Organization (Osaka), a consortium of major companies in the Kansai area, also plans to launch a biotech venture fund targeting start-ups focused on environmental and medical technology. According to Tadashi Tamura, head of the organization, they are hoping to raise a total of ¥2 billion with support from companies such as Suntory (Osaka), Matsushita Electric (Osaka), and Kansai Electric (Osaka), as well as from the Ministry of International Trade and Industry (MITI; Tokyo).

Many analysts attribute the rapid emergence of new biotech venture funds and increased confidence among venture capitalists to last year's launch of MOTHERS (market for

high-growth and emerging stocks), a new stock market for venture companies, and the impending launch in June of another new venture-based market, Nasdaq Japan. "The launch of the new venture-orientated stock market has changed the picture dramatically; a better scope for return for investment has helped raise confidence among investors and potential entrepreneurs," says Max Kuroishi, a CSK director responsible for biotech-related investments.

In addition, the infrastructure for encouraging startups has improved somewhat over the past year, in line with the government's aim of creating 1,000 new biotech businesses within the next decade (*Nat. Biotechnol.*, 17, 320). Changes include an increased government budget for biotech start-ups, the launch of a technology transfer law, and deregulation of industry–university collaboration. "The government has helped build the foundation, and it is now the industry's turn to take over the show," says Yoshihiro Otaki, a special advisor to JAFCO.

Nevertheless, CSK is taking a cautious approach to biotech venture investments, and plans to invest in no more than 10 start-ups over the next three years. Of these, three are likely to be based on research into tissue engineering and "tailor-made medicine" carried out at Tokyo University's Institute of Medical Sciences.

CSK's Kuroishi was involved last June in setting up Effector Cell Kenkyujo (Tokyo), one of the first university biotech spin-offs. Although the company has recently succeeded in attracting further investment, bringing its total capital up to ¥116 million from the initial ¥10 million, Kuroishi is concerned about the lack of a proven track record of a successful biotech venture in Japan, and a lack of human resources to support and manage new companies.

The year 1999 saw an emergence of nearly 20 new biotech startups, including DNA Chip Kenkyujo (Yokohama), a chip venture set up by Kenichi Matsubara, a leading genome researcher, and MedGene, a gene therapy

venture set up by researchers from Osaka University (Osaka).

However, Otaki warns venture capitalists against rushing into biotechnology without a global appreciation of the industry. There are currently 500 biotech companies in Japan, compared to 1,400 in the US and 700 in Europe, but only 200 hold technology seeds with commercial potential, and only a handful are real ventures in the sense that they are not affiliated with pharmaceutical companies or government institutes. Many startup projects in Japan have in the past been largely dependent on government money, and a less-than-favorable regulatory environment with a lack of technology transfer mechanisms has long stymied commercialization of research. This means that the majority of fundamental biotechnology-related patents—such as those related to DNA chip technology and gene therapy—are already owned mainly by US companies.

Hiroshi Sakakura, senior equity analyst from Tokyo-Mitsubishi Securities (Tokyo), says that the DNA chip market, for instance, should present high growth potential for companies in Japan, especially with the start of post-genome sequencing research and increasing efforts in proteomics (*Nat. Biotechnol.*, 18, 16). But he says that with Affymetrix (Santa Clara, CA) holding the key patents, and the domestic biotechnology industry too small to create a healthy balance between supply and demand for such products, the turnover of chip companies in Japan is unlikely to expand dramatically from its current ¥2 billion to the ¥30–50 billion size in the US.

Otaki says the fusion of robotics and electronics with genomics—exemplified by the development of a high-throughput capillary sequencer by Hitachi (Tokyo), a leading electronics company—holds great potential for the development of next-generation technologies, and considers it a field biotech ventures should focus on. "There is little point in pursuing what has already been done."

Asako Saegusa

Geron issued UK Dolly patents

Geron Corp (Menlo Park, CA) announced the issuance of two patents by the UK Patent Office covering the nuclear transfer technology used to produce Dolly the sheep, the first animal cloned from an adult cell. Although the announcement on January 19 prompted a 30% hike in Geron share price to \$33.375, the decision has sparked controversy concerning the rights of ownership of human embryos.

Geron obtained the license rights to the nuclear transfer technology in May 1999, when it acquired Roslin Bio-Med Ltd., a spin-off of the Roslin Institute (Edinburgh, UK). As part of that deal, Geron committed nearly \$20 million in research funding to the Roslin

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