# Government unveils plan to kick-start gene therapy R&D in Japan

Hot on the heels of its approval of Japan's first gene therapy trial (*Nature Medicine* 1, 188; 1995), the Japanese government is trying to stimulate commercial development of gene therapy technology and reduce Japan's dependence on foreign (particularly American) know-how.

As *Nature Medicine* went to press, a new government-sponsored research and development company was due to be officially established in mid-March. The company, DNAVEC (pronounced 'deenavec') Research Inc., is a joint venture between seven large Japanese drug firms and the Organisation for Adverse Drug Reaction Relief, R&D Promotion and Product Review (or drug organization for short), a semigovernmental *tokushu-hojin* body. DNAVEC Research will be involved principally in developing and producing new gene therapy vectors, agents (often based on an inactivated virus) that carry the therapeutic gene into the patient's cells.

**DNAVEC Research's new home will be located in the building on the far right.**



The investment officially announced so far is relatively small — a total of ¥48.2 million (US$500,000) — but this is intended to cover only the two-week period between the establishment of the company and the end of the financial year on 31 March. The total investment over the next 7 years is expected to reach around ¥3 billion (US$33 million). The drug organization, whose capital comes from the Ministry of Finance, will own just over 60% of the stock, with the rest being held by its industrial partners.

The drug companies involved are Hisamitsu Pharmaceutical, Sankyo, Shionogi & Co., Kyowa Hakko, Sumitomo Pharmaceutical, Tanabe Seiyaku and Yamanouchi Pharmaceutical. All are said to have more or less equal financial stakes in the venture. The new company will be based in laboratories rented from Hisamitsu Pharmaceutical in Tsukuba science city, north of Tokyo and all research staff will come from the seven parent drug companies. The company president and head of research have yet to be appointed.

An official statement issued by the drug organization early last month sets out a series of aims for DNAVEC Research. The intention is to develop safer, more stable vectors with higher specificities for target cells, more effective methods of administering treatment, and improved vector production technology.

DNAVEC Research will own the intellectual rights to any products it makes and is free to sell these to laboratories or to other companies. The stated aim is to turn a profit but the heavy level of public investment suggests that the founders realize this is unlikely in the foreseeable future. For all its promise, gene therapy is still highly experimental, has a low success rate and is hindered by numerous ethical problems, so it is not surprising that Japan's large drug firms were reluctant to be involved until the government provided an impetus. Expecting small start-up companies to make the running is also unrealistic because venture capital is almost unheard of in Japan. So far, the only Japanese company involved in vector production is Midori Juji (Green Cross Corporation) in Osaka, which has imported its technology from Viagene Inc. of San Diego, California.

In a separate development, the Ministry of Health and Welfare's central pharmaceutical affairs council met in early March to set in motion its production of safety and quality guidelines on gene therapy vectors. It has created a dedicated committee to consider advice from various academic and industrial sources before publishing recommendations, possibly as early as this month. This appears to be a move towards creating a second tier in the gene therapy approval system, which would make it more like its counterparts in the United States and Britain. Unlike Japan, proposals in these countries are considered by a committee with a broad brief covering both scientific and ethical concerns, and a separate body that considers only matters of medical safety (although in the United States there are plans to consolidate the review process, see page 292). Japan currently has the first of these but not the second and has so far relied on the US Food and Drug Administration to ensure vector quality and safety. The issuance of formal guidelines is also seen as an attempt to reduce the regulatory uncertainties that make Japanese pharmaceutical companies shy away from gene therapy.

The drug organization's statement makes it clear that it wants to see an end to Japan's almost total reliance on gene therapy technology from abroad, particularly from the United States. The reasons seem to have as much to do with national pride as with any perceived strategic advantage in this emerging medical field. But money alone is unlikely to be a sufficient remedy because Japan still lags well behind the United States in the quality of its basic medical science. This, above all, is likely to ensure that for some time to come, Japanese doctors who want to use the latest medical techniques will have to look across the Pacific for resources and advice.

TIMO HANNAY
*Tokyo*