Massachusetts Institute of Technology. "There is tremendous enthusiasm from all quarters to finish the mouse genome, and scientists won't have to wait very long," he says.

But he admits that "the importance of a lot of different projects will have to be juggled, and it'll all get done in an order that is maximally useful to scientists as a whole". Like the NIH, Germany and France are waiting to assess the scientific promise of different species before committing their national sequencing efforts to finishing the mouse.

Jordan points out that the public consortium, concurrent with providing a working draft, will finish selected areas of the mouse genome judged to be biologically important. Although primarily intended to support priority areas of mouse genetics, this "will also give us a better idea of how much better it really [would be] to have the finished sequence", she says.

Mouse geneticists need no such convincing. "A draft sequence will be a poor tool for mouse geneticists," says Phil Avner, head of the mouse molecular genetics unit at the Pasteur Institute in Paris. It will allow no more than 80 per cent of genes to be identified, and will not provide key information about areas of the genome that regulate the genes, he says.

Even some zebrafish geneticists agree that finishing the mouse genome is a high priority because of the uniquely advanced level of genetic tools available. "But zebrafish biologists will also need a working draft within the next year or two," says Wolfgang Driever, a zebrafish geneticist at the University of Freiburg. "So ultimately it will be a question of timing and funding." ■

Internet gateway planned for neuroinformatics data

Paul Smaglik, Washington

Data on the human brain will soon be available over the Internet via an electronic gateway. Currently being planned by an international consortium, the portal will give researchers access to data at various levels of detail and sophistication.

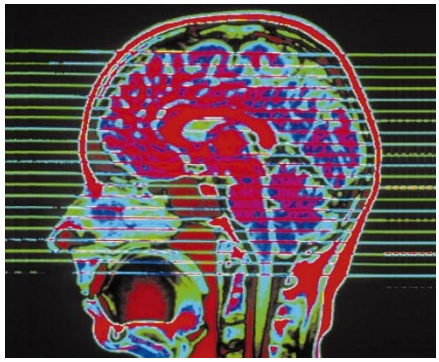
Backed in principle by the Organisation for Economic Cooperation and Development (OECD), the consortium aims to devise common standards and procedures for the various neuroinformatics databases and software programs scattered around the world.

An OECD working group set up to develop the gateway met for the first time in Genoa last month, and announced that it plans to make decisions on a launch date at its next meeting in Washington in September.

"We'd like to create a portal that would provide access to all the resources that are out there," says Stephen Koslow, director of the Office on Neuroinformatics with the US National Institute of Mental Health, and chair of the OECD working group.

Koslow points out that many individual programs already exist, each working at their own levels of analysis. Finding them and linking them to one site will be the first step, he explains. The next step will be to make them work with each other.

The project resembles earlier efforts to built computational tools for studying genomes. Many groups independently created computer programs that eventually became consolidated into software suites.



SPL

Head first: brain data, such as this MRI scan, will soon be brought together on the Internet.

But neuroinformatics covers a broader spectrum of tools than computational genomics, ranging from brain imaging to the study of genes and proteins. And tying together data dealing with different levels of analysis is a huge challenge. Data can be in many forms, including brain scans showing the development of Alzheimer's disease and genetic databases detailing susceptibility to the disease.

Scientists involved in the Human Brain Project — a US government-backed effort to develop a variety of neuroinformatics tools — are already working to make the various pieces of software more accessible.

Jonathan Cohen, professor of psychology at Princeton University, said last week that although independence in the early days of neuroinformatics software development had resulted in many useful programs, it had also created an electronic 'Tower of Babel'.

"Since a lot of people build these things on their own, they are not always in a format that everyone can use," Cohen told a conference on the Human Brain Project held last week in Bethesda, Maryland.

Cohen's group is providing 'wrappers' to make different programs look the same on a computer screen. So far, this 'FisWidgets' project has provided interfaces for 43 public-domain neuroimaging programs.

Another problem is that data can be in different forms, or images in different resolutions. This is especially daunting when developing multiple-scale models of the nervous system, Nigel Goddard, a bioinformatician at the University of Edinburgh, told the meeting. Such modelling provides a broad map of a system, along with the ability to zoom in on selected parts for greater detail, and retrieve data associated with that image. "We need to have some set of standards so we can integrate the efforts," said Goddard. ■

Software spend boosts Israeli R&D

Haim Watzman, Jerusalem

A recalculation of Israel's spending on research and development (R&D) shows that it spends 3.5 per cent of its gross domestic product (GDP) on civilian research — more than any other OECD country. The figures are the first in Israel to include accurate data on spending by small software companies in Israel.

The new picture comes from a survey carried out by Israel's Central Bureau of Statistics. Previous assessments had placed this figure at just under 3 per cent of GDP (military R&D figures remain classified). Such estimates for high-tech R&D spending were based primarily on information from large companies, explains Simcha Bar-Eliezer, the statistician responsible for the survey.

Shlomo Herskovic, the director of planning and information for the Planning and Budgeting Committee of the Council for Higher Education, which oversees and allocates the country's higher-education budget, says the new figures change the overall picture of Israel's spending on research.

The survey shows that 21 per cent of the country's civilian research spending is at the universities. Herskovic says the data could be used to argue that the universities should get more research funds. Given the extra spending in software companies, the government is now responsible for only 8 per cent of civilian research expenditure.

The high level of research spending in the software sector could also have implications for computer science programmes at universities. Even current plans to increase the number of computer science graduates by a factor of five over the next three years may be inadequate to supply software firms with the professionals they need, says Herskovic. ■