

Scientists unveil first draft of human genome

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The first working draft of the human genome has been completed ahead of schedule and hailed by Michael Dexter, director of the Wellcome Trust, as “the outstanding achievement not only of our lifetime but in terms of human history.”

The draft maps 97% of the genome, of which 85% has been sequenced with an accuracy of over 99.9%. It contains 38 000 confirmed genes and 115 000 possible genes. The two rival groups competing to be the first to complete the draft joined forces to announce the achievement in Washington, DC, and in London.

Richard Dawkins, professor of the public understanding of science at Oxford University, said: “Along with Bach’s music, Shakespeare’s sonnets, and the Apollo space programme, the human genome project is one of those achievements of the human spirit that makes me proud to be human.”

The project’s cancer group is systematically searching through sequenced genes in the draft to compare them with those in cancer cells. The genetic differences are likely to be clues to the biological mechanisms of cancer development and may help in finding new diagnostic tools and treatments. Mike Stratton, head of the cancer project, said: “In 20 years’ time the treatment of cancer will have been transformed.”

The project has been an international collaboration between eight publicly funded university centres; it began mapping the genome in 1990. The US biotechnology company Celera, founded in 1998 by Craig Venter, claimed to have a faster mapping technique, which would have sequenced the entire genome by June of this year (22 January, p 206).

Some scientists are trying to



John Sulston, director of the Sanger Centre, criticised the private sector’s assault on the genome

play down the tensions between the groups. Francis Collins, head of the US genome project, said at the press conference in Washington: “The only race we’re interested in discussing is the human race.”

But others in the human genome project made public their resentment of Celera’s commercial enterprise. John Sulston, director of the United Kingdom’s Sanger Centre in Cambridge, which is responsible for a third of the project’s sequence data, said: “I didn’t want my genetic information to be under the control of one entity, one corporation.” Dr Sulston denied that Celera’s efforts had helped to speed up publication of the first draft: “This project was on track and has remained on track. It has not been accelerated greatly.” Dr Venter courted controversy by saying at a press conference in Washington, “This is a historic

moment for private industry.”

Unlike the human genome project, which will make its draft available free on the internet, Celera is allowing only paid subscribers access to its sequence data. This has led to fears that pharmaceutical companies will attempt to patent specific genes for commercial rather than public gain.

President Bill Clinton and the British prime minister, Tony Blair, reiterated the importance of keeping the sequence data in the public domain as a global resource. There was widespread concern about other potential misuses of the genetic information contained in the first draft. Tony Blair said that the information must “be used to transform medicine, not abused to make man his own creator or invade individual privacy.”

Lord Sainsbury, science minister, believes that the Human

Genetics Commission, an advisory body to the UK government, will help to protect society from such misuses. It will address “a whole series of questions,” he said, “taking in issues of patenting, genetic testing and insurance, and genetic testing and employment.”

Although the media have suggested that the map of the genome will lead to immediate cures for many diseases, scientists remain guarded about the content of the first draft and its clinical implications. “We don’t know what’s junk and what isn’t,” said Dr Sulston, “We have no way of passing DNA through a machine that tells us what is junk.” □

The first draft of the human genome will be available free at www.ensembl.org. The Human Genetics Commission’s website is at www.hgc.gov.uk.