

Human genome mapped

Breakthrough marks beginning of new era in medicine

By Paul Recer
THE ASSOCIATED PRESS

WASHINGTON — The book of genetic instructions for the human body is complete to an accuracy of 99.99 percent, a scientific achievement once deemed impossible but now considered the foundation for a new era of medical advances, an international research team said Monday.

With the entire sequence in hand and available to scientists worldwide, experts predicted it would lead to new drugs, better forecasts of people's health and new ways to treat or prevent many of the most devastating human illnesses.

A joint statement from the leaders of the six nations, including President Bush, said the genetic map "provides us with the fundamental platform for understanding ourselves from which revolutionary progress will be made in biomedical sciences and in the health and welfare of humankind."

The group, along with a competing private effort, completed a rough draft of the genome in 2000, but that draft included thousands of gaps in the long sequence of DNA base pairs. Now all but 400 of those gaps have been closed.

"After three billion years of evolution ... we have before us the instructions set that carries each of us from a one-celled egg through adulthood to the grave," said Dr. Robert Waterston of the International Human Genome Sequencing Consortium. "It is written in an arcane language and encompasses a complexity that we just beginning to understand."

The genome is composed of about three billion pairs of DNA chemicals within 24 chromosomes. The genes that control the body's development, growth, functions and aging are made of specific sequences of these chemical pairs. A small change in these sequences can be enough to cause disease.

By identifying the correct and healthy

sequence of base pairs, researchers hope to find the disease-causing genetic flaws that could yield to treatment.

Scientists are still uncertain how many genes there are in the genome, but most believe it is about 30,000. This number is expected to be refined with more research.

Hundreds of scientists in the consortium, representing 18 organizations in six countries, started the sequencing work in 1990.

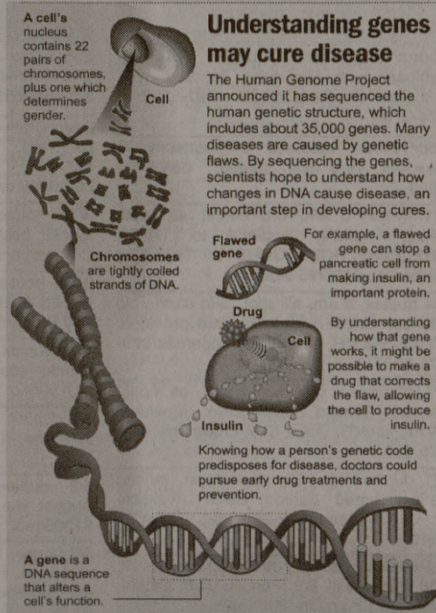
American agencies and universities, led by the National Human Genome Research Institute and the Department of Energy, completed the project at a cost of about \$2.7 billion, some \$300 million less and two years earlier than the original estimate. The United States did about half of the DNA sequencing, and some of the money budgeted for the human project was spent on sequencing other organisms, such as the mouse, and on associated technologies.

Celera Genomics, a private company led by Craig Venter, raced the international effort to produce a parallel rough draft of the genome. Completion of the competing efforts was announced at a joint news conference at the White House in June 2000. But Dr. Francis Collins, director of the NHGR, said that Celera did not go on to refine the rough draft, leaving the consortium with the only essentially complete sequence. Venter now does work for the Department of Energy.

Announcement of the completed sequence comes just days before the 50th anniversary of the discovery of the double helix structure of DNA by James Watson, an American, and Francis Crick, a British biophysicist. They shared the Nobel Prize for the work.

Watson, who was the first director of the American sequencing effort, said at Monday's news conference that his decision to devote three percent of the genome research effort to studying the ethical consequences of the gene sequencing may have been "the wisest decision that I made."

He said there were concerns that if the



SOURCE: National Human Genome Research Institute AP

research identified people with a genetic predisposition for disease it could lead to discrimination in employment and in other elements of life. Forty states have now passed laws forbidding genetic discrimination and federal laws have been proposed.

Dr. Francis Collins, head of the National Human Genome Research Institute, said the complete sequence of the genome is just the beginning of the genetic revolution. Researchers now will use the sequences to try to speed identification of genes that cause cancer, diabetes, heart disease and other disorders and then to develop drugs that either prevent or treat the disorders. Some disorders might be treated by manipulating or replacing flawed genes, he said.

It eventually may be possible to provide the unique genetic sequence for each patient and then to tailor therapy or prevention care for that specific person, the experts said. This could relieve some of the side effects caused by broad spectrum drugs.

Feds continue lie detector use despite study

By Pete Yost
THE ASSOCIATED PRESS

WASHINGTON — The Energy Department decided Monday to continue using lie detector tests to protect the nation's nuclear arms stockpile, despite a scientific study that found severe shortcomings in the tests' accuracy.

Energy Secretary Spencer Abraham said the department must use the best tools available to protect sensitive information about the stockpile. Critics said the department is making a mistake by ignoring recommendations of the study of polygraph effectiveness done six months ago at the urging of Congress.

"Basically they've ignored the evidence," said Stephen Fienberg of Carnegie Mellon University, who chaired the National Academy of Sciences study.

A spokesman for Sen. Jeff Bingaman, D-N.M., said the Energy Department's response to the National Academy of Sciences is "a surprising and disappointing result" that is hard to understand.

Congress ordered the Energy Department to heed, and take the study's findings into account.

In a proposed rule, howev-

er, the department says retaining the program is well-suited to fulfilling national security needs.

The scientific review headed by Fienberg concluded that federal agencies should not rely on lie detectors to screen current workers and job applicants because the machines are simply too inaccurate.

The likelihood of ignoring a spy because he passed a polygraph test is so high that relying on the tests probably is a greater danger to national security than discarding them, Fienberg said in response to the proposed new Energy Department rule.

"It's bureaucratic impudence," said Steven Aftergood of the Federation of American Scientists. "Energy said, 'We'll replace the existing policy with precisely the same policy.'"

In justifying keeping the polygraph program as it is, the Energy Department pointed to language in the Academy's study about the use of lie detectors as a trigger for a fairly detailed follow-up investigation.

Abraham said the polygraph tests are not simply used on a "stand-alone basis but as part of a larger fabric of investigative and analytical reviews."

RA Appreciation Day

Help us thank them! It's Resident Advisor Appreciation Day and we, the Department of Residence Life, want you to know the names of our outstanding RA staff. Not everyone is cut out for the job, so we are very grateful to these men and women for their willingness to share their time and talent (no matter what the hour of the day or night). They are instrumental in working with our residence hall students to develop strong communities, leadership opportunities and support for the individual.

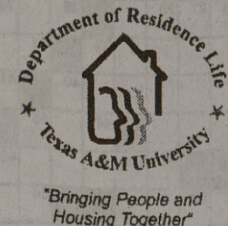
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- Jill Atkinson
- Precious Atlas
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- Christy Bedford
- Cassandra Behr
- Ryan Bippert
- Meg Boan
- Kelly Brashares
- Mark Breaux
- Chris Brenes
- Scott "Scooter" Cady
- Morgan Casmus
- Daniel Chapman
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- Gabriel Chisholm
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- Melissa Daniels
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- Russell Joffrion
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- Chris McGuirk
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April 15, 2003