

Dutch scientists first to sequence female DNA

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Geneticists of Leiden University Medical Centre (LUMC) are the first to determine the DNA sequence of a woman. She is also the first European whose DNA sequence has been determined. This has been announced by the researchers this morning, during a special press conference at 'Bessensap', a yearly meeting of scientists and the press in the Netherlands.

Following in-depth analysis, the sequence will be made public, except incidental privacy-sensitive findings. The results will contribute to insights into human genetic diversity.

DNA of geneticist Marjolein Kriek

The DNA is that of dr Marjolein Kriek, a clinical geneticist at LUMC. "If anyone could properly consider the ramifications of knowing his or her sequence, it is a clinical geneticist," says professor Gert-Jan B van Ommen, leader of the LUMC team and director of the 'Center for Medical Systems Biology' (CMSB), a center of the Netherlands Genomics Initiative.

Van Ommen continues: "Moreover, while women don't have a Y-chromosome, they have two X-chromosomes. As the X-chromosome is present as a single copy in half the population, the males, it has undergone a harsher selection in human evolution. This has made it less variable. We considered that sequencing only males, for 'completeness', slows insight into X-chromosome variability. So it was time, after sequencing four males, to balance the genders a bit". He smiles: "And after Watson we also felt that it was okay to do Kriek".

Eight times coverage

The DNA sequencing was done with the Illumina 1G equipment. This has been installed in January 2007 in the Leiden Genome Technology Center, the genomics facility of LUMC and CMSB. In total,

approx. 22 billion base pairs (the 'letters' of the DNA language) were read. That is almost eight times the size of the human genome.'

Dr. Johan den Dunnen, project leader at the Leiden Genome Technology Center: 'This high coverage is needed to prevent mistakes, connect the separate reads and reduces the chance of occasional uncovered gaps.

Johan den Dunnen: 'The sequencing itself took about six months. Partly since it was run as a 'side operation' filling the empty positions on the machine while running other projects. Would such a job be done in one go, it would take just ten weeks".

The cost of the project was approximately €40.000.- This does not include further in-depth bioinformatics analysis. This is estimated to take another six months.

History

In 2001, the DNA sequence was published of a combination of persons. The DNA sequences of Jim Watson, discoverer of the DNA's double helix structure, followed in 2007, and later the DNA of gene hunter Craig Venter. Recently the completion of the sequences of two Yoruba-Africans was announced.

Source: Leiden University

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