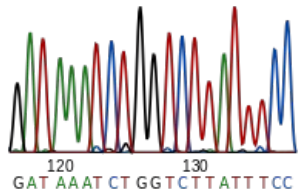
Map of the human genome, HUGO, use

Map of the human genome



DNA sequence

The human genome is a set of all the DNA information in individual cells.

The human genome mapping project began at the Los Alamos Laboratory and the Lawrence Livermore Laboratory as early as 1983, when libraries of individual DNA clones began to be created. The basis of the research was the sequencing of random parts of the genomes of volunteers. These were ethnically diverse groups. The individual sequences obtained were subsequently multiplied in suitable vectors (especially E. coli) into several million copies – thus creating so-called bacterial artificial chromosomes. Thus, a sample of sequences was obtained, which, however, did not follow each other in the corresponding order. This order was subsequently determined using algorithms using very powerful computers. They processed many millions of data and determined the order of individual base pairs by comparing individual parts of human genomes. These corresponded to the final number of all 23 pairs of chromosomes.

The first sequenced human chromosomes were the 16th and 19th chromosomes in 1995. Two years later (1997) the complete E. coli genome was sequenced. Thanks to the international cooperation of individual research teams, a relatively "quick" mapping of the human genome took place. In 2000, the completion of the working version of the complete human genome was announced - so the research took 17 years. 80,000 human genes were described in the project ..

Over 300 sequencers were used during genome assembly and sequencing. The technical demands on computer equipment are today regarded as one of the most demanding electronic operations ever.

Even today it is a project that raises many doubts in the field of ethics and morals. The most common concerns are related to the misuse of information about the genomes of individual people. Many diseases and disabilities of the wearer are also encoded in them (a problem with insurance companies, employers,...). Most of the concerns are related to the possibilities of using the project.

Using gene mapping

- In the future, it is expected to be applied in the field of early diagnosis of various genetic diseases and prerequisites for them.
- As part of the development of pharmacogenomics, individual drugs could be prepared individually for individual patients so that they do not harm the patient.
- Estimating the health risks of mutagenic or carcinogenic substances will improve, which may lead to reduced risks of disability.
- Better identification in forensics using DNA

HUGO (HUman Genome Organisation)

The organization was founded in April 1988 at the first gene mapping and sequencing meeting. Its existence was necessary for the international coordination of research in individual states. Although it was originally an organization with the possibility of membership for all persons connected with human genome research, later there was a shift to an academic organization and the number of members is now limited.

HUGO Goals

- investigate the nature, structures, functions and interactions of genes, genetic elements and genomes of humans and relevant pathogenic organisms
- characterize the nature and development of genetic variability in humans and other organisms
- study the influence of genetic variability and the environment on the characteristics, causes, treatment and prevention of diseases
- promote the interaction, coordination and dissemination of information and technologies among the general public in the fields of genomics, proteomics, bioinformatics, systems biology and clinical sciences by promoting quality education
- sponsor dialogues on social, legal and ethical issues associated with genetic and genomic information

Links

Related articles

- Mapping the genome
- Sequencing
- Gene
- Vector
- Chromosome

External links

- HUman Genome Organisation (http://www.hugo-international.org/abt_missionstatements.php)

References

- Časopis Natura – Mapování lidského genomu dokončeno (http://natura.baf.cz/natura/2000/8/20000803.html)