of high quality. Also, modern high technologies are inseparable from the ecological style, because they are aimed at saving and humane handling of natural resources, for example, washing machines and dishwashers use water and electricity economically. Thus, durable materials and functional objects embodies the main idea of environmental movements - reducing the negative impact on the environment through waste reduction.

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UDC 575

PERSONALIZED MEDICINE AS A NEW TYPE OF MEDICINE

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What will be your reaction, if I say, that cancer and other rare diseases could be defeated in the future. I think you will have some doubts concerning my claim. That's why I want to tell you about a new ambitious project of English scientists, which is named "The 100.000 Genomes Project". It gives the opportunity to cope with some great problems of our world. This Project was launched in England in late 2012 with the aim to create a new genomic medicine service for the NHS (national health service) and transform the way people are cared allowing the development of treatment which is individual for each person.

Let's consider in details the main aims of this project:

• Patient benefit: providing clinical diagnosis and timely new or more effective treatments for patients.

• New scientific insights and discovery: (with the consent of patients, creating a database of 100,000 whole genome sequences linked to continually updated long term patient health and personal information for the analysis made by researchers).

• Stimulating and enhancing industry: by providing the access to this unique data resource by industry for the purpose of developing new knowledge, methods of analysis, medicines, diagnostics and devices.

• Increasing public knowledge and support for genomic medicine: (delivering an ethical and transparent program which has public trust and confidence and working with a range of partners to increase the knowledge of genomics).

• Create personalized medicine, which could give individual treatments for each person.

When we have found out what this project has been started for, we should get acquainted with basic terms and concepts for understanding how it works. What is a genome? − Your genome is your unique sequence of DNA. It is over 3 billion letters long. It is found in almost every cell in your body. What is genomic? − Genomics is the study of the whole genome and how it works. Why scientists research our genome? − It helps them understand how disease develops and which treatments will be most effective. How a man of science studies our genome? − It is done due to an Illumina HiSeqX sequencing machine, which helps sequence human genome faster and better.

The process of sequencing is difficult and has several stages. And now, we can describe all of them in details.

• The First step is collecting DNA. People take part in the 100,000 Genomes and they donate a sample of DNA. This usually comes from a small blood sample of about 5 ml (a tablespoon). Cancer patients also donate a small piece of their tumor.

• The Second step is sequencing. DNA sequencing machines cannot sequence the whole genome in one go. Instead, they sequence the DNA in short pieces, around 150 letters long. Each of these short sequences is called a 'read'.

• The Third step is mapping. The reads from the sequencing machine are matched to a 'reference genome sequence'. This is done by 'mapping' software on high performance computers. The software finds where each read belongs on the genome.

• And the Fourth is the last step – the analysis. Every person has millions of differences to the reference sequence. The differences are called 'variants'. These might be a single letter. Or a string of letters may be in a different place or even missing. Most of the differences are completely harmless – they are the reason due to which we differ from each other.

Indeed some differences could cause a disease. Scientists use a range of software to filter millions of differences down to just a few that could be harmful. By the way after using new sequencing machine, studying becomes faster, cheaper and better. In the past sequencing took 13 years and 2 billion of pounds for reading every letter of our genetic code. And now it takes only 2 days and 1 thousand of pounds to read every letter. So you could understand how scientific and technological advance help and develop this project. In addition due to this equipment scientists research the whole human genome and could take all the information, what they need, from our sequencing.

Moreover this project has main directions of its exploration. One of them is cancer genomics. The 100,000 Genomes Project aims to improve cancer care for patients and outcomes through personalized medicine. Cancer can be described as a genomic disease. It is caused by changes to DNA. The changes cause cells to divide and grow uncontrollably. Scientists are sequencing DNA from a patient's tumor and healthy cells. They compare the two sequences. This information can improve

diagnosis. It can also help doctors choose treatments most likely to be effective for each person.

The same way program has second important direction, which is connected with rare disease. Most of them have a genetic component. Changes to DNA are involved in about 80% of rare diseases. Scientists look at every letter of DNA in a person's genome. This gives them more chances to find the change that is responsible for causing a disease. And gives possibility to find new unexplored disease.

On 5 December 2018 the project reached its main goal and collected sequencing of 100.000 whole genomes. As a result the UK has become the first nation in the world to apply whole genome sequencing at scale in direct healthcare, that's why they have possibility for providing access to high quality identified genomic data for the research aimed at improving patient outcomes.

Summarizing the information I must say that genomics is going to be fundamental for the future of the healthcare, transforming outcomes for patients. The specialists in the sphere of genomic use these technologies and it has already had impact on healthcare. Along with Elon Mask's projects, this is the most exciting project on the planet because it could change all the knowledge and the attitude to medical treatment and healthcare. In my opinion this program could help to cope with great problems of humanity.

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FOUNTAIN OPERATION

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The method of operation of wells, in which the rise of oil or a mixture of oil and gas from the bottom to the surface is carried out at the expense of reservoir energy, is called the fountain operation.

If the pressure of the liquid column that fills the well is less than the reservoir pressure and the bottomhole zone is not contaminated (the wellbore is connected to the formation), then the fluid will overflow through the wellhead, i.e. well will gush. Gushing can occur under the influence of hydrostatic pressure or the energy of a gas that expands, or of both.