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SOLUTION IN TRANSLATING BIOTECHNOLOGICAL TERMS FROM ENGLISH LANGUAGE

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Education is about teaching, learning skills and knowledge. It also means helping people to learn how to do things and support them to think about what they learn. It's also important for educators to teach ways to find and use information.

Now no less important is the use of biotechnological terms in teaching English

Biotechnology is the integration of natural and engineering Sciences, allowing the possibilities of living organisms for the creation and modification of products or processes for various purposes.

A Hungarian engineer, Ka**rl Ereky**, coined the term **«biotechnology»** in **1917.** At that time, the term meant all lines of work by which products are produced from raw materials with the aid of living organisms.

Until recently, the term **"biotechnology"** was used as a synonym for the more common expressions "industrial (or technical) Microbiology". In the last 30 years, the concept of "biotechnology" has included new branches of life Sciences such us: genetic engineering and therapy, methods of using cell cultures, cloning of living organisms and other achievements of molecular and cell biology.

Today the biotechnology has become one of the areas of an industry of macroeconomic importance. Developed countries attach great importance to its development, and therefore national and international biotechnology programs are funded by public and private capital.

Biotechnology methods are used in the pharmaceutical industry (diagnostics, medicines, medical materials, methods of treatment); protection of the environment (diagnostics, purification of soils, purification of water, disposal of oil, household and industrial waste, protection of forests); **i**n the mining and processing industry (bio metallurgy, oil production); in the food industry (packaging materials, food additives, beverages, dairy products, product quality control); in agriculture (transgenic plants and animals, fertilizers, growth promoters and plant protection agents, probiotics).

The term biotechnology was first used in Kazakhstan's Mass Media in 1995. More common terms like "cloning", "genetic engineering" and "mutation" were widely used in different biotechnological spheres.

Common terms in biotechnology

№	Term	Translation	Definition	Who,when
1	Cloning	Клондау	The process of producing genetically identical individuals of an organism either naturally or artificially.	J. B. S. Haldane, 20th century
2	Genetic engineering	Генетикалық инженерия	The process of altering the DNA in an organism's genome	Paul Berg, 1972
3	In vitro fertilization (IVF)	In vitro ұрықтандыру	A complex series of procedures used to treat fertility or genetic problems and assist with the conception of a child.	Robert Edwards, 1950
4	In vivo fertilization (IVF)	In vivo ұрықтандыру	Fertilization of a ripe egg within the uterus of a fertile donor female, rather than in an artificial medium, for subsequent nonsurgical transfer to an infertile recipient.	Louise Brown, 1978

5	Nutrient medium	Қоректік орта	A liquid or gelatinous substance containing nutrients in which microorganisms, cells, or tissues are cultivated for scientific purposes.	19th century
6	Breeding	Будандастыру	The mating and production of offspring by animals.	Robert Bakewell, 1783
7	Mutation	Мутация	a change that occurs in our DNA sequence, either due to mistakes when the DNA is copied	John Christopher Willis, 1923
8	Strain	Штамм	a low-level taxonomic rank used at the intraspecific level (within a species).	19th century
9	Thermostat	Термостат	A device that automatically controls heating or cooling equipment	Cornelis Drebbel, 1620
10	Autoclave	Автоклав	is a pressure chamber used to carry out industrial processes	Charles Chamberland, 1879
11	complementary DNA (cDNA)	Комплементарлы ДНҚ	a DNA sequence which was produced from mRNA by reverse transcription.	
12	ribosome	рибосома	a complex of protein and rRNA in the cytoplasm which can translate mRNA into protein.	
13	phenotype	фенотип	the aggregate of all the observable characteristics of a cell or organism.	

From the table above, we can see that 7 terms out of 10 translated directly from the English language to the Kazakh language. It means that big part of scientific terms (thermostat, mutation, cloning) are came to our lexis without any changes. In addition, the less part of terms (strain, breeding, nutrient medium) translated by the saving meaning but with another words.

Today Kazakh scientists have achieved considerable success in the field of biotechnology. Biological engineering of plants is actively developing in Kazakhstan.

Highly productive forms of crops were obtained, which can resist stressing factors and diseases based on biotechnology methods. There have been developed and effective methods of immunological, molecular genetic diagnosis and prevention of particularly dangerous animal diseases.

We have many scientists in biotechnology sphere in Kazakhstan. One of them is **Bauyrzhan Aituov**, who is **promotes dental innovation** worldwide. During last three years, Bauyrzhan Aituov is developing a technology for restoration of tooth enamel. It helps to treat caries at an early stage.

Majority of us have heard about the good domestic antibiotic **"Roseofungin"**, on which our scientists worked for a long time at the Institute of Microbiology and Virology, led by academician **Amankeldi Sadanov**. **"Roseofungin"** inhibits the growth of pathogens of superficial and deep mycoses. The drug **"Roseofungin"** treats skin fungal infections.

Biotechnology is defined as one of the priorities of industrial development of the Republic of Kazakhstan.

Kazakhstan pays great attention to the industrial biotechnology from **XX century**. Specialized institutions, which were part of the military-industrial complex created. In the early 90-ies, Kazakhstan came up with a solid baggage - in the form of developed infrastructure, highly qualified personnel and modern production base.

When students deal with Biotechnology in Science or Biology courses at school they get to know a technology that is on the one hand very old – if we think of techniques of making bread or wine – but that on the other hand - when we think of genetic engineering for example - comprises very new aspects. This “modern” part of biotechnology shows a high potential for solving various problems of our modern world but at the same time it is accompanied by new and especially ethical questions and problems. From the high relevance as well as from the ambivalence of the topic biotechnology a particular responsibility of the science subjects at school concludes. This is the responsibility to – on the one hand - inform the students in a sound way of the scientific and technical aspects of biotechnology and – on the other hand - to qualify them as the decision makers of the future to cope in a reasoned way with the chances and the risks of biotechnology.

From a pedagogical and from a didactical point of view school education must deal with the basic knowledge as well as with the effects of Biotechnology. In addition its aim should be to improve the students ability of reasoned decision making in respect to this technological field. Education should lead the students to a basic understanding of the methods, the achievements and the effects of biotechnology on the one hand. On the other hand on the basis of this knowledge it should help the students to find own, justified decisions in respect to this topic and to act in a corresponding way.

As the knowledge in the life - sciences has exploded during the last two decades, for science teachers it is necessary to restrict to the main fields of biotechnology for teaching. However, the central application fields of biotechnology (pharmaceutical industry, medicine, farming, nutrition and environmental technology) as well as the procedures (*i.e.* genetic engineering, cell culture techniques, cultivation of microorganisms) should be taken into account. Out of the variety of all the procedures that are summarized under the term biotechnology genetic engineering is still one of the most discussed. Especially because of its potential significance for the future in the following the examples for teaching biotechnology will focus on this technique.

In this article first examples for teaching (traditional) biotechnology topics and examples for experiments are described for school education on different levels. For many biotechnological methods microorganisms are used. As microorganisms and especially bacteria play such an important role in biotechnology they are central for the understanding of this technique. As many research studies in biology-, chemistry- and physics - didactics show, pre-educational students’ conceptions have an important influence of the learning outcome of students. As an example the results of an empirical study on students’ preconceptions of bacteria and consequences for teaching – in this context especially of teaching biotechnological topics – will be shown. Beside this cognitive aspect of learning the motivational aspect of learning processes must be considered. Especially the interest in the particular topic that must be learned is very important for the learning

outcome. To give an insight into this aspect of learning biotechnological issues the results of an empirical study on students' interest in gene technology are described. In the following hints for teaching materials on biotechnology are given. One important characteristic of the topic biotechnology in school education is the fact that it is such a complex issue that it should be taught in an interdisciplinary way. Ethical questions can not be excluded when teaching gene technology for example. Therefore finally a tool for discussing ethical problems in a structured way – an ethical analysis – is described and illustrated in a specific example.

Literature

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