

## **ARTIFICIAL ORGANS - SAVING PEOPLE OF THE FUTURE**

*Olexandra Grachova*

*Faculty of Sociology and Law,*

*National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"*

Science and technology are developing these days. They are the fundamental element of our existence. However, science which helps to save a person is improving very quickly and positively. This is the window of the future - artificial organs. In 2016, a study was conducted. Over the years, scientists at Wake Forest University have been trying to create a gorgeous digital printer. With its help, it is possible to create artificial organs, such as the ear, brain and skull, which can save not a single human life, namely the victims of road accidents. Also, as the professors reported, the organs easily took root in animals: mice, dogs and a bat who got burns and injuries from their owners.

Extracellular mactrix technology has been used for a long time to use the correct organ printing. According to statistics for 2021, about 45% of patients were saved thanks to innovation in countries such as the United States and Great Britain. It has been used for only a few years and is built on the basis of synthetic and natural products, which is completely safe for use.

Moreover, an artificial matrix is synthesized from synthetic and natural substances. Polylactide (lactic acid polymer), polyglycolic acid and polycaprolactone are most commonly used. All of them are absorbed in the body over time without the release of harmful substances, being replaced by a natural extracellular matrix. Natural materials are protein (e.g., collagen) or carbohydrate (e.g., hyaluronic acid) in nature. To impart the required three-dimensional mesh structure to materials in experiments and in practice, many methods are used (self-assembly of nanofibers, textile technologies, partial dissolution, foaming, electrospinning, three-dimensional printing, and others). These methods do not reproduce the intricacies of the organ microstructure and do not form a framework for the vascular network. Therefore, they are suitable only for organs with a relatively simple structure - skin, blood

vessels, cartilage and others. Most often, as statistics shows, such complex and vital organs are created: heart, liver, kidneys. They are the same as organs that were taken from a dead donor. In order to desensitize the transplant, a high concentration detergent solution is used to rinse the seal residues. After that, when the cells are completely removed, they are ready for transplantation (Wang, 2012, p. 955).

In addition, the functional tissue was initially grown on a matrix by immersing it in a nutrient solution containing cells and growth factors. Recently, hydrogels are increasingly used for this purpose, which, when solidified, provide an even distribution of cells, their better fixation and diffusion of nutrients and gases. When using a decellularized donor matrix, a solution of cells and growth factors is passed through its vessels. The first patients with artificial organs were the cultivation of artificial cartilage back in 2006 in Spain, when it was not popular and printers were not available. The experiment had good results, but also received criticism from scientists.

Having realized the thoughts of scientists, there was also a lack of emphasis that artificial organs are very humane from the point of view of philosophy and religion. They are not a sacrifice of a dead person, a part of a body, but an artificial cell. Therefore, according to statistics, 85% of people from all over the world approve of their use (Fritzch, 2014, p.631).

The disadvantages of artificial organs so far are that this is not a popular transplant and a relatively new one which makes people alert. Furthermore, some scientists believe that not all organs can easily take root, such as the heart, the eyes will be tested for a long time and will be revived only from the 2050th century.

Though, the main trend is that artificial organs are really becoming the future for society. They are humane, moral from the point of view of philosophy, and do not include so much legal regulation. Artificial organs formed to effectively reform the planet, they are new that will save any human life.

#### **References:**

Fritzsch B. (2014). Electric organs: history and potential. *Science*, 345(6197), 631–632.

Wang X. (2012). Intelligent free form manufacturing of complex organs. *Artif Organs*, 36(11), 951–961.

## **ENERGY MANAGEMENT**

***Bogdan Homzik***

*Institute of Energy Saving and Energy Management,  
National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”*

Under the conditions of transition to a market economy, the constant growth of the energy component in the costs of production as well as services, special relevance on the basis of modern views on the process of energy consumption requires energy management.

Energy management is a set of organizational and technical measures that make it possible to implement the economically reasonable potential of reducing the energy intensity for commercial products and fixed costs of energy resources that do not depend on the volume of products. The target of energy consumption is to help organizations establish systems and processes that improve energy efficiency and meet the modern requirements, to adapt application and ratio of the consumed energy. A systematic approach can be used to perform tasks such as reducing greenhouse gas emissions and other environmental impacts including energy costs.

Addressing to energy efficiency issues within the framework of energy management leads not only to a reduction in energy costs but also allows to increase profitability, competitiveness, and to get additional investments.

In conclusion, today saving fuel and energy resources should be considered globally. Countries are interested in efficient use of resources, in the production costs reduction, as well as concerned about the climate change. This is also relevant for Ukraine, so the strategic line of our state policy in economic and social development aims to increase energy saving. These actions will result in high economic efficiency and competitiveness among the European countries.

### **Reference:**

Energy management: concept, principles and methods of regulation. (January