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# THE ROLE OF PHYSICS IN BIOLOGY

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**Abstract**
Physics plays a key role in the formation of biochemistry, molecular biology, molecular genetics, genetic engineering and biotechnology. The main biological processes that take place in a living organism are carried out through physical processes of the genetic code, the transmission of hereditary characters from generation to generation, the transfer of substance ions from membranes, photosynthesis and energetic processes. This article provides information about the diversity of energy metabolism in living organisms.

## Introduction

It is known that there is a huge reserve of energy around us and in the universe as a whole. For example, if humanity could control and use the energy coming from the Sun, the energy from earthquakes, thunder and lightning, and pulsars, the amount of energy on our planet would last for hundreds and thousands of years.

Today, the main source of energy for all living things on our planet is sunlight. If life is not provided with energy, soon the cell, tissue, organ and the whole organism, which has acquired a delicate structure, will be destroyed, metabolism will stop, and it will die. Energy exchange in the body is carried out by electrical, chemical, osmotic and color-various mechanical methods. The process of carrying out certain biosynthesis processes in a plant cell in exchange for light is called photosynthesis. Organisms performing such practices are called autotrophs (plant life).

It is known that light from the Sun has different wavelengths. And the plant receives rays of a specific wavelength through the light-receiving "antenna" - chlorophyll grains. When returning, it returns only green light. That is why the color of the leaves of the plant is green. The rays coming from the sun are in a quantum or discrete state and are absorbed by the chlorophyll in the plant leaf. As a result, energy-rich excited electrons are formed in the leaf. These electrons pass through intermediates and then return to their original state. [1] In the process of passing through energy-rich electron intermediates, it transfers its energy to ADF (Adenodine Diphosphate), which converts it into ATF (Adenodine Triphosphate), which is the accumulator of a macro (high) energy living organism.

$$ADF + F + E \rightarrow ATF$$

ATF is directly involved in biosynthesis, hydrolysis, electrical, chemical and mechanical processes in the control of metabolism in a living organism. The process of photosynthesis in plants is reminiscent of the phenomenon of the photoeffect in physics. As shown above, macro-





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energy electrons accumulate their energy in small portions in the form of ATF as they pass through intermediates or the respiratory chain. This process is similar to converting the energy of a waterfall flowing down a mountain into electricity with the help of power plants.

Biological oxidation is similar to combustion. Firewood, coal, gas, etc. When they burn, high-energy electrons are given to oxygen. As a result, energy is released as heat and light rays (fire), and the final product is carbon dioxide (SO2) gas and water vapor. These products are also formed during biological oxidation. [2] It became clear from the above points that energy exchange in the body is subject to the laws of thermodynamics, like physical-chemical processes. The second law of thermodynamics plays an important role in biological processes. According to this law, energy exists in two states: useful and useless. According to this rule, when energy undergoes any physical change, useful energy decreases and entropy increases. As a living organism is an open system, it always needs energy.

As long as the biological system does not receive free energy every minute, it soon comes to a state of equilibrium with the inorganic nature. This is equal to death. Ayzik Azimov, a famous scientist of the USA, commented on the second law of thermodynamics - "Nature is prone to disorder, not order. If you leave your house in its condition without cleaning and repairing it, dust, disorder and deterioration will soon begin. Even if you don't take care of yourself, your health will deteriorate." Material things are subject to deterioration and disintegration. So, nature is prone to disorder, disorder - chaos. [3]

In order to fight against this law, we always eat and consult doctors. We repair the houses and try to keep them in a certain order.

So, the development of physics has a positive effect on the development of biological science. It is known from history that the development of macrophysics caused the formation of microphysics. The development of microphysics transformed biology from a descriptive field to an experimental one.

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