

Respiration is the fundamental process of life on Earth. It allows organisms to convert the energy stored in food into biologically useful energy. Every organism needs energy for maintaining its life processes - nutrition, movement, reproduction, excretion, response to stimuli, growing. Conversion of the energy takes place in every living cell during a process called cellular respiration. In the cells of nuclear organisms, this process takes place in the mitochondria, which contain proteins capable of accomplishing this action, i.e. enzymes. These enzymes are organized into chains, thus creating a sequence of reactions. One such enzyme is a protein called Complex III, which plays a key role in the respiration process. Bacteria also perform the process of respiration using the bacterial counterparts of mitochondrial enzymes. However, in some bacteria, the Complex III counterpart is different from the mitochondrial one. Therefore, it has been called alternative complex III. It plays the same role as the canonical complex III, but it is built up completely differently, so it carries out the same reactions in a different way. The idea of this project is to understand how alternative complex III works and how it communicates with complex IV with which it is connected. The results of the research will also be applicable to other proteins that contain structural motifs similar to alternative complex III.