

# “Nanochemistry and biotechnology”

## Mechanism of active electron transfer along a protein-like nanowire in real conditions

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In previous researches [1], [2], [3], the theoretical model of electron transfer through the conduction band of a protein-like nanowire in real temperature conditions was constructed and substantiated. In particular, it was shown that in the absence of external factors that disturb the electrostatic equilibrium of the electronic subsystem of the nanowire in question, the current does not arise at any temperature in a nanowire. Such a temperature "behavior" indicates the physical adequacy of the model.

In this research, the model was further generalized by including a factor, which in [1], [2], [3] was named an effective electrostatic field. The physical origin this factor stipulated by the amino acid heterogeneity of the protein-like nanowire. The calculations show that one electron transferred by this effective field creates a micro-current in the range from 0.0143 to 0.1287 nanoamperes.

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3. Suprun A.D., Shmeleva L.V. Temperature Effect on the Basis States for Charge Transfer Through a Polypeptide Fragments of Proteins and on the Nanocurrent in it. Chapter in “Nanophysics, Nanophotonics, Surface Studies, and Applications” //Springer Proceedings in Physics. Editors: Olena Fesenko, Leonid Yatsenko. --2017. **184** . (in the publication).