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Temperature effect on the basis states for charge transfer through a proteins (polypeptides) and on the nanocurrent in it

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Today there is already quite enough knowledge [1] about the processes that occur during the donor-acceptor mechanism of electron transfer between cell organelles. These questions were considered in detail in articles [2, 3].

By analogy to [3], was performed a calculation test of current density in complete absence of factors that disturb electrostatic balance of the system and can be interpreted as the external field. But, as opposed to [3], these calculations were performed at non-zero temperature.

The sufficiently strong dependence of the energy states positions of conductivity on temperature was got. It is determined by factor $227^0/T$.

However, in totality the conductance states provide an absence of current under complete absence of factors that disturb electrostatic balance of the system. In other words, the energy position of every individual conductivity state has strong temperature dependence, but together they provide absence of current.

That is, the temperature doesn't affect on the emergence of current from injected electron if the external electrostatic causes of its occurrence are absent. From a physical point of view this result is more fundamental than obtained in [3], as confirms the accepted model for any temperature, not only for zero.

1. *Petrov E. G., May V. and Hänggi P.* Controlling electron transfer processes through short molecular wires// Chem. physics.-2002.-**281**, N 2.P: 211-224.
2. *Anatol D. Suprun, Liudmyla V. Shmeleva*. Primary structure of proteins as a nanowire for metabolic electronic transport// Nanoscale Res. Lett.-2015.-**10,** N1. P. 1-8.
3. *Anatol D. Suprun, Liudmyla V. Shmeleva*. Current in the Protein Nanowires: Quantum Calculations of the Base States// Nanoscale Res. Lett.-2016.-**11,** N1. P. 1-8.