

Review of: "Forecasting of the influence of physical fields on the metabolic nanocurrent in proteins"

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Potential competing interests: No potential competing interests to declare.

This is an interesting paper that tries to provide an insight on the role played by physical fields (i.e. magnetic fields and temperature) in the ATP synthesis and consequently on debated topic of the possibility that MF may influence biological functions and related biological effects.

A more appropriate title should be "Forecasting of the influence of magnetic fields and temperature on the metabolic nanocurrent in proteins"

Their approach of considering the primary structure of proteins as a active nanowire of a semiconductor is of interest but has to be considered as a first attempt since the approximations used are too general to give results useful for a biological interest.

Authors should better explain the rational sustaining the two equations of the Oxygen and Nitrogen-Oxygen models.

The authors find a cutoff of 100 mT magnetic field, above which there is "a negative effect" and below which "a positive effect" on the synthesis of ATP molecules, depending on the magnetic field effect on the metabolic electron transfer along protein-like nanowire.

These kinds of effects are expected to have biological consequences.

The available extensive bibliography on biological effects due to magnetic fields exposure with intensity below 100 mT reports both positive and negative biological effects (Lai, H. 2019. Exposure to static and extremely-low frequency electromagnetic fields and cellular free radicals. *Electromagn. Biol. Med.* 38:231–48; Saliev, T., D. Begimbetova, A. R. Masoud, and B. Matkarimov. 2019. Biological effects of non-ionizing electromagnetic fields: Two sides of a coin. *Prog. Biophys. Mol. Biol.* 141: e36; Schuermann, D., and M. Mevissen. 2021. Manmade electro- magnetic fields and oxidative stress-biological effects and consequences for health. *Int. J. Mol. Sci*22:3772).

Authors should clarify that the transfer of electrons have a key role in biochemistry but the electron's participation to any biochemical reactions depends not only on the conduction states but also on other chemical/physical factors, among which the very important electron spin states (Tofani, S. 2022. Magnetic fields and apoptosis: a possible mechanism. *Electromagn Biol Med* 41:293-303).

