Synthesis of ATP by endogenous UV radiation

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Abstract

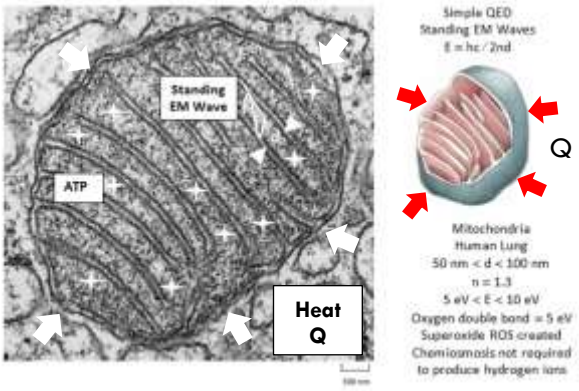
Statement of the Problem: In1961, Mitchell proposed [1] ATP synthesis in mitochondria occurs by oxidative phosphorylation in chemiosmosis from a flow of H+ protons across the inner membrane. However, ATP synthesis by chemiosmosis has a history of controversy. Chemiosmosis in mitochondria was supported by the acid-bath chloroplast experiment showing ATP produced in a pH gradient across the inner membrane. However, ATP may be created by the heat of titration that increases temperature. But the nanoscopic grana cannot increase in temperature as the heat capacity vanishes by the Planck law. Instead, the grana conserve the heat of titration by creating UV radiation [2] that produces ATP by the dehydration reaction, ADP + Pi + UV → ATP + H_2O. On the early Earth, UVC was intense, but after the ozone layer formed UVC ceased and to survive the mitochondria was required to evolve its own source of UV. What was and now is the UV source?

Methodology & Theoretical Orientation: Simple QED is a nanoscale heat transfer process based on the Planck law of quantum mechanics differing significantly from that of classical physics. The Planck law denies atoms in nanoscale regions of mitochondria the heat capacity to change in temperature. Instead, heat Q in mitochondria is conserved [3] by the emission of EM radiation that depending on size produces UV radiation. The image shows UV radiation produced by EM waves (shown in white) standing in the space d between adjacent cristae.

Findings: Mitochondria produce Planck energy E = hc/2nd at UVC levels in spaces d between 50 - 100 nm between adjacent cristae.

Conclusion & Significance: In the acid-bath experiment, the ATP was produced by UV enhanced dehydration from ADP + ribose between nanoscale spaces in stroma of chloroplasts - not by H+ protons in chemiosmosis. Similarly, mitochondria produce ATP by UV induced dehydration between cristae that by simplicity alone supersedes the chemiosmosis. However, the UV also damages DNA, but DNA repair systems allow [4] almost complete recovery. Survival of the species from the early Earth to this day has been a balance between ATP produced and attendant DNA damage. Darwin's origin of the species most likely evolved [5] from UV enhanced DNA mutations on the early Earth.

Image



Recent Publications

1. Mitchell P. (1961). Coupling of phosphorylation to electron and hydrogen transfer by a chemiosmotic type of mechanism. Nature, 191:144–148.
2. Ponnamperuma, C., et al. (1963). Synthesis of Adenosine Triphosphate under possible primitive Earth conditions. Nature 199, 222.1.
3. Prevenslik TV. (2019) ATP Synthesis by Endogenous UV Radiation. 10th Congress Targeting Mitochondria, Oct. 28-29, 2019 - Berlin, Germany.
4. Beyer RE. (1959). The Effect of Ultraviolet Light on Mitochondria. I. Inactivation and Protection of Oxidative Phosphorylation during Far-Ultraviolet Irradiation. Archives of Biochemistry and Biophysics. 79, 269-274.
5. Prevenslik T. Simple QED Theory and Applications See https://www.nanoqed.org, 2016-2020.

Biography

Thomas Prevenslik is a retired American living in Hong Kong and Berlin. He began simple QED nanoscale heat transfer development in Hong Kong in 2010. Simple QED has nothing to do with Feynman's QED and is based on the Planck law that precludes atoms in nanostructures the heat capacity to conserve heat by temperature. Instead, heat conservation proceeds by creating size dependent standing EM radiation E inside the nanostructure. For a spherical NP, simple QED creates a quantum state E = hc/2nd, where h is Planck's constant, c the velocity of light, with n and d the refractive index and diameter of the NP.

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Notes/Comments: