TITLE: ATP SYNTHESIS BY ENDOGENOUS UV RADIATION

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Introduction: Today, mitochondria are thought (1) to synthesize ATP by complex chemistry in the controversial theory of chemiosmosis that a H+ gradient is produced across the inner membrane. Although a high-energy chemical intermediate (2) provided a more rational explanation, chemiosmosis has survived as the ATP mechanism because the high-energy intermediate was never found. In this controversy, the validity of a H+ gradient in chemiosmosis was supported by the plant chloroplast acid-bath experiment showing ATP was produced from a pH change across the thylakoid membrane

Material & Methods: Simple QED was developed (3) for nanoscale heat transfer. By the Planck law, heat absorbed in nanostructures induces high EM confinement that denies constituent atoms the heat capacity to increase in temperature. Heat is therefore conserved by creating EM radiation from waves standing across the nanostructure.

Results: In the acid-bath experiment, chloroplasts comprising stacks of nanoscale grana conserve the heat of sunlight by simple QED creating UV standing inside the lumen similar to mitochondria creating standing UV waves across the matrix between cristae.

Conclusion: Chemiosmosis by H+ gradients is superseded by oxidative ATP synthesis from endogenous UV created by simple QED. Perhaps, endogenous UV is the high-energy intermediate in mitochondrial ATP that was never found.

References

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