

Quantum Process in Life Sciences

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Quantum biology is one of the emerging disciplines in the field of quantum mechanics that has attracted a lot of attention over the past decade. In the past, it was assumed that the properties of quantum mechanics such as coherence, entanglement, and tunneling would occur only at temperatures close to absolute zero and pure systems; Therefore, they would collapse at ambient temperature and in biological systems which are hot and humid environments. Hence, the non-trivial quantum effects were ignored in biological systems.

Is there a functional role for quantum mechanics or coherent quantum effects in biological processes? While this question is as old as quantum theory, only recently have measurements on biological systems on ultra-fast time-scales shed light on a possible answer. Recent evidences suggest that some biological phenomena may use some of the unique properties of quantum mechanics to gain biological advantage. So far, scientists have been able to observe these quantum properties in the processes related to handful of biological phenomena such as photosynthesis, avian magnetoreception, olfaction, and enzymatic catalysis. Quantum biology is the study of such processes. In this review we present the latest results for non-trivial quantum effects in biological phenomena.

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