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Quantum entanglement communications in photoactive synthetic bio systems and in neuron synapses and neural networks

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Together with my collaborators, I have been investigating the self-assembly of molecules that result in supramolecular bioorganic and minimal cellular systems, as well as the biochemistry of these assemblies. The self-assembly and biochemistry depend on quantum mechanics laws which induce hydrogen and Van der Waals bonding. Therefore, our work has been done through modelling based on quantum mechanical time dependent density functional theory, which also makes it possible to study quantum entanglement in such systems (TD-DFT). In the work presented here, quantum entanglement takes the form of a quantum superposition of the active components in synthesized self-assembled and self-replicating living systems. When a quantum calculation of an entangled biosystem is made that causes one protocell photoactive biomolecule of such an entangled pair to take on a definite value (e.g., electron density redistribution tunnelling or electron spin density redistribution tunnelling), the other protocell photoactive biomolecule of this pair will be found to have taken the appropriately correlated value (e.g., electron density redistribution tunnelling or electron spin density redistribution tunnelling) in two quantum entangled excited states of this bicellular system. In our simulations, the starting separation distance of the supramolecular biosystems changed during geometry optimization procedures, taking on final values that mimic those associated with real-world intermolecular interaction processes. Furthermore, the modelling indicates that quantum entanglement occurs between the prebiotic subsystems which enhance the photosynthesis of the combined systems. The enhancement occurs because two additional quantum entangled excited states are created through the simultaneous excitation of the combined system's two prebiotic kernels or two protocells. The additional photosynthesis made possible by the quantum entanglement potentially provides a selective advantage through an enhancement of usable energy leading to faster growth and self-replication of minimal living cells, which in turn can lead to accelerated evolution. Living systems that are self-assembled and self-replicating exist in wet and warm environments where stochastically moving supramolecular subsystems continuously generate and destroy quantum entangled states by non-equilibrium effects. While no static entanglement exists, quantum entanglement nonetheless temporarily occurs amongst the biomolecules inside the combined system or between the living subsystems, i.e., between two protocells or two prebiotic kernels. This warm quantum coherence is proposed by others as a basis for DNA stability and for the understanding of brain magnetic orientation during migration in more than 50 species of birds, fishes and insects. Experimental evidence also exists for quantum-coherence as a basis for more efficient light-harvesting in plant photosynthesis. Furthermore, quantum entanglement exists between supramolecules used in the sense of smell and in the microtubules of brain neurons where it gives rise to critical quantum vibrations. Using quantum mechanical investigations, we have now started to design quantum entanglement communication molecular logical devices which hold promise for use in nano-medicine biorobots to fight molecular diseases such as cancer tumors, and against the new kinds of synthesized microorganisms and nano guns. Our current research concerns quantum entanglement communication phenomenon in neuron synapses and neural networks.

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