# Cellular quantum entanglement oscillations

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**Abstract:**

Entanglement is a key feature in quantum information theory. Recently, quantum mechanics in biological systems have attracted lots of attention. A major interest is toward brain science. It is hypothesized that reality comes from the wave function collapse(Tuszynski, n.d.). So they believe that classical reality arises from brain cells decoherence. The introduction of quantum coherence in brain cells can probably open up a new window to the brain functionality as a quantum computer. It should be noted that many quantum features are destroyed in a large, warm, wet, noisy environment. Therefore it seems that quantum effects don't survive in the vivo. On the other hand it is proved that brain cells mitochondria can emit biophotons(Rahnama et al., 2011). Microtubules are composed of tubulin dimers to form cytoskeletons of the cell..Bose et al. show that irrespective of the temperature of the field, for a thermal state of a cavity field, the entanglement can arise. In this paper the quantum entanglement between cellular bio photons and tubulin states is investigated. It is theoretically observed that some entanglement oscillations occur near the microtubule. We use thermal states to present and explain the oscillations. When it comes to transfer of information in the brain, these oscillations may play an essential role.

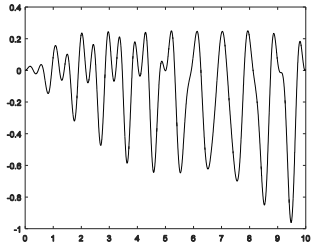

**Fig.1 . Plot of negativity measure for n=10 number of biophotons.**

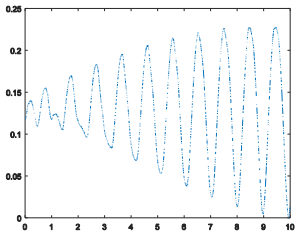

**Fig.2. The entanglement dynamics between cellular biophons and tubulin dimers, n=10.**

**Biography:**

Vahideh Tahmoorian got her Ph.D from Tabriz university and started teaching at Islamshahr Azad university as assistant professor. She is also working at a telecom company that inspires her to work on quantum networks.