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Acetylcholine Molecular Arrays Enable Quantum Information Processing

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Abstract:

We have found self-assembly of four neurotransmitter acetylcholine (ACh) molecular complexes in a water molecules environment by using geometry optimization with DFT B97d method. These complexes organizes to regular arrays of ACh molecules possessing electronic spins, *i.e.* quantum information bits.

These spin arrays could potentially be controlled by the application of a non-uniform external magnetic field. The proper sequence of resonant electromagnetic pulses would then drive all the spin groups into the 3-spin entangled state and proceed large scale quantum information bits.

Keywords: Acetylcholine molecular arrays, Regular arrays of electron spins, Quantum information bits, Liquid state quantum information processing devices

1. Introduction

Neutral radical acetylcholine molecule is a prominent neurotransmitter of the peripheral and the central nervous system, so the synaptic release of ACh, called cholinergic transmission, are more numerous than the other modulatory systems and distributed in a wide range of brain areas.

We have already investigated molecular structure of positively charged ACh molecule but occurs that the total energy of this derivative is in 0.082 atomic units (2.238 eV) higher than that of the neutral radical ACh molecule (atomic units (Hartree) vs eV = 27.2114).¹

Our used quantum mechanical methods are exact and successfully used by many other authors therefore we expect that in vivo exist neutral radical ACh molecule.

The experimental evidence of existence of neutral radical ACh molecule is considering in the paper². Author summarizes his experimental research with two sentences: “In the reaction with reducing agents at the postsynaptic membrane acetylcholine decomposes to form a neutral molecule and free radical trimethylamine acetate. Simultaneously acetylcholine in the synaptic cleft is also destroyed in non enzymatic reaction to form choline and acetic acid.”

The second cited sentence was also considered in our paper [Ref. 1].

The main quantum mechanics principles state that if one can construct the stable structure as it is positively charged ACh molecule, then in nature exist superposition of both ACh molecules but with different coefficients of possibility. Therefore positively charged ACh molecule might exist but

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