

This chapter is second part of the bi-chapter devoted to various aspects of metabolism. The basic topics is TGD inspired view about brain metabolism and molecular motors. I have included to the end of the chapter some rather weird sounding ideas such as an explanation of super-luminality in terms of remote metabolism.

\vm{\it 1. Dark matter hierarchy, sensory representations, motor action, and metabolism}\vm

The vision about a hierarchy of generalized EEGs associated with dark matter hierarchy gave a decisive boost leading to new views about quantum metabolism. The crucial new element is that at higher levels of dark matter hierarchy photons with arbitrarily low frequencies can correspond to energies above the thermal threshold. This explains the observed mysterious effects of ELF radiation on living matter and implies that magnetic bodies are key participants in the metabolism. The equally mysterious findings about the ionic membrane currents can be understood if these currents are essentially non-dissipative and that ionic channels and pumps are actually ionic receptors. Hence it seems that generalized EEGs could take a lion share of the metabolic energy rather than ionic currents as thought usually. This picture allows to understand various strange findings about neuronal metabolism.

\vm{\it 2. Holy trinity of red blood cells, neurons, and astrocytes}\vm

The vision about dark matter hierarchy and various ideas about quantum metabolism allow to develop a general view about how the sensory representations and motor control are realized in terms of MEs. Time mirror mechanism is the basic elements in the general model for how magnetic

body controls biological body and receives sensory information from it.

A model for motor control and sensory representations based on the trinity of red blood cells, astrocytes, and neurons emerges and raises astrocytes from a status of passive energy storage to an active link in the quantum control of brain by magnetic body. One can also identify mechanisms for the generation of coherent locomotion construct a quantum view about how ATP serves as a universal energy currency.

This view also allows a deeper interpretation of chemical communications and biological information molecules. There are full reasons to believe that substructures of these molecules can have bound state entanglement with the surrounding world. This entanglement can be interpreted in terms of \blockquote{telepathic} quantum communications. In fact, I introduced already few years ago the notion semitrance as entanglement with higher level selves but at this time I had not yet understood that quantum jump involves also state function preparation process realized as a cascade of self measurements against which only bound state entanglement is stable.

For a long time glial cells were believed to play a rather passive role in the functioning of brain taking care of basic services such as providing metabolic energy and serving as supporting structures for neurons. During the recent years the views about the role of glia have however changed dramatically. In TGD framework the very fact that metabolism relates very closely to the re-organization of negentropic entanglement forces to recheck this view. Also the slowness of glial dynamics as compared to neuronal dynamics suggests that large values of Planck constant responsible for long time time scales and therefore also for the highest levels of consciousness (including functions like long term memory) are assignable to

glia.

\vm{\it 3. Molecular motors}\vm

During last years molecular motors have become the hot topics of biology.

The so called Brownian motors are the dominating theoretical paradigm but there are some empirical findings challenging the concept.

TGD suggests an alternative approach based on the notion of quantum motor.

The basic idea is that all moving parts of the quantum motor move on the

non-atomic space-time sheets so that momentum dissipation is minimal. It

turns out that this picture might work but that TGD allows both quantum and

classical modes for the molecular motors and it is quite possible that both

modes are present. The model allows a new view about the real function of

ATP leading to precisely correct quantitative predictions. Also the real

function of membrane potential can be understood and quantum model for

nerve pulse and EEG constructed.

The fascinating ability of molecular motors to co-operate finds an explanation in terms of the notion of super-genome: super-genome consists

of sequences of nuclei analogous to text lines at the pages of book represented by magnetic flux sheets. Also the magnetic bodies of molecular

motors can integrate in a similar manner to larger structures so that the

population of molecular motors becomes a society.

\vm{\it 4. Remote metabolism and effective super-luminal velocities}\vm

After the pioneering experiments of Nimtz and his collaborators 1992 a

lot of evidence for effective super-luminal signal velocities has been

accumulating. A possible model for the super-luminality and related

effects is in terms of remote metabolism associated with detectors and

other instruments. This idea belongs to the class of ideas which look like curiosity after decade.

I have included to the end of the chapter also other miscellaneous topics such as an old proposal for the possible role of four-wave interactions in the construction of conscious holograms.

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