

# On Bioresonant Patterns-Qua-Attractors and Healing Boundary Conditions within Quantum-Holographic Psychosomatics

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**Abstract**—The subject of this paper is quantum-informational Hopfield-like holographic framework for integrative medicine and transpersonal psychology, and the related bioresonant electromagnetic patterns-qua-attractors and healing boundary conditions. In the focus of their holistic methods are body's acupuncture system and consciousness, with underlying bioresonant electromagnetic patterns-qua-attractors and healing boundary conditions. The presented quantum-holographic framework for psychosomatics might have significant holistic implications, providing better understanding of the nature of psychosomatic diseases.

**Keywords**—Hopfield-like quantum-holographic psychosomatics, acupuncture system, consciousness, downward causation, bioresonant patterns-qua-attractors, healing boundary conditions.

## I. INTRODUCTION

In past few decades there is increasing interest in quantum entanglement and decoherence in non-equilibrium biological environments (photosynthesis [1], avian magneto-reception [2], conformational transitions and chain folding [3]), as well as foundational multi-scale issues of quantum-informational biology (from proteins and cells to cognitive and social systems [4]), cognitive science and consciousness studies [5-12], all the way down to quantum-informational roots of the universe [13,14], to name few of them.

They are motivated by growing experimental evidences and/or deep theoretical reasons which cannot be accounted by the existing classical biological paradigm. The underlying macroscopic quantum-coherent non-locality is of fundamental physical significance, as it tackles the still open question of universal validity of quantum-physical laws for macroscopic phenomena as well, and presumably needs additional phenomenological assumptions (see [3,7] and refs therein).

The same macroscopic quantum trend has been observed in bioresonant electromagnetic (EM) quantum-informational medicine technologies [15] (in sharp contrast to the pharmaceutical-oriented medicine technologies). On these lines it has been appeared that stress-induced psychosomatic diseases imply the necessity of application of holistic methods, suggesting their macroscopic quantum origin – giving rise to fast development of integrative

medicine (cf. website of the Academic Consortium for Integrative Medicine and Health, founded by the end of 1990s, which includes over 60 highly esteemed US academic health centers and affiliate institutions [16]) and transpersonal psychology (cf. website of The Association for Transpersonal Psychology, founded by the beginning of 1970ies, and considered by A. Maslow as the fourth force in psychology, alongside with psychoanalysis, behaviorism, and humanistic psychology [17]).

In this paper for the sake of completeness of our argumentation we shall first outline methodology of our quantum-holographic framework for psychosomatics, and based on it we shall later consider bioresonant patterns-qua-attractors and healing boundary conditions in psychosomatics.

## II. METHOD: OUTLINE OF QUANTUM-HOLOGRAPHIC FRAMEWORK FOR PSYCHOSOMATICS

In the focus of mentioned quantum-holistic methods are body's acupuncture system and consciousness, which are the only manifestly macroscopic quantum systems within the body: consciousness because of in-deterministic manifestations of free will and holistic manifestations of transitional and altered states of consciousness [7-12], and acupuncture system because of demonstrated quantum-coherent characteristics of diagnostics and therapy [18-25]. Having in mind that Peruš has shown that any quantum system has formal mathematical structure of quantum-holographic Hopfield-like neural network (cf. refs [6] and [24]), then it follows that acupuncture system and consciousness have fundamental (not model-dependent!) informational structure of quantum-holographic Hopfield-like neural network. Then their memory patterns-qua-attractors (term applied by Peruš, cf. [6] and refs therein, implying encoding a specific information on several bottom-up and top-down bioresonantly interconnected hierarchical levels) could be treated as psychosomatic states, representing biophysical basis of acupuncture-based and consciousness-based psychosomatics [24-29].

Within this quantum-informational framework, it is plausible to consider healthy psychosomatic state (of the acupuncture system/ consciousness), as the simplest informational state of the lowest quantum entropy (with single memory pattern-qua-attractor), and disordered psychosomatic states as more complex states of the higher quantum entropy (with additional side memory patterns-qua-attractors, cf. Fig. 1).

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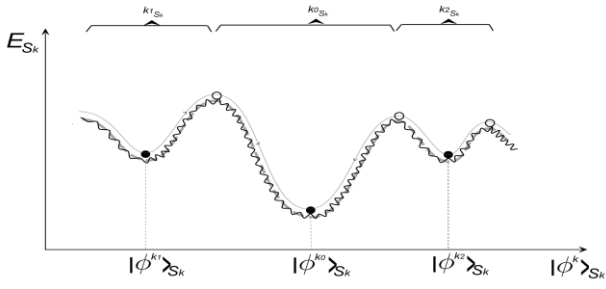


Fig. 1. Schematic presentation of the memory-qua-attractors in the energy-state hypersurface of *psychosomatic state of open macroscopic quantum-holographic acupuncture system/ consciousness*, as proposed quantum-holographic manifestations of psychosomatic disorders (hundreds of them being in primary psychosomatic diseases and thousands of them in their combinations according to acupuncture-based *Tibetan traditional medicine*, with therapeutic goal to balance/ remove all unwilling side memory attractors in procedure traditionally recommended half a year, cf. [24-26] and refs therein). This information might be *quantum-holographically* projected onto *lower open macroscopic quantum-holographic cellular enzyme-gene level* (which also functions on *quantum-holographic-like cellular quantum-conformational level* of the molecular recognition, thus influencing gene expression and possible somatisation of the top-down hierarchically projected non-balanced/ non-removed psychosomatic disordered information). On the other hand, *higher open macroscopic hierarchical level of quantum-holographic collective consciousness* and the related (*quantum*) *holistic global psychosomatics* might also be *quantum-holographically* projected onto *lower levels of quantum-holographic individual acupuncture systems/ consciousnesses* (with spiritual/ social implications on the necessity of transpersonal quantum-holographic removing of all unwilling side memory pattern-qua-attractors on the level of collective consciousness, which unless would result in further transpersonal transfer of memory pattern-qua-attractors onto individual and collective consciousnesses in this and future generations). See the text for further explanation.

So, considering psychosomatic state in generally mixed quantum state, described by the density matrix:

$$\widehat{\rho}_{S_{kv}}^{(k)} = \sum_i |c_{k_i}|^2 |\phi_v^{(k_i)}\rangle_{S_{kv}, S_{kv}} \langle \phi_v^{(k_i)}| \equiv \sum_i p_{k_i} |\phi_v^{(k_i)}\rangle_{S_{kv}, S_{kv}} \langle \phi_v^{(k_i)}|$$

then von Neumann's quantum-mechanical entropy can be expressed in the form  $S = -kTr(\widehat{\rho}_{S_{kv}}^{(k)} \ln \widehat{\rho}_{S_{kv}}^{(k)})$ , which is reduced (after calculation of trace) to classical Shannon's entropy  $S = -k \sum_i p_{k_i} \ln p_{k_i}$  (where  $p_{k_i}$  are probabilities of realization of the  $k_i$ -th state) [24,30]. In the mentioned

quantum-holographic framework, *entropy of pure-healthy state* of the psychosomatic system (described by single  $k_0$ -th term in superposition:  $\widehat{\rho}_{S_{kv}}^{(k_0)} = |\phi_v^{(k_0)}\rangle_{S_{kv}, S_{kv}} \langle \phi_v^{(k_0)}|$ , of probability  $p_{k_0} = 1$ ), would be equal to  $S_{k_0} = 0$  (as a consequence that pure quantum state  $\widehat{\rho}_{S_{kv}}^{(k_0)}$  provides

maximal possible information about the quantum psychosomatic system), while *entropy of mixed-disordered state* of the psychosomatic system (described by the full superposition:  $\widehat{\rho}_{S_{kv}}^{(k)} = \sum_i |c_{k_i}|^2 |\phi_v^{(k_i)}\rangle_{S_{kv}, S_{kv}} \langle \phi_v^{(k_i)}|$ , with the sum of probabilities  $\sum_i p_{k_i} = 1$ ), would be equal  $S_{\widehat{\rho}} > 0$

(as a consequence that mixed stochastic state  $\widehat{\rho}_{S_{kv}}^{(k)}$  provides uncomplete information about the quantum psychosomatic system). Thus, in the mentioned quantum-holographic framework, *psychosomatic healthy state* is the state of the *minimal entropy*, while *psychosomatic disordered state* is the state of the *increased entropy*; in the same framework, application of some *psychosomatic therapy* naturally *decreases entropy* (degradation) i.e. *increases information* (organization) of the psychosomatic system.

Then, in the context of holistic acupuncture-based and consciousness-based approaches and techniques [24-29], their goal would be bioresonant excitation of the target palpatory-painful/ psychologically-traumatic pattern-qua-attractors of acupuncture system/ (individual) consciousness. That enables disordered initial patterns-qua-attractors to be one by one resonantly excited (similar to annealing procedure in artificial neural networks [31]), thus becoming shallower and wider on the account of deepening of (energy-dominating) pattern-qua-attractor of the healthy quantum state (acupuncture palpatory painless or psychologically non-traumatic). This information of the healthy quantum state is then altogether quantum-holographically projected on lower quantum-holographic cellular level, thus changing the expression of genes in morphogenesis. Therefore, all holistic acupuncture-based and consciousness-based approaches and techniques could be treated as quantum-informational therapies, by imposing new healing boundary conditions in the energy-state space of the acupuncture system/ (individual) consciousness.

However, when this process is hindered by transpersonal entangled blockages in the energy-state space of EM field of acupuncture system/ (individual and collective) consciousness (on significance of transpersonal experiences cf. [9,17]) – then memory attractors of quantum-holographic network of the field-related collective consciousness should be removed as well (via prayer or circular psychotherapies from all relevant meta-positions included in the problem, to dis-entangle energy-informationally all mental addresses included in the problem, with final goal to achieve permanent healing i.e. spiritual integration of personality) [9,17,24-29].

In the above Hopfield-like quantum-holographic associative neural network (HQHNN) framework, since all successive quantum-holographic cellular enzymatic biochemical reactions are functionally interconnected, so are the successive HQHNNs in the corresponding enzymes occupational bases (confirmed also by statistical mechanic study of a dissipative metabolic network of different cellular enzymatic activities under different external stimuli, showing that the dissipative metabolic network can behave as Hopfield-like attractor metabolic network [32]). They may be presented in the form of Haken's multi-level synergetic neural network composed of layers of successive HQHNNs [33], having a formal Hopfield-like mathematical structure in the form of (non-morphological/ abstract) 'formal neurons' massively inter-connected by 'formal connections', with HQHNNs layers mutually quantum-holographically coupled via their

'patterns-qua-attractors' (i.e. their quantum-holographic memory states, within occupational bases of conformational states of the corresponding enzymes involved) [3]. Such a generalized quantum-holographic framework of Haken's multi-level synergetic neural network, representing corresponding coupled intra-cellular and extra-cellular biochemical reactions, is in line with trends of modeling hierarchical information processing in higher cognitive processes too [5-8,24-29].

It should be added, that quantum nature of water might also mediate in coupling quantum-informational intra-cellular and extra-cellular biochemical reactions (this being possible quantum-informational basis of some intriguing field-mediated self-organizing genetic experiments [34,35]).

### III. ON BIORESONANT PATTERNS-QUA-ATTRACTORS AND HEALING BOUNDARY CONDITIONS IN PSYCHOSOMATICS

Our macroscopic quantum-informational biological framework is also indirectly supported by Resonant Recognition Model (RRM) of biomolecular recognition [36,37], with current advances in experimental and computational drug discovery and design [38,39], and with prediction and in vitro evaluation of the anti-cancer cytotoxic effects of low intensity FIR EM therapy [40,41]). Considered in the framework of Hückel-like theory of molecular orbitals [42], our quantum approach to the RRM-model has shown that discrete Fourier transform in the RRM model is basically related to sequential contributions to the first order correction of energy of the primary sequence of amino-residues. In the RRM context, the same characteristic single-electron RRM frequency of the protein(s) and corresponding target(s), presumably characterises not only general bio-molecular function of the protein(s) and target(s), but also their quantum biomolecular recognition interaction on the level of biological cell – giving rise to (energy-favourable) many-electron energy-deepening of the conformational final state and many-electron energy-shallowing of the conformational initial state on the macroscopic quantum level of cell, i.e. to dynamic modification of many-electron energy-state hypersurface of cell's protein(s) macroscopic quantum system [24-26].

These transitions are RRM theoretically predicted [43,44] and experimentally observed [45] in the wide frequency range – which incorporates infrared radiation (when vibrational excitations of the ground many-electron hypersurface should be involved, including low-energy long-range coherent microwave Fröhlich excitations created as a result of interaction of the electronic and phonon subsystems [46,47], of particular significance in acupuncture-based microwave resonance therapy [18-21,24-26]), and also visible and a small portion of the ultraviolet radiation (when higher electronic-vibrational excitations of the many-electron hypersurfaces should be involved). The interpretations of even lower bands down to MHz and KHz regions were presented in [45-47].

The results of the RRM model also imply that on the biomolecular level an information processing is going on in the inverse space of Fourier spectra of the primary sequences of biomolecules, bearing resemblance to

quantum-holographic ideas that cognitive information processing is going in the inverse space of Fourier spectra of the perceptive stimuli [5], thus indirectly supporting quantum-holographic fractal coupling of various hierarchical levels in biological species, with significant psychosomatic implications mentioned in this paper.

As an illustration, the stress-induced quantum-informational origin of cancers should be expected to be characterized by tumor-specific patterns-qua-attractors (with nonlinear coupling of different frequency modes in the organism having a tendency to destroy quasi-periodic movements with three and more frequencies – and to replace them with chaos [26]). Really, it was reported in trials of low-intensity amplitude modulated RF EM fields to treat cancer patients (at precise modulation frequencies ranging from 0.1 Hz to 114 kHz [48-50]), that patients had numerous tumor-specific modulation frequencies [48]. Although results of the experiments on cancer cell cultures in the laboratory suggest that low-level amplitude modulated RF EM fields interfere with the activity of genes in cancer cells [51], the exact biophysical mechanism for this process is still open [51,52]. But, it is quite possible that the organism might be considered as quantum-informational hierarchy of adjusted patterns-qua-attractors in various frequency ranges, thus sensitive for corresponding bioresonant diagnostics and therapies [18-26], and self-organizing genetic experiments [34,35] (especially having in mind that different cellular enzymatic activities under different external stimuli can behave as Hopfield-like attractor metabolic network in the framework of statistical mechanics [32], and that (bio) chemical transformations can be formulated in the framework of fundamental quantum chemistry [53]).

On these lines, the holistic clue for imposing healing boundary conditions in the energy-state space of acupuncture system/ (individual and collective) consciousness of patients should be taken into account, with significant psychosomatic implications on necessity of including three front lines of psychosomatic integrative medicine in top-down order (cf. [24-29] for phenomenologically supporting refs therein): (i) collective consciousness, (ii) acupuncture system/ individual consciousness, and (iii) somatic level. It should be pointed out that the necessary activities in the second and third levels, with neglect of the first level, would result in further transpersonal transfer of memory pattern-qua-attractors on the level of individual and collective consciousness in this and future generations. So, this implies necessity to focus on the origins of many psychosomatic problems on underlying prenatal trans-generational levels (cf. [28,29] and refs therein).

Finally, it should be noted that our macroscopic quantum-holographic informational framework is also supported by fundamental holographic principle [13] according to which any (3D) physical system is isomorphic to holographic information embedded on its (2D) surface, which implies that the full quantum-informational content of our 3D body could be quantum-holographically contained in the corresponding 2D surface layer – bearing resemblance to traditional psychosomatic concepts of energy-informational acupuncture system/ individual consciousness [24-29].

#### IV. CONCLUSION

The outlined macroscopic quantum-informational Hopfield-like holographic framework for psychosomatics might have significant holistic implications for better understanding of quantum-holographic feedback control mechanisms of morphogenesis, and applications of bioresonant patterns-qua-attractors and healing boundary conditions in acupuncture-based and consciousness-based psychosomatics.

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