

Exploration

Quantum Resonance & Consciousness

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Abstract

Resonance can trigger a series of quantum events and therefore induce several changes related to consciousness at micro as well as macro level within a living system. Therapeutic effects have been observed in several religious meditative and healing practices, which use resonance in the form of chanting and prayers. A living system may have many resonant frequencies due to their degrees of freedom, where each can vibrate as a harmonic oscillator supporting the progression of vibrations as waves that move as a ripple within the whole system. A cell as an organism or cells in multicellular organisms act as resonating bodies that trigger oscillation of oscillatory proteins of the cytoskeletal network. The resulting protein conformational changes generate a conscious moment that is regulated via electron tunneling, delocalization and superposition in space time geometry. Consciousness or sentience are phenomenal characteristics of every cell and even though we don't know the "why" we surely can predict and hypothesize the "how" of consciousness to be quantum computed, which enables the cell to understand and judge perceptions giving it a prospect to behave as per will.

Key Words: Resonance, meditation, quantum, consciousness.

Introduction

Resonance is a phenomenon that occurs when a given system is driven by another vibrating system or external force to oscillate with greater amplitude at a specific preferential frequency (Wikipedia). Vibrations travel in the form of waves and can interact at any given point of time in the universe and so is the possibility of it being absorbed within a living system. Resonance is used as a medium to transfer power into all kinds of waves ranging from lasers to microwave ovens and musical instruments. The brain works on electrical activity which exists in the form of brainwaves ranging from high amplitude, lower frequency delta waves to low amplitude, higher frequency beta waves (Zhuang et al 2009). The Adaptive Resonance Theory (ART) predicts that all conscious states are resonant states but not all resonant states are conscious states for it has yet to be proven (Carpenter and Grossberg 2003). Similarly, the Phase Conjugate Adaptive Resonance (PCAR) theory, proposes this form of resonance that occurs in living forms created through the processes of quantum entanglement and which results in an instantaneous exchange of information (Mitchell and Staretz 2011).

Resonance occurs when an object is vibrated at its natural frequency or naturally occurring frequencies. The technique of healing is a best example of resonance, where healers focus on their subjects to create a resonance interference pattern resulting in a healing effect, attributed to the supernatural. Similarly, when people pray for others they initiate a non-local resonance

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process which may result in a positive effect due to focused attention. Brain regions associated with attention and sensory processing were found to be thicker in persons who would meditate daily in comparison to persons who would not, and the thickness of these areas increased with increasing years of mediation practice (Lazar et al 2005). In deep meditative states, the oscillators bring about a creation of standing wave within the body, which is the natural vibration frequency of the body that gets amplified due to the presence of a same frequency vibration from another body which may be living or non-living.

A living form is made up of water and therefore is a damped oscillating system, where water brings about a damping effect by reducing the energy carrying capacity of the resonating waves (Jenkins 2011). The phenomenon of resonance creates an increase in the extent of oscillations of the oscillators present within the living form e.g. proteins (Julicher 2001). According to quantum physics, there is no empty space between two objects; this vacuum is the Zero Point Field (ZPF) which propagates vibrations as forms of quantum fluctuations at specific frequencies (Puthoff and Little 2010). Vibrations as resonating waves creates interference patterns which may be constructive if the frequencies are similar and destructive if the frequencies are not similar. A constructive pattern would result in an enhanced positive effect while a destructive pattern would result in reduced negative effect. The holographic model by Pribram suggests that the brain acts like a frequency analyser and filter, which allows the brain to use what it needs preventing an overexposure which may be an event occurring at a cellular level (Pribram 1999). Animals without auditory features, identify complex sounds by segregating them into their constituent frequencies which is a feature achieved by vertebrates through selective tuning of mechanosensory hair cells.

Does resonance play a role in cognition and does it support consciousness at cellular or multicellular level? Consciousness generated through quantum computing by means of the ORCH-OR model suggests microtubule vibrations that resonate within the tubules to generate a stream of consciousness (Hameroff and Penrose 2014). Resonant vibrations in megahertz and kilohertz frequencies have been recorded within single microtubules and bundled microtubules inside the neural cells which correlate well with the quantum computed process of the ORCH-OR model (Pitkanen 2014). Ordered water on the microtubule surfaces and the internal hollow core of the tubules have also been suggested to enhance transmissions through quantum based optical modes calculated by its Frohlich coherence. Electron tunnelling, exciton hopping, long-range classical and non-local quantum processes involving entanglement, superposition and quantum computation is possible within the cytoskeletal structures is due to the lattice-based geometries that exist within these structures (Hameroff 2013) and are triggered by the resonant waves absorbed.

Electromagnetic impulses of apt frequencies can produce resonance at cellular levels and may stimulate a variety of functions within the cells that may have propounding effects visible at the exterior. Quantum based models such as the ORCH-OR theory when applied at cellular level has helped sort the “how” of consciousness and cognition which may not be wholly related to neural cells but definitely influences the biological cellular network through resonance. Alzheimer’s disease is caused due to cognitive dysfunctioning, and its main cause is the disruption of the microtubular Tau protein (Kolarova et al 2012) which confirms that microtubules act as propagators for consciousness and cognition. Meditation and chanting is an art of managing one’s own vibrations at a cellular level, which is not produced directly but is derived by a

summation of electromagnetic vibrations within the cells that can produce healing effects within tissues and poorly functioning cells (Barnes 2015). Over time meditation produces permanent changes in the state of the brain in relation to consciousness wherein higher level in activity of the frontal cortices have been observed in regular meditators. It is a cognitive process that induces relaxation, regulates attention and develops an attitude of detachment from one's own thoughts (Newberg et al 2010).

Modern science claims that biological systems are too warm, wet and noisy for quantum processes to occur with the major problem being decoherence that has been discounted based on the evidences of molecules to harness heat and energy that promote quantum states rather than decoherence (Bhattacharya and Raha 2013). Resonance occurs without regard to distance or time separations and without physical communications. Experiments have provided a confirmation that these resonant based experiences are not illusionary or imaginary, but occur through a form of interconnectedness created by resonating frequencies inside and outside the living system (Cambray 2009). A living system may have many resonant frequencies due to the degrees of freedom where each can vibrate as a harmonic oscillator which supports the progression of the vibrations as waves bringing about a ripple effect within the whole system.

Resonance at Cellular Level

Vibrations as resonating waves of different frequencies found all around us and some of these vibrations occur at frequencies which may not be perceivable, but interact with our bodies. But do cells in a living system resonate? Resonating waves of different frequencies and wavelengths can be absorbed as a mix within the cell, which may lose their energy due to the damping effect of the water-based cytoplasm resulting in reduced frequencies triggering off a cascade of quantum events within the cytoskeletal protein network of the cells. Simplest to the most complex organisms are interconnected using information obtained by nonlocal quantum coherence (Josephson and Pallikari-Viras 1991). Based on the ORCH-OR theory (Hameroff and Penrose 2014), it can be hypothesized that every cell generates its own nonlocal quantum coherence through quantum computing within cytoskeletal structures like the microtubules and the evolution of these cytoskeletal structures suggests that they were present even in the most simplest form of primitive organisms (Pereira 2015).

Resonance occurs when a damped oscillating system such as a cell is subjected to frequency similar to the oscillation of the system which results in accumulation of energy within the oscillators e.g. microtubular proteins which are known to generate mechanical resonance at a frequency of 1510 MHz (Pizzi et al 2010). The cell, its microtubules and proteins can be considered as a "tuned system" which consists of oscillators of identical resonant frequencies wherein if one oscillator starts emitting, the others get activated and because the coupling is ideal they will respond to the lowest signals and resonate. A quantum phenomenon operates at macro as well as micro level which support the communication and signalling processes that exist in a cell. Cellular resonances have been detected in a wide range of cell types, including bacteria, yeast, algae, avian and mammalian cells (Pohl and Pollock 1986). Several changes and stimulation effects at different frequencies of vibrations generated by means of sound waves have been noted in plant cells (Hassanien et al 2014).

Sound waves are the best sources of vibrations and exist as three classes, infrasound, audible sound and ultrasound and their effects vary accordingly. At vibrations of 261 Hz altered growth in human gingival fibroblast cells was observed by Jones and team, which showed an increased and decreased rate of proliferation based on the amplitude and exposure time (Jones et al 2000). Electrical oscillations have been measured in yeast cells during reproduction which was found to be maximal during mitotic division (Pokorny et al 2001). Resonant vibrations generated through music are known to affect mood and emotions, which has been mainly focussed on the brain and its cells and not on cellular metabolism, which may be the case in organisms with non-auditory apparatus. Yeast cells demonstrated a 12% increase in growth rate and 14% reduction in biomass production with a significant difference in the metabolite profiles on exposure to different sound frequencies, confirming the enhancing effect of these vibrations at a cellular level (Aggio et al 2012).

Unicellular eukaryotes such as amoeba and paramecia exhibit complex cognitive capabilities like cooperation, learning, feeding and escaping without the presence of neural tissues. These organisms manage these cognitive functions via quantum computing in the microtubules present in the cytoplasm which is the same in microorganisms with the FtZ type of tubulin proteins (Pereira 2015). Cooperative spinning in suspended cells has been observed in yeast cells, erythrocytes and protoplasts at 30 – 40, 20 – 40, 80 – 100 and 140 – 180 Hz which has been demonstrated in a Frohlich model, where an assembly of randomly oscillating, lightly coupled similar dipoles, cooperate if the chemical input power exceeds a certain level (Cifra et al 2011). Theoretical quantum biophysics and computer based simulations have been used to analyze quantum coherence within the tryptophan rings of the tubulin molecules present in the microtubules which use quantum dipole coupling among the tryptophan generated resonance clouds mediated by exciton hopping or Forster resonance energy transfer (FRET) across the tubulin protein lattice (Di Maiò et al 2014). Evolutionary patterns of tubulin and tubulin-like proteins of the cytoskeletal network of the cells have existed from the very beginning of life, and though not comparable to the present forms, have given rise to similar structures by maintaining their purpose of existence (Pereira 2015).

Cultured human breast cancer cell line MCF7 showed an alteration in cellular morpho-functional parameters such as cell size and cell granularity when exposed to music generated resonant vibrations conforming to the direct interference of these vibrations with hormonal binding processes that could modulate physiological and pathophysiological processes within these cells (Lestard et al 2013). Vibrations through music therapy have also been associated with the NAc activation and ventral tegmental area (VTA) regions of the brain which regulate autonomic, emotional and cognitive functions. Dopaminergic neurons that originate in the VTA region directed to the NAc and forebrain regions associated with rewarding stimuli have been activated with vibrations generated through music (Chanda and Levitin 2013). Pulsed transcranial ultrasound has been shown to improve memory functioning in Alzheimer's mice by the breakdown of amyloid plaques which may help to boost the weakened semi-field within the neurons or the microtubules within the neurons (Craddock et al 2012).

A cell as an organism or cells in multicellular organisms act as resonating bodies that oscillate trigger a flow of vibrations through the whole system, mediated by the oscillatory proteins of the cytoskeletal network. Sheldrake's theory of Hypothesis of Formative Causation explains this concept, utilizing resonance as his model in a developing organism. According to him,

developing organisms are shaped by resonating fields which contain the form and shape of the organism, with each species having its own field and several fields collaborating and interfering in a multicellular organism like humans or a colony like the ones found in bacteria (Sheldrake 1992). If a tuning fork designed to produce a specific frequency is subjected to oscillate and is brought into the vicinity of another tuning fork of the same frequency it will begin to oscillate, this is known as resonant entrainment which can also be applied to biological systems wherein cells oscillating at a particular frequency can oscillate neighbouring cells at the same frequency generating a quantum-based conscious or cognitive effect.

Cognition & Consciousness as Quantum Resonating Characteristics of a Cell

Human based consciousness comprises of, what we see, hear, touch, taste, smell, feel, etc, which is termed as 'phenomenal consciousness' and this has led to a one-way thinking in determining the existence of true consciousness (Clark 2001). Cognition and consciousness have always been linked to the neural tissue or the brain which is collection of neural cells, but there is more in understanding conscious driven efforts by a single cell. Understanding and reasoning forms the basis for intelligence in many unicellular organisms which survive, based on the ability to perform cognitive functions without the presence of a neural system (Shapiro 2007). This kind of intelligence cannot be compared to the intelligence observed in higher organisms, but does show some overlap in areas of mental activity, memory and learning (Westerhoff et al. 2014).

Amoeba proteus is a well known protozoan, known to show several behavioural responses e.g. regulation in the rate of reproduction based on availability of food, encapsulation, etc (Anderson 1988) which are conscious activities driven by awareness. Pseudopodium is a highly defined energy mediated structure formed in amoeba and supports behavioural responses associated with procurement of food as well as exhibiting a choice for food. They also demonstrate the capability of differentiating between inorganic and organic food and can isolate an unknown object from an engulfed food particle (Parsons 1926; Mast and Hahnert 1935) which demonstrates the decision making capability of the organism. Amoeba has no structures for reception of stimuli but the protoplasm is aware and responds to a stimulus, which gives it the ability to perceive and recognize its own kind and engage in cooperative behaviour. Cognitive smartness and intelligence in these organisms, supports social behaviours related to learning, memory, anticipation and risk management (Gregor et al. 2010). Can these conscious events be quantum computed via resonant vibrations induced in microtubules present within the cytoplasm of these organisms?

Sentience or consciousness can be hypothesised as a quantum computed event driven by the microtubular proteins oscillating at similar frequencies that create a quantum resonant wave of energy driving the feeling of being aware. It is based on a signal that a simple unicellular organism procures from the environment which can be compared to a firing potential of the neuron that creates a coordinated and synchronized pattern within the system. Awareness or being conscious holds the key to survival and is displayed by all living beings. Adaptive cooperative behaviours observed in primitive organisms e.g. Archae, has helped these organisms survive in the past as well as present, which also justifies the fact, that quantum consciousness

and cognition may have been the cause of evolution and differentiation or may have been the reason for a shift from unicellularity to multicellularity (Pereira 2015).

The relevance of quantum measurement theory in biology is based on the hypothesis that it already takes place within the cell and is responsible for consciousness and conscious driven activities. The “how” of consciousness can be understood but the “why” can never be answered because it is a phenomenal event which divulges the reasons for creation. Whether unicellular or multicellular, we all depend on our past experiences and its observations and use this for several actions that need to be performed in our day to day life, which is managed by the conscious decisions that we take, which may be new or retrieved from memory. Induced vibrations at different frequencies have helped enhance this activity at cellular and multicellular level with the mechanism of its action similar to the processing of a quantum based computer.

Schumann calculated the Earth’s-ionosphere cavity resonance frequency to be 7.83Hz, which is known as the Schumann resonance, and which is also the frequency by which our biological system is tuned to earth. Several studies were conducted, where people were shielded from the naturally occurring Schumann resonance frequency, which resulted in disruption of circadian rhythms resulting in health effects such as migraine, headache and emotional stress which was restored when the subjects were re-exposed to this frequency (Persinger 2014). Quantum generated resonance processed through electron tunnelling and super positioning of phonons or photons results in conformational changes in proteins within the cytoskeleton network of cells; a conscious event gets generated.

Meditators, healers, religious, mystics and natural psychics routinely use the technique of resonance, by focusing attention on physical objects and icons by allowing intuitive perceptions to enter a state of conscious awareness. The experience is an altered sense of space-time with closure of self and a unified sense of relationship with all that exists through the balance of the resonating frequencies between the cells, the body, the earth and the universe (Mitchell and Staretz 2011). Consciousness and cognition are phenomenal characteristics of every cell and even though we don’t know the “why” we surely can predict and hypothesize the “how” of consciousness as quantum mediated, which enables the cell to understand and judge perceptions giving it a prospect to behave as per will. The flow of consciousness can enhance cognitive features in unicellular and multicellular living forms giving them the ability to survive and become aware of their environment.

Understanding Meditation & Religion via Resonance

The universe comprises of things which have known frequencies or more than one frequency. Resonance occurs when objects vibrate at their natural frequency or multiple natural frequencies transferring energy to its adjacent objects so that they begin to vibrate at the same frequency. This process occurs at a macro as well as a micro level and is the main driver for consciousness. At a macro level the whole body or object feels the presence of consciousness or encounters the feeling of awareness which hypothetically originates at a micro level via quantum processing within the microtubules of the cells. Vibrations from the external environment can enhance the quantum processes within the cytoskeletal network of the cell, which generates energy utilized

by the cell to perform its biochemical processes. This is an involuntary process which has been in existence since the creation of life but can be enhanced through religious or non religious meditative techniques.

Meditation is a process that self-regulates the body and mind and maybe associated with psychological and neurophysiological alterations. Meditation studies have been linked to an increased activity in the prefrontal cortex of the brain which is associated several cognitive based functions (Previc 2006). EEG recordings of skilled Buddhist monks with years of training have shown a significant rise in gamma wave activity in the 80 – 120 Hz range while this effect was lower in new meditators. For these Buddhist monks, the purpose of meditation is to free oneself from suffering and gain spiritual liberation which is the same reason for meditative practice in other religions (Davidson and Lutz 2008). Meditation can result in major changes in consciousness which have been observed in people in the state of trance, self-hypnosis and mystical states (Holroyd 2003). Qigong masters have enhanced or reduced biochemical rates during plant growth through their meditative practices which involves determining the position and velocity of the trajectory of an object that needs to be targeted via techniques that involve vibrations (Jahnke et al 2010).

Behavioural changes though observed externally are a cause of quantum restated activities within each cell; it is a propagation or coherent flow of consciousness within a cell and the cells in a system. Healers or people praying for others initiate a non-local resonance process with objects of their focussed attention which has direct effects at a cellular level. A healing prayer of any religion has always produced positive results which have been always linked to the supernatural, which may be a possibility, but hypothetically is induced via quantum computation at a cellular level. What about unicellular organisms? Do they meditate? Unicellular organisms or sentient organisms follow an involuntary cycle that helps them resonate with their surroundings to generate energy via quantum processing within the microtubules making them aware of their surroundings. Adaptive cooperative behaviours observed in microorganisms are more of a group meditation, wherein microorganisms resonate within their colonies. This behaviour has helped these organisms survive extreme conditions in the past as well as present, which also justifies the fact, that it may have helped their ancestors during the evolutionary process from unicellularity to multicellularity.

Meditation induces hypothetical quantum dipole oscillations which regulate protein conformational changes by quantum computation such as electron tunnelling, delocalization and superpositioning within the microtubules. Quantum superpositions was first suggested by Penrose who demonstrated this feature by his quantum gravity ‘objective reduction’ process which was confirmed to be computed in microtubules that collapse or reduce by an objective factor related to quantum gravity (Penrose 1996). Resonance triggers off quantum based events at vibrations of gigahertz, megahertz and kilohertz frequencies that have been found in isolated microtubules termed as the “Bandyopadhyay Coherence” (Sahu et al 2013). Microtubule quantum vibrations induced during clinical trials at megahertz frequencies using transcranial sounds have shown several therapeutic effects (Craddock 2015) which are similar to therapeutic effects generated through meditative and healing practices like chanting and praying.

Conclusion

Quantum resonance is a phenomenon; a hypothesis that is driven by another vibrating system or an external force which oscillates a damped oscillating system at preferred frequencies and triggers a series of quantum events as a form of energy transfer at a cellular level. Microtubules act as strong oscillating systems which amplify and filter out the signals generating a conscious moment which terminates at the collapse of the wave function in space time geometry (Hameroff and Penrose 2014). Consciousness generated through quantum based principles is thus governed by the vibratory patterns of the universe and the particles that create the magic of being aware. Conscious states are therefore resonant states that trigger learning and cognitive representations in all living organisms and which helps us in our daily lives, work, rewards and losses.

Meditation and healing practices that induce vibrations have provided us the secrets of resonance, which can induce several conformational changes in the patterns of consciousness. Even though meditation is induced, it is known to create an enhanced effect within the system that can be correlated to enhanced quantum computation occurring within the microtubules of the cytoskeleton at a cellular level. We are all part of a universe that demonstrates harmonic resonance, which includes the smallest wave-like vibrations that can be generated via the smallest particles of matter to larger orbital resonances that emerge from the galaxies and stars oscillating at specific frequencies. Biophysics suggests that our biological systems are tuned into the background frequency of our planet via the Schumann Resonance which occurs at a steady pulse of 7.83 Hz within the ionosphere cavity of the earth and therefore could be the source of resonant vibrations that triggers of the progression of quantum generated consciousness within cells of all living beings.

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