

Chapter 2

Archaeal Digoxin and the Model of the Mind -
Digoxin Mediated Model of Conscious
Perception and Quantal Perception

Archaeal digoxin a membrane $\text{Na}^+\text{-K}^+$ ATPase inhibitor may probably regulate conscious perception. The elements of conscious perception include perceptual binding, focussed attention and short-term memory. The evidence of increased hypothalamic archaeal digoxin in schizophrenia points to a role for the hypothalamus. The hypothalamus is connected to the thalamus by the mamillothalamic tract and digoxin may play a role in regulating these synapses. There are two-way connections between the cerebral cortex and the thalamic nucleus. There are also two-way connections between the cerebral cortex and the hypothalamus and digoxin may also regulate these synapses. The hypothalamus-thalamus-cerebral cortex reverberatory circuit would play a role in mediating conscious perception.

Perceptual binding important in consciousness occurs when all the neurons associated with any one object's perceptual map in layer 5 of the cerebral cortex fire in bursts and in a synchronised pattern but out of synchrony with those representing other objects. When an object is perceived there is a simultaneous activation of the cerebral cortex-hypothalamic two-way connections and liberation of digoxin from the hypothalamus to stimulate the widely dispersed cerebral cortical neurons receiving the incoming perception and their resultant synchronised burst firing. Digoxin and the sodium potassium ATPase inhibition it produces can lead on to a paroxysmal depolarisation shift resulting in sustained synchronised burst firing of cerebral cortical neurons.

Short-term memory, important in conscious perception, depends on the hypothalamic-thalamic-cerebral cortex reverberatory circuit as well as the phenomena of sustained synchronised burst firing of neurons in layer 5 of the cerebral cortex. Sustained synchronised burst firing produced by digoxin can temporarily strengthen the relevant synapses so that this particular pattern of firing is recalled quickly similar to a type of short-term memory. Transient

synaptic changes of this type are due to an alteration in the presynaptic neuronal calcium produced by digoxin. The thalamic-cerebral cortex reverberatory circuit mediating short term memory is glutamatergic and digoxin could amplify the circuit by its inhibitory effect on glial uptake of glutamate and increasing synaptic glutamate content.

All axons that pass either way between the cerebral cortex and thalamic nucleus must go through the thalamic reticular nucleus and all give off collateral excitatory glutamatergic branches that innervate the reticular nucleus. The reticular nucleus in turn provides an inhibitory GABAergic innervation back to the thalamic nucleus that provides the input. Reticular nucleus is involved in mediating selective attention by intensifying or detaching a particular active thalamic input into the cortex. The amplification or focussing and detachment of attention occurs by digoxin's effect in promoting glutamatergic transmission in the collaterals to the reticular nucleus by inhibiting the glial uptake of the glutamate and increasing its synaptic content. The back projections from the cerebral cortical perceptual map of external world to hypothalamus decides whether hypothalamic archaeal digoxin should act on the glutamatergic collaterals to reticular nucleus and thus focus or detach attention.

A quantal perception model for brain function and consciousness has been proposed by several groups of workers. The brain is hypothesized to function as a quantum computer. Reiki like healing practices involving the transfer of a low level electromagnetic force from the healer to the patient has been in use in patients with seizure disorders. The Reiki like treatment practices, if effective are hypothesized to act via quantal perception since the electromagnetic force is too weak to be transferred by normal sensory perceptive mechanisms. The present study was conducted to assess the efficacy of such treatment protocols in epileptic patients. The seizure frequency was used as the end point to assess

the efficacy of treatment. Previous reports have demonstrated an endogenous membrane $\text{Na}^+\text{-K}^+$ ATPase inhibition related biochemical cascade in primary generalised epilepsy. Elevated levels of a hypothalamic archaeal endogenous membrane $\text{Na}^+\text{-K}^+$ ATPase inhibitor digoxin has been reported in epilepsy. It was considered pertinent to study the changes in the membrane $\text{Na}^+\text{-K}^+$ ATPase inhibition cascade in seizure patients undergoing Reiki like treatment practices. The results are discussed in this paper and a hypothalamic archaeal digoxin mediated quantal/extra sensory perceptive model of brain function is proposed.

The human brain can be considered as a modified archaeon colony network. The archaeon are eternal and can last for billions of years. The human brain is basically an information storage system. The archaeon has got dipolar magnetite and porphyrins and can function as quantal computer. The archaeal colony with its dipolar magnetite and porphyrin in the setting of archaeal digoxin induced membrane sodium potassium ATPase inhibition can function as a pumped phonon system mediating quantal perception. The archaeon in the brain is capable of information storage at a point in time and space. The experiences and information stored in the archaeon is immortal and eternal. The archaeon can have a wave particle existence and can exist in multiple quantal possible states and can inhabit multiple quantal multiverses. The interaction between information stored in quantal computers in multiple different archaeon systems all over the universe by the quantal interactions results in eternal existence of information in quantal multiverses. The information in the quantal multiverses can have a particulate existence creating a newer mode by quantal interactions between information stored at multiple points of time. This creates the particulate mythic world of human existence. These are what are called as Samsaras. The mind is uploaded into information in the neuronal archaeal colony network and its quantal computers. The

information stored in the archaeal colony network mediated quantal state is eternal and can be considered as a digital version of the brain, a mind downloading technique or whole brain emulation. The archaeal colony network stores the human experiences in an eternal manner and can contribute to biological reincarnation.

Materials and Methods

Fifteen patients with refractory primary generalized epilepsy (patients with persistent seizures on three or more antiepileptic drugs in full dosage and total compliance over a period of 3 years) were chosen for the study. The age of the patients ranged from 30 to 50 years. An equal number of age and sex matched healthy subjects served as controls. All patients and controls were on the same dietary regimen, which gave adequate amounts of trace elements especially magnesium throughout the course of the study. They were not on any drugs like digoxin and lithium. The weight of the patient population was all in the normal range as they were all freshly diagnosed cases. The general health status of the patient population was normal and they did not suffer from any malnutrition. An equal number of age and sex matched healthy subjects served as controls. The control group was free from all systemic diseases and was selected randomly from the generation population of Trivandrum City. The patient and control groups were fed the same normal hospital diet for a period of 2 weeks after admission to the metabolic ward of the hospital. The blood samples were drawn from the control and patient groups after they were on the same hospital diet for 2 weeks. The dietary samples were analysed and were confirmed to be free of lithium contamination by atomic absorption spectrophotometry. They underwent daily Reiki like healing hand therapy for one hour, where the healer meditates, reaches a trance like state and transfers his low level of body EMF by the touch of his hand to the patient. They were clinically assessed with seizure

frequency counts at the end of 3 months of therapy. The following biochemical parameters were assessed at the start of the therapy and at the end of three months: plasma HMG CoA reductase, serum digoxin, serum magnesium and RBC membrane $\text{Na}^+\text{-K}^+$ ATPase activity. The serum levels of tyrosine, dopamine, noradrenaline, tryptophan, serotonin and quinolinic acid were also assessed. Fasting blood was collected from each of the patients for various estimations. RBCs were separated within 1 hour of collection of blood for the estimation of membrane $\text{Na}^+\text{-K}^+$ ATPase. Serum was used for the estimation of HMG CoA reductase activity. Plasma / serum was used for the estimation of the other parameters. All biochemicals used in this study were obtained from M/s Sigma Chemicals, USA. Activity of HMG CoA reductase of the plasma was determined using the method of Rao and Ramakrishnan by determining the ratio of HMG CoA to mevalonate. For the determination of the $\text{Na}^+\text{-K}^+$ ATPase activity of the erythrocyte membrane, the procedure described by Wallach and Kamat was used. Digoxin in the plasma was determined by the HPLC procedure described by Arun, Ravikumar, Leelamma and Kurup. Magnesium and lithium in the plasma was estimated by atomic absorption spectrophotometry. Tryptophan was estimated by the method of Bloxam and Warren and tyrosine by the method of Wong, O'Flynn and Inouye. Serotonin was estimated by the method of Curzon and Green and catecholamines by the method of Well-Malherbe. Quinolinic acid content of plasma was estimated by HPLC (C_{18} column micro BondaparkTM 4.6 x 150 mm), solvent system 0.01 M acetate buffer (pH 3.0) and methanol (6:4), flow rate - 1.0 ml/minute and detection - UV (250 nm). Statistical analysis was done by ANOVA.

Results

- (1) Pre-therapy the activity of HMG CoA reductase, concentration of serum digoxin and lithium were increased and RBC $\text{Na}^+\text{-K}^+$ ATPase activity and

serum magnesium were reduced in patients with refractory primary generalised epilepsy. Post-therapy the activity of HMG CoA reductase, the concentration of digoxin and lithium were reduced and RBC $\text{Na}^+\text{-K}^+$ ATPase activity and serum magnesium were increased in these patients.

(2) The concentration of serum tryptophan, quinolinic acid and serotonin was increased in the plasma while that of tyrosine, dopamine and noradrenaline was decreased in the pre-therapy group. Post-therapy the concentration of serum tryptophan, quinolinic acid and serotonin was reduced in the plasma while that of tyrosine, dopamine and noradrenaline was increased.

(3) The post-therapy seizure frequency showed a significant decrease.

Discussion

Archaeal Digoxin and Epileptogenesis

The results showed that plasma HMG CoA reductase activity and serum digoxin were increased in primary generalised epilepsy. Previous studies in this laboratory have demonstrated the incorporation of ^{14}C -acetate into digoxin in rat brain indicating that acetyl CoA is the precursor for digoxin biosynthesis in mammals also. The elevated HMG CoA reductase activity correlates well with elevated digoxin levels and reduced RBC membrane $\text{Na}^+\text{-K}^+$ ATPase activity. The increase in endogenous digoxin, a potent inhibitor of membrane $\text{Na}^+\text{-K}^+$ ATPase, can decrease this enzyme activity. The inhibition of $\text{Na}^+\text{-K}^+$ ATPase by digoxin is known to cause an increase in intracellular calcium resulting from increased $\text{Na}^+\text{-Ca}^{++}$ exchange, increased entry of calcium via the voltage gated calcium channel and increased release of calcium from intracellular endoplasmic reticulum calcium stores. This increase in intracellular calcium by

displacing magnesium from its binding sites, causes a decrease in the functional availability of Mg^{++} . This decrease in the availability of magnesium can cause decreased mitochondrial ATP formation, which along with low magnesium can cause further inhibition of Na^+-K^+ ATPase, since ATP magnesium complex is the actual substrate for this reaction. Cytosolic free calcium is normally buffered by two mechanisms, ATP dependent calcium extrusion from cell and ATP dependent sequestration of calcium within the endoplasmic reticulum. The magnesium related mitochondrial dysfunction results in defective calcium extrusion from the cell. Thus is there a progressive inhibition of Na^+-K^+ ATPase activity firstly triggered by digoxin. Low intracellular magnesium and high intracellular calcium consequent to Na^+-K^+ ATPase inhibition appear to be crucial to the pathogenesis of primary generalised epilepsy. Serum magnesium was found to be reduced in refractory primary generalized epilepsy and serum lithium was increased. Lithium is also a membrane Na^+-K^+ ATPase inhibitor. The generation of endogenous lithium can lead on to further added membrane Na^+-K^+ ATPase inhibition. Membrane Na^+-K^+ ATPase inhibition can produce defective neuronal membrane repolarisation and a paroxysmal depolarisation shift resulting in epileptogenesis.

The digoxin, apart from affecting cation transport, is also reported to influence the transport of various metabolites across cellular membranes, including amino acids and various neurotransmitters. The present study shows that the concentration of tryptophan, quinolinic acid, and serotonin were higher in the plasma of epilepsy patients while that of tyrosine, dopamine, and norepinephrine were lower. Thus there is an increase in tryptophan and its catabolites and a reduction in tyrosine and its catabolites in the patient's serum. This could be due to the fact that digoxin can regulate neutral amino acid transport system with a preferential promotion of tryptophan transport over

tyrosine. The decrease in the membrane $\text{Na}^+\text{-K}^+$ ATPase activity in primary generalised epilepsy could also be due to the fact that the hyperpolarising neurotransmitters (dopamine and noradrenaline) are reduced and the depolarising neuroactive compounds (serotonin and quinolinic acid) are increased. Dopamine deficiency in primary generalised epilepsy and dopamine receptor blockade producing epileptogenesis have been documented in literature. The neurotransmitter pattern of reduced dopamine and noradrenaline and increased serotonin could contribute to epilepsy related psychosis. Quinolinic acid, an NMDA agonist can contribute to NMDA excitotoxicity reported in epilepsy. In the presence of hypomagnesemia, the magnesium block on the NMDA receptor is removed leading to NMDA excitotoxicity. The increased presynaptic neuronal calcium can produce cyclic AMP dependent phosphorylation of synapsins resulting in an increased glutamate release into the synaptic junction and vesicular recycling. Increased intracellular calcium in the post-synaptic neuron can also activate the calcium dependent NMDA signal transduction. The plasma membrane glutamate transporter (on the surface of the glial cell and presynaptic neuron) is coupled to a Na^+ gradient, which is disrupted by the inhibition of $\text{Na}^+\text{-K}^+$ ATPase, resulting in decreased clearance of glutamate by presynaptic and glial uptake at the end of synaptic transmission. By these mechanisms, inhibition of $\text{Na}^+\text{-K}^+$ ATPase can promote glutamatergic transmission and excitotoxicity contributing to epileptogenesis.

Quantal Perception Model of Brain Function

A quantal perception model of brain function has been postulated by several groups of workers. Though conscious perception is the dominant form of perception in the brain, external world information is also gained by quantal perception for integration into the conscious conical perceptual data bank. The low level of EMF from the healer is probably transferred to the recipient patient

by quantal perception. The perceived element in quantal or subliminal perception could be the quanta of matter dependent upon electric and magnetic fields. The brain functions as a quantum computer with the quantum computer memory elements constituted of superconducting quantum interference devices - the SQUIDS can exist as superpositions of macroscopic states. Bose condensation, the basis of superconductivity is achievable at room temperature in the Frohlich model in biological systems. The dielectric protein molecules and polar sphingolipids of the neuronal membrane, nucleosomes (which are a combination of basic histones and nucleic acid) and cytoplasmic magnetite molecules are excellent electric dipole oscillators, which exist under a steep neuronal membrane voltage gradient. The individual oscillators are energised with a constant source of pumping energy, by the digoxin binding to the membrane $\text{Na}^+ - \text{K}^+$ ATPase and producing a paroxysmal depolarisation shift in the neuronal membrane. This prevents the dipole oscillators from over settling into thermal equilibrium with the cytoplasm and interstitial fluid which is always kept at a constant temperature. This results in a neuronal quantal state. There are direct connections between the hypothalamus and cerebral cortex and digoxin may serve as neurotransmitter for these hypothalamo-cortical synapses. Bose condensed states produced by digoxin mediated dielectric protein molecular pumped phonon system could be used to store information which might be encoded, - all within the lowest collective frequency mode - by appropriately adjusting the amplitudes of and phase relations between the dipole oscillators. The external world sensory impressions exist in the cortical dipole oscillators as probabilistic multiple superimposed patterns - the U phase of quantum mechanics. The part of the incoming quantal data maps of the external world built by quantal perception in logical sequence and corollary to the preexisting cortical external world maps built by conscious perception is chosen. Hypothalamo-cortical connections mediated by digoxin acting on the neuronal

membrane help to magnify the chosen map to one graviton criteria and to the threshold required for the neuronal network to fire and consciousness. It is then integrated into the cortical conscious perceptual external world map. The comparison between quantal perceptive maps and conscious perceptual maps of the external world occurs by a quantal non-local quasicrystal tiling effect which mediates the activation and deactivation of synapses through the contraction and growth of dendritic spines. This model of quantal perception gives a mechanism for extrasensory or subliminal perception. The R part of quantal subthreshold perception is not deterministic and it introduces a completely random element into the time evolution, and in the operation of R there might be a role for free will, an important component of conscious perception.

Quantal Perception, Biological Transmutation and Reiki Like Healing Practices

Reiki like healing practices may affect neuronal function via quantal perception. Post - therapy there was an increase in RBC $\text{Na}^+\text{-K}^+$ ATPase activity and serum magnesium and a reduction in HMG CoA reductase activity and digoxin synthesis. Also the level of tyrosine and its hyperpolarising catabolites (dopamine and noradrenaline) increased while that of tryptophan and its depolarising catabolites (serotonin and quinolinic acid) decreased. Reiki like healing practices can transmit low level EMF from the healer to the recipient by a quantal perceptive mechanism. A low level of EMF can stabilise the neuronal membrane and increase the neuronal membrane $\text{Na}^+\text{-K}^+$ ATPase activity. The stimulation of $\text{Na}^+\text{-K}^+$ ATPase is known to cause a decrease in intracellular calcium resulting from decreased $\text{Na}^+\text{-Ca}^{++}$ exchange, decreased entry of calcium via the voltage gated calcium channel and decreased release of calcium from intracellular endoplasmic reticulum calcium stores. This decrease in intracellular calcium causes an increase in the functional availability of

intraneuronal Mg^{++} . Magnesium excess is known to inhibit HMG CoA reductase activity. Digoxin is synthesized by the isoprenoid pathway and HMG CoA reductase is the rate limiting enzyme of this pathway. This leads to reduced digoxin synthesis. Reduced levels of digoxin can stimulate membrane Na^+-K^+ ATPase further and increase intraneuronal magnesium to a greater extent. This starts off a cascade, which stimulates the membrane Na^+-K^+ ATPase further and stabilises the neuronal membrane. The stimulation of membrane Na^+-K^+ ATPase can promote neuronal membrane repolarisation and inhibit the generation of a paroxysmal depolarisation shift and epileptogenesis. Thus, stabilisation of the neuronal membrane leads to a reduction in seizure count and seizure frequency. Digoxin is known to promote tryptophan transport over tyrosine. Low levels of digoxin can lead to an increase in serum tyrosine levels and a decrease in serum tryptophan. This leads to an increase in the levels of tyrosine catabolites and a decrease in the levels of tryptophan catabolites. The increased levels of noradrenaline and dopamine have an antiepileptic action. The increase in serum Mg^{++} also helps to downregulate glutamatergic transmission and inhibits epileptogenesis. The Mg^{++} block on the glutamate NMDA receptor is strengthened.

The decrease in serum magnesium and the increase in serum lithium in the pre-therapy group and the increase in serum magnesium and the reduction in serum lithium in the post - therapy group could also be due to the phenomena of biological transmutation. The increase / decrease in serum magnesium / lithium in the pre - / post-therapy group is significant in the presence of similar normal dietary regime and magnesium / lithium intake for the pre and post-therapy groups. Serum magnesium / lithium levels are increased / decreased, suggesting an increase/decrease in total body magnesium / lithium rather than a functional replacement of calcium with magnesium. Biological transmutation has been

postulated by several groups of workers. Hypothalamic archaeal digoxin induced pumped phonon system produces a quantal state within the neuron and in the cell membrane. In this quantal state biological transmutation between lithium and magnesium can happen leading to an increase / decrease in serum magnesium / lithium levels despite only adequate or normal intake. The evidence for this is the correlation between the increase / decrease in serum magnesium and lithium in the pre / post-therapy groups. In the pre-therapy group serum magnesium is reduced and serum lithium is increased. In the post-therapy group serum magnesium is increased and serum lithium is reduced.

Transmutation has been described in biological systems. Low temperature transmutation or cold fusion has been described. For the first time the experimental study of cold nuclear transmutation of isotopes was carried out by Vysotskii in a growing microbiological culture with controlled conditions of growth. With the help of the Mossbauer effect the formation of Fe isotope from Mn in nutrient medium based on heavy water was observed. It can be shown that quantizing structures of optimal size and shape are necessary for such non-barrier nuclear interaction. The exact parameters of these structures are very hard to calculate. The situation substantially improves when the hole parameters are slowly changing inevitably passing through optimal value. This situation is realized in growing microbiological cultures. In the growth process the replication of DNA and other biomolecules takes place. In this case, in the region of growth, the interatomic potential holes with slowly changing sizes are constantly appearing. If Mn atom and a deuteron are in such a changing hole, conditions for a new Fe isotope fusion could appear. If all the above-mentioned conditions are met, the quantizing of the deuteron in the hole independent from Mn nucleus takes place. In this case the wave function of deuteron $\psi_n(r)$ in this optimal hole does not depend on the position of Mn in the hole and in all states

of its quantized motion can differ from zero at the point r_{Mn} in the hole where the Mn nucleus is located. This leads to a high probability of nuclear fusion $\lambda = C |\Psi_n(r_{Mn})|^2$, C is the constant of purely nuclear Mn-d² interactions. The mechanisms provide a short term elimination of the Coulomb barrier of the pair interaction in optimal micro-potential hole with the structure that is close to parabolic. For such a system the diagonal elements of interaction energy matrix of Mn+d complex [quasimolecule (MnD)⁺] should be small and the probability of interlayer transition because of this interaction should also be small.

Thus the effect of Reiki like treatment practices on seizure count and frequency as well as on biochemical pathways related to membrane Na⁺-K⁺ ATPase stimulation provides evidence regarding quantal perception and brain function. It also provides evidence on the regulation of metabolic processes by quantally perceived low levels of EMF induced changes in neuronal transmission. The phenomena of psycho-neuro-molecular biological and an environmental low level of EMF mediated regulation of metabolic processes needs further study.

Quantal Perception and Extrasensory Phenomena

- (1) *Out of body experience* - This model of quantal perception gives a mechanism for extrasensory or subliminal perception. This model of quantal perception gives an explanation for phenomena like out of body experience, psychokinesis, mind travel and reincarnation.
- (2) *Universal mind* - Because of quantal perception different brain information storage systems in different individuals can function as one single quantal supercomputer. This could be the basis of a universal mind or of the experience of God.

- (3) *Hypnosis and quantal perception* - Hypnotic suggestions could also work by the phenomena of quantal perception which can alter brain function.
- (4) *Inter/intra-galactic fields and behaviour / astrology* - Quantal perception could also result in low strength intra and intergalactic electromagnetic fields of the universe affecting brain function. Solar flares can change the electromagnetic fields of the earth resulting in altered brain function. Inter/intra-galactic fields can also affect brain function. This is exemplified by diurnal and seasonal changes in disease incidence as well as human behaviour.
- (5) *Mind travel* - The spooky phenomena of communication of two points spread over a long distance but not in physical continuity as described in the Einstein-Podolsky phenomena occurring in the quantal state could form the basis of mind travel. Mind travel from one part of the galaxy to the other could be done via wormholes in the quantal state. There could also be the phenomena of quantal teleportation. The quantal foam is riddled with worm holes.
- (6) *The mind-body-universe interrelationship* - Digoxin by modulating conscious perception contributes to the observer function of human consciousness. Human consciousness depends on the information perceived from the external world by conscious or subliminal perception and is momentary. Consciousness or human personality thus depends upon the external world and does not have an independent existence. If there is no external world to observe there is no human consciousness. This has been proved by sensory deprivation studies. It is consciousness that converts the quantal world of probabilities into the classical objective real world of matter by the act of making an observation. The external world comes into existence because of the observer function of human

consciousness. Thus human consciousness and the external world have an interrelated existence. In real terms there is neither the external world nor human consciousness. Both exist as an interrelated mirage more aptly described by the philosophical term of maya. The evidence of this comes from the delusions and hallucinations observed in schizophrenia where elevated levels of digoxin have been demonstrated.

(7) *Reincarnative experiences* - Reincarnative experiences have been described in the first three years of life. This would involve the phenomena of quantal perception. The information stored in the preexisting neuronal quantal computer systems of deceased individuals are perceived and transferred to other developing foetal/neonatal neuronal quantal computer systems. This transferred reincarnative information is integrated with the information perceived quantally during the individual's lifespan. This may be one method of information transfer from generation to generation akin to the genetic transfer of information.

Quantal Perception and the Evolution of the Universe

A quantal perception model of brain function has been postulated by several groups of workers. The human endosymbiotic archaea produces an endogenous membrane $\text{Na}^+ - \text{K}^+$ ATPase inhibitor digoxin. Archaeal digoxin probably plays a role in mediating quantal perception and consciousness. The observer function role of human consciousness in the existence of matter is important in this respect. An archaeal digoxin mediated model for quantal perception / consciousness is postulated in the article. This article deals with a hypothesis linking the quantal perception of information stored in other individual neuronal networks to the development of synaptic networks in the fetal / infant brain.

Also in the quantal state, self-replication of macromolecules is possible leading to their later self organisation and formation of cellular organelle. The organelle/independent unicellular bacteria cluster together symbiotically to form the neuronal / cell. This leads as to the serial endosymbiotic theory of evolution where the individual cell is thought of as a symbiotic collection of bacteria. This article takes the theory further to postulate that the human brain and other neuronal networks / multicellular organism are a symbiotic collection of flagellated bacteria forming a large colony with later formation of synaptic connections between the individual bacteria. The role of intergalactic magnetotactic bacterial networks in the evolution of the universe is also highlighted in this context. The details of the hypothesis are described in the article.

Digoxin, Quantal Perception and Observer Function of Consciousness

The perceived element in quantal or subliminal perception which could play a role in schizophrenic symptomatology could be the quanta of light, sound, vibration pressure and matter dependent electric and magnetic fields. The brain functions as a quantum computer with the quantum computer memory elements constituted of superconducting quantum interference devices - the SQUIDS can exist as superpositions of macroscopic states. Bose condensation, the basis of superconductivity is achievable at room temperature in the Frohlich model in biological systems. The dielectric protein molecules and polar sphingolipids of the neuronal membrane nucleosomes, which are a combination of basic histones, and nucleic acid, and cytoplasmic magnetite molecules are excellent electric dipole oscillators which exist under a steep neuronal membrane voltage gradient. The individual oscillators are energised with a constant source of pumping energy from outside, by digoxin binding to membrane sodium potassium

ATPase and producing a paroxysmal depolarisation shift in the neuronal membrane. This prevents the dipole oscillators from ever settling into thermal equilibrium with the cytoplasm and the interstitial fluid, which is always kept at a constant temperature. There are connections between the hypothalamus and cerebral cortex and digoxin may serve as a neurotransmitter for these synapses. Bose condensed states produced by a digoxin mediated dielectric protein molecular pumped phonon system could be used to store information which might be encoded - all within the lowest collective frequency mode - by appropriately adjusting the amplitudes of and phase relations between the dipole oscillators. The external world sensory impressions exist in the cortical dipole oscillators as probabilistic multiple superimposed patterns-the U phase of quantum mechanics. The part of the incoming quantal data maps of the external world built by subliminal perception in logical sequence and corollary to the cerebral cortical external world maps built by conscious perception is chosen. Hypothalamo-cerebral cortical connections mediated by digoxin acting on the neuronal membrane help to magnify the chosen map to one graviton criteria and to the threshold required for the neuronal network to fire and consciousness. It is then integrated in to the cerebral cortical conscious perceptual external world map. The comparison occurs by quantal non-local quasicrystal tiling effect, which mediates the activation and deactivation of synapses through the contraction and growth of dendritic spines.

This model of quantal perception gives a mechanism for extrasensory or subliminal perception. The R part of quantal subthreshold perception is not deterministic and it introduces a completely random element into the time evolution and also in the operation of R there might be a role for free will, an important component of conscious perception. It is consciousness that converts the world of probabilities into the classical objective real world of matter by the

act of making an observation. Quantal perception leads to foetal / infant brain quantally perceiving the information stored in other individual neuronal networks. This leads to the initiation of information storage in the fetal synaptic networks and development of synaptic connectivity in the fetal / infant brain. This could be a possible mechanism of information transfer between generations of human populations.

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The Symbiotic Theory, Isoprenoid Organism and Evolution

Symbiogenesis is evolutionary change, brought about through long-term physical contact between members of different species. A lichen is a partnership of two entirely different kinds of life: a fungus and a photosynthesizer - either a green alga or a cyanobacterium. Symbiogenesis has been instrumental not only for the evolution of the lichens, but also for all plant and animal cells - including, of course, the cells of human beings. Serial endosymbiosis theory holds that all cells with nuclei are composites formed from the mergers of as many as four different kinds of bacteria. Margulis set out the central tenets of the theory: that certain present-day cell components were once free-living bacteria, and that any live being larger than a bacterium is a superorganism whose cells evolved by symbiogenesis through bacterial corporeal mergers. The host cell itself is probably related to *Thermoplasma*, a heat and acid tolerant

archaebacterium that lacks a cell wall. Mitochondria are related to the proteobacteria, a very common oxygen-breathing walled bacteria that inhabit water of all kinds. Chloroplasts began as photosynthetic bacteria that live in microbial mats, muds, pools and rivers and at the surface of the ocean. In the course of becoming cell organelles, they lost their cell walls and much other equipment needed for independent life. The DNA governing those features - they shed as well, or relinquished to the nucleus of the host. The fourth former bacterium, the calonymphids in the nucleated cells, descended from a spirochete: the former spirochete is a little dark-staining dot called a centriole-kinetosome. This gave the organism the capacity to move and reproduce efficiently. The centriole kinetosome is important in the evolution of dividing nucleated cells.

In the archaeal digoxin induced neuronal quantal state individual dielectric molecules like proteins, nucleic acid, mucopolysaccharides and isoprenoidal lipids can store information and undergo self replication on a preexisting template. Such macromolecules would have been the initial form of life on earth. The isoprenoid macromolecule could have been the initial self replicating organism at the beginning of evolution. Information could have been stored in the isoprenoid-repeating units. It would be tempting to speculate on a role for self-replicating macromolecules like proteins, nucleic acid, mucopolysaccharide and isoprenoids in human diseases. Prions are self replicating proteins and have been implicated in neurodegenerative disorders.

Cellular organelle can be considered as symbiotic conglomeration of these macromolecules, which would have undergone self-organisation. The cell can be considered as a symbiotic collection of these organelle. Each organelle may evolutionally represent an organism - like mitochondria and nucleic acids. The cell may be considered as a symbiotic merger of different bacteria representing individual organelle. It is possible to visualise functional clusterings of such

bacterial cells. The brain with its axonal and dendritic connections can be viewed as a colony of such flagellated bacterial organisms with its interlinking connections. The axons and dendrites have a similarity with the flagella of bacteria. Synaptic connections would have formed in the bacterial colony over a period of time leading on to the formation of the primitive neuronal networks. Such bacterial networks would have evolved into the human brain and various organs with the neural networks controlling the rest of the cluster. The same holds good for all multicellular organisms. Thus there has been no evolution in the real sense only symbiotic clustering of unicellular organism. In this theoretical model there is no evolution but only a different conglomeration of the initially existing macromolecules - anevolution. The clinical evidence for such a theory is seen in immune mediated neurological disorders like acute disseminated encephalomyelitis and systemic disorders like rheumatic fever. The phenomena of molecular mimicry between the bacterial / viral and human antigens would depend on this evolutionary phenomenon.

Quantal Perception and Origin of the Universe

The universe can probably evolve in the quantal perceptive stage of the brain or in the super conscious meditative state. To begin with there were quantal electromagnetic traces of the past, present and future existing, which unfolded into matter as the universe, evolved. Initially in the intergalactic magnetic fields there existed protons, neutrons and electrons. They combined to form the hydrogen, nitrogen, carbon and oxygen atom.

Fusion of this nuclei resulted in the formation of amino acids and isoprenoid lipids. The amino acids later self organised to form proteins and enzymes. The isoprenoid unit self organised to form isoprenoidal macromolecules. The initial organism was a proteolipid organism formed of proteins and isoprenoid

macromolecules. The membrane $\text{Na}^+\text{-K}^+$ ATPase, which could also function as an ATP synthesizing enzyme functioned as the initial energy reservoir. A primitive mitochondria formed of the isoprenoidal compound ubiquinone and proteins with iron sulphur centers evolved later. All the macromolecules of the proteolipid organism underwent self-replication. The isoprenoidal compound digoxin would have functioned as an endogenous membrane $\text{N}\&\text{-K}$ ATPase inhibitor regulating intracellular calcium / magnesium ratios and the function of various organelle. Digoxin would also induce a cellular quantal perceptive state.

Later dUTP, dATP, dGTP and dCTP were synthesized and RNA was formed leading to the second generation RNA organism. The RNA was formed initially on a poly-amino acid chain serving as a template. The RNA started to function as the information storage structure of the organism. The ribosomes evolved as the next stage and protein synthesis was initiated.

Later on with RNA serving as a template the DNA was formed and the DNA organisms came into existence. Thus the initial unicellular bacterial organisms came into existence.

The initial organisms in the intergalactic magnetic fields were the magnetotactic bacteria. The networks of magnetotactic bacteria served as an observer for the creation of the universe according to anthropomorphic principle. The universe came into existence because there was an initial observer in the magnetotactic bacterial networks. The cosmic dust grains occupy the intergalactic space and are thought to be formed of magnetotactic bacteria, identified according to their spectral signatures. According to the Hoyle hypothesis the cosmic dust magnetotactic bacteria play a role in the formation of the intergalactic magnetic field. A magnetic field equal in strength to about one millionth part of the magnetic field of earth exists throughout much of our galaxy. This magnetic field can be used to trace the spiral arms of the galaxy

following a pattern of field lines that essentially connect young stars and dust in which new stars are forming at a rapid rate. Studies have shown that a fraction of the dust particle has elongated shape similar to bacilli and they are systematically lined up in our galaxy. Moreover, the direction of alignment is such that the long axes of the dust tend to be at right angles to the direction of the galactic magnetic field at every point. Magnetotactic bacteria have the property to effect the degree of alignment that is observed. The fact that the magnetotactic bacteria appear to be connected to the magnetic field lines that thread through the spiral arms of the galaxy, connecting one region of star formation to another support a role for them in star formation and in the mass distribution and rotation of stars. The nutrient supply for a population of interstellar bacteria comes from mass flows out of supernovas populating the galaxy. Giants arising in the evolution of such stars experience a phenomenon in which material containing nitrogen, carbon monoxide, hydrogen, helium, water and supplies of trace elements essential for life flows continuously outward into space. The interstellar bacteria need liquid water. Water exists only as vapour or solid in the interstellar space and only through star formation leading to associated planets and cometary bodies can there be access to liquid water. To control conditions leading to star formation is of paramount importance in cosmic biology. The rate of star formation is controlled by two factors. Too high a rate of star formation produces a destructive effect of UV radiation and destroys cosmic biology. Star formation as skated before produces water, crucial for bacterial growth. Cosmic biology of magnetotactic bacteria and star formation are thus closely interlinked. Systems like solar system do not arise in random condensation of blobs of interstellar gas. Only by a rigorous control of rotation of various parts of the system would galaxies and solar system evolve. The key to maintaining control over the rotation seems to lie in the intergalactic magnetic fields as indeed the whole phenomena of star

formation. The intergalactic magnetic fields owes its origin to the lining up of magnetotactic bacteria and the cosmic biology of interstellar bacteria can prosper only by maintaining a firm grip on the interstellar magnetic field and hence on the rate of star formation and type of star system produced. This points to a cosmic intelligence or brain capable of computation, analysis and exploration of the universe at large - a cosmic intelligence of magnetotactic bacterial networks.

The origin of life on earth according to the Hoyle's hypothesis would be by seeding of bacteria from the outer intergalactic space. Comets carrying microorganisms like magnetotactic bacteria would have interacted with the earth throughout its entire history of 4.5 billion years. A thin skin of graphitised material around a single bacteria or clumps of bacteria can shield the interior from destruction by UV light. The sudden surges of evolution and diversification of species of plants and animals and their equally sudden extinctions evident in fossil record point to sporadic evolution produced by induction of fresh cometary genes with the arrival of each major new crop of comets. Cometary genes would get grafted on to preexisting biological stock leading to dramatically new lines. The most likely route to ground level for an extra terrestrial microorganism that comes to be dispersed in the stratosphere is via the rain. The micro-organism would effectively serve as a nucleus around which a particle of water ice could grow. The cosmic dust grains of bacteria have been hypothesized to seed the clouds to produce rain.

The evolution of neural networks in living things would have been from self-organised clumps of magnetotactic bacteria. The primitive magnetotactic bacterial clumps would have evolved into higher life forms. The clumps of magnetotactic bacteria would have been the origin or progenitor of all neural organisations in living beings. It would have evolved initially to the

polysynaptic neural networks of the initial multicellular organisms and by progressive cephalisation to organised brains. This could be the evolutionary origin of the magnetoreceptors and magnetoperceptive functions of organisms.

The general systems theory shows that living organisms tend naturally to self organise towards increasingly complex and hierarchal structures described by what is known as creative evolution. Consciousness itself, the highest fruit of such biological systems and typical of the highest tiers of hierarchal systems in general, exerts downward control over the various level beneath. For the evolution of order and complexity as described, the pattern of already created assemblies is conserved and used over again, this suggests the existence of memory in nature or a memory field.

The self is a collection of momentary images of the external world stored in the neuronal networks mediating short-term memory. The sum total of information in various neuronal networks in living selves/organism taken as a collective universal whole represents a memory field serving the purpose of information storage for self organisation to higher levels of complexity. This collective mind represents the memory field of nature. The memory field information is conserved by an interneural network transfer of informational traces by quantal perception.

The role of this collective mind or memory field in self organisation or evolution of complex life forms in earth is comparable to the intergalactic magnetotactic bacterial clumps related magnetic fields playing a role in formation of galaxies and solar systems. The intergalactic magnetic field of magnetotactic bacteria, the cosmic brain communicates with animal and human brains via quantal perception. The intergalactic magnetic field and geomagnetic field of earth can thus regulate human brain function. It is a well defined

non-locally interconnected closely knit system of interacting intergalactic, geomagnetic - and neuronal magnetic fields.

Digoxin and Morphogenesis / Embryogenesis - Reincarnative Experiences - Archaeal Digoxin and Fertilisation

The fertilisation between the ovum and the sperm results in the formation of the embryo. The mechanism of fertilisation has been worked out in the sea urchin embryo. There is an increase in the enzyme nitric oxide synthase within the sperm head prior to fertilisation, Nitric oxide synthase catalyses the formation of nitric oxide. This nitric oxide is injected in to the ovum. There is an increase in calcium in the embryo before embryogenesis starts. The same mechanisms are postulated to occur in the human embryo also before fertilisation.

Studies with rabbit embryos have demonstrated elevated endogenous digoxin in the embryos after fertilisation. This digoxin is synthesized by the human hypothalamus as well as locally in the sperm head and probably in the ovum by the isoprenoid pathway. Digoxin produces membrane $\text{Na}^+ - \text{K}^+$ ATPase inhibition and this results in an increase in intracellular calcium and reduction in intracellular magnesium. Magnesium can regulate the function of DNA polymerase, RNA dependent DNA polymerase, DNA ligase and ribosomal integrity. Magnesium can thus regulated the DNA replication, translation and protein transcription process. In the presence of magnesium deficiency the ribosome will disintegrate. The alteration in embryonal calcium / magnesium ratios can regulate all this cell function. Thus embryogenesis depends upon hypothalamic archaeal digoxin secretion.

Reincarnative experiences could result from a transfer of information by quantal perception to virgin newborn minds to create an initial bank of

information to which new information is added by experiences in life. This could create a continuous process of information transfer from generation to generation creating different personalities as an end product of interactions occurring in forward directions through years and centuries. Human almanacs have been described in several civilisations describing the past, the present and future births of individuals. The basis of it could be by transfer of information by quantal perception. In the quantal state the past, the present and future exists at the same time. This could be the basis of mind travel to the future and to the past.

Neuronal network independent electromagnetic traces can get impregnated within the embryo during the early stage of morphogenesis. Digoxin can produce a dielectric protein molecule pumped phonon system. This can produce a Bose condensed state at normal temperature resulting in quantal perception of neuronal network independent electromagnetic traces by the embryonal neuronal network developing in the brain. This could be the basis of reincarnative experiences. The NIMHANS study has shown evidenced for reincarnative experiences during the early stage of human development especially in childhood. The existence of spontaneous activity in foetal brain even before patterned sensory experience could be in part due to the reception of neuronal network independent electromagnetic information traces of deceased individuals.

References

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