➔ Neuro-Cognitive Warfare: Inflicting Strategic Impact via Non-Kinetic Threat | Small Wars Journal

MESS$_r$ 0001 - Report on Potential vectors of neurostrike/PNCC via NMDA receptor

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ABSTRACT

In this paper the author follows definitive studies conducted for pharmacological purposes[1] as well as developmental technologies to further understand and defend against "Havana Syndrome" and PNCC[2]/neurostrike potentials.

Key Words: Glutamate - Protein - Havana syndrome - NMDA - EMF

[1] Figure 1 - Metabotropic glutamate receptor - Proteopedia, life in 3D "*Structure of the glycosylated rat binding domain of the Metabotropic Glutamate Receptor, GluR1, bound to glutamate, Hepes and Mg+2 ions (1ewk)*"
[2] (DOC) NEURO-COGNITIVE WARFARE: INFLICTING STRATEGIC IMPACT VIA NON-KINETIC THREAT | Robert McCreight - Academia.edu

Report

Our brain is protected by a nice set of 22 bones including the frontal, parietal, occipital, sphenoid, and temporal bones. There is actually very little data on the material properties and related micromechanical features of the "cranial vault"[3] and we are limited by a lack of knowledge concerning its unique three dimensional properties as well the diploic characteristics. The diploic vein system interwoven throughout the skull acts as an additional site of reabsorption of cerebrospinal fluid.[4] This is an interesting point to recognize along with the fact that the micromechanical observations[5] tend to basically indicate the human skull is way "over-engineered" to simply function as a vault for muscular and skeletal protection alone.[6] The relationship between the different plates as well as the difference in density of muscle-bering bone vs. non-muscle-bearing bone may prove to be significant points of delineation in terms of providing other means of protection. Of course,this is provided further studies are conducted. For now, too little is known to draw any major conclusions; needless to say the cranial vault is simply "over-engineered" for something as simple as skeletal integrity.

> *"The brain has been recognized as one of the organs that is most vulnerable to microwave radiation…recent studies that have explored the effects of microwave radiation on the brain, especially the hippocampus, including analyses of epidemiology, morphology, electroencephalograms, learning and memory abilities and the mechanisms underlying brain dysfunction. However, the problem with these studies is that different parameters, such as the frequency, modulation, and power density of the radiation and the irradiation time, were used to evaluate microwave radiation between studies. As a result, the existing data exhibit poor reproducibility and comparability. To determine the specific dose-effect relationship between microwave radiation and its biological effects, more intensive studies must be performed."*[7]

Have we been unknowingly disrupting our development as a species? More urgently: have we unknowingly been the victims of a directed yet very subtle attack?

Concentrated and various forms of electromagnetic frequencies (EMFs) have been lingering throughout our environment for a long time now. In various concentrations and amplitudes based on where precisely in the world an individual spends the majority of their time. Nevertheless it is almost impossible to avoid all EMFs completely in today's modern world.

> *"Since regular radio broadcasts started in the 1920s, exposure to human-made electromagnetic fields (EMFs) has steadily increased. Nowadays, radio waves come not only from radios but also from a variety of other sources, such as navigation and communication systems, as well as high voltage transmission and transformation systems. Consequently, a very large fraction of the global population is exposed to EMFs"*[8]

Studies have been completed that demonstrate EMFs can cause DNA fragmentation to occur[9] yet fall very short of sounding any connective alarm to the general public. In fact, arguments can be made for the

[3] Cranial vault | Radiology Reference Article | Radiopaedia.org
[4] Cerebrospinal fluid - Wikipedia
[5] Material properties of the human cranial vault and zygoma
[6] (PDF) Material properties of the human cranial vault and zygoma | Paul Dechow - Academia.edu
[7] Recent advances in the effects of microwave radiation on brains | Military Medical Research
[8] Effects of Long-Term Exposure to L-Band High-Power Microwave on the Brain Function of Male Mice
[9] Biological effects of non-ionizing electromagnetic fields: Two sides of a coin - ScienceDirect

exact opposite occurring.[10] Any true concern raised is either quickly silenced or hurriedly rushed "off stage" for the sake of economic progress and technological advancement. This is the ignoring of potentially important evidence and data surrounding the 'side effects' of our modern world!

> *"...the results show the importance of the amplitude modulation in the interaction between EMF and neocortical astrocytes."*[11]

Neocortical astrocyte interaction with EMFs and the severity depend on a multitude of factors such as amplitude, frequency, exposure time and the physical homeostatic condition of the absorbing body. Astrocytes are an important part of processing neurons properly.

> *"Astrocytes are abundant throughout the mammalian central nervous system (CNS) and provide physical and nutritional support to neurons. Recent studies have also revealed that these cells contribute to information processing through regulation of synapse formation and elimination, as well as of synaptic transmission."*[12]

Electromagnetic fields (ELF-EMFs) have a direct effect on the processes taking place within the brain as well as the rest of the human body. There can be little doubt on this point based on the large number of observations, studies and research conducted. Yet, the extent, severity, long-term implications, short-term implications or even if it is a positive or negative effect has yet to be fully realized. Reportedly, unlike high-energy (ionizing) radiation, EMFs in the non-ionizing part of the electromagnetic spectrum cannot damage DNA or cells directly[13]. Some scientists have speculated that ELF-EMFs could cause cancer through other mechanisms, such as by reducing levels of the hormone melatonin.[14] Simultaneously, multiple studies have indicated there is a direct relationship between melatonin and glutamate found in observed defensive processes.[15]

> *"Melatonin very potently blocked glutamate neurotoxicity at all doses tested, with 10−3 M, the highest dose tested, being the most effective. Glutamate may exert a neuroprotective effect by blocking one or more steps of the oxidation cascade in neurons and this effect may be blocked by melatonin."*[16]

But what exactly is glutamate and why does it play such a critical role in this process? Glutamate acts as the medium through which neurotransmitter messages travel.[17] This is an important responsibility especially when regulation and equilibrium are vital to the successful delivery of each message. The development of new models and further understanding of the observed data sets as well as the underlying structure have led to interesting and significant findings.

> *"Glutamate receptors*[18] *mediate fast excitatory synaptic transmission in the central nervous system and are localized on neuronal and non-neuronal cells. These receptors regulate a broad spectrum of processes in the brain, spinal cord, retina, and peripheral nervous system…*

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[10] On the subject of Lying gurus and electrical universe
[11] Reactive oxygen species levels and DNA fragmentation on astrocytes in primary culture after acute exposure to low intensity microwave electromagnetic field
[12] Layer-specific morphological and molecular differences in neocortical astrocytes and their dependence on neuronal layers | Nature Communications
[13] Havana syndrome - Wikipedia ; see JASON reports
[14] Electromagnetic Fields and Cancer - NCI
[15] Melatonin disrupts circadian rhythms of glutamate and GABA in the neostriatum of the aware rat: a microdialysis study
[16] The Effects of Melatonin in Glutamate-Induced Neurotoxicity of Rat Cerebellar Granular Cell Culture - ScienceDirect
[17] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4133642/
[18] Glutamate Modulation Animation

Without question, the field of glutamate receptors has entered a new, structural era. Crystallographic data sets have created new opportunities to design functional studies from a perspective that previously was largely conjecture. Such studies promise to achieve a new level of understanding on how glutamate receptors link agonist binding to channel gating and will aide in defining how channel activation is controlled by receptor subtypes, stoichiometry, post-translational modifications, and protein-protein/protein-lipid interactions.

In transfected mixed cortical cultures, Gria4(Glutamate receptor 4) promoter constructs drove luciferase expression predominantly in neurons, indicating a 6- to 12-fold neuronal preference (Borges et al., 2003). Deletion of the Gria4 transcriptional initiation region decreased luciferase activity in neurons, but increased activity in C6 cells, suggesting that neuronal regulatory elements reside in this region."[19]

Luciferase is a completely different topic but the interaction and definition is an important addition. The study of photoproteins and the relationship to light and melatonin and therefore glutamate should not go unnoticed.

"Luciferase is a generic term for the class of oxidative enzymes that produce bioluminescence, and is usually distinguished from a photoprotein. The name was first used by Raphaël Dubois who invented the words luciferin and luciferase, for the substrate and enzyme, respectively. Both words are derived from the Latin word lucifer, meaning "lightbearer", which in turn is derived from the Latin words for "light" (lux) and "to bring or carry" (ferre).[20]

Whereas melatonin we know when exposed to light resets the circadian rhythm and acutely inhibits melatonin synthesis. Again, studies have shown how the protective nature of glutamate to highly oxidative states may be blocked by higher amounts of melatonin.[21] The relationship between melatonin and glutamate can and should be studied further for better understanding as well as its importance in allowing messages to be transmitted and received properly.

Monosodium glutamate, or MSG, is the sodium salt of glutamate.[22] MSG is actually an acidic form of glutamate and it is found in most all processed foods and used as an additive in multiple variations. Further as one can see demonstrated in Figure 2 below the NMDA receptor absorbs sodium in the process of transmitting messages between the axon and receptor. If the body has an increased amount of sodium present (in this case delivered in the form of MSG) then one can easily deduce the magnesium displacement that is normally created could possibly retain a certain specific charge. This charge would be in direct opposition to the magnesium normally displaced being produced in a divalent ionic state that would benefit the body in other locations. Valence is measured by the number of hydrogen atoms the particular element can displace or combine with. When in a divalent ionic state Magnesium contains the potentiality of two energetic states to be utilized in other places. If the divalent state is obstructed or lessened by the introduction of glutamate or the acidic form of glutamate through the addition of the MSG there could be obvious negative potentials. At the very minimum there will be an imbalance within the glutamate medium where the messages are normally transferred and lead to disruption in the ligand-gated ion channel being opened properly.

[19] Glutamate Receptor Ion Channels: Structure, Regulation, and Function - PMC
[20] Luciferase - Wikipedia
[21] The Therapeutic Potential of Melatonin: A Review of the Science - PMC
[22] Questions and Answers on Monosodium glutamate (MSG) | FDA .

"Magnesium ions (Mg2+) are the most abundant divalent metal ions within cells. They bind to a number of proteins and nucleic acids, regulating a wide range of biological processes such as ATP utilization, enzyme activation, and maintenance of genomic stability (Hartwig, 2001; Cowan, 2002). In humans, abnormal Mg2+ homeostasis is reportedly associated with several diseases including cardiovascular disease, diabetes, and high blood pressure."
Cellular Mg2+ homeostasis is maintained by a class of transmembrane proteins termed Mg2+ transporters."[23]

"The highest melatonin levels are in African-Americans. In each racial group they are highest in young African-Americans [30–50 years old (yo)], old Caucasians (60–90 yo) and Caucasian females.

"In humans, melatonin is well known for regulating circadian rhythm. It also has many other effects including regulation of immune and endocrine functions, and it shows anti-oxidative and protective properties against the cellular toxins and internal and environmental insults."[24]

"Environmental insults" is a very generous way to describe being poisoned en masse. It is almost undeniable this poison has a very distinct and targeted audience of individuals.(Ibid.) How would a nefarious group intent on controlling internal homeostatic processes go about reducing the protection provided by the recognised higher melatonin amounts within these age groups and specific demographics? As an extremely idiosyncratic and outside hypothesis; potentially African-Americans within the range of 30-50 could easily be targeted by economically positioned food choices within communities(with elevated MSG) combined with focused marketing. The Caucasian elderly could be potentially targeted through the delivery of large amounts of physician supplied pharmaceuticals. And the female Caucasians targeted through the supply of birth control medication in conjunction with marketing and societal pressures. Or if that fails just inject all groups with a mandatory vaccine of unknown, untested, unverified substances. But this is just a very loose and subjectively proposed hypothesis.

Are the effects of EMF exposure directly related to the amount of melatonin present? The studies all seem to indicate, "Yes." How much does the consistency and amount of glutamate present change things or exacerbate the effects? It appears to be significant, once out of balance/equilibrium.

The alarm needs to go off and people need to be held accountable before it is simply too late.

The number of mental disorders and psychological conditions present in the general population may continue to increase as a result of this being allowed to continue especially in the presence of EMF.

"Mechanistically, antagonist-mediated blocking of NMDA receptor (hypofunctioning) leads to the excessive release of excitatory neurotransmitters (glutamate and acetylcholine) in different brain regions, which in turn causes hyperstimulation of postsynaptic neurons and subsequent induction of psychotic conditions."[25]

[23] Functional roles of Mg2+ binding sites in ion-dependent gating of a Mg2+ channel, MgtE, revealed by solution NMR | eLife
[24] Melatonin and its metabolites accumulate in the human epidermis in vivo and inhibit proliferation and tyrosinase activity in epidermal melanocytes in vitro - PMC
[25] What are NMDA Receptors?

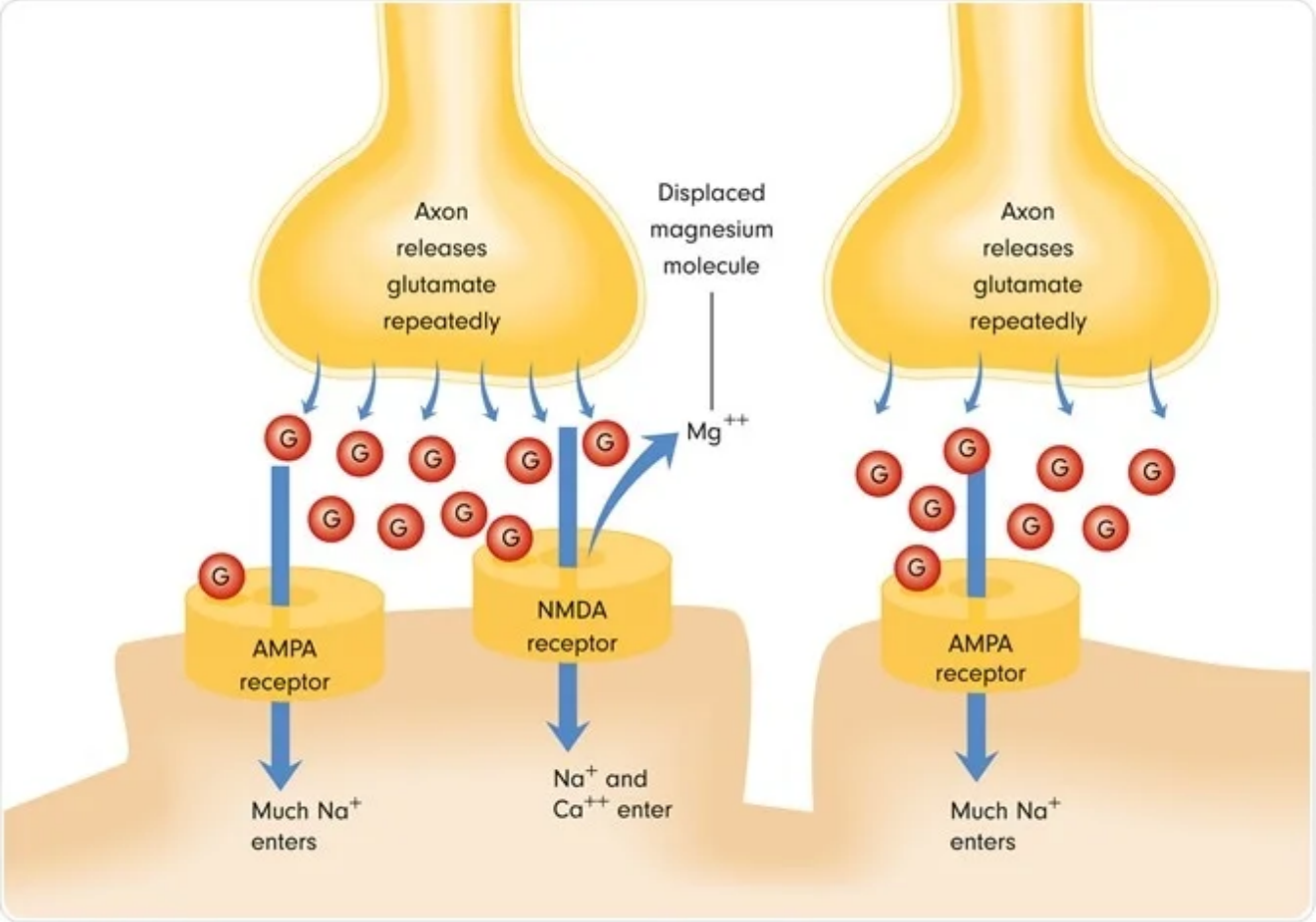


Figure 2 - NMDA receptor ; credit: Wikipedia

> *"N-methyl D-aspartate (NMDA) receptors are ligand-gated cation channels activated by an excitatory neurotransmitter, glutamate. These receptors are located mostly at excitatory synapses, and thereby, participate in excitatory neurotransmission in the central nervous system."*[26]

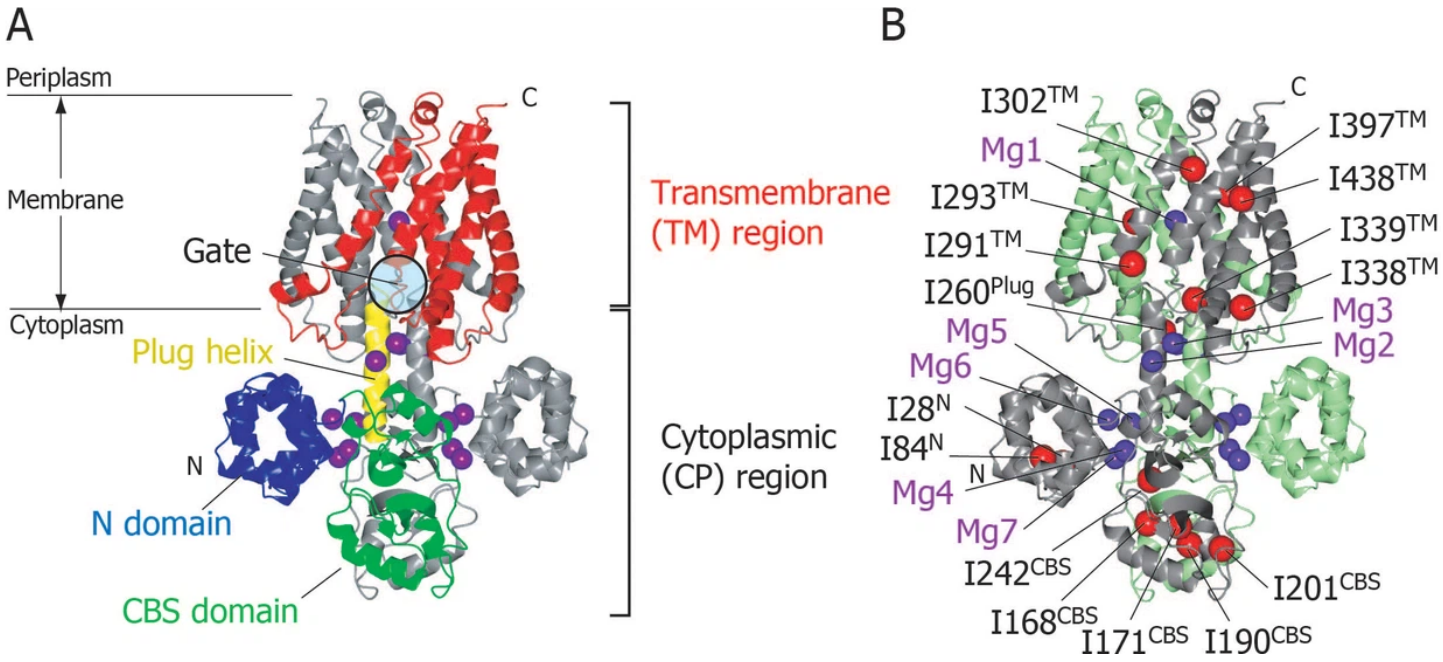
Ligand-gated ion channels (LIC or LGICs)[27] are receptors that allow portals to open within the medium i.e. glutamate to allow ions to pass freely through. The formation of portals takes place very rapidly and is part of the process commonly referred to as "thought". Memories, both long and short term, complexity of thought, recall potential as well as simply understanding different variables in a given situation, are all directly affected by this ionic portal opening being conducted properly and in a homeostatic environment. EMF interference to this process or improper disruption through an imbalance of medium, or both, result in a multitude of short and long term effects for the psychological and physical condition of any human being.

[26] What are NMDA Receptors?
[27] Ligand-gated ion channel - Wikipedia

Cellular and biological Star Gate and Force Fields

As we see have discussed divalent Magnesium states are displaced in the normal process of messages being sent within the glutamate medium. The benefit Mg divalent ions provide may be of greater importance than truly understood. The figure below and referenced study demonstrates the protection provided to RNA folds. The example below is only one of many to the importance commanded by Mg within the human brain and more specifically the presence of its necessary divalent ionic state.

> *"Mg2+ ions are important in biological systems, particularly in stabilizing compact RNA folds. Mg2+ is strongly polarizing, and representing its interactions in heterogeneous environments is a challenge for empirical force field development."*[28]



<u>Systemic Lupus Erythematosus(SLE) study showing cross-reation with NDMA to anti-DNA antibodies:</u>

The studies conducted and the research provided while observing existing conditions present in individuals have provided a great baseline for use in understanding ultimately how there could be an interconnectivity to EMF interference or imbalance in the medium for transmission of messages. One example of such are the studies conducted on SLE and the abundance of antibodies found present in the blood-brain barrier in specific locations as opposed to dispersed over large areas of the same.

> *"The recent appreciation that a subset of anti-DNA antibodies cross-reacts with the N-methyl-D-aspartate receptor (NMDAR) encourages a renewed examination of anti-brain reactivity in SLE autoantibodies. Moreover, investigations of their autospecificity present a paradigm for studies of anti-brain reactivity and demonstrate that 1) serum antibodies access brain tissue only after a compromise of blood-brain barrier integrity; 2) the same antibodies have differential effects on brain*

[28] Balancing the Interactions of Mg2+ in Aqueous Solution and with Nucleic Acid Moieties For a Polarizable Force Field Based on the Classical Drude Oscillator Model | Request PDF

function depending on the region of brain exposed to the antibodies; and 3) insults to the blood-brain barrier are regional rather than diffuse.

The benefit of using current case studies and completed analysis of neurological and psychological conditions cannot be understated. The abundance of information, though potentially confusing as an individual capture of isolated incidents; collectively will eventually form the full and complete picture of occurrences. The relationship to the physical and then back to precisely how external influences (such as EMF directed activity) would be a major benefit to all and an expected output to this endeavor once undertaken.

The etiopathogenesis of cognitive impairment and mood disorder remain a mystery. Studies of serum antibodies and cytokines have failed to show a reproducible signal…Further complexity is introduced by the fact that these symptoms can wax and wane, or, can be irreversible. Thus, it is not clear if one mechanism or multiple mechanisms are responsible for these symptom complexes…"[29]

Conclusions

Though there remains an ample amount of information to gather and studies to be conducted it is obvious that EMF has a direct and potentially harmful effect on the process of messages being sent to receptors within the brain. This effect most likely exists in conjunction with other factors such as the medium being polluted or over/under oxidation as well as the change in the ionic charge potential of the displaced element during the message transfer process. Ultimately; it is highly recommended further research be initiated on this topic and cross referenced to existing completed case studies of psychological and neurological conditions found in the past and present population.

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