

Various natural pathways to neurological malfunctions: Analysis of new research into various factors influencing neurological regulation

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Statement of the Problem: A major issue with research into treatment of neurological conditions is due to the mechanisms behind the brain's functions not being fully understood, it is very hard to then interpret malfunctions as we have no base from which to define a fault. Current research into neurology is now shedding new light into how combined factors create a balanced and cohesive system that operates the human brain. This study provides a cross-analysis of several current research fields that apply to the operation of the brain's electrical activity at how this combined information could provide new avenues for the detection, treatment and future research for seizures and other Neurological conditions.

Method: Several recent studies were examined across the fields of RNA gene Neuromodulation, timing malfunctions in Neuron pores creating irregularities in ion intakes, Neurological flaring caused by both increases in Excitatory neuron activity AND decreases in Inhibitory Neuron activity, research into possible Neurological and Psychological data encryption in the brain's electrical signals and studies being done into medical applications for advanced computer modelling of Neurological systems. These studies were analyzed in the context of detection and possible medical research applications into Epileptic seizures.

Findings: Numerous fields of study are finding that even if a minute malfunction occurs that is part of the system that regulates or influences the brain's normal

operational functions... if that fault is repetitive there is a domino effect that results in the fault not only increasing - but becoming exponential in effect by spreading to surrounding systems.

Conclusion: Given the highly complex mathematical nature of the issues and implausibility of being able to do any form of physical testing of these kinds of malfunctions, Advanced Computer Modelling via simulation seems the most likely first step in studying this in real detail.



Figure 1: Neurological structure with key elements reliant on cohesive regulation. Linked nature of system combined with individual processors reliant on signal integrity may lead to exponential & spreading faults.

Recent Publications

1. **Catia Andreassi, Hamish Crerar and Antonella Riccio (2018) post-transcriptional processing of mRNA in neurons: the vestiges of the RNA world drive transcriptome diversity. Front. Mol. Neurosci., 11:304.**
2. **Jochen C Meier, Marcus Semtner, Aline Winkelmann and Jakob Wolfart (2014) Presynaptic mechanisms of neuronal plasticity and their role in epilepsy. Front. Cell. Neurosci., 8:164.**
3. **Jokūbas Žiburkus, John R Cressman, and Steven J Schiff Seizures as imbalanced up states: excitatory and inhibitory conductances during seizure-like events Journal of Neurophysiology 109:5.**

Biography

Paul Lang is the CEO/Founder of ECA and has operational expertise and experience in a global non-profit organization that provides support and awareness for epilepsy, but also an online affiliate network that gives groups charity, medical, government and public entities based in epilepsy services into a centralized database and collaborative network(s). Having to provide information to the public via awareness campaigns and private enquiry combined with providing online services to charity to do similar requires a large amount of research into medical, social and technical fields. Due to the varying fields of research ECA has to cover and CEO analyze, several publications from the foundation and presentations made by CEO are based on cross-analytical studies done from research into current studies ECA/ he has compiled through work from enquiries, campaigns and various collaborative efforts with the foundations from ECA's connection base spread around the world across numerous fields.

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