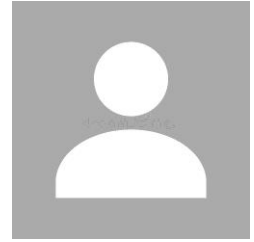


## Epilepsy as a Cortical Network Organization Disorder

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### Abstract (600 Word Limit):

Oscillatory rhythms in different frequency ranges mark different behavioral states and are thought to provide distinct temporal windows that coherently bind cooperating neuronal assemblies. However, the rhythms in different bands can also interact with each other, suggesting the possibility of higher-order representations of brain states by such rhythmic activity. To explore this possibility, we analyzed local field potential oscillations recorded simultaneously from the striatum and the hippocampus. As rats performed a task requiring active navigation and decision making, the amplitudes of multiple high-frequency oscillations were dynamically modulated in task-dependent patterns by the phase of cooccurring theta-band oscillations both within and across these structures, particularly during decision-making behavioral epochs. Moreover, the modulation patterns uncovered distinctions among both high- and low The brain is naturally considered as a network of interacting elements which, when functioning properly, produces an enormous range of dynamic, adaptable behavior. However, when elements of this network fail, pathological changes ensue, including epilepsy, one of the most common brain disorders. This review examines some aspects of cortical network organization that distinguish epileptic cortex from normal brain as well as the dynamics of network activity before and during seizures, focusing primarily on focal seizures. The review is organized around four phases of the seizure: the interictal period, onset, propagation, and termination. For each phase, the authors discuss the most common rhythmic characteristics of macroscopic brain voltage activity and outline the observed functional network features. Although the characteristics of functional networks that support the epileptic seizure remain an area of active research, the prevailing trends point to a complex set of network dynamics between, before, and during seizures.

### Importance of Research (200 Word Limit):

The rapid pace of disease gene discovery has resulted in tremendous advances in the field of epilepsy genetics. Clinical testing with comprehensive gene panels, exomes, and genomes are now available and have led to higher diagnostic rates and insights into the underlying. Carbon dioxide concentrations were measured at various depths and times in the unsaturated zones of two hydraulically and geochemically contrasting field sites, one in southeastern Washington state, and the other in south central Saskatchewan. In situ CO<sub>2</sub> production rates.

### Biography (150-200 Word Limit):

McGill University/Montreal Children's Hospital The cytoskeleton is thought to play a central role in cellular mechanotransduction. However, the specific mechanisms operative in bone cells have not yet been clearly elucidated. Isolating the roles of the specific cytoskeletal elements could ultimately aid in development of treatments for conditions related to the

mechanoresponsiveness of bone (e.g. osteoporosis, space flight). Using an osteoblast-like cell line, the minimum doses of nocodazole (microtubules) and cytochalasin D (actin filaments) that would partially disrupt the cytoskeleton while leaving some elements intact were determined. Cultures were exposed to fluid flow shear, and loaded in the presence or absence of inhibitory drugs at the previously established doses. In untreated cultures, shear stress was associated with significant increases in mRNA levels for collagen I and matrix metalloproteinases 1 and 3. These increases were maintained in.

### Information of Institute/ University/ Laboratory :(200 Word Limit)



McGill University (French: Université McGill) is a public research university located in Montreal, Quebec, Canada. Founded in 1821 by royal charter granted by King George IV,[9] the university bears the name of James McGill, a Scottish merchant whose bequest in 1813 formed the university's precursor, University of McGill College (or simply, McGill College); the name was officially changed to McGill University in 1885. McGill's main campus is on the slope of Mount Royal in downtown Montreal in the borough of Ville-Marie, with a second campus situated in Sainte-Anne-de-Bellevue, also on Montreal Island, 30 kilometres (19 mi) west of the main campus. The university is one of two universities outside the United States which are members of the Association of American Universities,[10] alongside the University of Toronto, and it is the only Canadian member of the Global University Leaders Forum (GULF) within the World Economic Forum

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