

# NOVEL THERAPEUTIC STRATEGIES IN NEUROSCIENCE

## IMPROVE MEMORY & COGNITIVE SKILLS

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[/EINPresswire.com/](http://EINPresswire.com/) -- The development of novel therapeutic strategies for Mild Cognitive Impairment (MCI) and Alzheimer's disease (AD) are major critical goals for neuroscience. Much attention has been given to the development of disease modifying pharmacological strategies targeting  $\alpha$ -Beta and/or p-tau accumulation, but to date, all relevant clinical trials have failed. This had led to a resurgence of interest in the development of tools for reducing disease burden and slowing disease progression. Of particular interest are noninvasive device based strategies, which, through mechanisms of

neuromodulation and neuroplasticity, can increase the efficiency of information processing by the brain. Synaptic dysfunction has been established as a core anatomical correlate of cognitive deficits in MCI and AD, with synapse loss preceding cognitive decline and cell death in AD.

The electroencephalogram (EEG) is generated by extracellular current sources and sinks established

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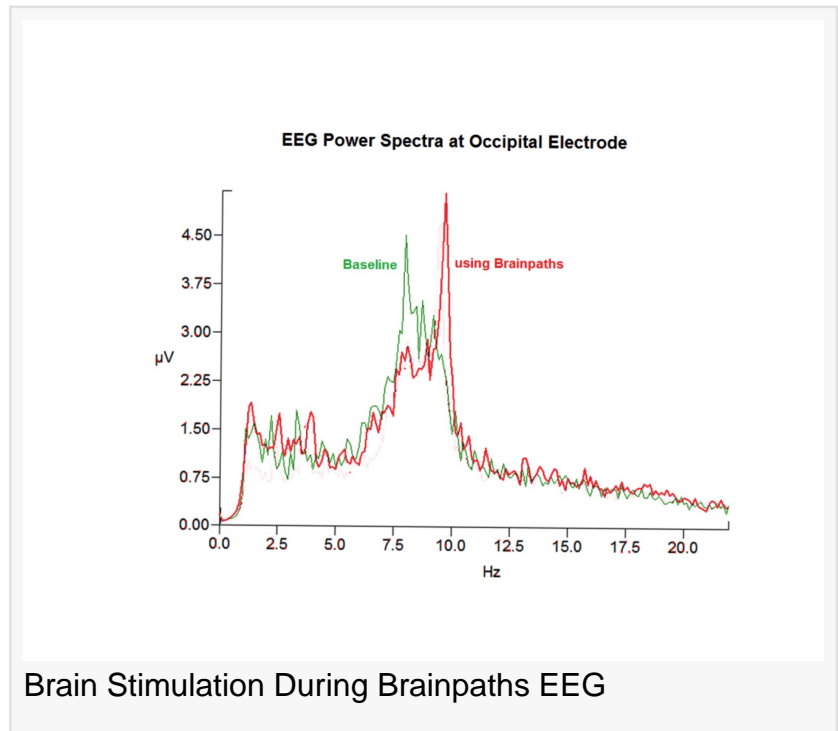
Brainpaths device is a hard, textured disk which, when pressed upon, provides substantial stimulation to the somatosensory system.”

*Dr. Jeffrey Lewine*

by synaptic currents. As such, the EEG is a potential, noninvasive index of the integrity of synaptic activity. The normal resting EEG is dominated by the posterior 8-13 Hz alpha rhythm. Longitudinal studies show that the peak resting-state frequency is relatively stable during most of adulthood, but, for normal ageing beyond 60 years, it starts to diminish by about 0.08 Hz/year. However, in patients with MCI/AD, rapid decline in peak frequency is often seen, with theta dominance (4-8 Hz activity) becoming dominant as dementia progresses. This raises the possibility that

therapeutic interventions aimed at maintaining synaptic stability as indexed by higher peak EEG frequencies might be of clinical benefit.

One such intervention may be the Brainpaths device. Briefly, the device is a hard, textured disk which, when pressed upon, provides substantial stimulation to the somatosensory system. In a single subject pilot study it was found that during use of the device there was a substantial increase in alpha peak frequency, as shown in figure 1. The device is very inexpensive, and it is easy and fun to use, so it has the potential to make a widespread impact on the aging community.



Several key issues must be addressed to provide a viable scientific evidence base and foundation for promotion of this device. The proposed research will address the following:

1. Can the acute impact of the use of Brainpaths on EEG activity be replicated in a larger normal aging population, and can it be extended to MCI and AD populations?
2. Does consistent daily use (20 minutes) of Brainpaths over the course of one month lead, through mechanisms of neuroplasticity, to a persistent baseline increase in alpha peak frequency that is seen even when the device is not being used during the EEG recording?
3. Are there clinically meaningful changes in cognitive abilities or mood that are associated with use of the device?
4. Are any persistent changes that are seen device specific, or can they be achieved with a placebo (non-textured) device.

Dr. Jeffrey David Lewine, Ph.D. Professor of Translational Neuroscience & Director of Business Development, MRN Mind Research Network, Director of Neuroscience, Lovelace Scientific Resources 1101 Yale Blvd Albuquerque, NM 87106 505-272-5028. Research is ongoing at MRN, Albuquerque, New Mexico, while other University Medical Research Programs add Brainpaths research to their studies.

Brainpaths: USPTO Utility Patent 9,132,059 and FDA 2018 Registration 3010937782: Brainpaths is a Medical Device exempt from 510K testing. Patricia Derrick, Brainpaths Inventor, President, Founder; 702-804-9997 [Brainpaths.com](http://Brainpaths.com), Brainpaths@gmail.com.

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