



GT Ref: 8745

## **Brain Stimulation Systems and Methods**

Category: Neuromodulation Technology

Contact: [Kashmira Kulkarni](#) Phone: 470-303-2350

### **Summary**

This technology offers a novel approach to treating neuropsychiatric and neurological disorders through non-invasive brain stimulation, using sensory flicker at specific frequencies to induce neurological responses. It targets stress-susceptible brain regions like the hippocampus and prefrontal cortex, areas traditionally difficult to reach with non-invasive methods. Originally demonstrated to reduce Alzheimer's disease pathology in mice, this method has now shown promising results in boosting resilience to stress and preventing stress-induced anxiety, anhedonia, and cognitive impairment.

### **Development Stage**

Prototype and First Operational Test Complete

### **Problem Statement & Solution**

Neuropsychiatric and neurological disorders profoundly impact millions worldwide, often exacerbated by chronic stress. Traditional treatments can be invasive or yield undesirable side effects, and non-adherence to therapies like exercise further complicates effective management. This novel non-invasive brain stimulation technology uses sensory flicker at specific frequencies to target traditionally inaccessible brain regions involved in stress response, such as the hippocampus and prefrontal cortex.

Researchers at the Georgia Institute of Technology have developed this innovative method of brain stimulation to effectively increase resilience to chronic stress, potentially reducing the incidence of disorders such as major depressive disorder and Alzheimer's disease. It also prevents symptoms like anxiety and anhedonia, offering a promising alternative to current treatments with fewer side effects.

### **Advantages**

- Completely non-invasive, avoiding the complications of surgical interventions.
- Prophylactic nature reduces the risk of developing stress-related conditions, rather than treating them post-development.
- Personalizable to meet individual patient needs, enhancing efficacy and patient compliance.
- Targets deep brain regions not accessible by current non-invasive stimulation methods.

### **Commercial Applications**

- Treatment and prevention of neuropsychiatric disorders like depression and anxiety.



- Prophylactic interventions for individuals at elevated risk of neurodegenerative diseases such as Alzheimer's.
- Stress management programs for improving mental health and cognitive functions.

**Lead Inventor:** [Annabelle C Singer, PhD](#)

**Intellectual Property Status:** US Patent Issued- [WO2023122281A1](#)

**Scientific Publication(s):** Pritchard, A., Singer, A., et. al: (2023). Brain rhythms control microglial response and cytokine expression via NF- $\kappa$ B signaling. [Science Advances, 9 \(32\)](#).