



# SEMA LAB

ENHANCING MINDFULNESS MINDFULLY

## The Problem

Mindfulness is an effective intervention for pain, addiction, and mood disorders, but often patients do not comply with the protocol long enough to experience the full potential for deep, long-term benefits.

## Our Solution

Our mission is to develop a tool (transcranial focused ultrasound, tFUS) that safely accelerates the benefits of mindfulness so that practitioners are more motivated to adhere to the practice over the long term.



## Our Vision

### Research and clinical applications

- Empirically validate safe sonication-enhanced mindful awareness (SEMA) applications
- Test SEMA in a wide range of populations (pain, depression, anxiety, addiction, etc.)
- Scale for use in clinical settings

### Hardware development

- Optimize device to be self-contained
- Develop optimal beam physics for effective transcranial transmission
- Create and lease hardware for use in other research settings

## Research Plan

### Research

Year 1

- MRI study demonstrating BOLD changes as a function of tFUS
- Longitudinal study demonstrating safety of more than 4 tFUS sessions
- Experiment to demonstrate usefulness of SEMA for pain management

Year 2

- Demonstrate SEMA's effectiveness for addiction, emotion regulation, anxiety, etc.
- Develop, test, and scale clinical protocols

### Development

- Remove necessity of MRI for precise tFUS application, making the device self-contained
- Solve beam scattering problems that arise when delivering tFUS through skull
- Build and lease research hardware to other laboratories in order to increase breadth of tFUS research

## Our Team



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