Description:

gamma rhythm is a music and video art piece based on the recent research of Li-Huei Tsai, director of the Picower Institute for Learning and Memory at MIT. Her work focuses on addressing Alzheimer’s disease via gamma rhythms, the rate of neuron firings that occurs in the brain. For patients with Alzheimer’s, gamma rhythms fire irregularly, and microglia (i.e. “janitor cells”) do not properly clean plaques that build up in the brain. In testing, Dr. Tsai’s team used flashing LED light optogenetics at a rate of 40/second on mice, discovering that this process can not only synchronize neural firing and encourage the janitor cells to resume cleaning, but may also allow memories to resurface after they have been forgotten. Though this noninvasive treatment is not a cure for Alzheimer’s and much more research is still being conducted, it has broken promising ground in the field of learning and memory.

My grandfather passed away in 2013 with Alzheimer’s; in the decade leading up to this, my family experienced the gradual and painful degradation of what made him “himself”. gamma rhythm is designed to evoke this experience, beginning with an explosion of human noises (humming, gasping, sighs, etc., all recorded by members of my family), an eventual erosion of these experiences, and a retreat into the brain, where memories are blurred and hazy. The optogenetics are realized through images of sparks and electricity, uneven at first but gradually becoming more regular, stimulating neural activity. All sounds used at the end are reversed, a comment on the recall of memories.

My goal for this submission is to draw awareness to this groundbreaking research through an artistic lens, reaching the many families of the 1 in 3 who will die from Alzheimer’s or age-related dementia.

Listening with headphones is recommended.

Resources:
All sounds used for this piece were derived from my family’s recording session, synthesizers, and some public domain electric sounds.
Video footage used for this project includes:
- Home movie: 10056: Visit to California, ca. 1920s (from archive.org’s Prelinger Archives)
- The Human Brain, DK Publishing UK: Neurotransmitter Synapse 3D Animation
- Deep-Tissue Imaging Techniques by UNC neuroscientist Garret Stuber, PhD

For more information on the Picower Institute:

For the Radiolab podcast that introduced me to this research in 2016 (an easy-to-digest version of this research, and a great listen all around):
https://www.wnycstudios.org/story/bringing-gamma-back