Yifan 326 Project

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Effects of Hearing Loss on Cognition

1. Methods
    a. Determine baseline neuron activity in auditory cortex in mice (2P)
    b. Continue long-term monitoring of specific cell groups before, during, and following noise-induced hearing loss
    c. Behavioral testing to determine degree of hearing loss (sound box)
    d. EXTRA: since noise-induced hearing loss has been shown to have deleterious effects on the hippocampus, we will test the ability of rats to perform a memory-guided task that has been previously learned and determine any changes in performance
2. Intro/background
    a. Issue of noise-induced hearing loss in the human population
    b. Studies showing hearing loss is associated with cognitive decline and memory impairment
    c. Mechanism of hearing loss:
        i. Loud sounds --> excessive vibration leading to damage of cochlear hair cells --> auditory signals not properly converted to neural signals
        ii. How does damage to cochlear hair cells affect CNS function by interrupting how auditory cortex interacts with cortex and hippocampus, leading to impaired memory/cognition? (this is what we want to study)
    d. Inner ear
    e. Auditory cortex
    f. Hippocampus
    g. Relevant pathways connecting them