**Analysis of mouse hippocampal neuron morphology across ApoE strains.**

Apolipoprotein E is the greatest genetic risk factor for Alzheimer’s disease. It’s associated with increased neuroinflammation, synaptic dysfunction, mitochondria/metabolism dysfunction, Tau aggregation, and Amyloid-beta aggregation/reduced clearance, which are characteristics of dementia. The hippocampus is a brain region that is critical for memory consolidation and retrieval and is one of the first structures damaged during the progression of dementia. Since ApoE-4 is associated with an increased risk of dementia, but the presence of other alleles is not, we hypothesize that neurons in the hippocampus of ApoE-4 mice will show different morphologies compared to the other strains. Therefore, this study sought to determine if Apo-E alleles affect hippocampal morphology. The objective for this project is to use R to create a script that compares morphologies of hippocampal neurons across various ApoE alleles. Therefore, the scientific approach is to generate a script that will extract data from NeuroMorpho.org API and compare morphological characteristics between ApoE alleles. NueroMorpho.org contains thousands of digitally reconstructed neurons that are uploaded from labs across the world. We extracted data from NeuroMorpho.Org, filtered for hippocampal neurons, ApoE-4, ApoE-Knockout, ApoE-3, and C57BL/6. Next, we wrote a script in R that compares soma surface area volume and surface area and plotted these results. Our data show that ApoE-3 have the biggest soma volume and total surface area.