

PHARMACOLOGY, PHYSIOLOGY, & NEUROBIOLOGY
COLLEGE OF MEDICINE

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

FOR APPLICATION YEAR: 2025

PROJECT TITLE: Interaction between human APOE polymorphisms, sex differences and obesity in hippocampal mitochondrial functions

Karthickeyan Chella Krishnan, PhD (he/him)
Assistant Professor
Pharmacology, Physiology, & Neurobiology
University of Cincinnati College of
Medicine
231 Albert Sabin Way
Cincinnati, OH 45267-0575
Office: MSB 4255
Lab: CARE 5882-86
Ph: (513) 558-8679
Email: chellakn@ucmail.uc.edu
Lab URL: <https://med.uc.edu/klab>

Project Description

Alzheimer's disease (AD) is a neurodegenerative disease that affects 6.5 million Americans aged 65 or older. Of the 6.5 million Americans with AD, 4.2 million of them are female, demonstrating that the female sex is at higher risk for AD than the male sex. One genetic risk factor for AD is the Apolipoprotein E (APOE) genotype. APOE has three predominant alleles in humans: APOE2, APOE3, and APOE4. Individuals that are homozygous for APOE4 have up to a 15-fold increase in AD risk compared to APOE3 homozygous individuals. A third, modifiable risk factor for AD is diet. A high-fat, 'Western' style diet has been shown to be associated with AD. The overall goal of this study is to test the direct relationship and cumulative burden between the APOE4 genotype, female sex, obesity and mitochondrial activity.