Newman Lab

Alzheimer's disease (AD) arises from the intersection of aging, disrupted metabolism, proteostatic collapse, and impaired neuronal plasticity. The Newman laboratory investigates how metabolic state governs these converging processes to influence vulnerability and resilience in the aging brain. Our recent work has defined β-hydroxybutyrate (BHB), a principal circulating ketone body, as a signaling metabolite that remodels the brain proteome and promotes the clearance of aggregation-prone proteins characteristic of neurodegenerative pathology. In parallel, short-term ketogenic interventions in aged mice have been shown to rejuvenate the synaptic proteome, engaging cAMP–PKA signaling and enhancing BDNF-dependent synaptic plasticity and cognitive performance. Together, these findings establish a mechanistic framework in which metabolic reprogramming restores proteostatic capacity and neuronal function in the aged brain.We continue to pursue this line of work, focusing on how changes in cellular metabolism and protein regulation shape brain health and longevity.