Research Abstract
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Exposure to phthalates, including di-(2-ethylhexyl) phthalate (DEHP), is ubiquitous in humans. The degree of DEHP exposure during gestation is positively associated with impaired neurodevelopmental outcomes in offspring. Phthalates induce oxidative stress, a proposed mechanism of altered neurodevelopment. In the MARBLES cohort, I found evidence of oxidative stress in the maternal serum metabolome of women with high DEHP exposure. This increased oxidative stress appeared to be rescued by high folate intake. High maternal DEHP exposure was inversely associated with offspring cognitive assessment, with high folate intake protective of developmental outcomes. I propose to mechanistically study the impact of folate supplementation in perinatal DEHP exposure on offspring neurodevelopment using a rat model. Dams will be exposed to DEHP with or without folate supplementation. I will validate the results observed in humans by assessing the maternal serum metabolome in pregnant rats with or without folate supplementation. The offspring will undergo cognitive testing to assess impacts on spatial learning. I will perform metabolomics, proteomics, and transcriptomics on the offspring hippocampi to assess the impact of DEHP exposure and folate during development. This will help to mechanistically understand how DEHP impacts offspring neurocognitive development, and the role folate can play to alleviate its impacts.