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**Dietary emulsifiers and their effects on differential gene expression in the amygdala, paraventricular nucleus, and arcuate nucleus of mice.**

Working Abstract (missing results and conclusion)-

As obesity, inflammatory disease and stress disorders continue to rise in western society, the assessment of factors contributing to the increase in these debilitating diseases becomes critically important. One such factor is the western diet. Recent findings show that western diets, which are high in food additives, such as emulsifiers, promote low grade inflammation, metabolic disease and anxiety-like behaviors. However, little is known about the effects of emulsifiers on brain areas that modulate feeding and stress related behavior. In this study, the effects of two emulsifier agents on gene expression in brain regions known to modulate feeding behavior or the stress response, were examined. Mice were given normal drinking water, drinking water containing carboxylmethylcellulose (CMC) or drinking water containing polysorbate 80 (P80) for 12 weeks. Gene expression of amygdala, paraventricular nucleus, and arcuate nucleus brain tissue was analyzed using next generation RNA sequencing (RNAseq). Differential gene expression and pathway enrichment analysis further elucidate possible mechanisms by which dietary emulsifiers influence feeding and stress-like behavior. In addition, candidate genes are identified that may contribute to the obesity and anxiety-like phenotype exhibited by emulsifier diet mice.