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"Impact of chronic plus binge alcohol exposure on the expression of inflammatory markers in the taste buds of young and aged male and female C57/Bl6 mice

Taste influences food preferences and dietary choices, which in turn can lead to changes in nutritional status and metabolic health. Understanding factors that contribute to taste dysfunction may elucidate mechanisms that lead to metabolic disease (e.g. obesity, diabetes). Previous studies suggest that inflammation of the taste buds may mediate taste dysfunction. Alcohol is a commonly consumed substance that has been shown to promote systemic inflammation. However, the effects of alcohol on taste bud inflammation have not been studied. This study aimed to investigate the impact of chronic plus binge alcohol exposure on markers of inflammation and cell proliferation in taste buds. Specifically, we assessed fungiform papillae density and the expression of inflammatory markers in the circumvallate papillae of young and aged, male and female mice.

Young (13 weeks old) and Aged (73 weeks old) male and female C57/Bl6 mice were given *ad libitum* access to either a liquid, Leiber DiCarli diet containing 5% ethanol or were pair-fed the Leiber DiCarli diet without ethanol. To mimic a chronic plus binge alcohol use pattern, mice were given a bolus of ethanol (5g/kg via oral gavage) on days 10 and 30. Diet intake and body weight were assessed daily. The tongue, circumvallate papillae and hypothalamus were collected 24 hours following the last ethanol binge. Fungiform papillae were counted following staining with 0.5% methylene blue. Expression of inflammatory biomarkers in the circumvallate papillae were assessed using qPCR.

The male and female fungiform density were analyzed using a two-way ANOVA, and there was no significant difference in fungiform density when comparing age groups or alcohol exposure groups. Males did have a significant difference between young and aged mice. When comparing body weight change by a mixed ANOVA, there were significant interactions between day, age, and alcohol. At day 5, young-alcohol and aged-alcohol lost less weight than the young-pairfed and aged-pairfed. From day 20-30, the aged-pairfed gained more weight than the young-pairfed. After binge 1, young-ethanol and aged-ethanol mice lost more weight than their pair-fed counterparts. After binge 2, the young-alcohol mice lost more weight than the young-pairfed. Expression of CCL2 mRNA, KCNQ1 mRNA, IL10 mRNA and Ki67 mRNA in the circumvallate papillae was not affected by alcohol and did not differ by sex. Analyses of other inflammatory markers and markers of taste signaling are underway.