

Department of Biological Sciences

Susan Chyou

Mentor: John Glendinning

The Influence of Allelic Variation in *Tas1r3* on Short-Term Licking Responses in Mice

Evaluating the process by which sweetener intake is controlled has important applications in dealing with current issues regarding physical health. The sweet taste receptor protein gene in mice, *Tas1r3*, has been implicated in influencing long-term sweetener intake and preference. Two different alleles have been discovered, designated as taster and nontaster, and are phenotypically distinguishable by the relative amount of sweetener consumed in long-term 48-hr tests. The nontaster allele is thought to be a less functional version of the taster allele, and thus reduces sweetener intake. Currently, *Tas1r3* is hypothesized to be the principal gene effecting differences in sweetener consumption between different strains of mice. To test the direct influence of the *Tas1r3* allele and minimize the effect of other factors, we analyzed 1-min short-term lick responses in 4 taster strains (FVB, SWR, B6, SM) and 4 nontaster strains (129, C3H, D2, Balb) to sucrose and SC45647, a noncaloric sweetener. Furthermore, heterozygous and knockout *Trp* mice also underwent evaluation. Our results show that sweetener intake does not assort to taster and nontaster status, and imply that there are other factors at play in addition to the *Tas1r3* gene. Further studies that are currently ongoing may help clarify the nature of other influences on sweetener intake.