

ABSTRACT

THESIS PROJECT: Comparison of Differences Between PWD/PhJ and C57BL/6J Mice and Effects of Glutathione on Chorda Tympani Nerve Responses to Calcium Solutions.

STUDENT: Chandra Mouli Cherukuri

DEGREE: Master of Science

COLLEGE: Sciences and Humanities

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I conducted electrophysiological work in C57BL/6J (B6) and PWD/PhJ (PWD) mice, with the goal of providing insight into the genetic and physiological controls of calcium intake. Prior behavioral preference tests indicated that PWD mice have higher preferences for calcium compounds compared to B6 mice, though several mechanisms could underlie this observation. I therefore measured taste-evoked chorda tympani (CT) responses in B6 and PWD mice, in order to investigate the specific role of taste sensation. A second experiment was conducted to investigate the role of the calcium-sensing receptor (CaSR) in gustatory transduction of calcium ions, using the CaSR agonist glutathione. In experiment 1, responses were significantly larger in PWD than B6 mice for CaCl₂, MgCl₂, citric acid and quinine, but did not differ between the strains for sucrose, KCl and NaCl. These strain differences in CT responses were especially large for tonic, rather than phasic, responding. These data suggest that differences in peripheral events, such as taste transduction, contribute to differences between B6 and PWD mice in

preferences for taste solutions such as CaCl_2 . In experiment 2, glutathione at $100 \mu\text{M}$ had negligible effects on taste-evoked CT responses, which does not support a role for CaSR in mediating taste transduction of calcium ions.