The Role of Central Amygdala Projections to the Parabrachial Nucleus on Ingestive Behavior in Rats

Abstract

Previous studies have shown that benzodiazepines, such as chlordiazepoxide (CDP), increase palatability through GABA, agonistic effects within the parabrachial nucleus (PBN). The PBN is a primary relay point in the gustatory pathway that receives input from corticofugal projections including the central amygdala (CeA). The purpose of this study was to determine the effects of selectively inactivating CeA projections to the PBN with the use of the DREADD technique in concurrence with the systemic injection of CDP. Bilateral cannulae were used to microinject CNO or aCSF into the PBN of naive male Sprague-Dawley rats. Rats’ licking behavior during consumption of 0.2 M sucrose and 0.3 M sodium chloride was analyzed. The results showed that there was a significant main effect of CDP on meal licks, burst size, pause duration, interlick interval and first minute licks in both the sodium chloride and sucrose conditions. The results also showed a significant main effect of inactivating the central amygdala on pause duration in the salt condition and the number of bursts in the sucrose condition, but this may be due to high variability across conditions. The results suggest that the central amygdala does not play a major part in mediating taste palatability possibly because there could be other structures that compensated when the central amygdala was inactivated. There also may not have been a long enough delay after injecting the CNO to completely silence the projections. Therefore, future studies should consider altering the injection protocol as well as assessing the role of other corticofugal projections to the PBN.
Figure 7. Licks in the first minute for salt (A) and sucrose (B) comparing CDP to saline and aCSF (CeA-control) to CNO (CeA-inactivated). Error bars represent standard error.