Chen Institute Retreat 2023

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Poster title: The cellular mechanism of osmolarity sensing in the mammalian brain

Abstract: Thirst perception is closely related to water and fluid intake for animals to maintain a water/salt balance and a robust osmolarity of the body fluid. A drive for thirst is raised when the osmolarity of body fluid is increased, a function closely linked to brain areas called circumventricular organs (CVO), including organum vasculosum lamina terminalis (OVLT) and subfornical organ (SFO). But, the cellular and molecular mechanisms by which the osmolarity changes in body fluid is monitored remain unclear. To address this question, we first examined the responsiveness of SFO neurons to hypertonic solutions, using electrophysiological recording and pharmacological methods. Surprisingly, we found that excitatory neurons in SFO are not intrinsically sensitive to hypertonic solutions. These results suggest that the mechanism of osmolarity sensing and thirst perception requires cell types other than neurons. To investigate this hypothesis, we developed a new calcium imaging platform for live brain slices containing CVOs. By utilizing this tool, we are investigating the responding profile of different cell types in CVOs. These results will provid new insights into the cellular mechanism of osmolarity sensing in the mammalian brain.