Presenter: Takako Yamamoto (Ichiki)

Title: Representation and sensing mechanisms of gut osmolality in the peripheral sensory ganglia

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Abstract: Ingested food and water stimulate sensory systems in the oropharyngeal and gastrointestinal areas before absorption. These sensory signals send feed-forward modulation signals to brain appetite circuits. Emerging evidence suggests that gut osmolality sensing rapidly inhibits thirst neurons upon water intake. Nevertheless, it remains unclear how visceral sensory neurons detect gut osmolality changes, and how they transmit the signals to the brain to modulate thirst. In this poster, we used optical and electrical recording to show that the vagal, but not the spinal pathway mediates visceral osmolality responses. Gut hypotonic stimuli activate a dedicated vagal population distinct from mechanical-, hypertonic, or nutrient-sensitive neurons. These hypotonic responses are partly mediated by a genetically defined vagal population. Together, our results revealed peripheral representation, signal transmission pathway, and functional significance of gut water signals.