

## **Session II    Lecture 1**

# **Diurnal Rhythms in Taste Buds Enhance Taste Sensitivity During Active Periods**

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### **Summary**

To clarify the diurnal rhythms of taste sensitivity, we examined thresholds, subjective taste intensity, and preference for the five basic tastes at three different time points in human participants. The results showed an increase in sensitivity for sweet and bitter tastes during the daytime. Next, taste rhythms were examined in nocturnal rats. Their licking behavior toward sweet solutions was greater during the dark period compared to the light period, while licking toward bitter solutions was reduced during the dark. These results suggest increased taste sensitivity during the active periods in both humans and rats. Furthermore, in rat taste buds, we examined the expression patterns of genes involved in the sensation of sweet, bitter, and umami tastes, and confirmed upregulation during the dark phase. The findings suggest that the diurnal rhythms of taste sensitivity may be mediated by the regulation of taste-related gene expression in taste buds. This taste rhythm, where sweet and bitter sensitivity is elevated during the active phase, serves a beneficial function in efficiently locating energy sources while avoiding toxins. The rhythm of taste sensitivity might have contributed to improved survival rates in mammals over a long evolutionary history.