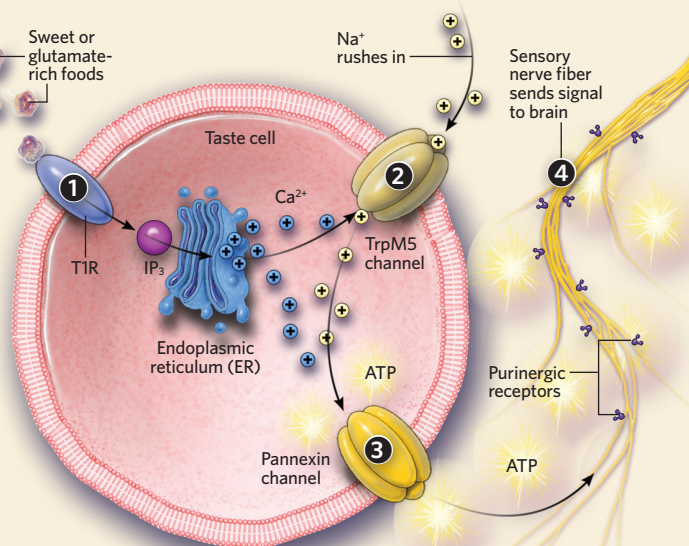


## TASTE IN THE MOUTH

Taste-bud receptors, primarily on the tongue, sense the qualities of salty, sour, bitter, sweet, and umami (the taste of glutamate). While sweet, umami, and salty foods provide pleasurable sensations that drive the intake of carbohydrates, amino acids, and sodium, the tastes of bitter and sour inhibit intake of potentially toxic substances and strong acids.



### THE TASTE SIGNALING CASCADE IN THE MOUTH

The binding of molecular components of sweet or glutamate-rich foods to T1R-class receptors and bitter substances to T2R receptors stimulates the release of Ca<sup>2+</sup> into the cytosol from the endoplasmic reticulum (ER) via G protein signaling and the second messenger molecule inositol trisphosphate (IP<sub>3</sub>) ①. The Ca<sup>2+</sup> activates the TrpM5 channel to allow the entry of sodium ions (Na<sup>+</sup>), depolarizing the cell ②. The combination of depolarization resulting from the influx of Na<sup>+</sup> and rise in intracellular Ca<sup>2+</sup> opens pannexin channels in the taste-cell membrane, releasing ATP from the cell ③. This in turn activates purinergic receptors on the sensory nerve fibers innervating the taste buds, thereby sending a signal to the brain ④.