

# Chem 452 - Lecture 10

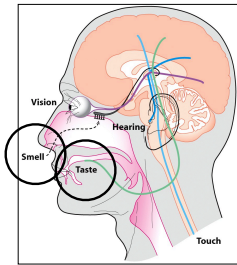
## Signal Transduction & Sensory Systems

### Part 5

**Question of the Day:** How can something sweet be made tasteless?

## Gustation (taste)

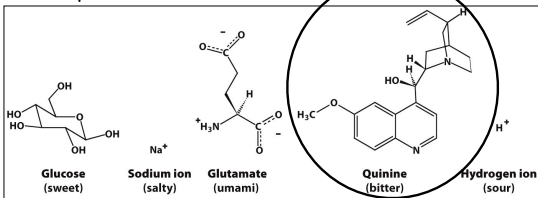
+ Complements smell



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## Gustation (taste)

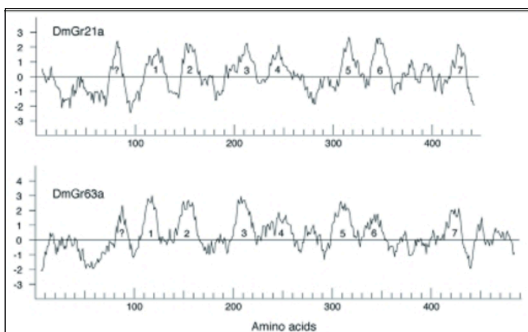
+ Gustation allows us to sense classes of compounds that we cannot smell.



**Question of the Day:** What evolutionary advantages might be derived from each of the five tastes; sweet, salty, umami (savory), bitter and sour?

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## Gustation (taste)

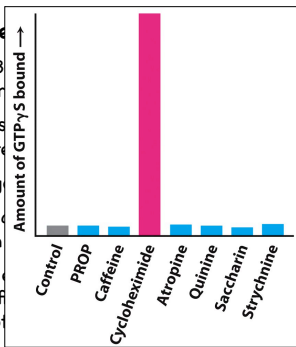


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## Gustation (taste)

† The **bitter**

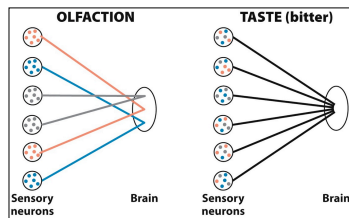
- About 30 bitter compounds have since been discovered
- There is a single receptor that responds to all bitter tastes
- The gustatory cells have taste buds.
- The sweet and salty receptors are GPCRs, which respond to a specific ligand and the



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## Gustation (taste)

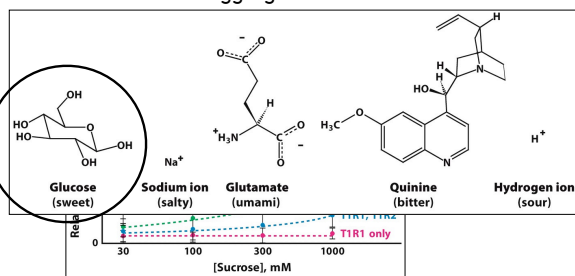
- † Unlike olfactory neurons, each bitter taste neuron expresses an array of different taste receptors, which all map back to the same region of the brain.



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## Gustation (taste)

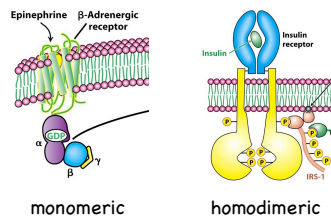
- † The **sweet receptors** appear to involve heterodimeric aggregates of 7TM subunits.



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## Gustation (taste)

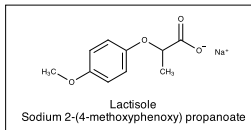
- † A heterodimeric receptor that is made from 7TM subunits present a new twist on receptor topography.



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## Gustation (taste)

- The sweet taste receptors can be blocked by lactisole
- Lactisole was originally isolated from Columbian arabica coffee beans.



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## Gustation (taste)

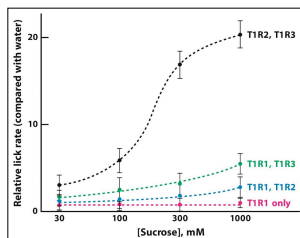
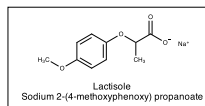
- Lactisole is used commercially to make sweet things unsweet
- e.g. Domino sugars Super Evison



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## Gustation (taste)

- Lactisole is believed to bind to the T1R3 receptor subunit and block the heterodimer formation.



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## Gustation (taste)

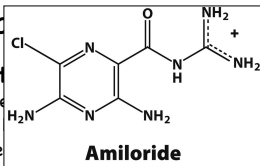
- The **umami receptors** appear to be closely related to the sweet receptors.
- They involve heterodimers of the T1R1 and T1R3 receptor subunits
- This compared to the sweet receptors which prefer the T1R2 and T1R3 receptor subunits.

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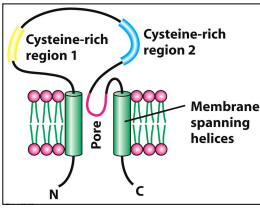
## Gustation

### + Salty taste

- This taste
- Like the an aggre



Amiloride

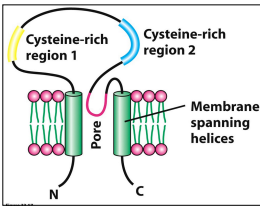


Na<sup>+</sup> taste channels can be blocked by amiloride

## Gustation (taste)

### + Likewise, the Sour taste involve H<sup>+</sup> ion channels.

- This taste also, does not involve 7TM receptors.



- Through their interaction and acidic and basic groups H<sup>+</sup> ions can also affect other types of channels

## Next up

### + Lecture 10 cond, Sensory Systems. (Chapter 33)

- Vision (transduction of light energy)
- Touch and Hearing (transduction of mechanical energy)

