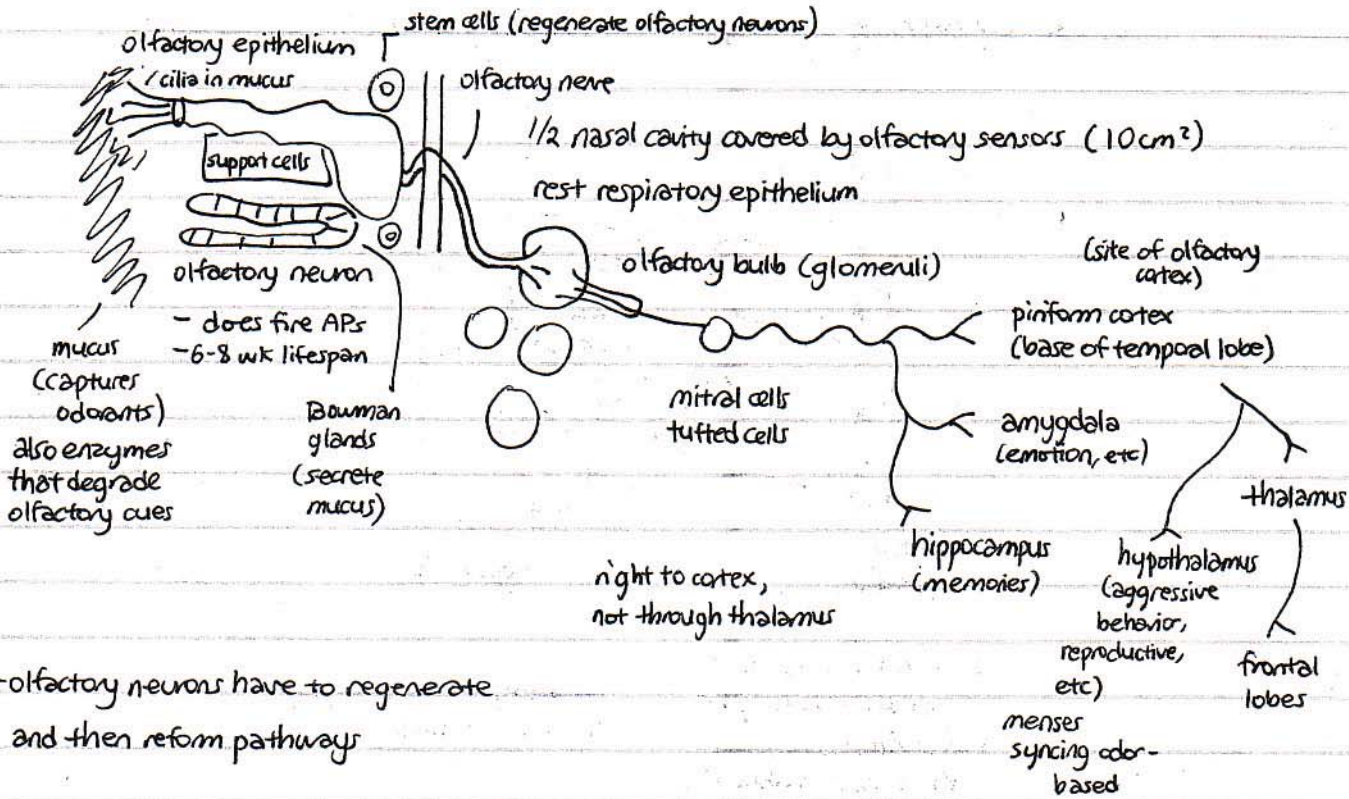


odor + taste:

- olfactory system can respond to thousands of odors

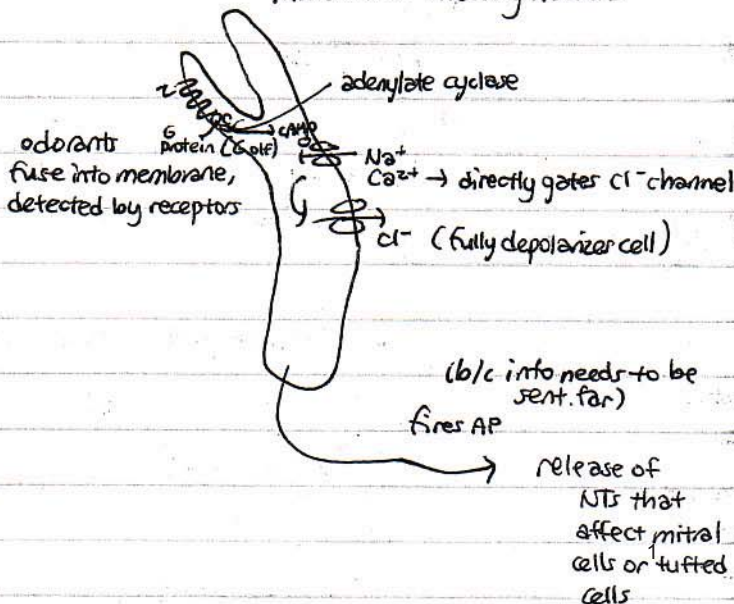


- olfactory neurons have to regenerate and then reform pathways

- genome encodes 200 - 1,000 olfactory receptors (all look quite similar, differences in TM domains)

microvilli of olfactory neurons

(N, C - termini similar)



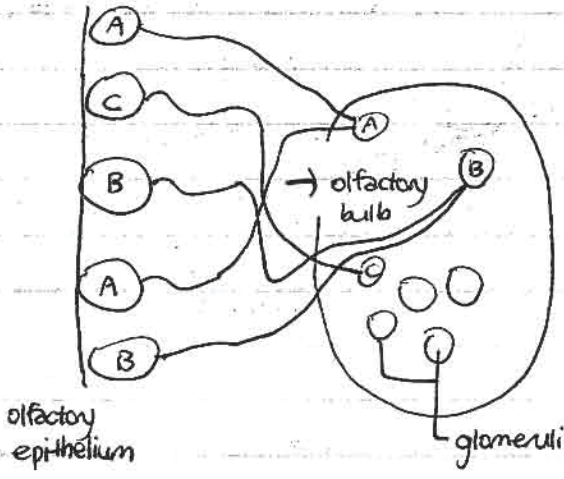
adaptation:

cAMP  $\neq$  gets PKA to phosphorylate + inactivate channel (receptor?)  
 also, Ca<sup>2+</sup> binds calmodulin, inhibits Na<sup>+</sup>/Ca<sup>2+</sup> channel  
 (2 mechanisms for shutting off stimulus)

(up to)

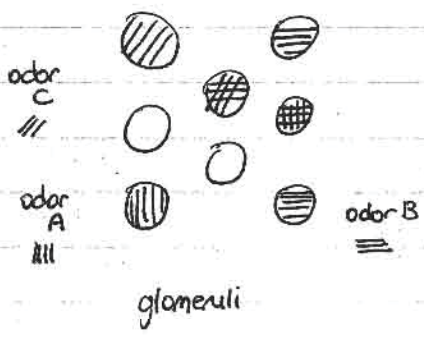
- humans recognize  $\leq 10,000$  odorants w/ only 1,000 receptors (receptors can each bind characteristic of odor)

1. receptors recognize multiple odors
2. each cell expresses one receptor (each olfactory neuron has one receptor)



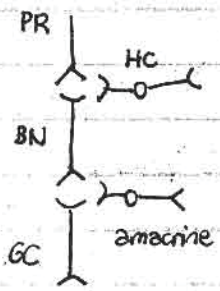
$\geq 10,000$  neurons that express same receptor (distributed randomly throughout epithelium, but output to same glomeruli) single glomerulus

olfactory receptor also plays role in path finding

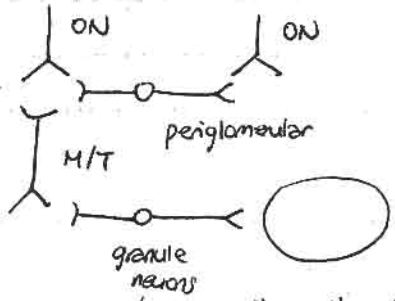


different odors light up different glomeruli  
[odorant] T can make glomeruli fire more, also fire new glomeruli

visual system:



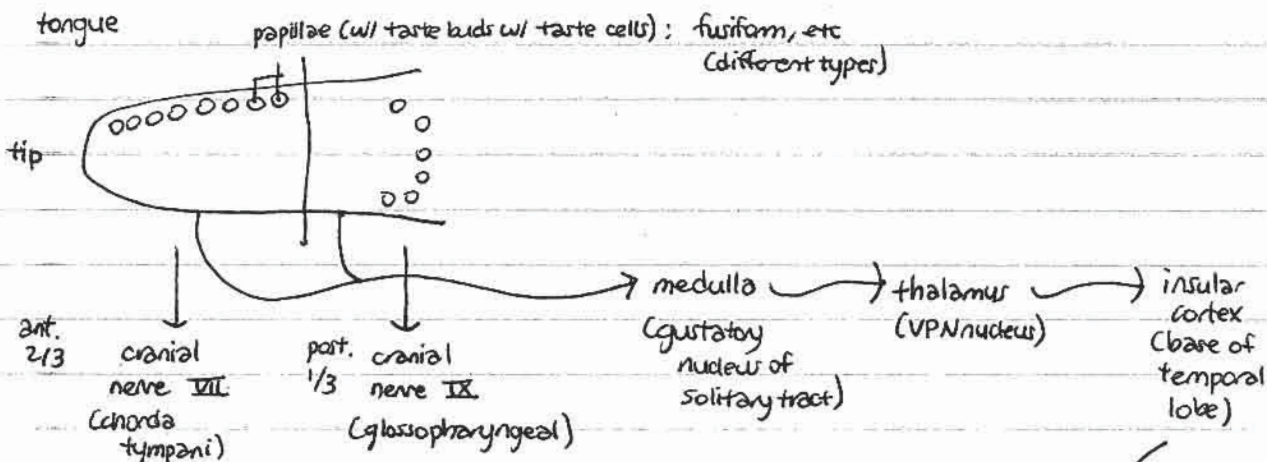
similar in olfactory system: (in olfactory bulb)



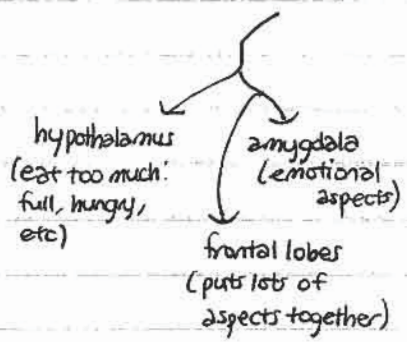
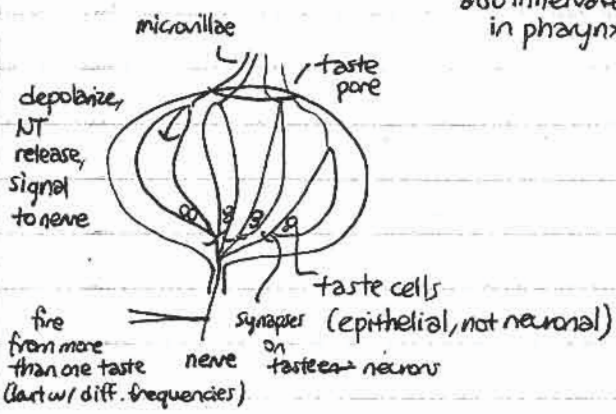
(so can talk to other glomeruli, silence neighbors)

gustatory system: distinguish different tastes

- complex anatomy (multiple cranial nerves)



cranial nerve X also innervates in pharynx



just know there are multiple pathways

fastant categories: (multiple components on each taste cell?)

1. salty
2. sweet
3. bitter
4. sour
5. umami

binding to  $\geq 7$  TM receptor,  $\rightarrow$   
6 proteins  $\rightarrow$  channels open  
(salty directly gates  $\text{Na}^+$  channel  
can inhibit  $\text{H}^+$ ,  $\text{K}^+$  can't get out)

- olfactory + gustatory systems ipsilateral

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