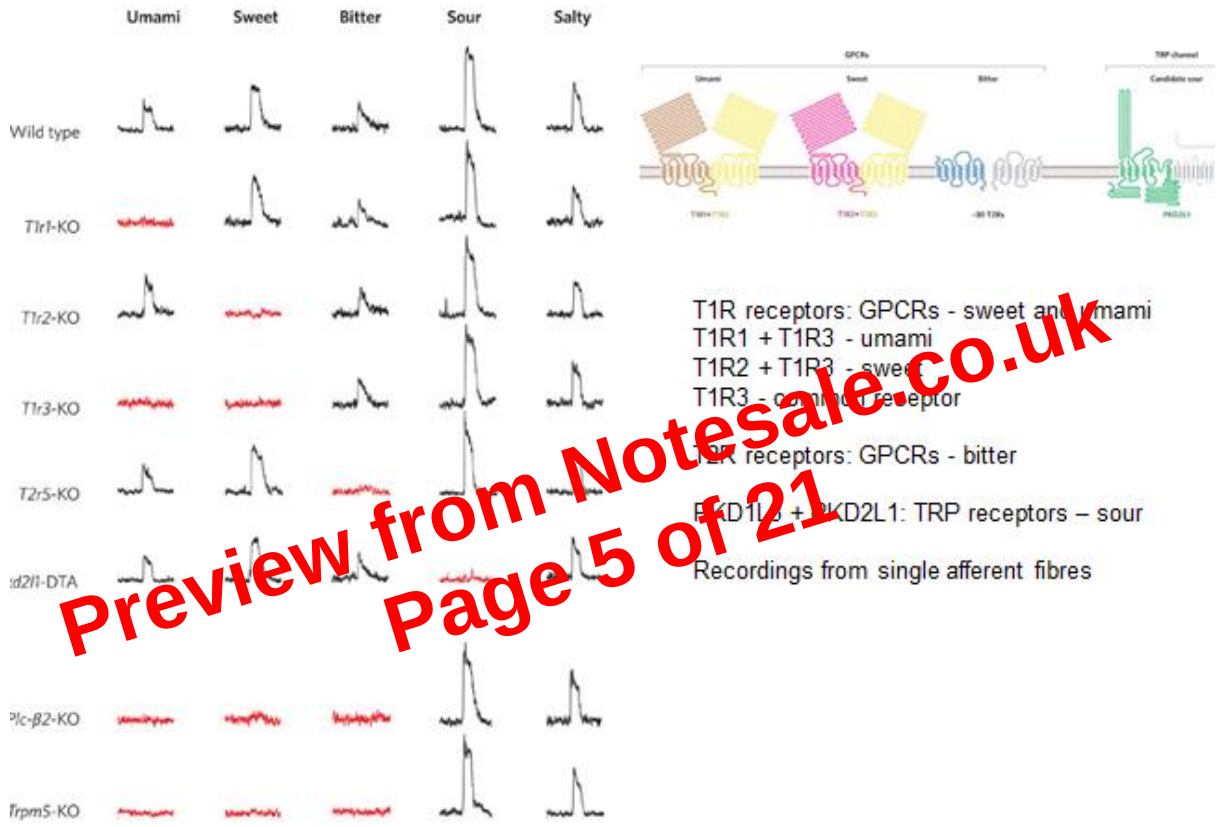
?????Also says about the idea that you can prime your mind to certain things, if you don't carry out the experiment correctly, psychological folk will work things out differently????

No taste map, all of the taste receptors reside in a taste bud. This is a taste bud which does some of the sifting out of the saliency

NOTES FROM POWERPOINT

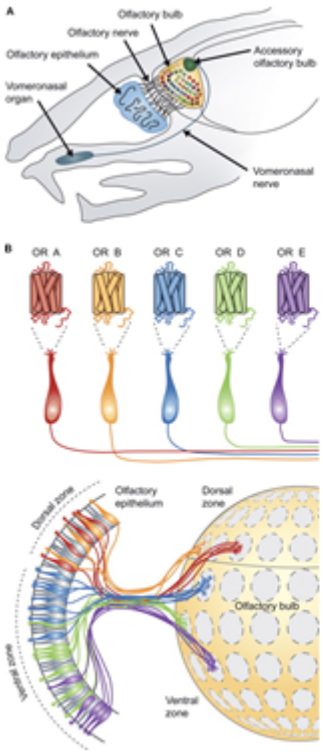
Tongue

Taste receptor cells are constantly renewed throughout life. They have an average lifespan of two weeks. Generates an interesting problem where the new taste receptor cells generate new neuronal connections.



Different taste receptors and genetic knockouts

Get different taste receptors, and we have genetic knock outs of some of these in mice. The GPCRS but can see the T1Rs have a larger extracellular domain. Can see with the sweet T1rs, large extracellular domains are tuned to any sort of sweet compound. There's only 3 T1Rs in the human genome so it's not like there's a huge diversity. The diversity is coded for in the extracellular domain that's broadly tuned and activation. It's also low affinity and this means it's very difficult to saturate, so when you come across something sugar tasting, you eat a lot, we are happy to continue eating something sweet. This goes also for umami, broad gating of due to these large extracellular domains.



Anatomy of the rodent peripheral olfactory system.

The expression of only one receptor per OSN generates a topographic map

5-10million olfactory sensory neurons in olfactory epithelium: ~1,800 glomeruli in each olfactory bulb:

an ~10^3 convergence of primary sensory axons onto each olfactory glomerulus: lies at heart of 'coding'

Also: vomeronasal tract- for non-volatiles (pheromones)

DeMaria S, Ngai J. JCB 2010;191:443-452

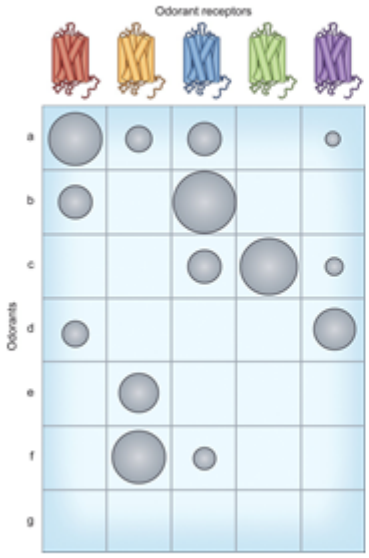
Can see an olfactory bulb/epithelium in the nasal passage, sending olfactory nerves to the olfactory bulb- which is usually close to structures like the hippocampus. Small is very tightly coupled to memory, don't know why- probably evolutionary.

There's also the vomeronasal tract- another type of smell. There's only one receptor for each olfactory sensory neuron which generates a topographic map or makes a line, olfactory sensor A makes contact with identifiable glomeruli- a second order structure with another neurons sending down its dendrites to meet the synapses that meet to induce the olfactory . Almost 1:1 ratio of olfactory neurons to glomeruli.

NOTES FROM POWERPOINT

Anatomy of the rodent peripheral olfactory system. (A) Schematic representation of a parasagittal section through adult mouse head. Axons of the OSNs in the main olfactory epithelium comprise the olfactory nerve and innervate the olfactory bulb. Vomeronasal sensory neurons project their axons via a separate tract, the vomeronasal nerve, to innervate the accessory olfactory bulb. (B) Each OSN of the main olfactory epithelium expresses only one odorant receptor gene (OR A, OR B, OR C, etc.) out of a repertoire of over 1,000 genes. Neurons expressing a given OR are organized into broad zones along the dorsal–ventral axis of the olfactory epithelium (OE) and converge to a common glomerulus at corresponding dorsal–ventral zones in the olfactory bulb (OB). Each glomerulus thus receives innervation from sensory neurons expressing a single odorant receptor, providing the anatomical basis of the olfactory sensory map.

Combinatorial coding of olfactory information.



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Patterns of receptors activated by an odour, each to a different magnitude

(some receptors tuned finely, others broadly)

Individual patterns therefore represent molecular identity.

It's not like the olfactory receptors are really type specific. The receptors may be broadly tuned to some odorants and finely tuned to others, it's the combination of different olfactory receptors activated, and then it's the glomerulus that make sense of this and send it back up to the brain and tell us what sort of odour we perceive. It's the pattern of activation that represents molecular identity of the odorant.

NOTES FROM POWERPOINT

Combinatorial coding of olfactory information. Graphic representation of the olfactory receptor combinatorial code. In this hypothetical example, the responses of five odorant receptors to seven odorants (a–g) are shown, with the magnitudes of responses proportional to the sizes of the circles. Reflecting functional studies on individual odorant receptors, some receptors are more narrowly tuned than others, and individual odorants can activate different subsets (and numbers) of receptors. The pattern of receptor activation elicited by a particular compound is thought to represent that compound's chemical identity. Discrimination and appropriate responses therefore occurs at higher order structures such as the piriform cortex