

# Debate

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## Structure

- Opening statement (5 minutes)
- Rebuttal (3 minutes each)
- Closing (3 minutes each)

## Topic

**Banning octopus farming:** The "pro" group is arguing for banning octopus farming, and the "con" group is arguing to continue farming.

## Things to do

**Assignment:** 1 paragraph reflection on what you think of the topic, and **include one reference**. This is to be handed in next week during discussion **PRINTED OUT**.

# Discussion 8: Olfactory System Worksheet

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## Human olfaction

- **Olfactory receptor:** these are receptors in the olfactory system which pick up chemical signatures from the air
  - human olfactory system is composed of ~350 genes, whereas other animals have ~1000 genes - this is why they generally have a much more sensitive olfactory system
- **Nerve Fibers:** The nerves which connect to olfactory receptor cells, and connects them to the brain (which is right above it)
- **Olfactory Bulb:** The location where information is processed
  - is it part of the brain or is it a bundle of nerves?

**Olfactory stem cells:** the stem cells which reside directly above the olfactory receptor cells - this is because they get damaged easily and need to be replaced every two months

**Olfactory receptor proteins:** the proteins that operate the olfactory receptors are GPCRs, and we believe that these proteins govern the structure of the cilia.

# Discussion 9: Lec 16/17 Review

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- You only really need to know that rod cells are sensitive to light, and they contain rhodopsin
- Retinal bends from cis- retinal to trans- retinal

## Visual Lesions

The signal goes from the optical nerve to the lateral geniculate nucleus (**LGN**), then goes to the visual cortex (in the occipital lobe).

- 90% of the signals goes to the LGN to the primary visual cortex (V1)

- The remaining 10% of the optic nerve travels to the superior colliculus.

### Specific lesions

- Scotoma: blind spot (lesion in V1)
  - appears like a black spot in the middle of your vision
- Hemianopia: half of the visual field is lost (lesion in V1)
- Achromatopsia: color perception problem (lesion in V4)
- Motion blindness: the inability to perceive motion (lesion in V5)
- Prosopagnosia: face recognition problems

V1, V4, V5 are different parts of the visual cortex.

## Sleep

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- Final exam; cumulative, covering chapters 1-22 and all lecture material
- Online, 90 minutes, available from 10am to 4pm.

## Memory

Memory is split off into two fragments, one of which stores short term and long term memory

- **Working memory (STM)**
  - has limited capacity, is transient
- **Long term memory**
  - *Declarative*
    - memory of describable things like location, time and place, nouns (also called semantic memory)
    - event-based memory (episodic memory)
  - *Non-Declarative*
    - Procedural memory (motor skills) → muscle memory
    - Classical conditioning (building associations)
      - Like pavlov and the dog (associating the bell with the expectation of food)
    - Priming
      - When exposure to a stimulus at an earlier time point influences your experience of that same/related stimulus later on.
      - Specifically references one point in time receiving a stimulus, and how it influences your experience in the future
  - In order to move information from WM to LTM, it requires some sort of rehearsal, repetition, or some strategy of retention, called **storage**
  - Accessing things from LTM to WM is called **retrieval**

## Amnesia

Amnesia is defined as a problem with memory

- Retrograde amnesia refers to forgetting things that happened to you before some incident
  - This is an issue with storage
- Anterograde amnesia refers to the inability to store new information

- This is an issue with retrieval

The hippocampus is essentially a hub that stores and consolidates new information coming in. It's essentially the structure that stores declarative long term memory. The patient WM experiment confirmed this, where patients had their hippocampus removed and found that they lacked the ability to recall information stored in the declarative LTM.

## Sleep

### Circadian Rhythms

Circadian rhythms are essentially our internal clocks, which approximately spans about 24 hours.

- our sleep schedule is not mediated by environmental cues, but instead by our own bodily rhythms → this is shown by the fact that our body's rhythm isn't disrupted even if you're in a closed room.

1% of optic nerves connect to SCN, and it's intrinsically photosensitive. They contain their own photoreceptor proteins (not from rods or cones)

- similar to photoreceptor proteins, the SCN has melanopsin, which helps our body adjust
- The optic nerve axons connect to the SCN - the nerve axons themselves connect to the SCN, and contain their own photoreceptor cells (called melanopsin) whose signals

**ask later about why how these nerve axons receive the light**

### REM sleep and dreaming

Sleep stages are hierarchical

- Deepest stage of sleep is REM sleep, and the other NREM stages are less deep
- neural excitation is moderated by acetylcholine, and causes us to dream
- your body is relaxed during REM sleep, because there's motor cortex inhibition during this phase.
- REM sleep is defined as the deepest sleep because neural consolidation and other things all happen here
- Rem Behavior Disorder
  - when your body flails around because inhibition isn't really being done properly
- narcolepsy is excessive daytime sleepiness,

## Emotion

Constructivist vs. biological evolutionist view on emotions

- constructivists argue that emotion is based upon cultural factors rather than biological factors
  - our emotions are different from indigenous people because our cultures and environments are different
- evolutionist views say that there are conserved emotions that all humans experienced
  - Ekman proposes there are 6 emotions that are conserved by all humans
    - happiness

- sadness
- disgust
- anger
- fear
- surprise
- the rationale is that these emotions are experienced by all humans (this is because these features are found in the facial muscles of all humans)
- Nerves and neurotransmitters
  - vagus nerve is important to emotion (this is what we've seen with Loewi and the frog)
  - activity of this vagus nerve is associated with more relaxed state
- Brain structures to note of
  - Amygdala → emotion perception center of the brain.
  - Hypothalamus → produces cortisol in response to stress.
- Neurotransmitters
  - Oxytocin →