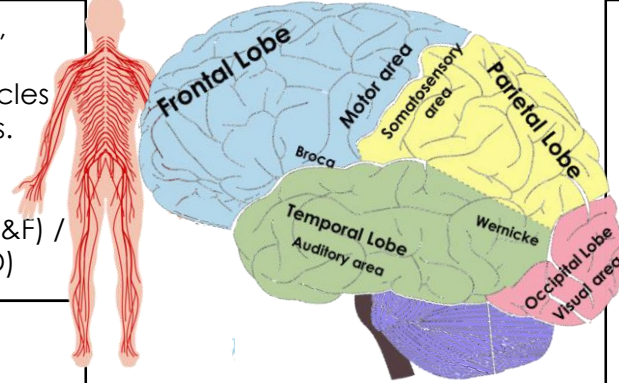


THE NERVOUS SYSTEM → collects, processes and responds to the environment & coordinates muscles and glands via neurotransmitters.

- **Central Nervous System**
- **Peripheral Nervous System** → Autonomic Nervous System (F&F) / Somatic Nervous System (R&D)



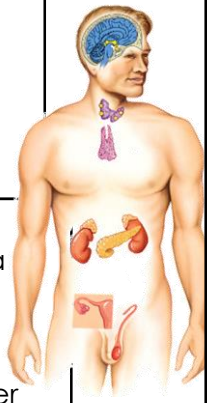
LOCALISATION OF FUNCTION → specific areas of the brain have specific functions Eg, Broca, Wernicke, Occipital lobe.

- Frontal Lobe → motor cortex / movement.
- Parietal Lobe → Somatosensory / senses.
- Occipital Lobe → Visual.
- Temporal Lobe → Auditory.
- **Broca's** → LEFT frontal lobe / speech production.
- **Wernicke's** → LEFT temporal lobe / language comprehension.

⊖ Biologically reductionist / gender differences
⊕ Broca & Wernicke's aphasia / fMRI scans

FIGHT OR FLIGHT

- Survival mechanism
- ANS & endocrine system work together.
- Dilated pupils / digestion and bladder inhibited / increased heart rate / increased sweat / pale skin / dry mouth.



THE ENDOCRINE SYSTEM → secretes hormones through blood vessels via glands.

- Hypothalamus → controls the pituitary gland.
- Pituitary gland → controls all other glands with its hormones.
- Pineal gland → melatonin / sleep
- Thyroid → Thyroxine / metabolism
- Ovaries → oestrogen / reproduction
- Testes → testosterone / reproduction
- Adrenal medulla → adrenaline
- Adrenal cortex → cortisol

PLASTICITY → The brain develops new neuronal connections and physical changes throughout life.
Synaptic pruning → 'removes' unused connections.

MAGUIRE → MRI scans of 16 right handed taxi drivers with 1.5y experience and compared to 50 non-taxi drivers. Found increased grey matter in the taxi drivers in the hippocampi.

FUNCTIONAL RECOVERY → A form of plasticity where the brain compensates for damaged areas.

- **Neuronal unmasking** → dormant synapses 'unmask' and compensate.
- **Stem cells** → Implanted or transplanted from healthy areas.
- **Spontaneous recovery** → Natural recovery which slows down./
- **Axonal sprouting** → New nerve endings grow and connect to damaged nerves.

⊖ Spontaneous recovery is short-term / negative plasticity
⊕ Musicians / animal studies with complex environments / cognitive reserve.



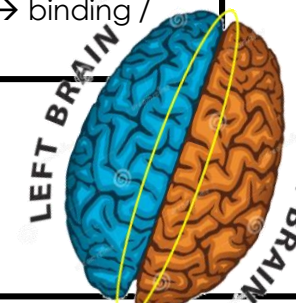
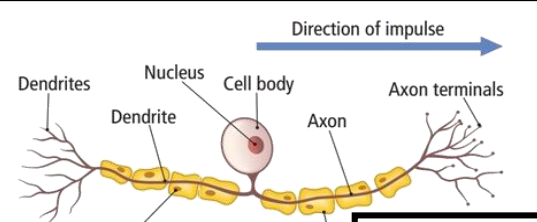
SPLIT-BRAIN RESEARCH – each hemisphere is responsible for a specific function. Left and right eye process information on the **OPPOSITE** hemisphere.

SPERRY → 11 ppts who had their corpus callosum removed. Describe what you see – Left hemisphere can describe, right cant. Tactile test – Left hemisphere can describe and identify an item, right can NOT describe but CAN identify. Drawing task – Left hemisphere draw poorly; Right hemisphere can draw clearly.

⊖ Case study of JW / pop-psychology
⊕ Controlled experiment / chickens can perform 2 tasks at once.

NEURONS → chemical and electrical signals.

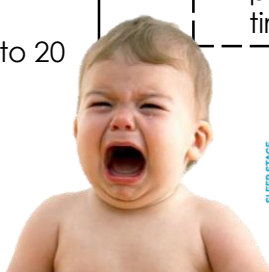
- **Sensory** → carry information **towards** the CAN.
- **Relay** → Found within the CNS, connect sensory and motor.
- **Motor** → Carry information **away** from the CNS to muscles/glands.
- **Receptors** → collect information from senses /
- **Effectors** → receive information (glands/muscles)
- They can only travel in one direction → binding / receptors / vesicles.



ENDOGENOUS PACEMAKERS → internal biological clocks
Suprachiasmatic nucleus → responds to light → melatonin releases melatonin which causes drowsiness/sleep.

- ⊕ Decoursey – chipmunks had their SCN destroyed and returned to their habitat. All died.
- ⊕ Ralph – bred mutant hamsters and adapted their cycles to 20 hours.

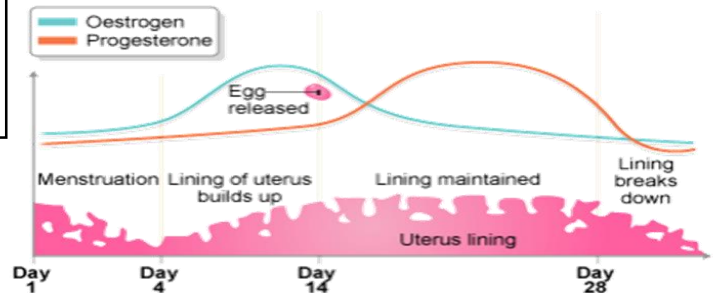
EXOGENOUS ZEITGEBERS → external environmental cues.
Entrainment → getting babies into a routine to control their sleep/wake cycle.
⊕ Campbell – light on the back of the knees wakes PPs



CIRCADIAN RHYTHMS → 24h cycle (sleep/wake)

- Primarily controlled by the **SCN** but needs light to reset each day.
- **Siffre** case study → Lived in a cave for 61 days* and found that his free-running body clock increased to 25 hours. When repeated at 60, his body clock increased to 36 hours.
- Shift work and jet lag.
- Aschoff and Wever → 4 weeks in a bunker. All ppts increased to 25h.
- Folkard → reduced the time of the day, nobody could adjust.

INFRADIAN RHYTHMS → A cycle longer than 24h (menstruation)
FSH / Oestrogen / Progesterone all linked to the menstruation cycle.
⊕ McClintock → pheromone study found that women who smelled the pheromones of other women altered the length of their cycle
SAD → yearly rhythm which creates depressive-like symptoms during winter months

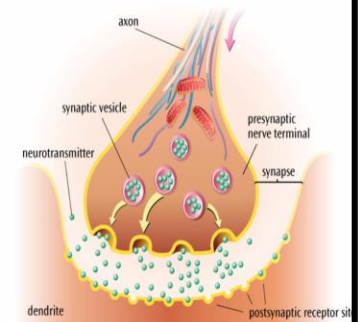
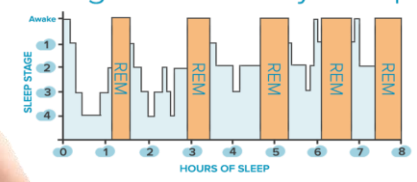


ULTRADIAN RHYTHMS → A cycle which repeated within 24h (5 stages of sleep)

5 stages of sleep which last about 90 minutes and repeat during 'sleep'

- ⊕ Dement – Found ppts who were woken during REM recorded dreaming whereas PPTs woken during N-REM struggled to return to sleep.
- ⊕ Kletman – We live our entire sleep/wake cycle in periods of 90 minutes. And move from being alert to tired.

Stages of Healthy Sleep



SYNAPTIC TRANSMISSION → the movement of information from one neuron to the next.
Presynaptic membrane holds vesicles full of NT / electrical current encourages secretion across the synaptic cleft / binding on to the receptors of the post synaptic membrane.
Summation → the higher net value of excitatory / inhibitory neurons will fire.

BRAIN SCANS

- fMRI** → measures a change in energy released by haemoglobin in the brain. Low temporal resolution / High spatial resolution / non-invasive but expensive.
- EEG** → Measures electrical activity on the scalp via electrodes. High temporal resolution / Low spatial resolution / can't record deep brain / non invasive and cheap.
- ERP** → Measures brain activity via electrodes on the scalp when the ppt performs a task. High temporal resolution / low spatial resolution / can't record deep brain / non invasive and cheap.
- Post Mortem** → structural examination after death. Detail examination on humans rather than animals / invasive / time between death and post-mortem / small samples.