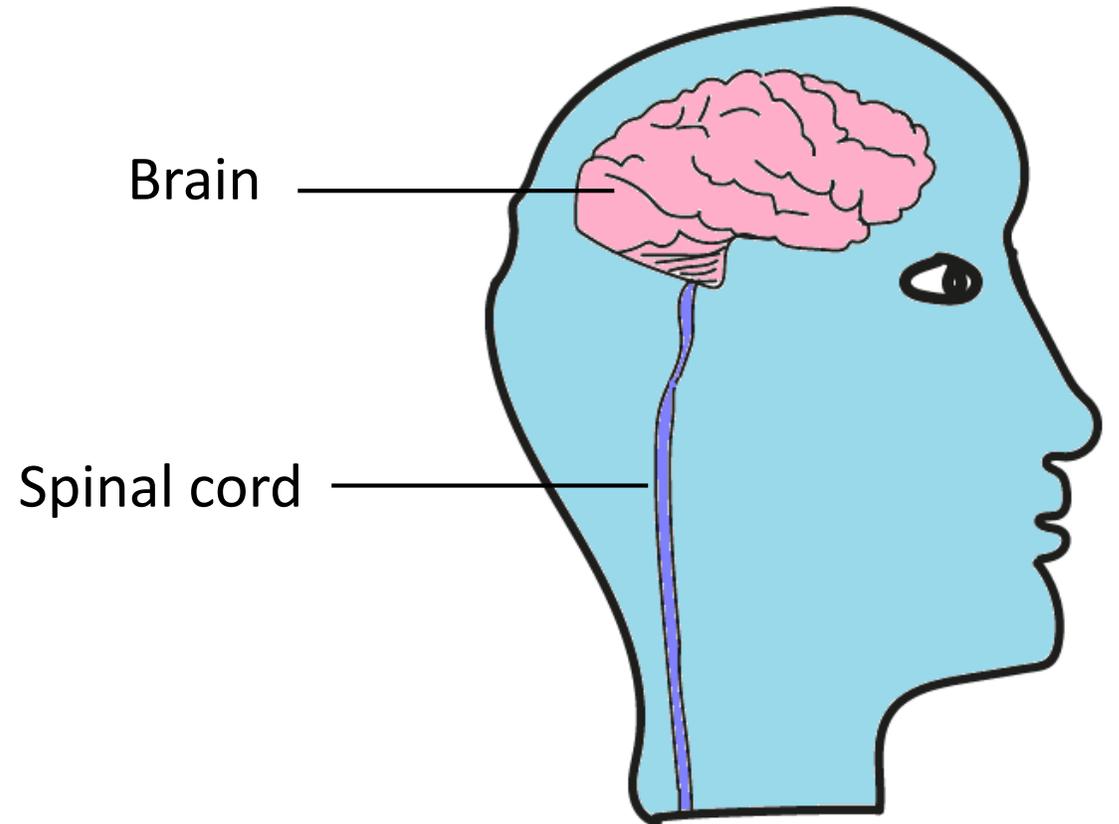
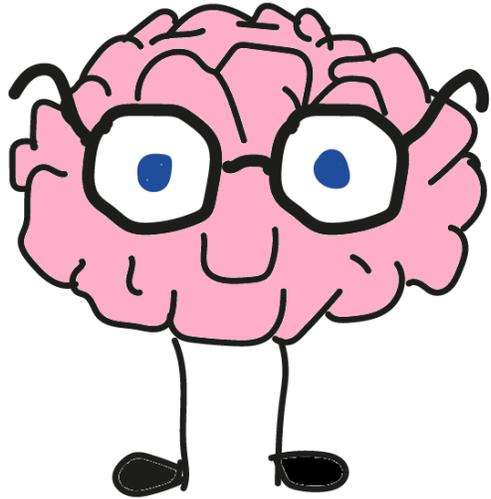
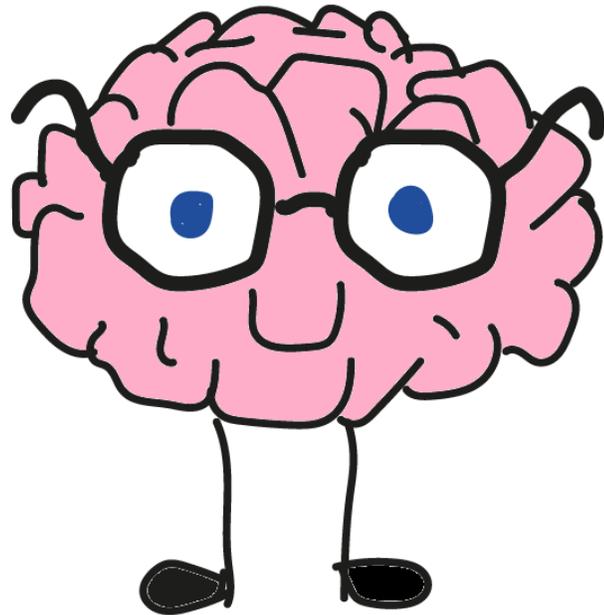


THE HUMAN BRAIN

The brain is an organ that is inside the head and it is part of the central nervous system.



THE ANATOMY OF THE BRAIN



The brain is made up of three main parts:

Cerebrum

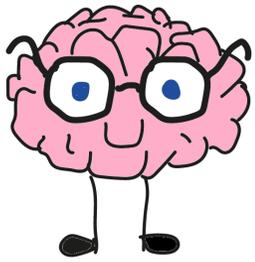
Cerebellum

Brainstem

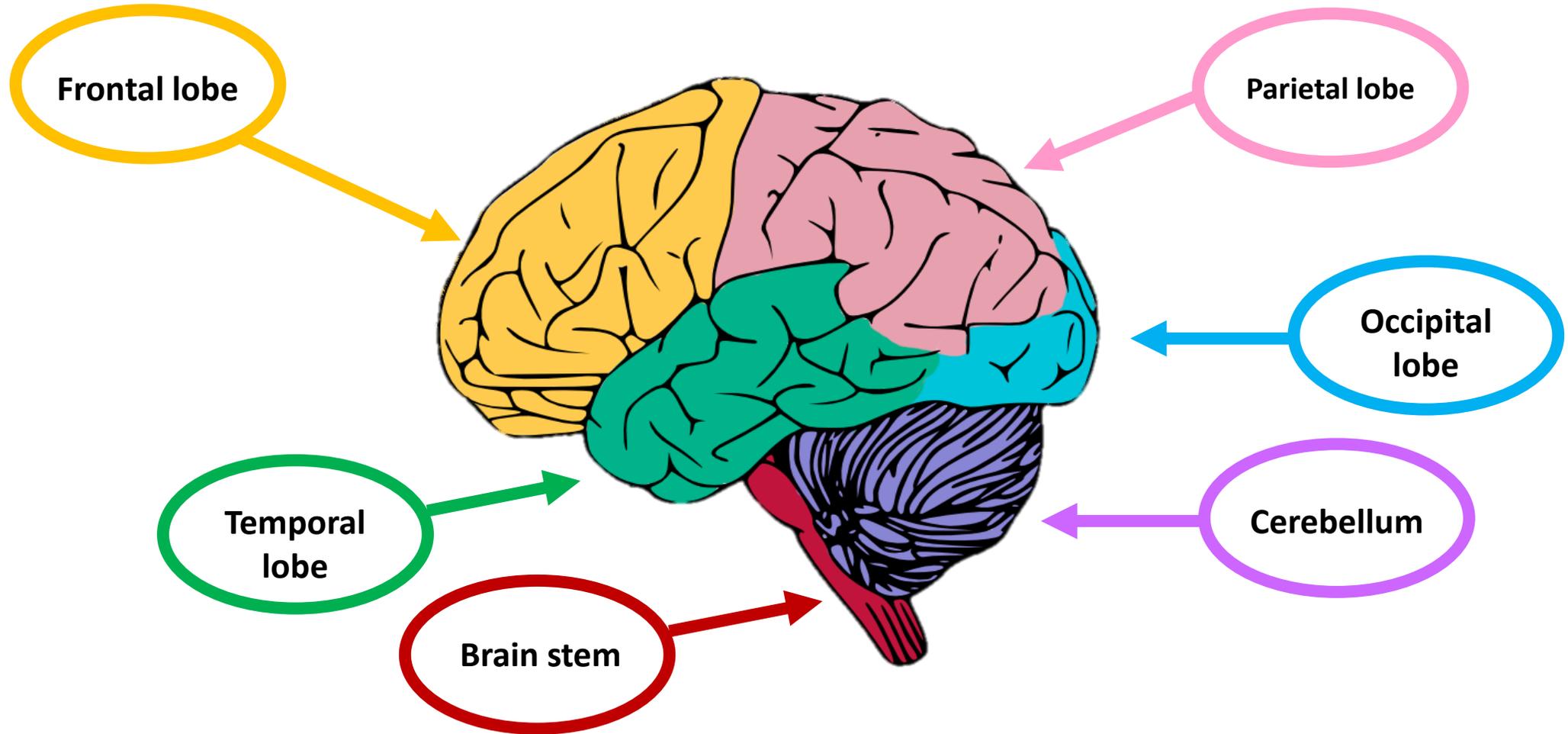
The **Cerebrum** is the largest part of the brain. It is divided in lobes and is responsible for learning, speech, motion and movement.

The **Cerebellum** is responsible for muscle movements and balance.

The **Brainstem** connects the cerebrum and cerebellum to the spinal cord. It regulates body temperature, digestion and many other things like coughing, and even your heart rate.

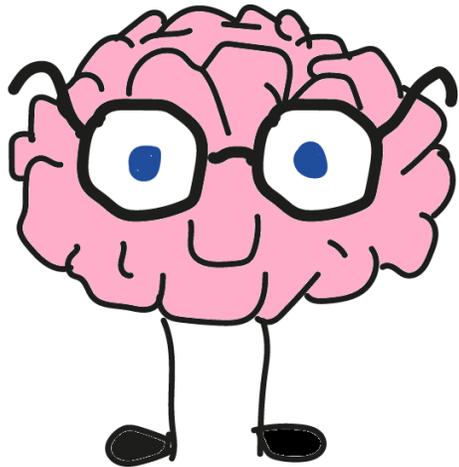


THE ANATOMY OF THE BRAIN



THE FUNCTIONS OF THE BRAIN LOBES

The different parts of the brain communicate with each other. They work together to control most of the activities of the body.



Frontal lobe – Cognitive skills

- Language
- Judgement
- Emotions
- Speech
- Reading and writing
- Problem solving

Temporal lobe

- Memory
- Hearing
- Organization
- Understanding language
- Behaviour

Parietal lobe – Sensory skills

- Words and language interpretation
- Processes sensory information from body and skin (touch, pressure, temperature)
- Helps interpret signals from our eyes and hears

Occipital lobe

- Select, organise and integrate visual information, such as: light; colour and movement

THE NEURON

The **neuron** or nerve cell is the core component of the brain.

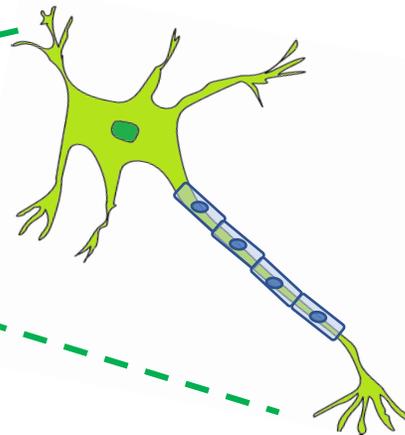
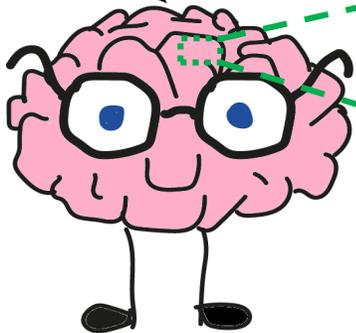
The neurons process and transmit information through electrical pulses (**action potential**) and chemical processes.

Each neuron can connect up to 10,000 other neurons and transmit information via synaptic connections. A **synapse** is a junction between two neighbouring neurons.

Neurogenesis is the process by which neural progenitor cells differentiate to create new neurons. This process only happens during foetal development.

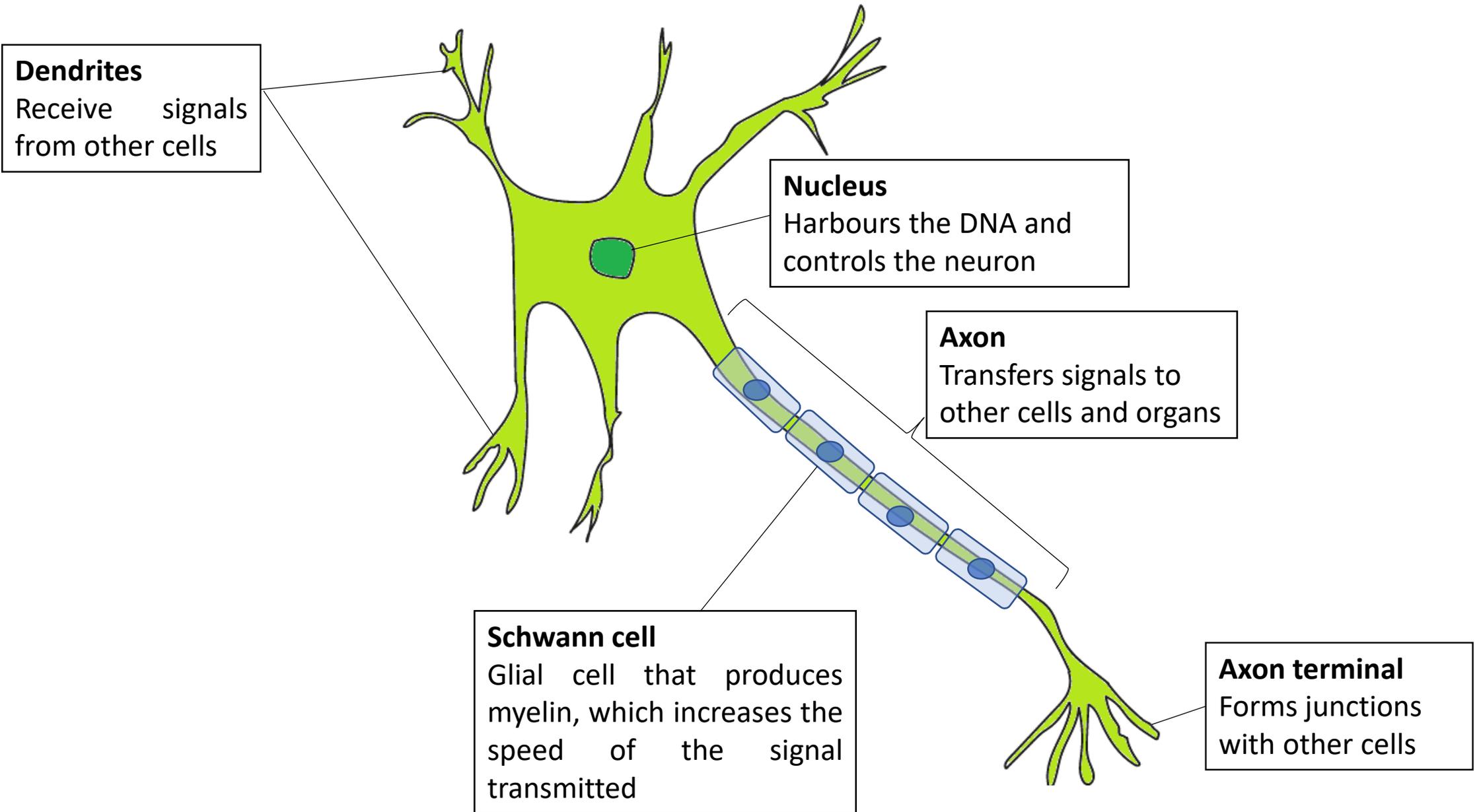
Neural progenitors are cells with the capacity to differentiate into **neurons** and **glial cells**

The brain has about 86 billion neurons.



The neurons in the adult brain don't divide to create new cells. They are designed to **last a lifetime**. In the adult brain, neurogenesis only continues throughout life in the **hippocampus**, a brain region embedded into the **temporal lobe** involved in memory.

THE NEURON



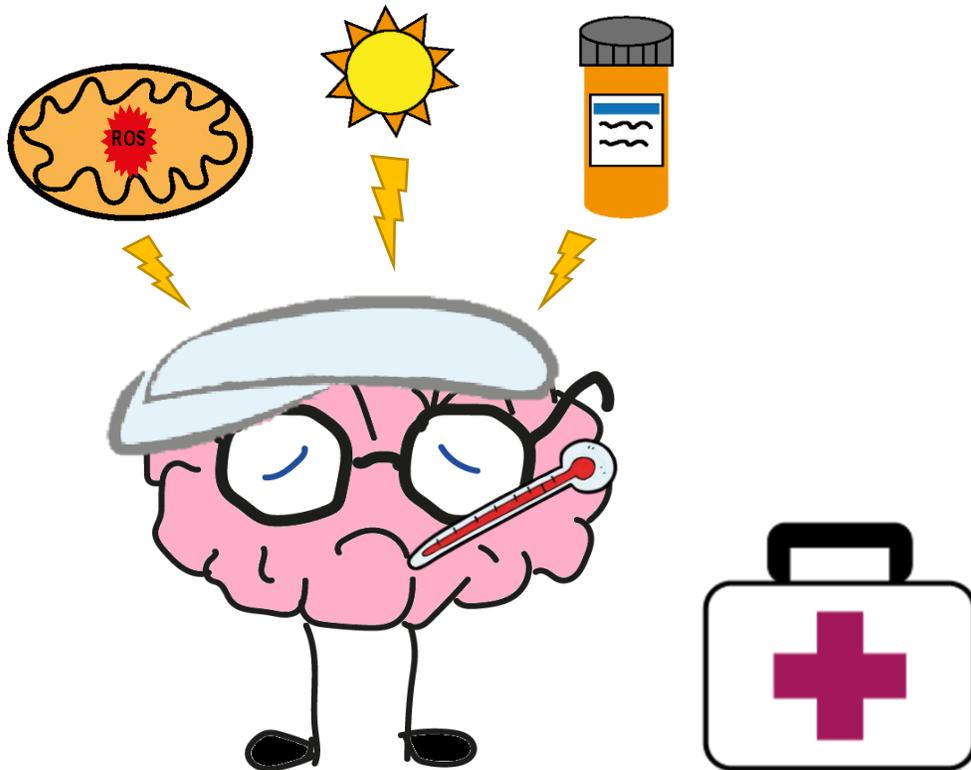
What happens when the brain is damaged?

Neurodegeneration is a process that describes the progressive loss of neurons in the brain.

Neurodegenerative disorders are a class of diseases in which different parts of the brain progressively degrade.

Neurodegeneration is caused by a variety of factors:

- Inability to repair DNA damage due to mutations in genes involved in these processes
 - Build-up of toxic proteins in the neurons
 - Mitochondrial dysfunction

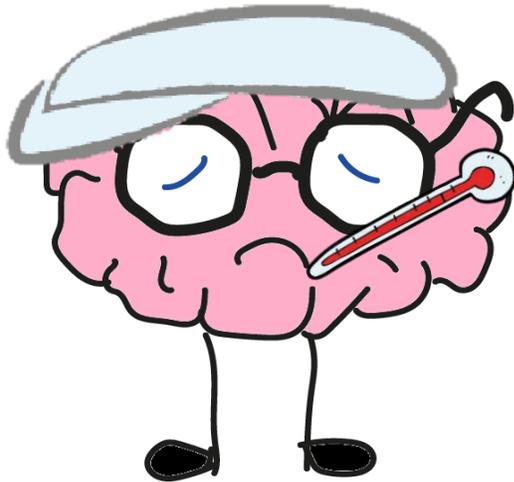


The symptoms of neurodegeneration depend on which part of the brain is affected. The symptoms might include:

- Memory loss (dementia)
 - Motor problems
 - Vision difficulties
 - Behavioural issues
 - Cognitive decline

Examples of neurodegenerative disorders

Neurodegenerative disorders mainly affect older people. These diseases are irreversible and progressive. Unfortunately, no cure is available.



Parkinson's disease:

Is a condition that affects movement. The symptoms involve tremors and stiffness.

Alzheimer's disease:

Progressive brain disorder that leads to memory loss.

Huntington's disease:

Hereditary brain disorder, which means that it can be passed from parent to child.

The symptoms include involuntary movements, cognitive and personality changes.