1. The brain is composed of specialised cells that enable it to process information by the use of electrical impulses
2. As the figure shows, these cells, neurons, have specialised into many many types. They serve different functions, include different proteins and markers, and can be classified in many different ways.

1. The most recent estimate puts the number of neurons in the human brain at 86B.

1. Each neuron connects with thousands of other neurons, forming a massive network.
2. This is especially important because we now know that it is in these synapses that learning occurs.

1. We learn when synapses change in the brain
2. As an example, let's say we have a neuron that was activated by a smell.
3. Later, we found out that that was the smell of some food, say curry.
4. Because these neurons fired one after the other here, this synapse is strengthened.
5. When this happens repeatedly, the synapse is strengthened again and again.
6. Until, the faintest whiff of the smell reminds you of the food!

1. Changes in whole synapses change the structure of the networks of neurons, and is referred to as structural plasticity
2. This led researchers to investigate stabilising processes which must work in parallel with learning

1. The protocol is pretty standard. Here, for a study in the visual cortex, the retinal field of a rat or a mouse is mapped.

1. Then, a part of the retina is lesioned. This cuts off inputs to a part of the visual cortex, as shown in the first figure. This forms the Lesion Projection Zone (LPZ). By repeated imaging of the region over months, the reorganisation of the network is tracked.
2. Other lesion studies use similar methods: digit removal, whisker trimming, and so on—anything that cuts off projecting activity on to a set of neurons.

1. Really small parts: 10000 neurons only