

Lecture 1 Why study the nervous system?

Aware of:	
<ul style="list-style-type: none"> - You know with certainty that you are thinking: <i>cognito ergo sum</i> (I think, therefore, I am) - When we are aware of thought, we recognise our mental existence - → it's hard to doubt we exist because then we are dismissing that experience of thought. 	<ol style="list-style-type: none"> 1. A universe which we are embedded actors 2. Variety of attributes of ourselves – feelings of internal environment 3. Capacity of action to change the environment <p>→ attributes due to the mind: products of the operation of the NS.</p>

How do we know the above 'awareness' things?

Ancient Egyptians	'Marrow of the head' <ul style="list-style-type: none"> - Centre of our soul/body: the heart - Provides flow of liquid, just like the Nile
Hippocrates 460BC	<ul style="list-style-type: none"> - He thought everything we attribute to the mind is coming from the brain - Big call during that time ("isn't it the heart, not the brain??")
Galen 200 AD	Admired: <ul style="list-style-type: none"> - Hippocrates: brain as the seat of intellect - Aristotle: about the 4 humours of body Galen: Tripartite soul <ol style="list-style-type: none"> 1. Brain: rational thinking – conceptual thinking 2. Heart: strong passion 3. Liver: weaker instincts <ul style="list-style-type: none"> - Makes sense because you feel emotions in your heart (visceral) - Liver: connected intimately with heart, digestive systems; also release bile (one of 4 humours) - Renaissance: lots of dissections during renaissance and ancient Greek era: but four humours prevailed.
Aristotle 384 BC	<ul style="list-style-type: none"> - Cardio-centric view of mind Why heart and not the brain? <ol style="list-style-type: none"> 1. Heart moves, brain doesn't 2. Simple animals move and react but have no apparent brain; they have vasculature (in fact, they do have brains – not visible to naked eye) 3. Warmth: (life) gives off the body's core <ul style="list-style-type: none"> - When things dead – cold. - Blood circulation = warmth = life 4. All known civilisation held heart to be centre of conscious being – appealing to authorities <p>→ sophisticated animals: had bigger convoluted brains → they ran hotter (more heat generated by heart)</p>

MRI scans	Structural	Radiofrequency pulse - magnetic field	Density of water in volume; Microwaves emitted	Paramagnetic protons which spin in different axis; From being aligned in N-S way, they emit energy as they go back to original conformation	Good Better than CAT and better contrast resolution	sec	Safe Uses no ionising radiation (non-invasive)	Expensive Long circulation – takes time(45 min)	MR Tractography: shows main fibres because water pushed readily along axis
fMRI	Functional	Radiofrequency pulse; - magnetic field	Magnetic feature of paramagnetic molecules (iron)	Take many MRI over time and space; Measures blood flow - Blood oxygen level dependent constant.	Brain/lobe to layers of cell Excellent!	Sec/min	-not that expensive; -30 or timelapse	Cant see individual cells; Doesn't measure neuronal activity directly (ie how many neurons firing); if something quick happened, cant detect with fMRI	Surrogate measure of how active brain is