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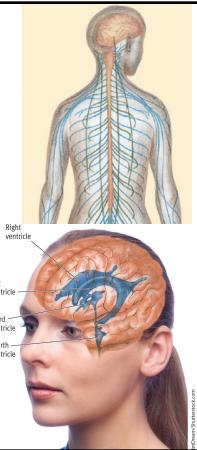
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## Central nervous system (CNS)

- Meninges
- Cerebrospinal fluid (CSF)
- Ventricles




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- Spinal cord damage
  - Paraplegic
  - Quadriplegic
- Brain = Important to behaviour




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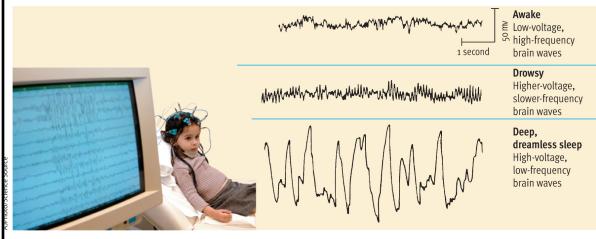
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## Research Methods – Electrical recordings

- Electroencephalograph (EEG)




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**Lesions**

- Destroy portion of brain to determine  
“Which behaviours are affected?”

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- Virtual lesions -  
Transcranial  
magnetic  
stimulation (TMS)

- Electrical  
stimulation of the  
brain (ESB)

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**Brain-imaging**

- Computerized  
tomography  
(CT)

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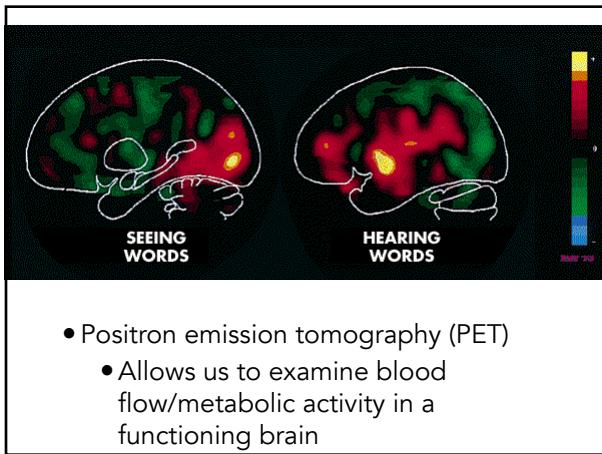
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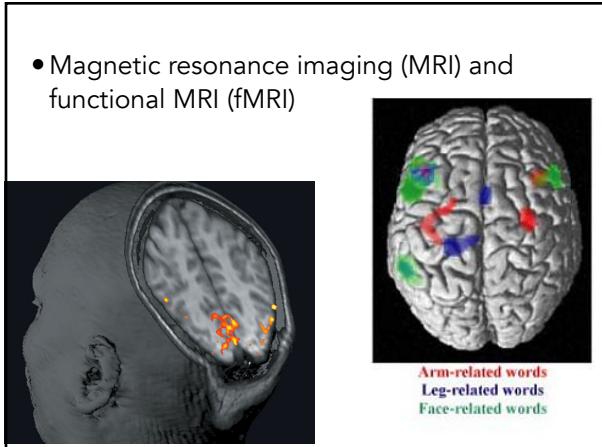
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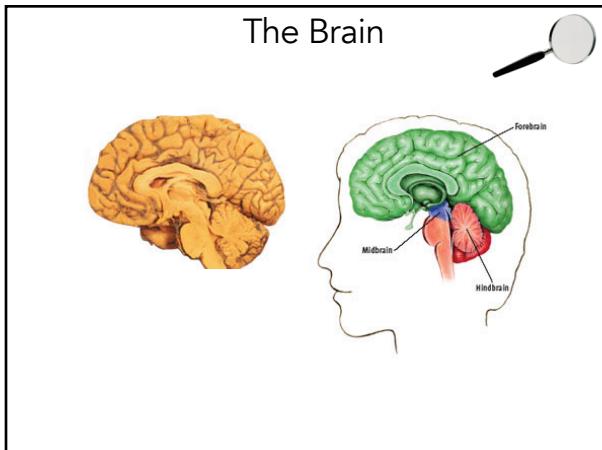
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- Positron emission tomography (PET)
    - Allows us to examine blood flow/metabolic activity in a functioning brain



- Magnetic resonance imaging (MRI) and functional MRI (fMRI)



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**Brainstem**

- Hindbrain
- Midbrain
- Diencephalon

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**Hindbrain**

- Medulla
- Pons
- Cerebellum

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**Midbrain**

- Integrates sensory processes
- Dopamine system
- Reticular formation

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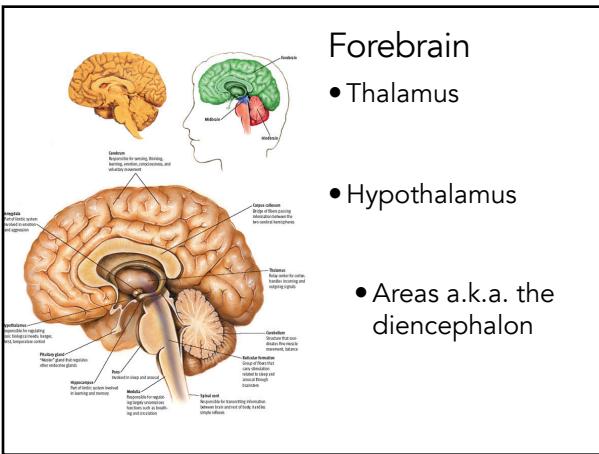
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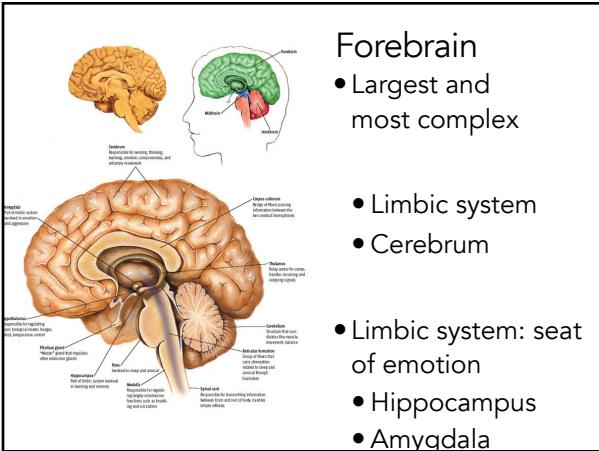
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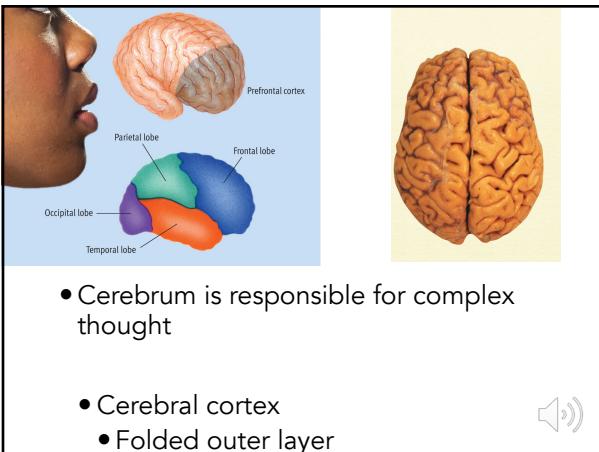
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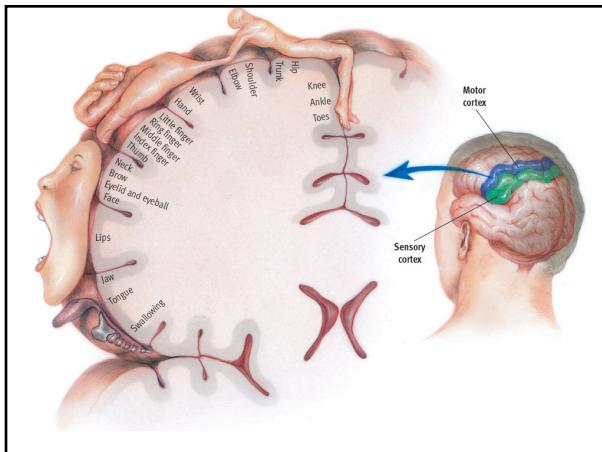
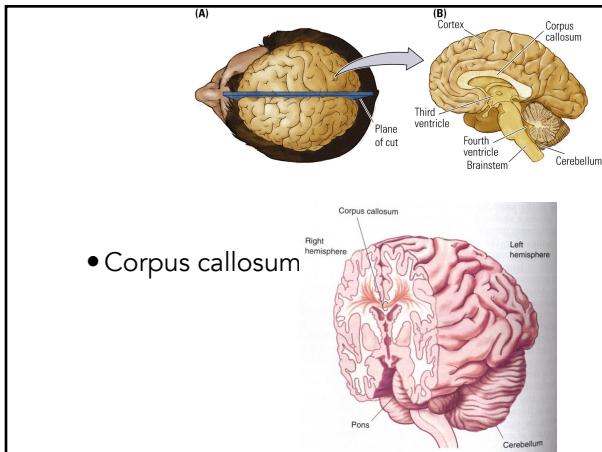
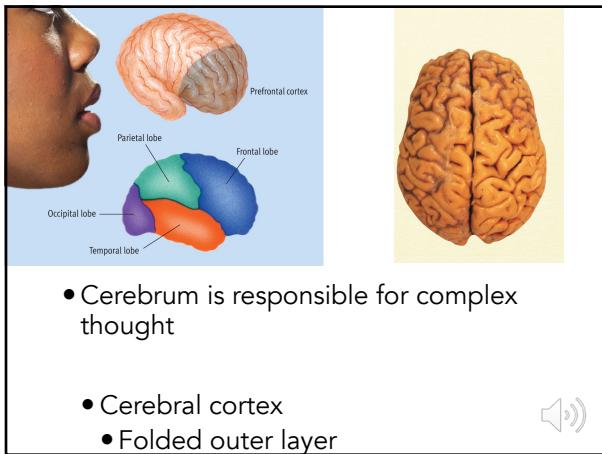
- Thalamus
  - Hypothalamus  
  - Areas a.k.a. the diencephalon



- Largest and most complex
  - Limbic system
  - Cerebrum
  - Limbic system: seat of emotion
    - Hippocampus
    - Amygdala



- Cerebrum is responsible for complex thought
  - Cerebral cortex
    - Folded outer layer



## Plasticity of the brain

- 1) Experience
- Somatosensory cortex in string musicians

• 2) Reorganization due to damage

• 3) Neurogenesis in the hippocampus and olfactory bulb




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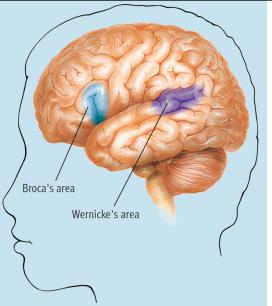
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## Specialization of function

- Broca's area – speech production
- Wernicke's area – speech comprehension

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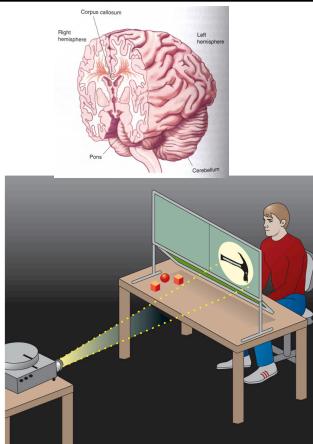
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- Split-brain patients
- Right visual field (VF) = can name and describe
- Left VF = can point or draw, but cannot name

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**Endocrine**

- Glands secrete chemicals into bloodstream
- Control bodily functioning
- Hormones

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**Basic principles of genetics**

- Chromosomes and DNA
- Human somatic cell - 23 pairs of chromosomes
- Genes: DNA segments that carry hereditary info

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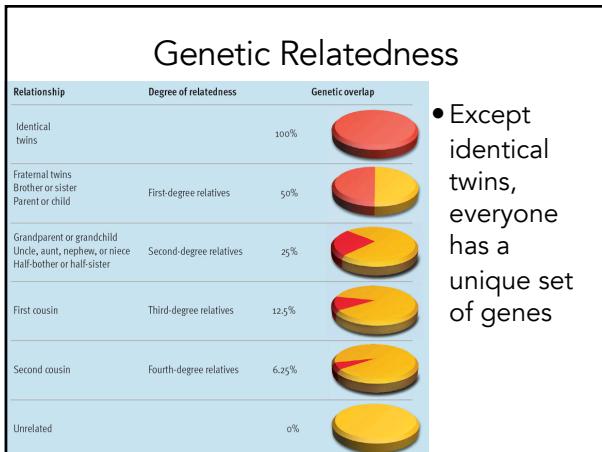
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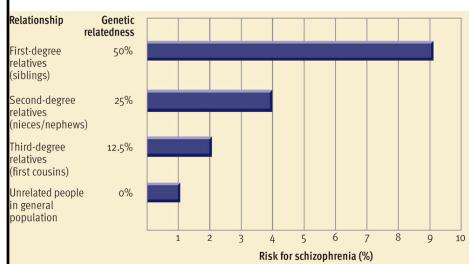
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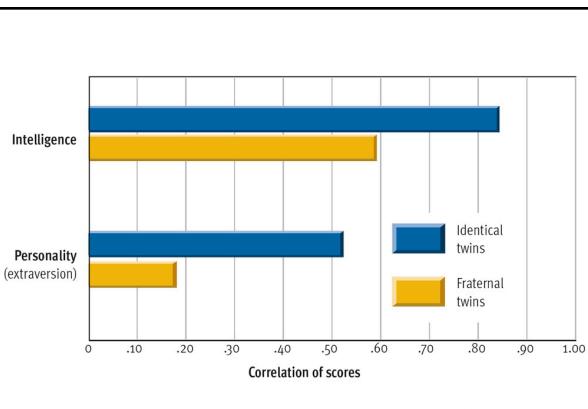
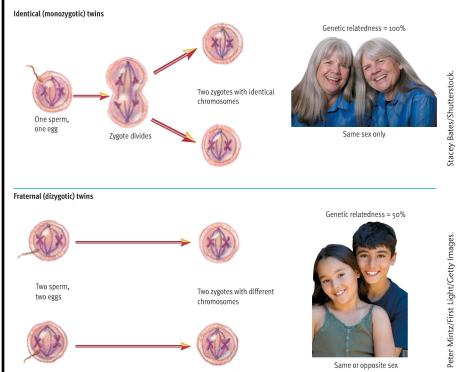


## Research methods

- Family studies - How much resemblance on a specific trait?



## Twin studies



- Adoption studies
- Resemblance between adopted children and biological and adoptive parents
- Other attempts at teasing apart the contributions of nature vs. nurture
- Epigenetics – heritable changes in gene expression (not due to DNA modifications)



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