

Presentation of the course dataset

Anne-Kristin Stavrum

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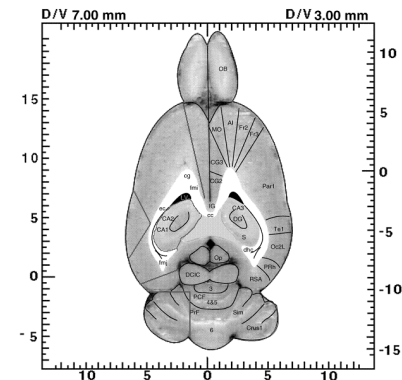
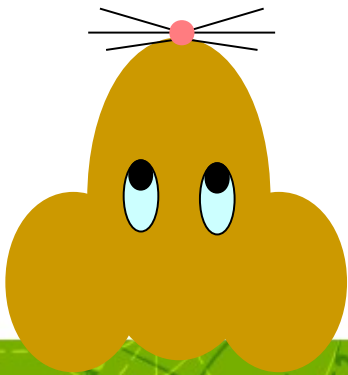


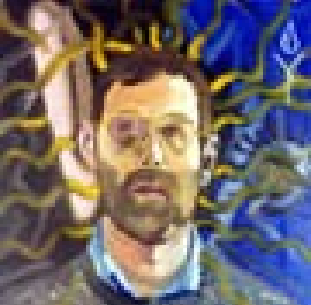


Regional specialisation of the brain revealed by gene expression analysis

Christine Stansberg

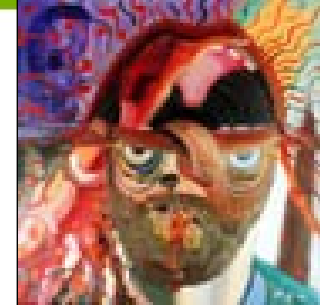
Dr. Einar Martens research group for Biological Psychiatry and Norwegian Microarray Consortium
Centre for Medical Genetics and Molecular Medicine,
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Bergen, Norway





Self portrait
B. Charnley

Serious psychiatric disorders



Self portrait
V. van Gogh

- Schizophrenia
- Mano-depressive (bipolar) disorder
- Major depression

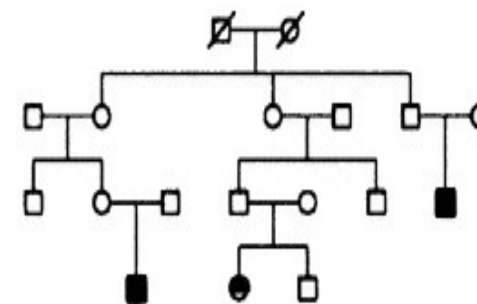
Family-, twin- and adoption studies



High estimated heritability

Risk estimates of schizophrenia:

General population	0.5-1%
First degree relative	5-10%
Dizygous twin	5-15%
Monozygous twin	30-50%



Schizophrenia Pre-frontal cortex?
 Dopamine?

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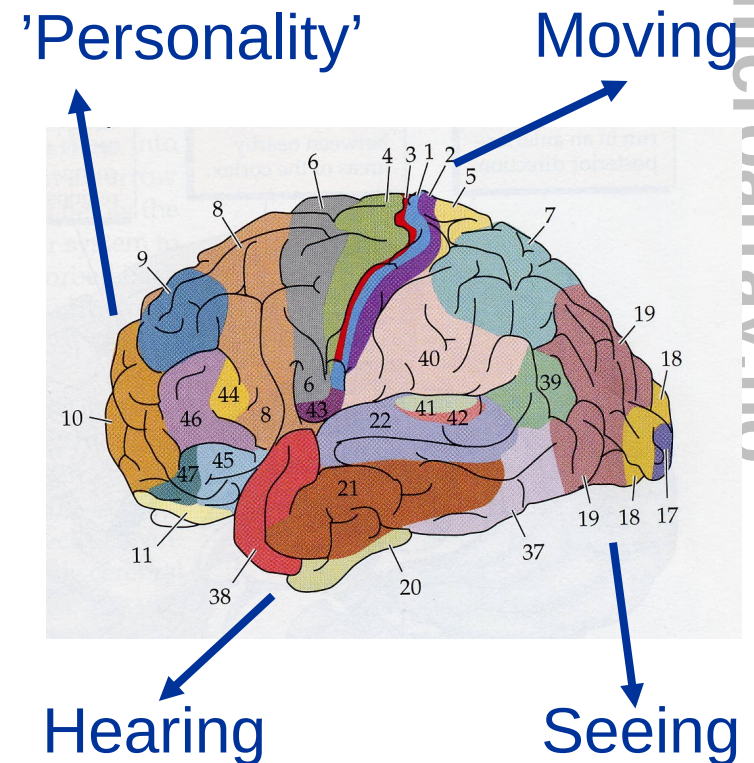
Which genes and biological processes are associated with susceptibility to psychiatric disorders ?

Large number of genes and proteins

→ Which genes to study?

Alternative strategy:

Selection of candidate genes through knowledge of regional gene expression patterns in the brain



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Aims...

Find genes enriched in selected regions of the rat brain
corresponding to regions with vulnerability in psychiatric disorders
in humans

Study functions of these genes

do we see a correlation between gene expression patterns and
specialised brain regional functions?

Find associations to disease in humans in these genes
Out of scope here...

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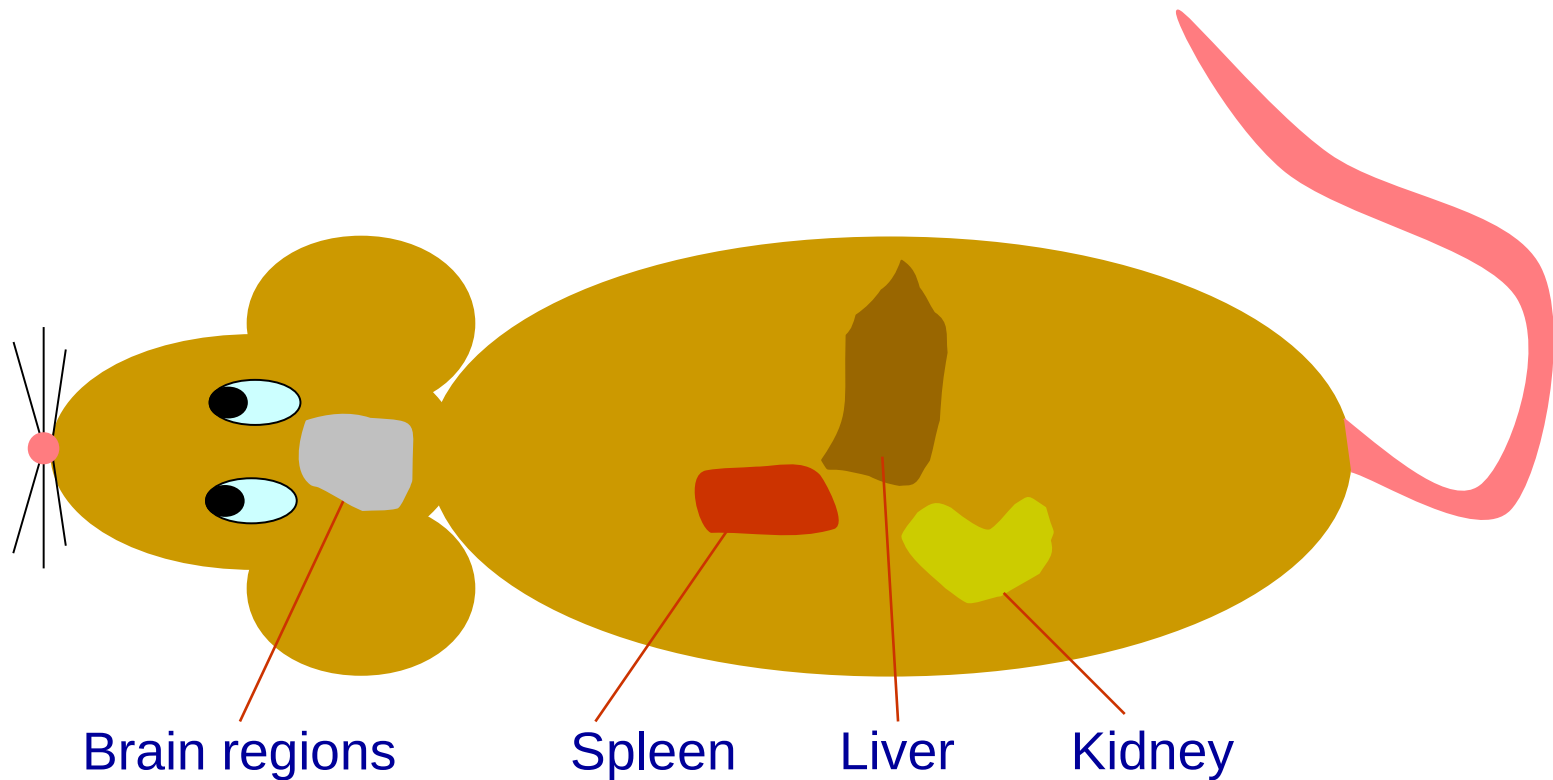


Rats and tissues

3 female outbred Sprague Dawley (SD) rats (250g)

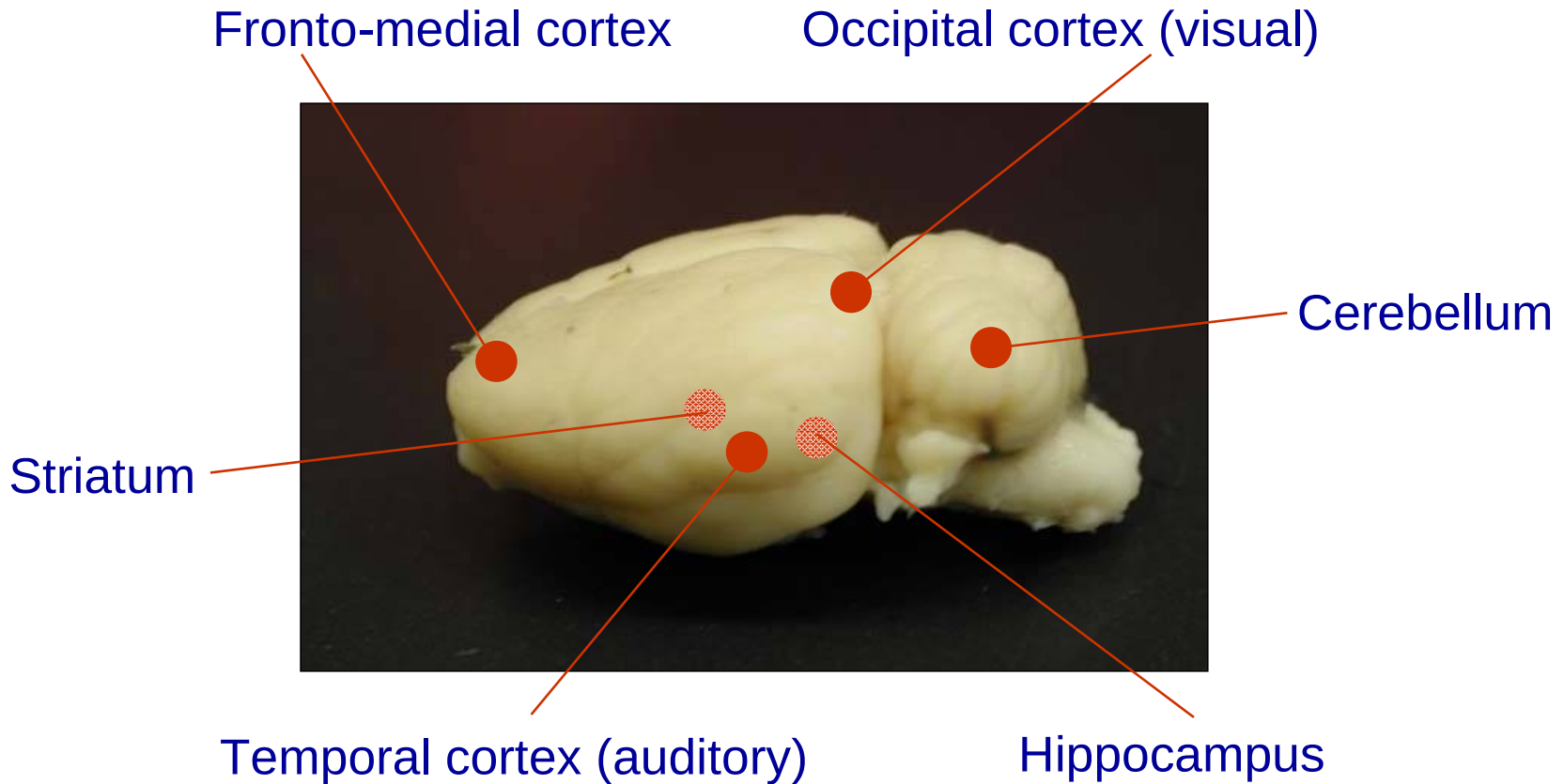
3 non-CNS tissues included for comparison

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Rat brain regions



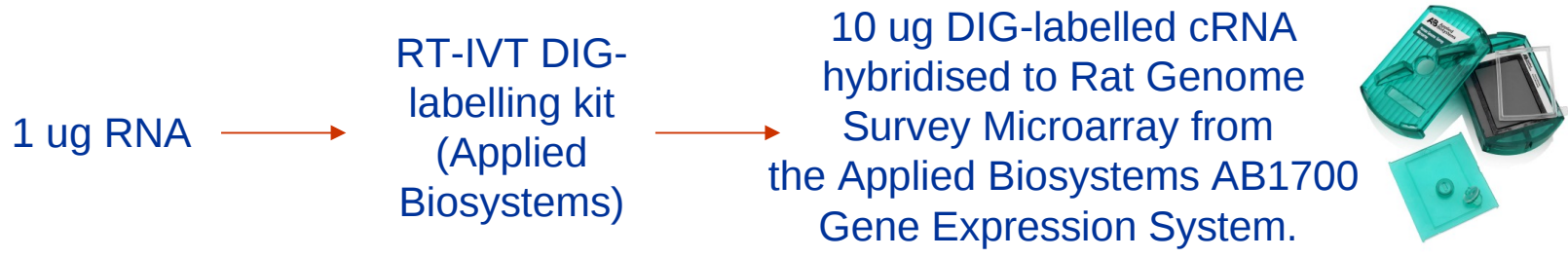
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Corresponding regions at left and right hemispheres.
N = 3 rats → 6 samples from each region

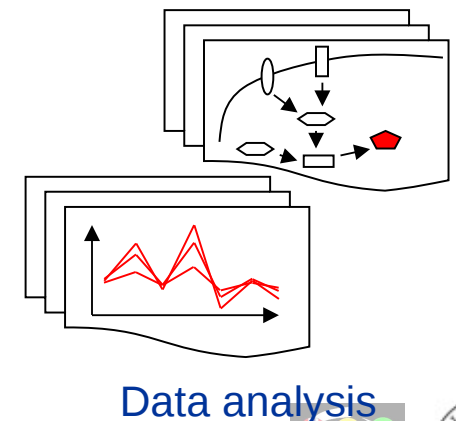




RNA and microarrays



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Data Analysis

We have data from 4 different brain regions

- From each region we have 6 samples from 3 rats (left and right side sampled separately)
- How can we analyse this dataset?



Data analysis

- Explorative approaches
- Differential expression
- Functional analysis

