NeuRA
Discover. Conquer. Cure.

Our vision is to prevent and cure disease and disability of the brain and nervous system.

SCHIZOPHRENIA RESEARCH LABORATORY

Discovering the neurobiology of schizophrenia

Honours / PhD projects

- Determining the neurobiology is crucial for the development of better treatments and ultimately a cure
- We use molecular and genetic techniques, cell lines, animal models and post-mortem brain cohorts
- We inform and collaborate with clinical trials of novel therapeutics for schizophrenia with in-depth examination of participants, including cognitive testing, in vivo brain imaging, and measurement of peripheral blood biomarkers

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Projects

We have a broad range of projects that can be tailored to your research interests. The main areas we investigate are at the forefront of schizophrenia research including:

-**Inflammation**
-**Neurotrophic factors** (e.g. BDNF)
-**Neurogenesis**
-**Determining subgroups within schizophrenia based on neurobiology**

Opportunity:

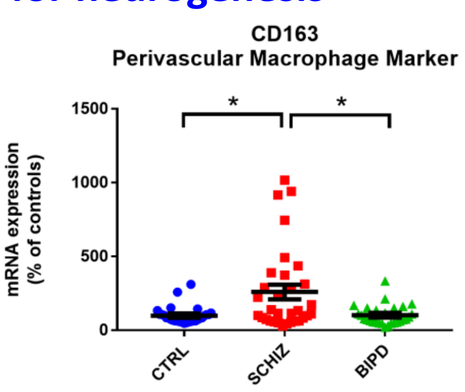
- The student will have a unique opportunity to work with valuable **post-mortem human brain tissue** and/or **rodent models.** Brain regions we study:
  - -Midbrain
  - -Prefrontal cortex
  - -Neurogenic niches (hippocampus and SEZ/SVZ)
- Our lab emphasizes the importance of publishing, and most PhD students publish ~3 papers in high impact journals

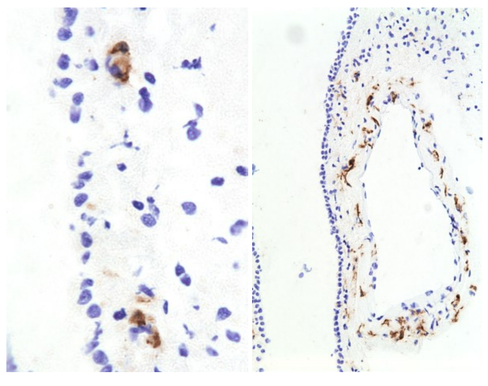
Techniques:

- **RNA sequencing and qPCR**: by measuring gene expression we get a unique insight into what happens in the brains of people with schizophrenia compared to controls
- **Immunohistochemistry (IHC)** and **microscopy**: to understand where and how cells/molecules interact in the human brain
- **MRI** and **blood**: to understand broad structural and peripheral changes in living patients that can relate to cognitive and behavioural measures
- **Protein quantification**: what processes are happening in brain cells

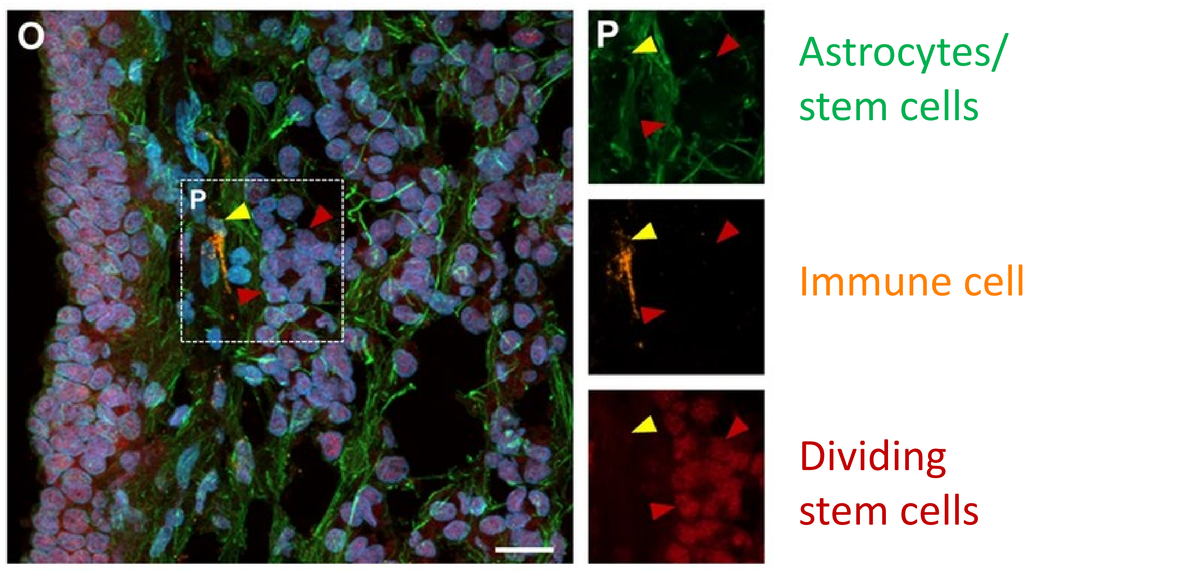
Our recent findings

Increased numbers of peripheral immune cells sneak into the brains of people with schizophrenia and reduce the capacity for neurogenesis





Gene expression and IHC of macrophages in the human SEZ



Fluorescent IHC showing proximity of macrophages to precious neural stem cells

Increased inflammation is related to worse attention and reduced cortical thickness in attention related brain regions in schizophrenia