AARHUS UNIVERSITY
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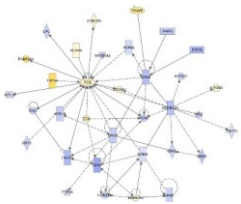

Psychiatric Disorders
Genes and Disease Mechanisms

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Background

Current large-scale genetic studies in human samples is revealing a plethora of novel psychiatric disorder risk genes. This has accelerated the need to understand how they elicit brain dysfunction.

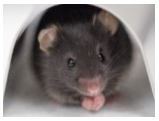
We aim is to discover **genetic risk factors and disease mechanisms in psychiatric disorders**. Our group primarily focus on schizophrenia and autism associated **transcriptional regulators** like e.g. BRD1 and KMT5B. We have also initiated efforts to map genetic risk factors in **nocturnal enuresis** (involuntary wetting of the bed during nighttime) which is a common disorder and comorbidity in psychiatric disorders. Hopefully, this research will reveal so far unknown determinants of balanced urine production, bladder activity and sleep.

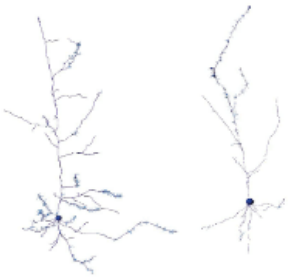
Projects and techniques

In our group, you can study changes in mouse behavior and brain structure, reinforcing effects of environmental risk factors, changes in gene expression at the RNA and protein level as well as more basic molecular investigations of changes in histone modifications, protein-protein or protein-DNA interactions and promoter methylation. You can also study genetic risk factors in human samples.

Your project will likely require a broad collection of techniques, thus we typically take a **highly collaborative approach** including relevant supervisors from other groups and departments.

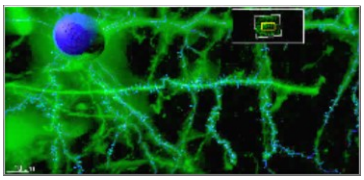
Your work could include:
Mouse models
Neuronal cell culture (patient-derived, human, or non-human)
Animal behavioral testing
RNAseq and qPCR on brain tissue or cells
Mass spectrometry and Western blotting
ChIP and co-IP
Bioinformatics





We take part in iPSYCH, The Lundbeck Foundation Initiative for Integrative Psychiatric Research, and iSEQ Centre for Integrative Research and we are affiliated to DANDRITE.

We are currently 4 staff members, 3 postdocs, 1 PhD student, 3 students (master, research year and bachelor). We are trained in biology, molecular biology, and medicine.



References to recent research from our group:

- Fryland et al. Identification of the BRD1 interaction network and its impact on mental disorder risk (2016). **Genome Biology.**
- Qvist et al. (2017). The schizophrenia associated Brd1 gene regulates behavior, neurotransmission, and expression of schizophrenia risk enriched gene sets in mice. **Biological Psychiatry**.
- Dyrvig et al. (2017). DNA methylation analysis of BRD1 promoter regions and the schizophrenia rs138880 risk allele. **PLoS One.**
- Toustrup et. A. (2018). The novel Ser18del AVP variant causes inherited neurohypophyseal diabetes insipidus by mechanisms shared with other signal peptide variants. **Neuroendocrinology.**