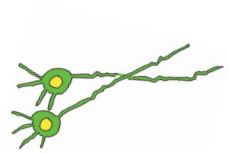
Department of Molecular Medicine
Neurobiology Research Unit

Neurobiology
8 research groups
(8 group leaders, 7 technicians, 6 postdocs)
7 clinical affiliates

Student projects ongoing (estimates)

PhD	11
Master	4
Pregraduate	3
Bachelor, ISA	5



Find us at
WP21, ground floor and 1. floor
WP25, 2. floor
Note: From Dec. 2023 at NytSund
https://www.sdu.dk/da/immed/nb

Neurobiology Research

Neurobiology research is directed toward:

Improving the understanding of the central nervous system's response to injury and disease

Alzheimer's disease
Parkinson's disease
Multiple sclerosis
Neuromyelitis optica spectrum disorders
Stroke
Spinal cord injury
Autoimmune encephalitis
Psychiatric/developmental disorders

We use:

Clinical material from patients (tissue, blood, CSF), animal models (transgenic mice), cell cultures (primary cells, stem cells, cell lines)
Molecular, cellular and histologic methods as well as more advanced technologies (proteomics, metabolomics, genomics…)

Bente Finsen:
Alzheimer's disease,
Stroke and Multiple sclerosis
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Åsa Fex Svenningsen:
Neuron-glia interaction in
neurodegenerative diseases
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Agnieszka Wlodarczyk:
Microglial subsets in
developing adult CNS
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Trevor Owens:
Neuroimmunology
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Kate Lambertsen:
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Bettina Hjelm Clausen:
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Mengliang Zhang:
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Morten Meyer:
Parkinson's disease,
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Clinical affiliates:

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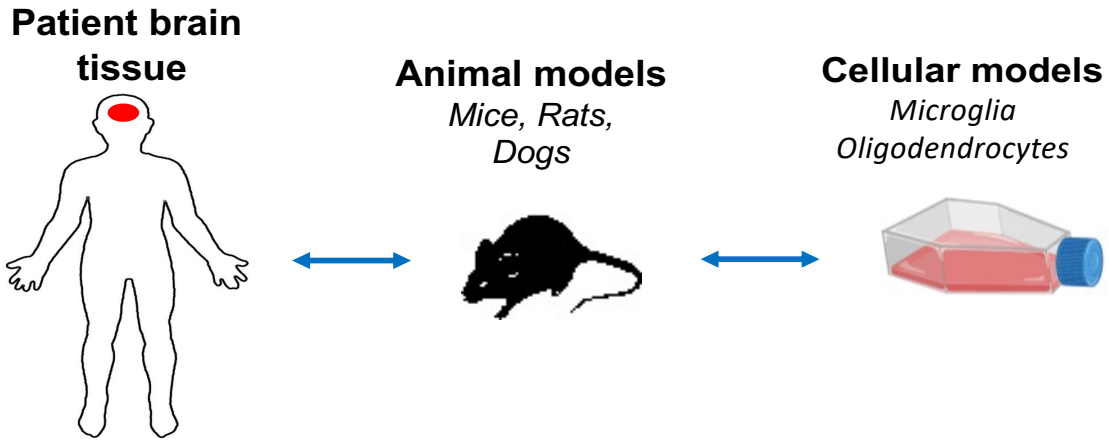
Mikael Palner (mpalner@health.sdu.dk)
Morten Blaabjerg (mblaabjerg@health.sdu.dk)
Lars Henrik Frich (lhfrich@health.sdu.dk)
Tanja Sheldrick-Michel (tmichel@health.sdu.dk)

Disease mechanisms and new therapeutic strategies in Alzheimer's disease (AD) and multiple sclerosis (MS) – Bente Finsen



AD: **PhD student Julie Schmidt Hansen**

PhD student Marco Anzalone

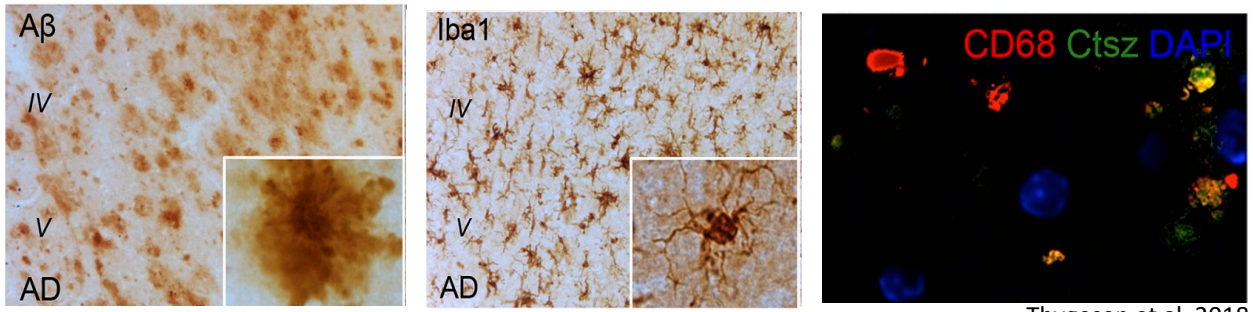
MS: **Postdoc Birgitte Villadsen**

bfinsen@health.sdu.dk

Project example: Effect of cKO of 5-HT2b receptor in microglia on microglial phagocytosis of amyloid beta

The project example is an Intergrated part of the PhD project by MSc Marco Anzalone

Cortical pathology in AD patient



Thygesen et al. 2018

Experimental model: **AD model mice with and without cKO of 5-HT2b receptor in microglia**
(APP/PS1$^{Tg/Wt}$:Cx3Cr1$^{CreER/wt}$:ht2b$^{fl/fl}$)

'Hyperreactive' microglia
Autoradiography for TSPO also used for PET-imaging of neuroinflammation in patients with AD

Unpublished original data removed

Frontal lobes in paraffin

Paraffin sections:	**Quantitative data:**
IHC for Aβ	% Aβ-plaque load
IHC for Iba1	Microglial morphology/density
IHC for CD68	Lysosomal size/density
IF for Iba1/Aβ or CD68/Aβ	Phagocytic uptake of Aβ

Tissue for RNA extraction:
Quantitative rt-RT-PCR:
- TNF mRNA, IDE mRNA etc

RNA-Seq on MACS-isolated microglia
- will lead to new questions …

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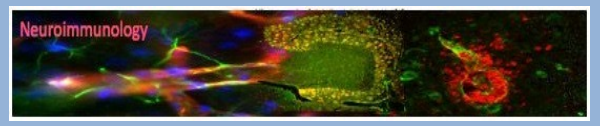
Regulatory mechanisms in neuroinflammation and in antibody-mediated demyelination

Trevor Owens

Neurobiology Research Unit, Department of Molecular Medicine,
University of Southern Denmark

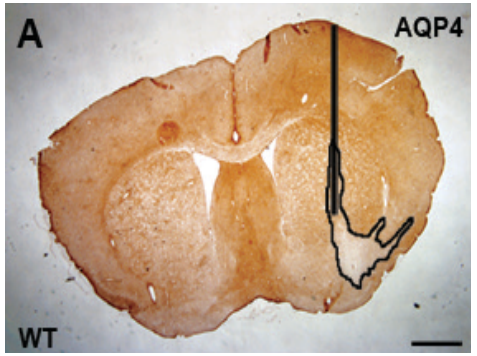


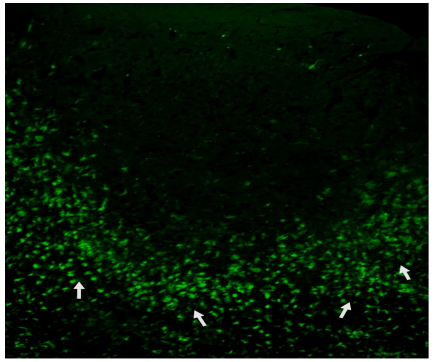
SDU

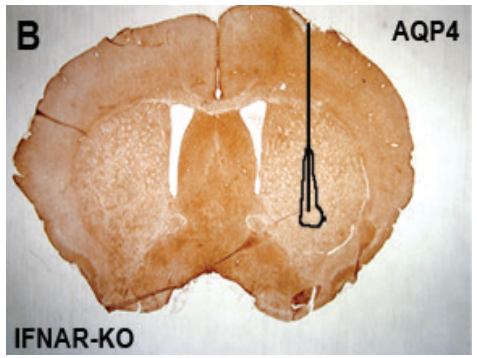
Reza Khorooshi

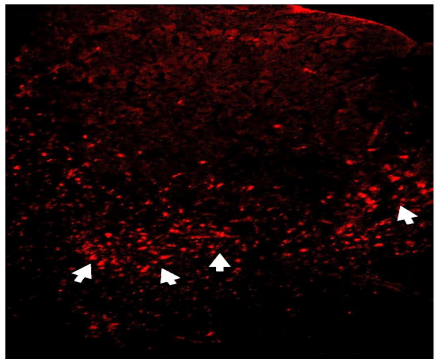
Innate regulation of Neuroinflammation and Antibody-mediated pathology in CNS

We study animal models of Multiple Sclerosis (MS) and Neuromyelitis Optica Spectrum Disorder (NMOSD). Anti-inflammatory cytokines, such as Type I Interferon and IL-10, are produced within the CNS, and we study the impact of aging on these responses.







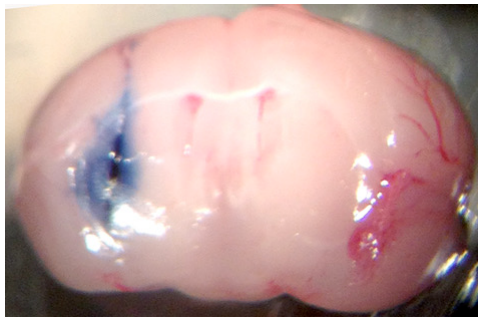


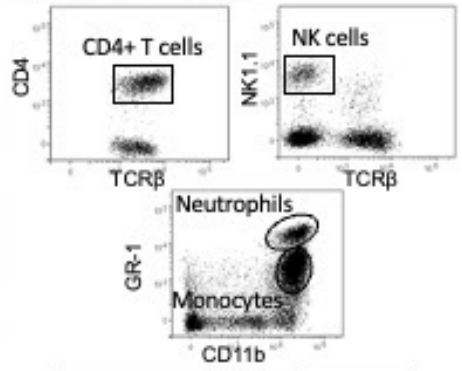
The goal of our ongoing research is to establish animal models that allow us to study:

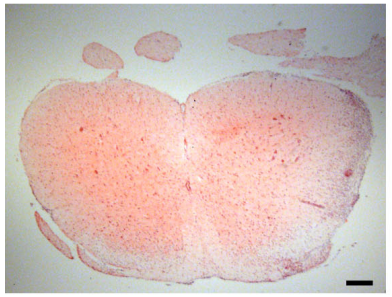
- the impact of innate immune signaling and aging on demyelinating lesions
- the underlying mechanism behind progressive MS and NMOSD
- candidate therapies in MS-like lesions and in antibody-mediated pathology

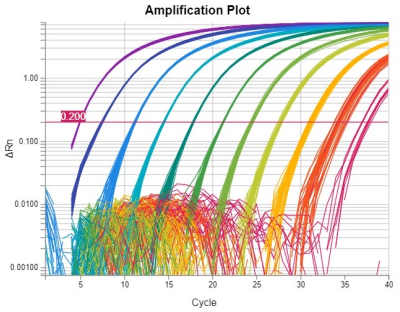
Methodology

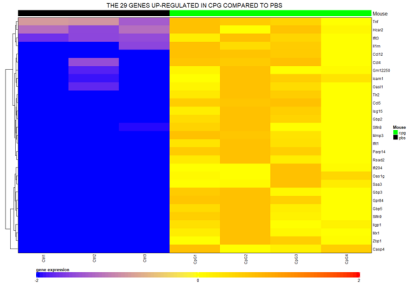
we can offer; Mouse models, intracerebral injection/transplantation/axonal transection, flow cytometry, histology, molecular analysis, in vivo imaging, and treatments

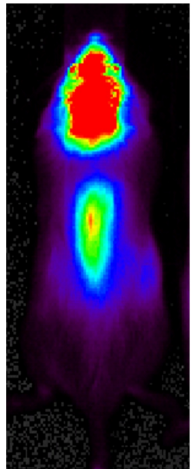












Thank you for your attention

Feel free to contact us!

https://www.sdu.dk/da/immed/nb