

INVOLVED SCIENTISTS

- Prof. Niels Hellings, PhD (neuroimmunology – T cells, repair)
- Prof. Veerle Somers, PhD (immunology – B cells, biobank)
- Prof. Jerome Hendriks, PhD (immunology – myeloid cells, nutrition)
- Prof. Markus Kleinewiefeld, PhD (immunology, nutrition & microbiome)
- Dr Tim Vanmierlo, PhD (neuroimmunology – cognition)
- Prof. Bart Van Wijmeersch, MD PhD (MS neurologist)
- Prof. Veronica Popescu, MD PhD (MS neurologist, MRI specialist)
- Prof. Peter Feys, PhD (rehabilitation)
- Prof. Bert Op 't Eijnde, PhD (rehabilitation)
- Prof. Piet Stinissen, PhD (immunology)
- Dr Liesbet Peeters, PhD (Datascientist)

RECENT CLINICAL TRIALS

- Natalizumab observ. (NCT02677077)
- Ofatumumab Ph. 3 (NCT02792218)
- ALK8700 Ph. 3 (NCT02634307)
- Ponesimod Ph. 3 (NCT02907177)
- BAF312 Ph. 3 (NCT01665144)
- Ocrelizumab Ph. 3 (NCT03085810)
- MD1003 Ph. 3 (NCT02936037)
- Task-oriented upper limb training Ph. 2 (NCT02688231)
- Exercise + Beta-alanine supplementation (NCT03418376)
- Auditory cues and music during walking (NCT03281330)

COLLABORATION OPTIONS

- Fee-for-Service
- Consultancy and training
- Joint research collaboration and grant applications
- Clinical Trial Site (MS center Overpelt)

PUBLICATIONS

- Wilck et al (**Kleinewiefeld**). Salt-responsive gut commensal modulates TH17 axis and disease. *Nature* 2017; 551(7682): 585-589
- **Vanmierlo** et al. The PDE4 inhibitor roflumilast improves memory in rodents at non-emetic doses. *Behav Brain Res.* 2016;303:26-33
- Janssens et al. (**Stinissen, Hendriks, Hellings**). Oncostatin M protects against demyelination by inducing a protective microglial phenotype. *Glia.* 2015 Oct;63(10):1729-37.
- Mailleux et al. (**Vanmierlo, Hendriks**) Low-density lipoprotein receptor deficiency attenuates neuroinflammation through the induction of apolipoprotein Front Immunol. 2017;8:1701
- Jorissen et al. (**Vanmierlo, Hellings, Somers, Van Wijmeersch, Stinissen, Hendriks**) Relapsing-remitting multiple sclerosis patients display an altered lipoprotein profile with dysfunctional HDL. *Sci Rep.* 2017;7:43410
- Montes Diaz et al. (**Van Wijmeersch, Somers**) Dimethyl fumarate induces a persistent change in the composition of the innate and adaptive immune system in multiple sclerosis patients. *Sci Rep.* 2018;8(1): 8194
- Dhaeze et al. (**Peeters, Van Wijmeersch, Somers, Stinissen, Hellings**). Circulating Follicular Regulatory T Cells Are Defective in Multiple Sclerosis. *J Immunol.* 2015 Aug 1;195(3):832-40
- Feys et al (**Eijnde BO, Van Wijmeersch, Popescu**) Effects of an individual 12-week community-located "start-to-run" program on physical capacity, walking, fatigue, cognitive function, brain volumes, and structures in persons with multiple sclerosis. *Mult Scler.* 2017.
- Moumdjian et al. (**Eijnde BO, Van Wijmeersch, Feys**) Walking endurance and perceived symptom severity after a single maximal exercise test in persons with mild disability because of multiple sclerosis. *Int J Rehabil Res.* 2018.
- Wens I et al (**Eijnde BO**). High Intensity Aerobic and Resistance Exercise Can Improve Glucose Tolerance in Persons With Multiple Sclerosis: A Randomized Controlled Trial. *Am J Phys Med Rehabil.* 2017 Mar;96(3):161-166.
- Kappos et al. (**Van Wijmeersch**) Siponimod versus placebo in secondary progressive multiple sclerosis (EXPAND): a double-blind, randomised, phase 3 study. *Lancet.* 2018;391(10127): 1263-1273
- Kapoor et al. (**Van Wijmeersch**) Effect of natalizumab on disease progression in secondary progressive multiple sclerosis (ASCEND): a phase 3, randomised, double-blind, placebo-controlled trial with an open-label extension. *Lancet Neurol.* 2018;17(5): 405-415
- **Peeters** et al. (**Van Wijmeersch, Hellings, Popescu, Feys**) Multidisciplinary data infrastructures in multiple sclerosis: Why they are needed and can be done! *Mult Scler.* 2018 Nov 1

BUSINESS DEVELOPER

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COLLABORATION OPPORTUNITY

Multiple Sclerosis research in vitro-to-patient toolbox

- Customized services to advance your MS product through consecutive development phases
- Multidisciplinary teams with decades of experience in the MS field



UHASSELT

KNOWLEDGE IN ACTION

IN VITRO MODELS

Adaptive immune cells

Primary human and rodent T and B cells
Lymphocyte phenotype and function:

- Activation & Proliferation
- Suppression & Cytotoxicity
- Cytokine secretion
- Migratory capacity
- Maturation/Differentiation
- Isotype class switching
- Co-stimulation & Antigen Presentation

Innate immune cells

Human and rodent monocytes and macrophages
(primary cells and cell lines)

Macrophage phenotype and function:

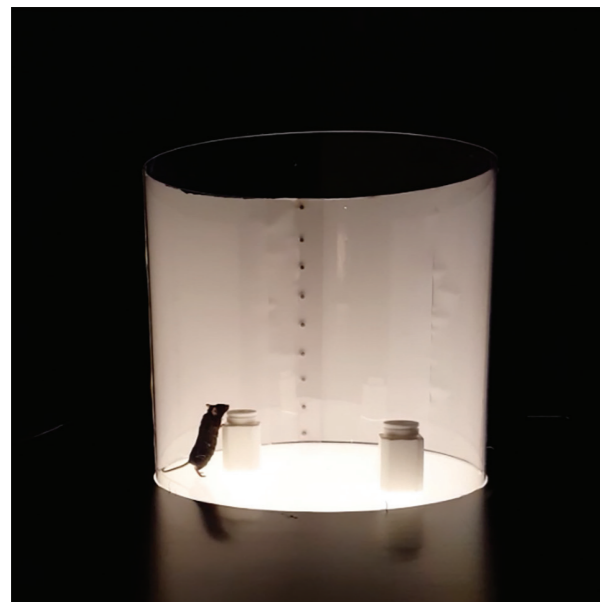
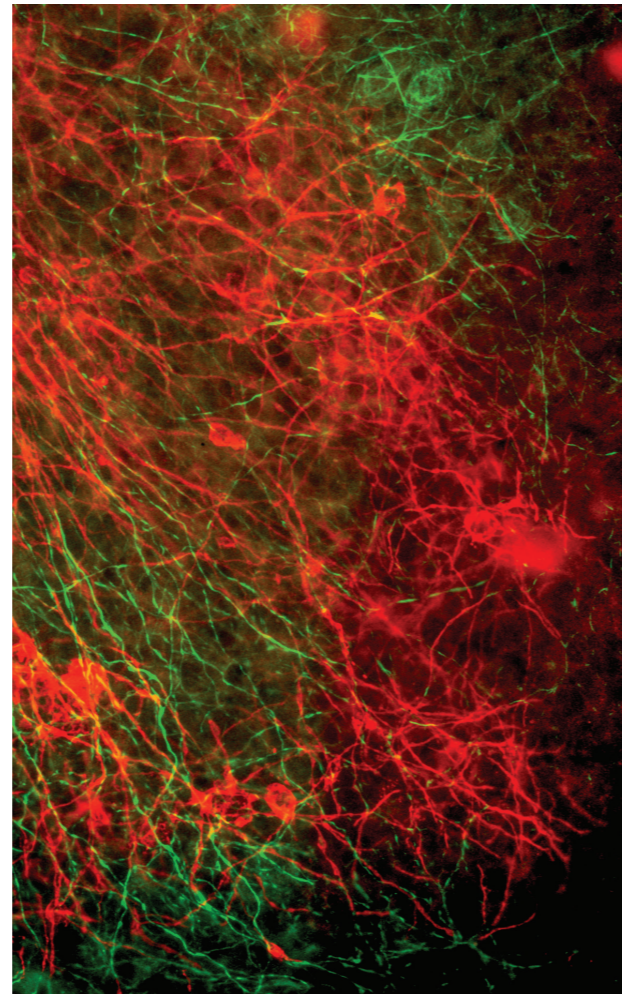
- Phagocytosis
- Migratory potential
- Reparative and inflammatory activity

CNS resident cells

- Primary rodent glia (oligodendrocyte progenitor cells - OPCs, microglia, astrocytes)
- OPC differentiation (+ genetic and epigenetic modelling)
- Brain slices "lyssolecithin induced remyelination model"
- Human and mouse blood-brain barrier models (static and flow conditions)

Techniques

Cell culture - flow cytometry - quantitative PCR - western blot
- ELISA - RNA sequencing



IN VIVO MODELS

Animal models

- EAE mouse model (neuroinflammation)
- Cuprizone mouse model (acute & chronic de- and remyelination of corpus callosum)
- Lyssolecithin mouse model (focal lesion model for de- and remyelination)
- Adoptive transfer & bone marrow transplantation models

Molecular read-outs

Quantitative PCR
Flow cytometry
Immunohistochemistry
Gut microbiota analysis

Functional read-outs

Disease score
Cognitive tests:

- object recognition task
- object location task
- open field task
- morris water escape maze
- spatial Y-maze
- Complex running wheel

BIOBANK

Biobank background

- Collaboration between Hasselt University, Hospital East-Limburg and Jessa Hospital
- Goal: collect, process and store high-quality biological material together with its associated clinical data
- Highest standards (following ESFRI, ECRIN guidelines)
- In total 42+ project collections (2017)
- In total 115,000+ samples (2017)

Multiple Sclerosis collections

- Plasma 1490+ samples/722 patients
- PBMC pellets 825+ samples/489 patients
- PBMC freezings 718+ samples/446 patients
- DNA 449+ samples/437 patients
- CSF 127+ samples/90 patients

Third parties can get access to the collections via a collaboration with the collecting principle investigator.

More information

www.universitybiobanklimburg.be

PATIENT STUDIES

MS network Limburg

The UHasselt Biomedical research institute and center for rehabilitation research are partnering with the Rehabilitation and MS center Overpelt and university college PXL to enable multidisciplinary and translational research to support the treatment of MS. Currently more than 700 patients are available in this network with a forecast of up to 1000 patients in the coming years.

Cross-sectional studies

- Investigate the prevalence, underlying mechanisms and relationship between frequently reported impairments and disabilities
- Optimize assessment tools to evaluate the progression of the disease, impairments and disabilities

Interventional studies

- Investigate the effect of new rehabilitation strategies such as training programs, cognitive-motor dual task training programs, exercise programs based on sonification and embodiment, task-oriented upper limb training
- Clinical pharmaceutical studies (phase 0 - 4): investigate drug therapy and the effect of therapy dosage

Techniques

- Blood analysis - muscle biopsies - gut microbiota analysis
- Movement analysis techniques - 3D movement registration using sensors
- Exercise testing and muscle dynamometry - evaluation of body composition
- Testing of functional capacity
- Evoked potentials - imaging (MRI)
- Optimization of clinical protocols and training programs
- Cognitive screenings - Questionnaires (fatigue, quality of life)
- Patient contacts - PROMs - PREMs

