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

INVOLED 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 Kleinewietfeld, PhD (immunology, nutrition & microbiome)
- Dr Tim Vannierlo, PhD (neuroimmunology – cognition)

- Prof. Bart Van Wijmeersch, MD PhD (MS neurologist)
- Prof. Markus Kleinewietfeld, PhD (immunology, nutrition & microbiome)
- Prof. Peter Feye, PhD (neuroimmunology – cognition)
- Prof. Bart Op’t Eijnde, PhD (rehabilitation)
- Prof. Piet Stinissen, PhD (immunology)
- Dr Liesbet Peeters, PhD (Data scientist)

BUSINESS DEVELOPER

An Voets, PhD
UHasselt - Biomedical Research Institute
T +32 (0) 497 06 75 34
an.voets@uhasselt.be

RECENT CLINICAL TRIALS

- Natalizumab observ. (NCT02677077)
- Ofatumumab Ph. 3 (NCT02792218)
- AIX8700 Ph. 3 (NCT02634307)
- Ponessimod Ph. 3 (NCT02907177)
- BAF312 Ph. 3 (NCT01665144)
- Orfilizumab Ph. 3 (NCT03085810)
- ND1003 Ph. 3 (NCT02996637)
- Task-oriented upper limb training Ph. 2 (NCT02688231)
- Exercise + Beta-alanine supplementation (NCT03418376)
- Auditory cues and music during walking (NCT03281330)

PUBLICATIONS

- Vannierlo et al. The PDE4 inhibitor ralflumilast improves memory in rodents at non-emetic doses. Behav Brain Res. 2016;303:26-33
- Mailfaut et al (Vannierlo, Hendriks). Low density lipoprotein receptor deficiency attenuates neuroinflammation through the induction of apolipoprotein (Front Immunol. 2017;8:1701)
- Peeters et al. (Van Wijmeersch, Hellings, Poppescu, Feye). Multidisciplinary data infrastructure in multiple sclerosis: Why they are needed and can be done! Mult Scler. 2018 Nov 1
IN VITRO MODELS
Adaptive immune cells
Primary human and rodent T and B cells
Lymphocyte phenotype and function:
• Activation & Proliferation
• Suppression & Cytotoxicity
• Cytokine secretion
• 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 “lysolecithin 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)
• Lysolecithin 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 Ymaze
  • Complex running wheel

IN VITRO MODELS
Primary human and rodent T and B cells
Lymphocyte phenotype and function:
• Activation & Proliferation
• Suppression & Cytotoxicity
• Cytokine secretion
• Maturation/Differentiation
• Isotype class switching
• Co-stimulation & Antigen Presentation

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)
• Lysolecithin 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 Ymaze
  • Complex running wheel

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

BIOLANK
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 ESFR, ECRIN guidelines)
• In total 42+ project collections (2017)
• In total 115,000+ samples (2017)

Multiple Sclerosis collections
• Plasma 149+ 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

MS DATACONNECT
F.A.I.R. data for next generation management of Multiple Sclerosis (Peeters LM. Mult. Scler. 20 18)
COLLECT - CONNECT - COMPLETE - CONSTRUCT

MS
DATACONNECT
F.A.I.R. data for next generation management of Multiple Sclerosis (Peeters LM. Mult. Scler. 20 18)