Board of examiners

Prof. dr. Sven Hendrix
Medical School Hamburg
Germany

Prof. dr. Sarah Gerlo
Faculty of Medicine and Health Sciences
Ghent University

Prof. dr. Sylvie De Raedt
Department of Neurology
Vrije Universiteit Brussel/UZ Brussel

Prof. dr. Jan Versijpt
Department of Neurology
Vrije Universiteit Brussel/UZ Brussel

Prof. em. dr. Jacques De Keyser
Center for Neurosciences
Vrije Universiteit Brussel

Prof. dr. Mark Van De Casteele, Chair
Diabetes Pathology and Therapy (DIAB)
Vrije Universiteit Brussel

Prof. dr. Ron Kooijman, Promoter
Department of Experimental Pharmacology
Vrije Universiteit Brussel

VRIJE UNIVERSITEIT BRUSSEL

PhD in Medical Sciences
2020-2021

INVITATION to the Public defence of

Ahmad SERHAN

To obtain the academic degree of **'DOCTOR OF MEDICAL SCIENCES'**

The role of microglia in neuroprotection by insulin-like growth factor-1 in a rat model for ischemic stroke

The defence will take place on **Thursday, 18th February 2021 at 5 p.m.**

and will be organised **online** accessible through the following link:

Click here to join the meeting

Summary of the dissertation

Stroke is one of the leading causes of death and long-term disability. Ischemic stroke which accounts for 87% of stroke cases, is caused by blockage in cerebral artery. Recombinant tissue plasminogen activator (rtPA) and endovascular thrombectomy are the only available treatments for ischemic stroke. Given that few stroke patients benefit from these treatments, there is a pressing need to find alternatives. Neuroprotection has attracted significant attention in preclinical stroke research, as it may have the potential to improve the stroke outcome. Insulin-like growth factor-1 (IGF-1) has neuroprotective effects when administered centrally or systemically following ischemic stroke. To further assess the usefulness of IGF-1 as a neuroprotective agent and to facilitate the translation to the clinic, we addressed its working mechanism and the effect of aging on the efficacy of the treatment with IGF-1. We first addressed the role of microglia in neuroprotection by IGF-1 in rats with an ischemic stroke. We found that the microglia in the ischemic hemisphere are a target for IGF-1 and that IGF-1 impairs the expression of pro-inflammatory mediators in microglia, and probably also in other cell types. IGF-1 decreased the infarct volume in both young adult and aged rats, but the sensorimotor functions were only significantly improved in young adult rats. In conclusion, IGF-1 is a promising drug for treatment of ischemic stroke, but the efficacy in aged rats should be increased.

Curriculum Vitae

Ahmad Serhan was born in Doha (Qatar). He obtained a bachelor in Biology from Lebanese University (Beirut, Lebanon) and master in Biology, specialized in Genetics, Cell and Developmental Biology with distinction from Vrije Universiteit Brussel. He conducted his PhD research at the Department of Experimental Pharmacology under the guidance of Prof. Dr. Ron Kooijman. His research was focused on investigating the mechanisms by which insulin-like growth factor-1 (IGF-1) induces neuroprotection in rats with ischemic stroke, and whether aging affects the efficacy of IGF-1 neuroprotection. He published two articles as a first author in international peer-reviewed journals and presented his work at national and international conferences.