

## HABILITATION THESIS REVIEWER'S REPORT

**Masaryk University  
Faculty**

**Procedure field  
Applicant**

**Applicant's home unit,  
institution**

**Habilitation thesis  
Reviewer**

**Reviewer's home unit,  
institution**

Faculty of Science

Animal Physiology

RNDr. Milan Číž, Ph.D.

Department of Experimental Biology, Section of Animal Physiology and Immunology

*Modulation of professional phagocyte activity*

**Adj. Prof. Jari Nuutila**

Department of Biochemistry, University of Turku,  
Tykistökatu 6, 20520 Turku, Finland

Applicant have been studying the possibilities of professional phagocyte modulation by both endogenous (serotonin) and exogenous (polyphenols and polysaccharides of plant origin as food constituents) mediators.

Applicant's studies brought the evidence that serotonin released from platelets is a very important modulator of professional phagocyte activity and that the inhibitory activity is manifested by the decrease in the generation of reactive oxygen species due to the inhibition of myeloperoxidase activity and by direct scavenging of reactive oxygen species. Applicant concluded that the effects of serotonin on professional phagocytes are partially mediated by 5-HTR2 receptor expressed on monocytes/macrophages but not on neutrophils.

Applicant have also introduced and optimized several methods to investigate antioxidant properties of plant extracts and individual plant polyphenols. Unfortunately, the thesis does not contain description whatsoever of these fundamental methods. In addition, detailed description about the luminol amplified chemiluminescence measurement should have been incorporated in the thesis.

Applicant have also found in his studies that many medicinal plants, vegetables and berries are rich sources of polyphenol compounds and free radical scavengers, and that various plant polyphenols and polysaccharides exerted evident immunomodulatory activity.

Applicant concluded that these compounds represent effective naturally occurring substances with potent pharmacological effects on respiratory burst of professional phagocytes useful for treatment of compromised immune system and control of inflammation.

Applicant was the first (n=3) or last (n=3) author in six out of 20 articles, indicating adequately enough the capability to plan, lead, and do independent scientific research. Applicant was co-author in rest of the 14 articles. The articles have been published between 2003 and 2019.

### Reviewer's questions for the habilitation thesis defence

1. How were the plateles used in serotonin experiments separated?

2. What was the optimal platelets to PMNL ratio in order to inhibit ROS production?
3. What is the substance being liberated from untreated platelets that inhibits ROS production?
4. Did applicant do any direct enzyme kinetic measurements with serotonin and pure (commercial) MPO?
5. Applicant stated that serotonin affected differently on isolated neutrophils and on total leukocyte suspension. How did platelet leftovers in the leukocyte suspension affected on these results?

## **Conclusion**

The habilitation thesis entitled *Modulation of professional phagocyte activity* by RNDr. Milan Číž, Ph.D. **fulfils** requirements expected of a habilitation thesis in the field of Animal Physiology.

Date: 30.9.2020 in Turku, Finland

Signature: