

## SZABOLCS PÉTER TALLÓSY



University of Szeged  
Institute of Surgical Research

Address: Pulz u. 1., H-6724 Szeged, Hungary

## RESEARCH AREA

According to the criteria of “Sepsis-3” consensus conference, sepsis is defined as a life-threatening organ dysfunction caused by a dysregulated host response to infection. Sepsis is still one of the most frequent cause of death in intensive clinical care, so a well-standardized animal model compatible with human symptoms is essential in research. There are many descriptions of the process of sepsis in the related literature, but the microbiological background is a less researched area, despite the fact that sepsis is caused by a polymicrobial infection. Based on the above, only that sepsis model is appropriate, where live microorganisms are used, and for this reason, it is indispensable to describe the microbial profile of the animals, and calculate the initial concentration of the microorganism suspension for the sepsis induction. One of the major problems during sepsis is the disproportion between oxygen transport and use, which necessarily leads to the energy deficiency of the cells, therefore, we the mitochondrial effects of different pharmacons from the therapeutic targets were investigated. In our view, the main target of sepsis can be the supply of oxygen and energy to the body, mitigating the mitochondrial dysfunction, and thus reducing the inflammatory response to severe organ damage. We believe that our therapeutic approaches to mitochondrial dysfunction can improve the condition of septic patients.

## TECHNIQUES AVAILABLE IN THE LAB

Our research laboratories are equipped with instruments to identify macro- and microcirculatory changes (hemodynamic computerized data-acquisition and analysis systems, laser-Doppler flowmetry, fluorescence-based intravital microscopy, orthogonal polarisation spectral imaging). Fluorescence confocal laser scanning endomicroscopy technique offers the possibility of acquiring precise in vivo data for histological analysis. A high resolution respirometer is available for examination of mitochondrial function (activities of the components of electron transport chain) and additional laboratory facilities (ELISA) to study inflammatory biomarkers. Animal house and fully-equipped operating theatres are available for surgical intervention of small (rats) and larger animals (minipigs).

## SELECTED PUBLICATIONS

**Tallósy, S.P.** (2014) et al., Investigation of the antibacterial effects of silver-modified TiO<sub>2</sub> and ZnO plasmonic photocatalysts embedded in polymer thin films. **Environ. Sci. Pollut. Res** **21(19)**: 11155–11167.

**Tallósy, S.P.** et al. (2016) Adhesion and inactivation of Gram-negative and Gram-positive bacteria on photoreactive TiO<sub>2</sub>/polymer and Ag-TiO<sub>2</sub>/polymer nanohybrid films. **Appl. Surf. Sci** **371**: 139–150.

**Tallósy, S.P.**, Janovák, L., Ménesi, J., Nagy, E., Juhász, Á., Dékány, I. (2014) LED-light Activated Antibacterial Surfaces Using Silver-modified TiO<sub>2</sub> Embedded in Polymer Matrix. **J. Adv. Oxid. Technol.** **17(1)**

Janovak, L. et al. (2014) Synthesis of pH-sensitive copolymer thin solid films embedded with silver nanoparticles for controlled release and their fungicide properties. **J. Drug Deliv. Sci. Technol.** **24(6)**: 628–636.

Janovák, L. et al. (2017) Hydroxyapatite-enhanced structural, photocatalytic and antibacterial properties of photoreactive TiO<sub>2</sub>/HAp/polyacrylate hybrid thin films. **Surf. Coatings Technol.** **326**: 316–326.

Deák, Á. et al. (2015) Spherical LDH-Ag<sup>+</sup>-Montmorillonite Heterocoagulated System with a pH-Dependent Sol-Gel Structure for Controlled Accessibility of AgNPs Immobilized on the Clay Lamellae. **Langmuir** **31(6)**: 2019–2027.

Samu, G.F. et al. (2017) Photocatalytic, photoelectrochemical, and antibacterial activity of benign-by-design mechanochemically synthesized metal oxide nanomaterials. **Catal. Today** **284**: 3–10.

Veres, Á. et al. (2012) **J. Adv. Oxid. Technol** **15(1)** [STI, Science & Technology Integration], 2012.