

## Abstract

- **Keywords:** Lung Tx, EVLP, NHBD, IR injury, ROS, hypercapnia, gender differences

This dissertation thesis deals with a very topical issue of the lack of donor organs for lung transplants. As with other organs, the number of patients on waiting lists in terminal stages of their diseases is also constantly rising but there is not an adequate increase in donor organs.

We focused our experimental work on the development of research concerning the solution which is most successful in a long-term perspective, i.e. organ transplants from non-heart-beating donors (NHBDs), in an *ex vivo* lung transplant protocol (EVLP) on an animal model (Wistar rats). This is a method which is clinically established worldwide (in the Czech Republic only experimentally) and is constantly subject to further research.

Based on earlier studies, we focused the first experimental part of this work on the potential **protective effect of hypercapnic ventilation on ischemia-reperfusion (IR) lung injury** in EVLP. The study proved that the hypercapnic ventilation has a protective effect on the generation of reactive oxygen species (ROS) in IR lung injury, but only when used in the period of reperfusion.

In the second experimental study, we followed up a very topical issue of **the effect of gender on IR lung injury** in EVLP in non-heart-beating donors. Also, here the hypotheses that female lungs are more resistant to IR lung injury than the lungs of experimental males were confirmed.

The results of both studies are significant in terms of further development of EVLP method and clinical application of results. Either it is a benefit for a patient in terms of the increase in the number of donor organs or short- and long-term thriving of the graft or selection of suitable donors.