



## Report on the visit of Radoslaw Maksym in the University of Saarland, Homburg/Saar, Germany within 7PR21/BASTION/WP1 (Twinning)

**Task:** T1.5.

**MUW:** Task leader - Dr Pawel Wlodarski

**Visitor:** Radoslaw Maksym , MD

**Foreign Partner:** Saarland University, Homburg/Saar, Germany

**Hosts:** Prof. Friedrich A. Grässer, Prof. Matthias Laschke (Clinical and Experimental Surgery).

From July 3<sup>rd</sup> until July 16<sup>th</sup>, 2014 I was a visitor at Institute of Clinical and Experimental Surgery, University of Saarland, Homburg/Saar, Germany. The task of the twinning was to train in unique methods of analysis of angiogenesis on animal model and train microsurgical skills.



The University of Saarland houses the facility – Institute of Clinical and Experimental Surgery – that is well recognized center that excel in research on animal models of angiogenesis in various diseases especially endometriosis. The stay allows getting expertise in unique and advanced methods like application of dorsal skinfold chamber technique. This technique enables real time observation of angiogenesis in vitro. Observation of the same animal without need of scarifying reduces inter-animal variability and significantly reduces the number of animals needed to conduct reliable analysis. I underwent practical and theoretical training in implanting dorsal skinfold chamber and further implantation of endometrial implants.

Fig.1 – In front of the building of Clinical and Experimental Surgery, University of Saarland.

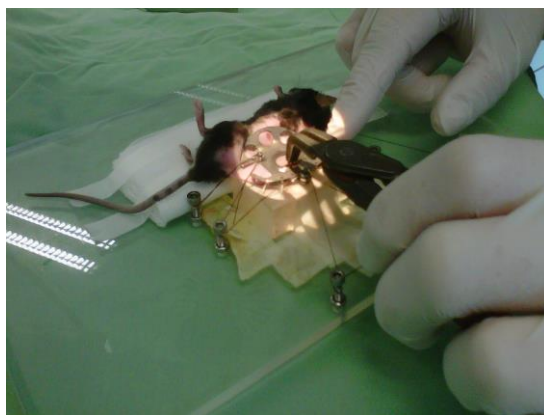


Fig. 2A and 2B - During practical classes in implantation of dorsal skinfold chamber

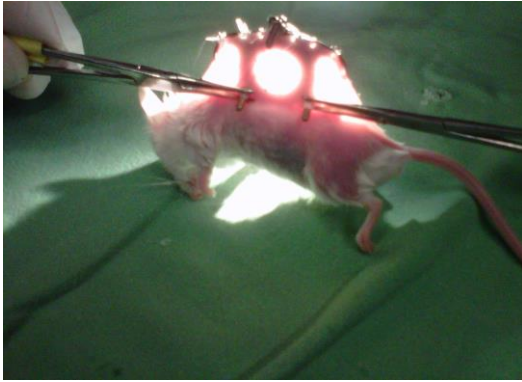


Fig. 3A and 3B – Microsurgical implantation of skinfold dorsal chamber.

Furthermore it was also possible to get deep knowledge about animal research and husbandry routine implemented at University of Saarland. I get knowledge about husbandry protocols and performing estrous cycle analysis, which is necessary in animal studies on hormone dependent diseases like endometriosis.

Next method trained by me was aorta ring assay. The assay allows assessment of angiogenesis on organotopic model. Implementing aorta ring assay enables examination of influence of diverse biophysical and pharmacological conditions (i.e.: drugs, cytokines, miRNA) on formation of new vessels in matrigel. Simple model utilizes vessel precursors from adventitia containing all types of cells and connective tissue milieu, therefore is more reliable than cell culture based approaches.

I have an opportunity to see and train operative procedures for induction of peritoneal and mesenteric lesions of endometriosis. Although peritoneal endometriosis model was used by me before, I had an opportunity to improve the protocol by standardized method of lesion induction.

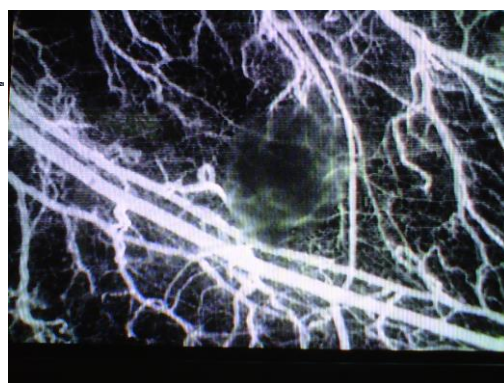


Fig. 4A and 4B – Workshops in computed data analysis of endometrial lesion microvasculature.

I have also obtained knowledge about computed methods of acquisition and data analysis implemented in laboratory. Results are analyzed by various noninvasive methods including: in vivo microscopy, MRI, X-ray and high resolution ultrasonography. Obtained data undergoes advanced computed analysis with 3D modeling. It is possible to analyze various parameters of blood flow in the microvasculature, microvasculature architecture and aspects of lesion growth.

During the stay I have also presented the results of my current research in the topic of endometriosis and techniques applied by our team. Future collaboration is planned in the field of tumor and endometrial angiogenesis.