**Abstract**

Cutaneous wound healing could be distinguished into two main types: embryonic and adult. Embryonic healing in contrast to adult is faster, scar-less and consists of early, middle, and late phases. Actin ring is formed during the early phase and its cables pull the edges of the wound towards apposite sites during the following middle phase. *De novo* expression of healing specific genes is initiated also during middle phase. However, process of the wound healing continues under the closed wound in the late phase which has been poorly described. Adult wound healing is more complex, longer, and is divided into 4 phases: haemostasis, inflammation, proliferation, and remodelling phase. Adult wound healing might end with the scar.

Pivotal role in the wound healing is given to matrix metalloproteinases (MMPs). These remodelling enzymes are important for releasing cytokines, inducing apoptosis, and degradation of extracellular matrix. Our laboratory performed temporal RNA-sequencing of the healing tissue using tailbud stage and swimming tadpole embryos. Results showed predominant expression of four *mmps*: *mmp1.L, mmp7.S, mmp8.S,* and *mmp9.L*. Injury or amputation caused the upregulation and their expression level peaked at 3-6 hours post injury which corresponds with late phase of healing. Thus, I focused on the main question: are these chosen *mmps* necessary for embryonic wound healing and what is their role?

I used *in situ* hybridization to visualize cells expressing *mmp1* and *mmp8* (epidermal) and cells expressing *mmp7* and *mmp9* (myeloid cells). I also studied functional relationships between selected *mmps* by using specific and general MMP inhibitors. I tested specific inhibitors for MMP8 and MMP9 and one general inhibitor which negatively affects MMP1, MMP8, and MMP9. I showed the negative effect of MMPs inhibitions on an actin ring formation and a laminin layer formation resulting in wound closure defects using immunohistochemistry. In addition, I performed RT- qPCR for deeper expression analysis of *mmps* and healing markers at the whole embryo and single cell levels.

**Key words**: *Xenopus laevis*, embryonic healing, matrix metalloproteinases, scar-less healing