Title: Epigenetic mechanisms of leg regeneration in the cricket *Gryllus Bimaculatus*

Abstract:

Different species have different capabilities for body part regeneration, which plays a crucial role in physiological integrity maintenance. However, the regeneration functional bases remain incompletely understood. In particular, regeneration involves cell identity changes controlled by large-scale transcriptional reprogramming. Those processes are highly controlled by chromatin organization in the cell, with diverse epigenetic mechanisms impacting regeneration abilities. Yet, despite their importance, the precise molecular mechanisms by which the epigenomic landscape allows or blocks regeneration are not clear. In this context, my host lab studies whole-leg regeneration in an emerging insect model, the two-spotted cricket *Gryllus bimaculatus*. During my thesis, I started to characterize the link between chromatin conformation in the leg and its regenerative potential. By developing amputation assays, I first showed that the regenerative potential decreases with age. Interestingly, this is accompanied by a large-scale reorganization of nuclear DNA in the leg, reminiscent of that occurring in senescent human cells. Further immunofluorescence experiments revealed that this is concomitant with global changes in histone post-translational modification profiles. To further understand the epigenomic dynamic, I am currently developing Cut & Run methodology for Cricket tissue. Altogether, my work uncovers a connection between regenerative potential and large-scale chromatin reorganization, which I seek to understand functionally during my PhD.