1. FINAL PUBLISHABLE SUMMARY REPORT

During the second year of my post-doctoral training, I dedicated a significant part of my time to the validation of candidate genes that I found to be potentially involved in the hinge patterning. Surprisingly, I could not validate any if these candidates. Therefore, I suspected an artifact inherent to the commercially available VDRC *drosophila* RNAi KK-library. By mean of genetic tools I recently demonstrated that the VDRC KK library can give rise to a hinge patterning defect even in absence of the RNAi construct. I showed that the insertion site of the RNAi contructs on the second chromosome was responsible for such an artifact. Nevertheless, I'm currently identifying the gene which is disrupted in the RNAi KK-library, since the phenotype is of a particular interest to get insights into the molecular mechanisms underlying the hinge patterning. In the meantime, to examine the cellular mechanisms underlying the hinge patterning, I developed long-term in vivo imaging of the drosophila wing at cellular resolution. I also designed the hardware and software strategy to handle exceptionally huge data sets. I showed that the apical cell surface area as well as the cell elongation reflect the progressive patterning of the hinge during development. I'm currently mapping tensions in the hinge by laser cuts to address how anisotropic forces pattern the hinge. Importantly, these biophysical experiments will also feed our theoretical model with biological data. I expect my work to give rise to significant improvements of our understanding of the molecular and cellular mechanisms underlying the morphogenesis of the drosophila wing epithelium.