

BRIDGE Fellowship – 7~27 July, 2019

Hélène Kiefer, INRA, Jouy-en-Josas, France

My main research activity during this stay was conducted at the University of Tokyo, Institute for Quantitative Biosciences in Pr. Okada's lab, where I have been thought how to prepare chromatin from mouse sperm using a pretreatment with nucleoplasmin. This unique technology allows a complete extraction of sperm histones, bringing to a new theory about histone retention in sperm (Yamaguchi et al, Cell reports, 2018). All the materials and tips have been described in detail to me, including recombinant nucleoplasmin preparation, so that I should be able to reproduce the protocol in France. My research is focused on bull sperm and Pr. Okada is interested in comparing histone retention in several species. I therefore performed several experiments using nucleoplasmin on bull sperm, under the supervision of Pr. Okada and her team members. This revealed major differences in structural properties between bull and mouse sperm. In particular, the addition of detergents in all buffers is mandatory to avoid bull sperm forming aggregates. Nucleoplasmin amount also required to be adjusted, but the time was too short to determine the optimal concentration. The interactions with Pr. Okada are ongoing. Recently she visited my lab and brought the plasmin encoding recombinant nucleoplasmin, and I will have the opportunity to visit her lab again in February. In the near future, I hope to set-up the method on bull sperm in France thanks to the expertise of Pr. Okada, and we will describe the results in a paper.

This stay in Japan was also an opportunity to develop my network in Japan. I visited the following researchers: Drs. Ogura (RIKEN), Takeda (NARO) and Kaneda (TUAT) at Tsukuba, and Pr. Yamagata and his team, Kindai University at Wakayama, and gave 3 seminars. The collaboration with Drs. Takeda and Kaneda on DNA methylation in bull sperm is ongoing. The discussion with Pr. Yamagata was very fruitful, and we hope to set-up a collaboration on epigenome editing on satellite sequences in bovine embryos.

The research support allowance has been used to purchase bull semen from a Japanese company (since importation of semen samples from France was impossible) and reagents for chromatin preparation. The maintenance allowance has been used for housing, meals, public transportations and Shinkansen tickets for Wakayama, round trip.