Marie Dupont
Laboratoire de Sophie Saunier, U1163
Institut Imagine, Paris

"Cilia Meeting 2016" Resume (Amsterdam)

I attended the Cilia Meeting 2016 in Amsterdam from October, 4th to 7th 2016. This congress provided me with my first experience of an international conference, and was additionally valuable as I had the chance to give an oral communication. Presenting my data to the community helped me to have other ideas for my project since I could talk with scientists from different backgrounds and expertise. Hopefully, the conference will contribute to develop new collaborations that will benefit my project. In addition, this congress gave me the opportunity to meet other PhD students or Post Docs, who have encountered similar experimental issues, notably for the KO or KI CRISPR/Cas cell or zebrafish line generation. I could discuss with them of other protocols and we shared advice to help us to improve our strategies.

My PhD project focuses on IFT52, an intraflagellar transport protein essential for the anterograde transport along the cilia, as we identified mutations in two families with different ciliopathies. I generated a Ift52 KO cell line (IMCD) by CRISPR/Cas9 and observed, as expected, defects in ciliogenesis, but also an abnormal centrosome splitting even in ciliated cells, suggesting a new role of the protein in centriole cohesion.
I enjoyed the oral presentations and posters, which were very good qualities and allowed me to deepen my knowledge and envision other perspectives for my project. For example, the work of Gregory Mazo aims to understand why vertebrate cells maintain submerged cilia. He generated KO for centriole sub-distal appendage (sDAP) proteins by CRISPR/Cas9 technology in vertebrate cells, and showed that loss of sDAP and their associated proteins had no effect on ciliogenesis. However, cilia are separated from the Golgi and there is a disruption of the membrane invagination which normally allows the formation of surfaced cilia, which could actively respond to mechanical stimuli and can recruit Hedgehog signalling components such as Smoothened and Gli2 in the absence of agonist, unlike submerged cilia, sugesting a spatial control of ciliogenesis. This work notably suggested me to check if cilia of rescued *Ift52* mutant cells are still associated to the Golgi and surfaced or not, and if defective signalling pathway, like Hedgehog could also be due to cilia submergence (?) .

The meeting also allowed me to discover new model organisms such as planarian, *C. elegans* or the trypanosome. Philippe Bastin from Pasteur Institute, Paris is interested in understanding how IFT

functions within the axonema, how the molecular motors specifically interact with microtubules, which remains unknown. He showed by Focus Ion Beam Scanning Electron Microscopy that in *Trypanosoma brucei*, IFT trains are restricted to doublet microtubules 4 and 7, with anterograde transport on A-tubule and the retrograde transport on B-tubule. This selectivity is explained by an increased polyglutamylation of doublets 4 and 7 and knock-down of glutamlylases resulted in shorter cilia, rare IFT trains and less IFT172, 22 and 56 along the flagella. This differential glutamylation of tubulin could thus explain the dedicated functions of microtubule doublets, which has also been found in murine sperm cells.

Others presentations demonstrated better understanding for intraflagellar transport (IFT) protein mechanism, such as Jaap van Krugten, from Amsterdam LaserLab, who presented a talk on the mechanism of IFT turn at the tip of cilia in *C. elegans*. IFT trains are composed of cargos and both IFT-A and B complexes. They are assembled at the ciliary base and driven by kinesin II and OSM-3 motors to the ciliary tip, where IFT dynein transport take them back to the base of the cilia. But the mechanism of IFT turnaround at the ciliary tip is still unknown. He demonstrated that IFT-B dissociates from the IFT train at the tip of cilia and remains constrained during a pause of on average of 3 seconds before returning. Then, they dock to an IFT-dynein driven retrograde train, contrary to IFT dynein, OSM-3 and IFT-A particles which turn back to the base almost instantaneously.

To conclude, I think to attend to a congress like Cilia Meeting 2016 is a great opportunity to meet specialists of my research subject, share experiments and advice and discover other models or research field around the cilia.