Abstract: Centrioles are microtubule-based structures that play dual roles inside eukaryotic cells. They can either serve as a core component of the centrosome with crucial roles in cell division, or they template the assembly of a cilia/flagella which are key structures for cellular motility.

Plant vegetative cells are devoid of centrioles. However, the sperm cells of several plant species are flagellated, assembling centrioles de novo during spermatogenesis. How are these centrioles assembled? And when and how do these centrioles disappear from the plant?

We are studying the origin and fate of centrioles during spermatogenesis in the moss Physcomitrella patens. So far we have been focusing on several known components of animal centrioles and characterizing de novo centriole assembly. With the tools already generated, we can now tackle the second question. To achieve this, we will use techniques such as immunofluorescence, super-resolution, electron microscopy and live-imaging.

In animal fertilization, both centriole inheritance and centriolar loss followed by de novo biogenesis are known to occur. However, the mechanisms remain mostly unknown. By approaching such events from a different evolutionary perspective, this work will increase our understanding of centriole biogenesis, inheritance and loss.