



Doctorate program  
Milan  
EXPERIMENTAL  
MEDICINE



UNIVERSITÀ  
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# International PhD Program in Experimental Medicine

# D-MEM SEMINAR



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Human Technopole, Milan

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Aula G24, via Golgi

## Primary cilium: a specialized cellular antenna involved in development, organ function and disease

Cells need to be able to sense different types of signals and can perform these functions through a specialized hair-like organelle, the cilium, that extends from the cell body as a sort of antenna. The signaling and sensory functions of cilia are fundamental already during the early stages of embryo development, coordinating the establishment of the internal left/right asymmetry typical of the vertebrate body. Later, cilia continue to be required for the correct development and function of specific tissues and organs, such as brain, heart, kidney, liver, and pancreas. Sensory cilia eventually allow us to sense the environment that surrounds us, for instance we see through the connecting cilium of photoreceptors in our retina or we smell through the sensory cilia at the tip of our olfactory neurons. Motile cilia, which themselves have sensory functions, also work as propeller-like extensions that enable to breathe, to reproduce, and even to properly reason, contributing to the flow of cerebrospinal fluid in our brain ventricles. Not surprisingly, defects in the assembly and function of these tiny organelles result in devastating pathologies, which are collectively known as ciliopathies. Exploiting in vitro reconstituted dynamic systems, genetics, biochemistry, image analysis methods, all the way to more classical cell biology, the Pigo Lab investigates the biology and the 3D molecular structure of ciliary components to understand how they orchestrate cilia-specific functions. The ultimate goal is to decipher the underlying molecular mechanisms of ciliary functions and dysfunctions, with the hope to inspire the development of possible therapeutic strategies for ciliopathies