

# Defining the molecular mechanisms driving intestinal epithelial cell specification

The intestinal epithelium is a dynamic system that constantly and rapidly regenerates throughout the organism life. This epithelium is organized in crypt and villus compartments harbouring distinct cell populations and functions. Intestinal crypts contain epithelial stem cells surrounded by differentiated Paneth cells. These latter cells express growth-promoting and cell-protective peptides to ensure optimal production of progenitors from the stem cells. Intestinal villi contain differentiated subtypes of epithelial cells including enterocytes, goblet and enteroendocrine cells. Although some clues have been collected over the past years on the nature of the molecular mechanisms that are required for epithelial cell specification and maintenance in this particular context, the exact regulatory circuit involved is still not well defined. This program of research aims to integrate the interactive transcriptional network between a set of transcription factors including some of which we have studied over the past years. This research takes advantage of a biological system that consists of culturing mini epithelial guts growing *ex vivo* that perfectly recapitulate proliferation and cytodifferentiation of the intestinal epithelium. It is our hope that these strategies will provide crucial information on the nature of the epithelial cell specific transcriptional interactome(s) in both epithelial stem and differentiated cells and allow a better understanding of the nature of regulators important for intestinal epithelial cell specification.