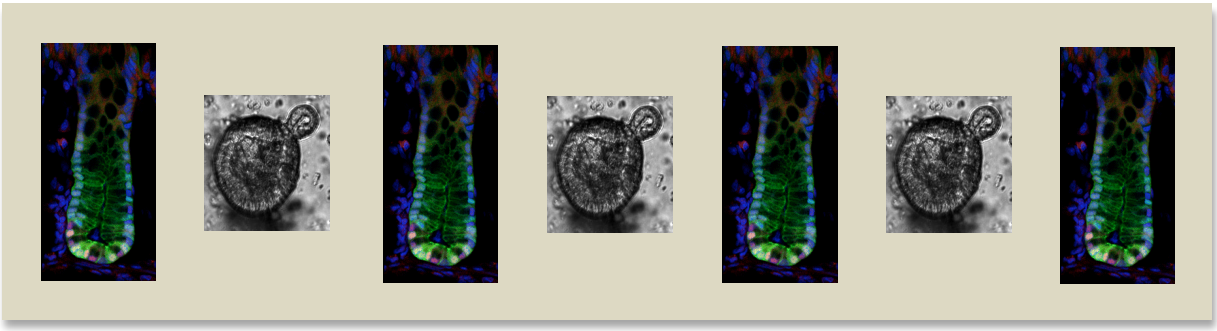

# Intestinal Stem Cells
## *New concepts and methods*

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### Thyroid Hormone signaling and intestinal epithelium stemness

The thyroid hormones (TH) are involved in developmental and homeostatic processes in several tissues. Their action results in different outcomes depending on the developmental stage, tissue and/or cellular context. It is largely documented that TH act via nuclear receptors, the TRs, which are transcription factors whose activity can be modulated by the local availability of the hormone T3. In the "classical view", the T3-induced physiological response depends on the expression of specific TR isoforms and the iodothyronine deiodinase selenoenzymes that control the local level of T3, thus TR activity. Recent data, however, have clearly established that the functionality of TRs is coordinated and integrated with other signalling pathways, specifically at the level of stem/progenitor cell populations.
The TH control several aspects of the gut development and homeostasis. In fact, we showed that they play a fundamental role in regulating the cell proliferation during the postnatal development at the weaning time. This is reminiscent of their action during the gut remodelling at the metamorphosis in amphibians. A transcriptional profile study in two-week old animals allowed us to show that the TH and the nuclear receptor TRα1 control several cell-cycle controlling genes as well as the Wnt and Notch pathways, key signalling regulators of gut development and of the stem cell biology.
In order to study the function of TRα1 in gut stemness we are currently using reporter mouse models enabling to label and study the stem from the progenitor cells present within the intestinal crypts. Data presented will focus on a new mouse model and on specific function of TRα1 in this compartment.