Hox proteins and cofactors: new rules, new perspectives

Hox proteins are key transcription factors specifying cell fates along the anteroposterior axis of all bilaterian animals. Like other molecules playing critical roles during embryonic development, Hox proteins are also involved in a number of pathologies upon mutations affecting their expression profile or activity. Although the role of Hox proteins is well established, the mechanisms underlying their molecular mode of action remain poorly understood. In particular, very few Hox partners have been identified though classical biochemical or yeast-hybrid assays, suggesting that Hox-cofactor interactions are context-specific and cannot be revealed outside their normal cellular environment.

We have recently established the Bimolecular Fluorescence Complementation (BiFC) in the developing *Drosophila* and chick embryos (*Hudry et al., BMC Biology 2011; Hudry et al., Plos Biology 2012*). This method allows visualizing protein-protein interactions *in vivo*, under normal conditions of protein expression. It thus constitutes an original approach for studying Hox-cofactor interactions in the context of an otherwise untouched cellular environment**.**

I will present how this novel angle of experimental approach allows challenging a previous paradigm on Hox-cofactor interactions, and how BiFC allows developing new tools for revealing unexpected regulatory partners of Hox proteins *in vivo*.