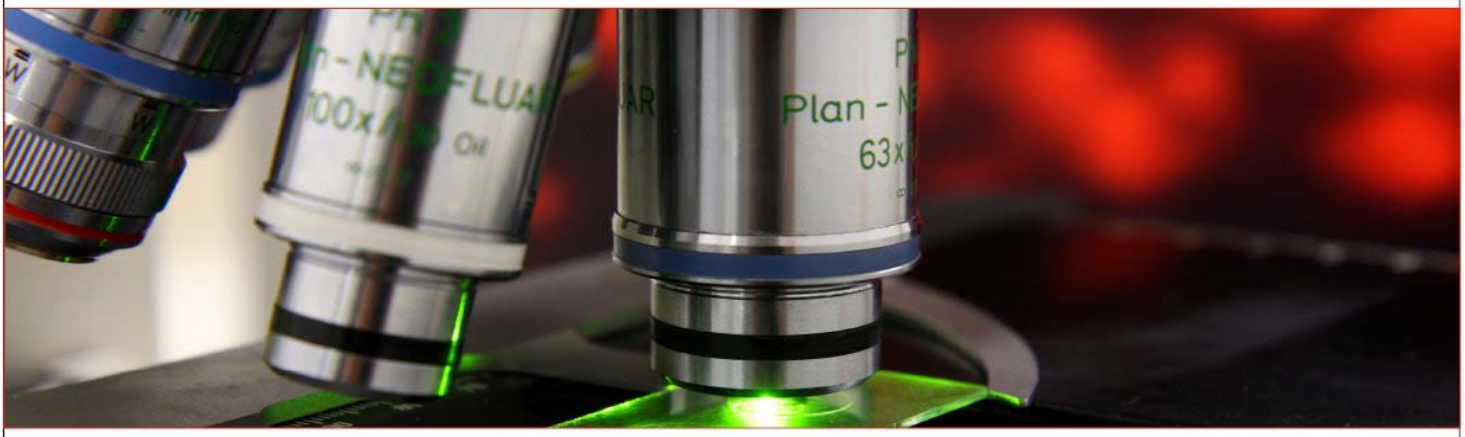
SÉMINAIRES ET CONFÉRENCES



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« How mRNP composition determines mRNA fate?»

Throughout their lifetime, messenger RNAs (mRNA) exist decorated with proteins as mRNA-protein particles, or mRNPs. A key component of all spliced mRNPs is the exon junction complex (EJC), which assembles during pre-mRNA splicing 24 nucleotides (nt) upstream of exon-exon junctions. The stable EJC core thus assembled serves as an interaction platform for peripheral proteins that direct mRNA export, localization, translation and nonsense-mediated mRNA decay (NMD). Both mRNPs and EJCs and are widely presumed to be "dynamic" entities that change during an mRNAs lifetime. I will discuss our new findings that the EJCs, and hence spliced mRNPs, undergo an extensive compositional overhaul after their export to cytoplasm. This compositional switch leads to a dramatic structural remodeling of the EJC from a multimeric mega-dalton sized RNP to its monomeric form. The change in EJC composition also leads to at least two distinct phases of the EJC-dependent NMD. I will also discuss our studies on EJC function during zebrafish early embryonic development. We find that EJCs recruited by 3'UTR introns regulate expression of many developmental genes via EJC-dependent NMD. Interestingly, a subclass of these 3'UTR introns appears to defy the existing 50 nt boundary rule, which requires 3'UTR intron to be at least 50 nt downstream of stop codon for it to induce NMD. Overall, mRNP composition dictated by specific gene structures and its spatiotemporal remodeling play an important role in determining mRNA fate.

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