Publications de l’équipe
Signalisation et développement de la crête neurale

Cécile Milet, Anne H Monsoro-Burq (2012 Feb 7)
**Neural crest induction at the neural plate border in vertebrates.**

**Résumé**

The neural crest is a transient and multipotent cell population arising at the edge of the neural plate in vertebrates. Recent findings highlight that neural crest patterning is initiated during gastrulation, i.e. earlier than classically described, in a progenitor domain named the neural border. This chapter reviews the dynamic and complex molecular interactions underlying neural border formation and neural crest emergence.

Anne H Monsoro-Burq (2011 Mar 2)
**A rapid protocol for whole-mount in situ hybridization on Xenopus embryos.**
*CSH protocols* : pdb.prot4809 : [DOI : 10.1101/pdb.prot4809]

**Résumé**

**INTRODUCTION**This in situ hybridization (ISH) protocol describes a simplified method using a digoxigenin-labeled antisense RNA probe on whole Xenopus embryos, suitable for both *X. laevis* and *X. tropicalis*. The protocol includes fixation, β-galactosidase staining (when lineage tracing is needed), and storage of the embryos prior to ISH. This method shortens the steps before hybridization, which limits RNA degradation in the sample, and preserves superficial structures. Hence, it is particularly suited for the analysis of ectoderm, neural, and mesodermal structures from blastula to early tadpole stages. Additional permeabilization steps are included to process later tadpole stages.

Noémie de Crozé, Frédérique Maczkowiak, Anne H Monsoro-Burq (2010 Dec 15)
**Reiterative AP2a activity controls sequential steps in the neural crest gene regulatory network.**

**Résumé**

The neural crest (NC) emerges from combinatorial inductive events occurring within its progenitor domain, the neural border (NB). Several transcription factors act early at the NB, but the initiating molecular events remain elusive. Recent data from basal vertebrates
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suggest that ap2 might have been critical for NC emergence; however, the role of AP2 factors at the NB remains unclear. We show here that AP2a initiates NB patterning and is sufficient to elicit a NB-like pattern in neuralized ectoderm. In contrast, the other early regulators do not participate in ap2a initiation at the NB, but cooperate to further establish a robust NB pattern. The NC regulatory network uses a multistep cascade of secreted inducers and transcription factors, first at the NB and then within the NC progenitors. Here we report that AP2a acts at two distinct steps of this cascade. As the earliest known NB specifier, AP2a mediates Wnt signals to initiate the NB and activate pax3; as a NC specifier, AP2a regulates further NC development independent of and downstream of NB patterning. Our findings reconcile conflicting observations from various vertebrate organisms. AP2a provides a paradigm for the reiterated use of multifunctional molecules, thereby facilitating emergence of the NC in vertebrates.

Caterina Pegoraro, Nicolas Pollet, Anne H Monsoro-Burq (2010 Nov 16)

**Tissue-specific expression of Sarcoplasmic/Endoplasmic Reticulum Calcium ATPases (ATP2A/SERCA) 1, 2, 3 during Xenopus laevis development.**


**Résumé**

Calcium-ATPase pumps are critical in most cells, to sequester calcium into intracytoplasmic stores and regulate general calcium signalling. In addition, cell-specific needs for calcium signals have been described and employ a diversity of calcium ATPases in adult tissues and oocytes. A major family of such calcium pumps is ATP2A/SERCA family, for Sarcoplasmic/Endoplasmic Reticulum Calcium ATPases. Although largely studied in adults, the developmental expression of the atp2a/serca genes remains unknown. Here, we provide genome organisation in *Xenopus laevis* and tropicalis and phylogeny of atp2a/serca genes in craniates. We detail embryonic expression for the three *X. laevis* atp2a/serca genes. We found that the three atp2a/serca genes are strongly conserved among vertebrates and display complementary and tissue-specific expression in embryos. These expression patterns present variations when compared to the data reported in adults. Atp2a1/serca1 is expressed as soon as the end of gastrulation in a subset of the myod-positive cells, and later labels prospective slow muscle cells in the superficial part of the somite. In contrast atp2a2/serca2 is found in a larger subset of cells, but is not ubiquitous as reported in adults. Notably, atp2a2/serca2 is prominently expressed in the neural-related tissues, i.e. the neural plate, cement gland, but is excluded from premigratory neural crest. Finally, atp2a3/serca3 expression is restricted to the ectoderm throughout development.