Sox21 is required for the posterior lateral line patterning by regulating FGF signalling

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The posterior lateral line (PLL) is a mecanosensory organ present in fishes and amphibians. During development, this structure is formed from a group of cells that migrate from a region near the otic vesicle to the tip of the tail, leaving neuromasts in its trail. Patterning in the PLL primordium occurs mainly by the antagonistic activity of two morphogens, Wnt and FGF.Two morphogens play a crucial role in PLL development. Wnt is requiered to maintain the proliferative state of cells and the counteracting FGF triggers the first steps of differentiation and epithelialisation(1). Currently upstream regulators of these two pathways remain unknown. Several genes of the Sox family are also expressed in the PLL primordium, among them *sox21a*, a gene required to the transition of progenitors to differentiated neurons in the vertebrate central nervous system (2), although its function in the PLL development is not yet known. Recently it has been shown that this gene in central nervous system trigger proliferated cells into differentiated state.Recently, we started to study the role that *sox21a* may play during PLL development. Here we present a functional assay of *sox21a* in the zebrafish PLL development. To that aim we performed knockdown experiments using morpholinos and in vivo reporters as readouts. In these assays we observed a delay in PLL migration and impairment of epitheliarization. In addition, in this same *sox21a* morphant condition, we observed a down regulation of specific molecular markers downstream of FGF, suggesting that *sox21a* is an upstream regulator of this signalling. These phenotypes are similar to loss of function of FGF. To that end, we postulate that *sox21a* is an upstream regulator of FGF signal in PLL. In total, we identify *sox21a* as new important player in the patterning of the PLL by controlling FGF signalling.

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