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Novel Activities of Mafb Underlie Its Dual Role in Hindbrain Segmentation and Regional Specification

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Abstract

The bZip transcription factor Mafb is expressed in two segments of the developing vertebrate hindbrain: the rhombomeres 5 and 6. Loss of *Mafb* expression in the mouse mutant *kreisler* leads to elimination of r5 and to alterations of r6 regional identity. Here, we further investigated the role of Mafb in hindbrain patterning using gain-of-function experiments in the chick embryo. Our work has revealed novel functions for Mafb, including a positive autoregulatory activity, the capacity to repress *Hoxb1* expression, and the capacity to synergise with or antagonise Krox20 activity. These different activities appear to be spatially restricted in the hindbrain, presumably due to interactions with other factors. Reinvestigation of the *kreisler* mutation indicated that it also results in an ectopic activation of *Mafb* in rhombomere 3, accounting for the previously described molecular alterations of this rhombomere in the mutant. Together, these data allow us to refine our view of the dual function of Mafb in both segmentation and specification of anteroposterior identity in the hindbrain.

Keywords

hindbrain; rhombomere; segmentation; Mafb; Hox; Eph; kreisler; Krox20

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