BCL11B expression in intramembranous osteogenesis during murine craniofacial suture development

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Sutures, where neighboring craniofacial bones are separated by undifferentiated mesenchyme, are major growth sites during craniofacial development. Pathologic fusion of bones within sutures occurs in a wide variety of craniosynostosis conditions and can result in dysmorphic craniofacial growth and secondary neurologic deficits. Our knowledge of the genes involved in suture formation is poor. Here we describe the novel expression pattern of the BCL11B transcription factor protein during murine embryonic craniofacial bone formation. We examined BCL11B protein expression at E14.5, E16.5, and E18.5 in 14 major craniofacial sutures of C57BL/6J mice. We found BCL11B expression to be associated with all intramembranous craniofacial bones examined. The most striking aspects of BCL11B expression were its increasingly complementary expression with RUNX2 in differentiating osteoblasts during development and its resulting high levels in the suture mesenchyme separating the osteogenic fronts of adjacent cranial bones. BCL11B was also expressed in mesenchyme at the non-sutural edges of intramembranous bones. No expression was seen in osteoblasts involved in endochondral ossification of the cartilaginous cranial base. BCL11B is expressed to potentially regulate the transition of mesenchymal differentiation and suture formation within craniofacial intramembranous bone. The main goal of the "Transcriptome Atlases of the Craniofacial Sutures" FaceBase2 project is to enable the efficient identification of genes such as *Bcl11b* that show suture sub-region-specific expression patterns during craniofacial development.