

## **The Role of Fam3c in Semicircular Canal Development**

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*Bmp4* (bone morphogenic protein 4) is a member of the TGF- $\beta$  family that has been implicated in the regulation of inner ear development. Three different *Bmp4* transcripts, 1A, 1B and intron 2, were described previously. While varied transcript expression has been reported, the expression of these isoforms in the inner ear is not known. The *Bmp4* transcripts are regulated by three distinct promoters. *Bmp4* promoters have regions of the conserved sequence (5'-CAAG-3'), which is a core binding sequence for the Hmx transcription factor family. Two members of the Hmx transcription factor family, *Hmx2* and *Hmx3*, are known to control development of the inner ear. These two transcription factors have been reported to have similar patterns of expression. *Hmx3* was chosen for analysis in this study. *Bmp4* isoform expression was determined by RT-PCR analysis of RNA from the mouse inner ear at E9 and P2. At P2, only transcript 1A was detected, while at E9, both 1A and 1B transcripts were identified. To detect spatial expression of *Bmp4* and *Hmx3*, we performed in situ hybridization on the mouse E17.5 inner ear cryosections. We found that *Bmp4* and *Hmx3* have overlapping patterns of expression.

These data suggest that *Bmp4* isoform expression in the inner ear may be regulated by *Hmx3*. By studying the spatial expression of *Bmp4* isoforms in the inner ear at different stages, further insight into the molecules involved in inner ear development can be gained. Further studies are underway to delineate the regulation of *Bmp4* in inner ear development and the relationship between *Bmp4* and *Hmx3*.