Bmp4 Gene Expression Analysis in the Murine Inner Ear Using LCM

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Bmp4 (bone morphogenic protein 4) is a member of the TGF-ß family that has been demonstrated to play a role in the regulation of inner ear development. There are three different *Bmp4* transcripts, 1A, 1B and intron 2. Varied transcript expression of *Bmp4* has been reported for the inner ear and other organs in the mouse model. We hypothesize that at least two of the known isoforms of *Bmp4* in the inner ear are tissue specific (epithelial vs. mesenchymal). LCM (Laser Capture Microdissection) was used to procure cells from inner ear cryosections of CD1 E10.5 mouse embryos that were fixed in 70% ethanol.
The otocyst epithelial and mesenchymal cells expressing *Bmp4* were identified using *In-situ* hybridization on corresponding inner ear cryosections of mice from the same litter that were fixed in 4% Paraformaldehyde. *Bmp4* isoform expression was determined by RT-PCR analysis of RNA obtained from LCM. At E10.5, only transcript 1A not the 1B transcript was detected, in both the epithelial and mesenchymal tissue. By studying the tissue expression of *Bmp4* isoforms in the inner ear at different embryonic stages, the molecules involved in inner ear development can be elucidated. Further studies are currently underway to delineate the *Bmp4* regulation in inner ear development at different embryonic stages.