the nucleus, associates with the LEF/TCF transcription factors, and affects transcription of target genes. The canonical Wnt pathway plays a role in the earliest stages of otic placode specification and continues to be important throughout the formation of the cochlea. While many components of the Wnt signaling cascade are expressed throughout the developing avian cochlea (Sienknecht and Feke, 2008), their specific functions remain unclear. Our study focuses on the role of the Wnt/β-catenin pathway on cellular fate and patterning in the developing basilar papilla (BP), the sensory epithelium of the avian cochlea. To characterize the function of Wnt/β-catenin signaling in the BP we performed in ovo as well as in vitro experiments in which components of this pathway were activated or inhibited. Activation of the Wnt/β-catenin pathway at E5/E6, a period representing the onset of cellular differentiation in the BP, resulted in a significant increase in the number of hair cells. The robust induction of hair cells in ovo and in BP explant cultures indicates a role for this cascade in sensory epithilium development. This data suggests that the Wnt/β-catenin pathway may regulate the size of the prosensory domain and induce the formation of hair cells.

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Program/Abstract # 431
Fzef1 and Fzef2, and the developmental control of chemosensory diversity in the mouse
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Program/Abstract # 432
An essential role for the tetraspanin, CD151, in trigeminal placode formation
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The peripheral nervous system is derived from two embryonic cell populations: the cranial neural placodes and the neural crest. Cranial neural placodes are thickened epithelium that give rise to the paired sense organs and some of the cranial sensory ganglia. To better understand the processes involved in placode formation, we performed a subtractive library screen to find new candidates involved in the formation of placodes as well as additional markers for these cell types. One of candidate genes, a tetraspanin protein, CD151, the expression was primarily confined to the trigeminal placode domain remain unknown. It is known that components of the Notch signaling pathway are expressed in the placodal ectoderm. In this study we have further characterized the expression of Notch/Delta pathway genes. In addition, we have tested the role of Notch signaling in opV placode development. Using DAPT, an inhibitor of gamma-secretase, we inhibited Notch signaling in 79 and 1315 somite chick embryo head ectoderm. We observed that attenuated Notch signaling caused precocious neuronal differentiation of opV cells at 79 somites and 1315 somites. Further, we activated Notch signaling by misexpressing the Notch intracellular domain (NICD) by in ovo electroporation, which resulted in targeted cells failing to differentiate, instead remaining in the surface ectoderm. Thus, Notch/Delta signaling plays an important role in opV development by selecting which cells differentiate and migrate to the opV ganglion.

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Program/Abstract # 434
Sbt1, a novel proneural bHLH target, is required for neuronal differentiation in the retina
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Proneural basic helix-loop helix (bHLH) transcription factors are key regulators of retinal neurogenesis and they function by activating the expression of target genes that execute a program of neuronal differentiation within progenitors. In a previous screen for proneural target genes we identified a novel gene called sbt1 (shared bHLH target 1). sbt1 is conserved across vertebrate species and encodes a novel protein with no conserved functional motifs. In situ hybridization analysis showed that sbt1 is transiently expressed in late proliferating or early differentiating cells in the nervous system of both Xenopus and mouse. Overexpression of sbt1 in Xenopus caused a reduction in phospho-histone H3 positive mitotic cells at the open neural plate stage and weak expansion of the primary neuron domain. Overexpression of either mouse or Xenopus sbt1 in retinal progenitors promoted differentiation of early born retinal neurons, and also enhanced the ability of proneural bHLH factors to promote neurogenesis. Conversely, inhibition of SBT1 translation in Xenopus retinal progenitors by injection of antisense morpholino into cleavage-stage blastomeres prevented or delayed retinal neuron differentiation. We have performed a yeast Zhybrid screen for potential SBT1 interactors and have isolated several candidate protein partners, most notably multiple

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