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Abstracts

Cell-cell signaling

Program/Abstract # 307
Withdrawn

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Program/Abstract # 308
FGF signaling is essential for ophthalmic trigeminal placode cell delamination and differentiation

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The ophthalmic trigeminal (opV) placode gives rise exclusively to sensory neurons of the peripheral nervous system, providing an advantageous model for understanding neurogenesis. The fibroblast growth factor receptor-4, FGFR4, is expressed in the opV placode at a time coincident with delamination of these cells from the ectoderm as they begin to enter the mesenchyme and express neuronal differentiation markers. In this study, we examine the role of FGF signaling during the two key events of delamination and differentiation in the opV placode. Inhibition of FGFR4 by electroporation resulted in Pax3+ opV placode cells failing to delaminate from the ectoderm or contribute to the opV ganglion. Blocking FGF signaling also led to a loss of the early neuronal marker Ngn2, as well as a lack of expression of the neuronal differentiation markers Islet-1, NeuN, and Neurofilament in targeted Pax3+ cells stalled in the ectoderm. In addition, without FGF signaling, targeted cells that remained in the ectoderm lost their opV placode specific identity by downregulating Pax3 in a normal developmental time course. We conclude that FGF signaling, through FGFR4, is necessary for opV placode cell delamination and differentiation.

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Program/Abstract # 309
Reporter mouse strains show different localisation of Wnt activity in the developing mouse molar tooth

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The canonical or β-catenin dependent Wnt signalling pathway is an important regulator of tooth development. The components of the pathway are expressed both in the epithelium and in the mesenchyme of developing mouse molars. In this study the localisation of the active Wnt signalling in the molars was analysed with three different reporter mouse strains, TOPGAL, BAT-gal and $Axin2^{lacZ/lacZ}$ mutants. Wnt activity and β-galactosidase in the embryonic tissue was revealed by X-gal staining. The $Axin2^{lacZ/lacZ}$ mutant staining was compared with wild type Axin2 expression. The localisation of Wnt activity showed a dynamic pattern during early molar development between E11 and E14.5. Staining of the dental epithelium and mesenchyme was different depending on the reporter strain studied. This suggests that the reporter constructs respond differently to Wnt activity. Also the expression of Axin2 gene did not directly correlate with X-gal staining of the $Axin2^{lacZ/lacZ}$ mutants.

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Program/Abstract # 310
Wnt11/Wnt5a interaction increases canonical Wnt signaling activity

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Wnt signaling plays important roles in embryonic development, tissue differentiation and cancer. In both normal and malignant tissue, Wnt family members are often expressed combinatorially. However, the significance of this has been poorly understood. We recently showed that two Wnt family members, Wnt11 and 5a, are both required for the initiation of embryonic axis formation, and further that the two proteins physically interact with each other. However little is known about the mechanism or biological significance of Wnt protein interaction. Here we show in three assays using *Xenopus* oocytes, mouse L-cells and human ES cells that secreted *Xenopus* Wnt11 and 5a complexes have more canonical Wnt signaling activity than secreted Wnt11 or 5a acting alone. We also show that Wnt11/5a complex formation is mediated by a specific post-translational modification. These findings raise the possibility that Wnt/Wnt syn-expression and complex formation in specific cellular contexts may add a new level of regulation to Wnt signaling activity in development and disease.

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