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## Neurogenin1 Defines Zebrafish Cranial Sensory Ganglia Precursors

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## Abstract

Cells delaminate from epithelial placodes to form sensory ganglia in the vertebrate head. We describe the formation of cranial neurogenic placodes in the zebrafish, *Danio rerio*, using bHLH transcription factors as molecular markers. A single *neurogenin* gene, *neurogenin1* (*ngn1*), is required for the development of all zebrafish cranial ganglia, which contrasts with other described vertebrates. Expression of *ngn1* delineates zebrafish ganglionic placodes, including trigeminal, lateral line, and epibranchial placodes. In addition, *ngn1* is expressed in a subset of cells within the otic vesicle that will delaminate to form the octaval (statoacoustic) ganglion. The trigeminal placode is the first to differentiate, and forms just lateral and adjacent to the neural crest. Expression of *ngn1* is transient and prefigures expression of a related bHLH transcription factor, *neuroD*. Interfering with *ngn1* function using a specific antisense morpholino oligonucleotide blocks differentiation of all cranial ganglia but not associated glial cells. Lateral line sensory neuromasts develop independently of *ngn1* function, suggesting that two derivatives of lateral line placodes, ganglia and migrating primordia, are under separate genetic control.


## Keywords

trigeminal placode; lateral line; epibranchial placode; otic placode; neurogenin; bHLH transcription factor; morpholino oligonucleotides

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