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Multiple zebrafish *atoh1* genes specify a diversity of neuronal types in the zebrafish cerebellum

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ABSTRACT

A single Atoh1 basic-helix-loop-helix transcription factor specifies multiple neuron types in the mammalian cerebellum and anterior hindbrain. The zebrafish genome encodes three paralagous *atoh1* genes whose functions in cerebellum and anterior hindbrain development we explore here. With use of a transgenic reporter, we report that zebrafish *atoh1c*-expressing cells are organized in two distinct domains that are separated both by space and developmental time. An early isthmic expression domain gives rise to an extracerebellar population in rhombomere 1 and an upper rhombic lip domain gives rise to granule cell progenitors that migrate to populate all four granule cell territories of the fish cerebellum. Using genetic mutants we find that of the three zebrafish *atoh1* paralogs, *atoh1c* and *atoh1a* are required for the full complement of granule neurons. Surprisingly, the two genes are expressed in non-overlapping granule cell progenitor popu-

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