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The Zebrafish *trilobite* Gene Is Essential for Tangential Migration of Branchiomotor Neurons

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Abstract

Newborn neurons migrate extensively in the radial and tangential directions to organize the developing vertebrate nervous system. We show here that mutations in zebrafish *trilobite* (*tri*) that affect gastrulation-associated cell movements also eliminate tangential migration of motor neurons in the hindbrain. In the wild-type hindbrain, facial (nVII) and glossopharyngeal (nIX) motor neurons are induced in rhombomeres 4 and 6, respectively, and migrate tangentially into r6 and r7 (nVII) and r7 (nIX). In all three *tri* alleles examined, although normal numbers of motor neurons are induced, nVII motor neurons are found exclusively in r4, and nIX-like motor neurons are found exclusively in r6. The migration of other neuronal and nonneuronal cell types is unaffected in *tri* mutants. Rhombomere formation and the development of other hindbrain neurons are also unaffected in *tri* mutants. Furthermore, tangential neuronal migration occurs normally in the gastrulation mutant *knypek*, indicating that the *trilobite* neuron phenotype does not arise nonspecifically from aberrant gastrulation-associated movements. We conclude that *trilobite* function is specifically required for two types of cell migration that occur at different stages of zebrafish development.

Keywords

zebrafish; hindbrain; motor neuron; tangential; radial; neuronal migration; gastrulation; rhombomere; green fluorescent protein; time-lapse microscopy

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