Assembly of specialized auditory brainstem circuits

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The central auditory system has specialized circuitry in the brainstem that is needed for sound localization. These neural circuits are highly precise in their properties and their connectivity. Our group studies the developmental mechanisms underlying the formation and lesion-induced plasticity of these circuits. Errors in these pathways are associated with some neurodevelopmental disorders, in which the balance of excitation and inhibition in the auditory brainstem nuclei may be associated with increased sensitivity to sounds. We have identified important roles for axon guidance molecules in establishing these brainstem circuits. In addition, we have shown that glial cells contribute significantly to maturation of these pathways and to reorganization of circuits after lesions.

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