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Cochlear Nuclei (Dorsal and Ventral)

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Definition

Cochlear nuclei is the nuclei that receive first-order auditory input from the organ of Corti in the cochlea of the inner ear.

Current Knowledge

The cochlear nuclei are divided into a dorsal and a ventral group. The dorsal cochlear nuclei give rise to the dorsal acoustic stria, which immediately cross the midline and contribute fibers that ascend contralaterally in the lateral lemniscus. The ventral cochlear nuclei are the source of two other auditory pathways, the intermediate and the ventral acoustic stria. The former also crosses the midline and, like the dorsal acoustic stria, ascends in the contralateral lateral lemniscus. Fibers making up the ventral acoustic stria, the largest of these three pathways, take three different paths after leaving the nucleus. They (1) synapse in both the ipsilateral or contralateral superior

olivary nuclei, which in turn send tertiary fibers to the inferior colliculi via the ipsilateral and contralateral lateral lemniscus, and (2) send fibers directly to the contralateral inferior colliculi, bypassing the superior olivary nuclei.

The crossing fibers of the ventral acoustic stria make up what is known as the **trapezoid body** of the pontine tegmentum. The dorsal and ventral cochlear nuclei themselves are located laterally in the rostral medulla at the pontine-medullary junction near the vestibulocochlear nerve.

Since the first-order neurons from the auditory nerve terminate in the cochlear nuclei and the decussations within the auditory system only begin with the second-order neurons originating in the cochlear nuclei, these nuclei receive input only from one ear. Hence, unilateral pontine lesions affecting the dorsal and ventral cochlear nuclei would be expected to result in ipsilateral hearing deficits (loss).

Cross-References

► [Auditory System](#)

References and Readings

Wilson-Pauwek, L., Akesson, E. J., Stewart, P. A., & Spacey, S. D. (2002). *Cranial nerves in health and disease*. Hamilton: B.C. Decker.