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Contributions of the brainstem and below to auditory scene analysis

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We are increasingly aware of the cues the auditory system uses in the segregation and fusion of auditory objects, however, we have very little evidence for how, or where, these cues are extracted in the auditory pathway. Here I will show how the inner ear and cochlear nucleus contribute to three classical auditory scene analysis phenomena. In the first, grouping by common onset; adaptation, lateral suppression and recovery from suppression all play a role. In the second phenomenon, a sequential streaming task, commonly referred to as ABA, the contributing low-level mechanisms are frequency tuning and neural adaptation. Finally, in the third phenomenon, comodulation masking release, which describes the seemingly paradoxical situation whereby the detection of a masked signal is improved by the addition of coherently modulated energy remote from the signal frequency, lateral suppression is an important mediator. Taken together these studies suggest that neurophysiological processes at, or before, the level of the cochlear nucleus make an important contribution to auditory scene analysis.