Interaural time difference and contribution of the MSO in cochlear implants

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Interaural time differences are considered important for sound localization and spatial unmasking in the lateral dimension. In normal mammalian hearing, the medial superior olive (MSO) is considered to be more sensitive to ITD cues encoded at low frequencies (also known as fine structure ITD cues) while at higher frequencies the ITDs of the signal envelope and level differences are processed by the lateral superior olive (LSO). However, in cochlear implant (CI) listeners the sensitivity to ITD cues in pulse trains degrades above 300 pulses per second (pps). One proposal is that the ITD cues are mainly processed via the LSO in CI listeners. Whether the MSO pathway is utilized by CI listeners is unclear. A few ideas regarding the question of how the MSO pathway contributes to ITD processing and whether these contributions can be implemented in the pre-processing stages of electric hearing are explored.