



*Auditory processing of temporal fine structure via temporal envelopes*

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Humans have an impressive ability to detect very small fluctuations in frequency, particularly for frequencies below about 4 kHz. This ability has long been ascribed to the use of timing information from phase-locked auditory-nerve responses to the stimulus temporal fine structure (TFS). Another mechanism, based on the tonotopic representation of frequency along the basilar membrane, provides an alternative way that fluctuations in frequency or TFS could be detected in the auditory system. According to this tonotopic or place-based alternative, frequency modulations (FM) are transformed to amplitude modulations (AM) via cochlear filtering and are thus detected via temporal-envelope fluctuations. This presentation will review multiple lines of evidence in favor of TFS coding based on phase-locked timing information and will explore the extent to which the results can instead be accounted for by a place-based mechanism that transforms stimulus TFS into a neural temporal-envelope code.