

Spectral properties of primary and non-primary auditory cortical activity

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ABSTRACT

Direct recordings from neurosurgical patients undergoing invasive monitoring for epilepsy provide an opportunity to resolve distinct auditory cortical fields on the supratemporal plane. Short-latency (< 20 ms) responses and prominent phase locking to 100-Hz click trains are consistently found in posteromedial Heschl's gyrus (HG), indicating a primary field. More anterolateral recording sites, presumably in a non-primary field, respond with longer latency and much less phase-locking. To more fully characterise electrophysiological properties of primary and non-primary auditory cortex we analysed activity in the frequency domain, prior to and during the presentation of clear and degraded sentences. In contrast with posteromedial HG, where power in the high gamma range (70-150 Hz) dominated, anterolateral HG, was characterised by high spontaneous alpha (7-10 Hz) activity that was strongly suppressed from 300 ms after the onset of a stimulus until its offset. This suppression was more pronounced in response to clear than to degraded speech. We consider possible explanations for differences in the spectral profile of primary and non-primary auditory cortical activity.

Keywords: Heschl's gyrus, auditory cortex, alpha

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