

Visiting Speaker

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Functional organization and frequency-selective adaptation in human auditory cortex: structural and functional MRI at 7T

Most models of the functional organisation of human auditory cortex (AC) are extrapolated from the primate. These models are in contradiction with each other depending on whether they rely on mainly fMRI tonotopic reversal measurements (A1 orthogonal to Heschl's gyrus) or on other criteria such as frequency selectivity or cytoarchitecture (A1 aligned with Heschl's gyrus). We used structural and functional MRI at 7T to measure tonotopy, frequency selectivity and myelination in human volunteers and delineate auditory fields in individual subjects. We show that the main mirror tonotopic gradients are orthogonal to the orientation of both myelin- and selectivity-defined A1 (and to Heschl's gyrus) and therefore that the organisation of human AC fundamentally differs for that of other primates.

We next use this individual functional parcellation of human auditory cortex to estimate frequency tuning in different auditory fields. BOLD fMRI probably greatly over estimate frequency tuning, both because of hemodynamic spatial spread and the variability of tuning properties across and within voxels. Here we use an adaptation paradigm and computational modelling to estimate average cell frequency selectivity in different auditory fields.

Date: Tuesday, July 5, 2016

Time: 2:30 pm

Location: Fisher Room, RRI