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Abstract

Although the tonotopic organization of the human primary auditory cortex (PAC) has already been studied, the question how its responses are affected in sensorineural hearing loss remains open. Twenty six patients (aged 38.1 ± 9.1 years; 12 men) with symmetrical sloping sensorineural hearing loss (SNHL) and 32 age- and gender-matched controls (NH) participated in an fMRI study using a sparse protocol. The stimuli were binaural 8s complex tones with central frequencies of 400 Hz_{CF}, 800 Hz_{CF}, 1600 Hz_{CF}, 3200 Hz_{CF}, or 6400 Hz_{CF}, presented at 80 dB(C). In NH responses to all frequency ranges were found in bilateral auditory cortices. The outcomes of a *winnermap* approach, showing a relative arrangement of active frequency-specific areas, was in line with the existing literature and revealed a V-shape high-frequency gradient surrounding areas that responded to low frequencies in the auditory cortex. In SNHL frequency-