

Accepted Manuscript

Tonotopic organisation of the auditory cortex in sloping sensorineural hearing loss

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PII: S0378-5955(17)30070-9

DOI: [10.1016/j.heares.2017.09.012](https://doi.org/10.1016/j.heares.2017.09.012)

Reference: HEARES 7426

To appear in: *Hearing Research*

Received Date: 14 February 2017

Revised Date: 28 July 2017

Accepted Date: 23 September 2017

Please cite this article as: Wolak, T., Cieśla, K., Lorens, A., Kochanek, K., Lewandowska, M., Rusiniak, M., Pluta, A., Wójcik, J., Skarżyński, H., Tonotopic organisation of the auditory cortex in sloping sensorineural hearing loss, *Hearing Research* (2017), doi: 10.1016/j.heares.2017.09.012.

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1 **Tonotopic organization of the auditory cortex in sloping sensorineural hearing loss**

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20 **Funding:** This work was supported by the Polish National Science Center [grant no 2012/05/N/NZ4/02]
21 awarded to Dr Katarzyna Cieśła.

22
23 **Abstract**

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

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