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## Background

Tinnitus is a phantom auditory perception without an external sound source and is one of the most common public health concerns that impair the quality of life of many individuals. However, its neural mechanisms remain unclear.

## Method

We herein examined population-level frequency tuning in the auditory cortex of unilateral tinnitus patients with similar hearing levels in both ears using magnetoencephalography. We compared auditory evoked neural activities elicited by a stimulation to the tinnitus and non-tinnitus ears.

## Results

Objective magnetoencephalographic data suggested that population-level frequency tuning corresponding to the tinnitus ear was significantly broader than that corresponding to the non-tinnitus ear in the human auditory cortex.

## Discussion

The results obtained support the hypothesis that pathological alterations in inhibitory neural networks play an important role in the perception of subjective tinnitus.