Dual tuning in the mammalian cochlea: dissociation of neural and basilar membrane responses at supra-threshold sound levels – a meta-analysis

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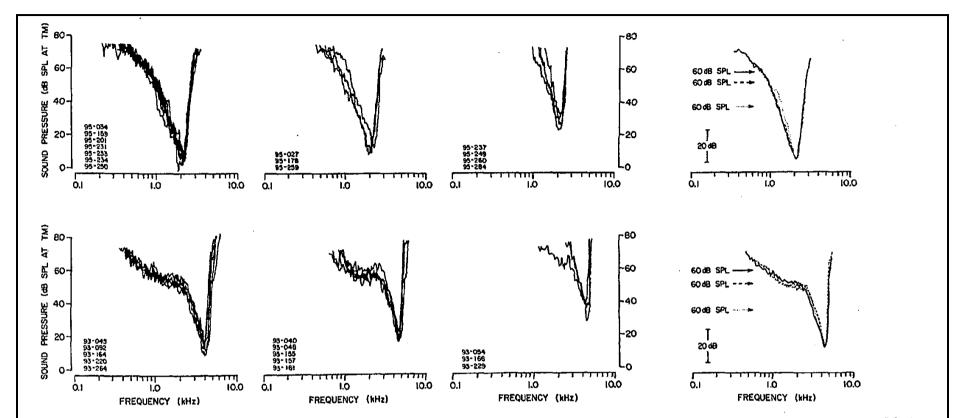


FIG. 13. Comparison of tuning-curve shapes in the three spont groups at two different CF regions. The data in the top and bottom rows are from two different chamber-raised animals. The top row contains all the tuning curves obtained in MCL95 with CF between 1.9 and 2.2 kHz. The bottom row contains all the tuning curves obtained in MCL93 with CF between 4.4 and 5.0 kHz. The curves in each row have been segregated into three groups according to the spont rate with which they were associated: high-spont units at the left, medium-spont units in the middle, low-spont units to the right. In the panel set apart at the far right of each row, the average tuning curves for each of the three spont groups have been superimposed, shifting the curves for the medium-(dashed) and low-spont (dotted) units in the threshold dimension so the tips of the tuning curves coincide. The amount of the threshold shift can be ascertained by comparing the solid, dashed, and dotted arrows to the left of the curves.

Figs. 7-9. Sharp tuning of high-threshold ANFs in the cat (Liberman, 1978).

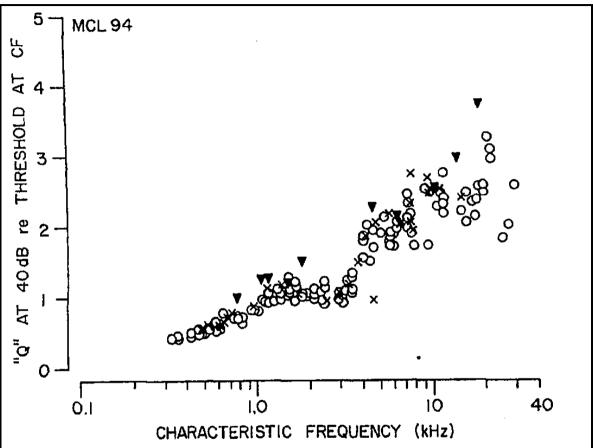
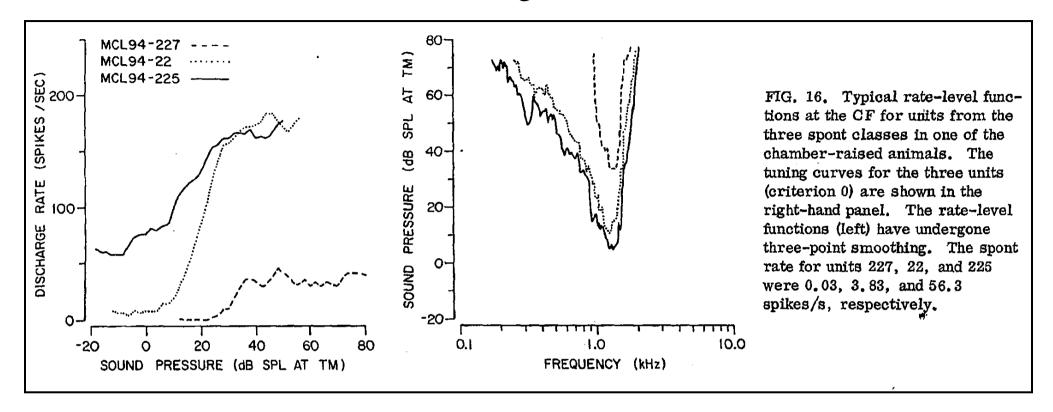


FIG. 14. Tuning curve "Q" as a function of CF with coding for spont rate. "Q" is measured at 40 dB re threshold at CF and is defined as the ratio of the characteristic frequency to the bandwidth of the tuning curve. Solid triangles represent low-spont units, crosses represent medium-spont units, and open circles represent high-spont units. The data are taken from one of the chamber-raised animals.

Fig. 9



Shift of frequency mapping with sound level - panoramic perspective 110 [dB SPL] 90 Pre-CF area: CF area: protected against energy reduction by resonant overstimulation 70 absorption Sound intensity 50 Basilar membrane: Auditory nerve fiber: shift of mapping no shift of mapping 30 Direction of traveling wave . 10 Base Apex — -10 Frequency mapping [scaling in half-octaves]

Fig. 5. Cochlear frequency mapping versus sound level. X-axis: BF place position along the length of the cochlea. Y-axis: sound intensity of the stimulus. BM data according to sample in Fig. 4. ANF data according to the summarized results of the present study.