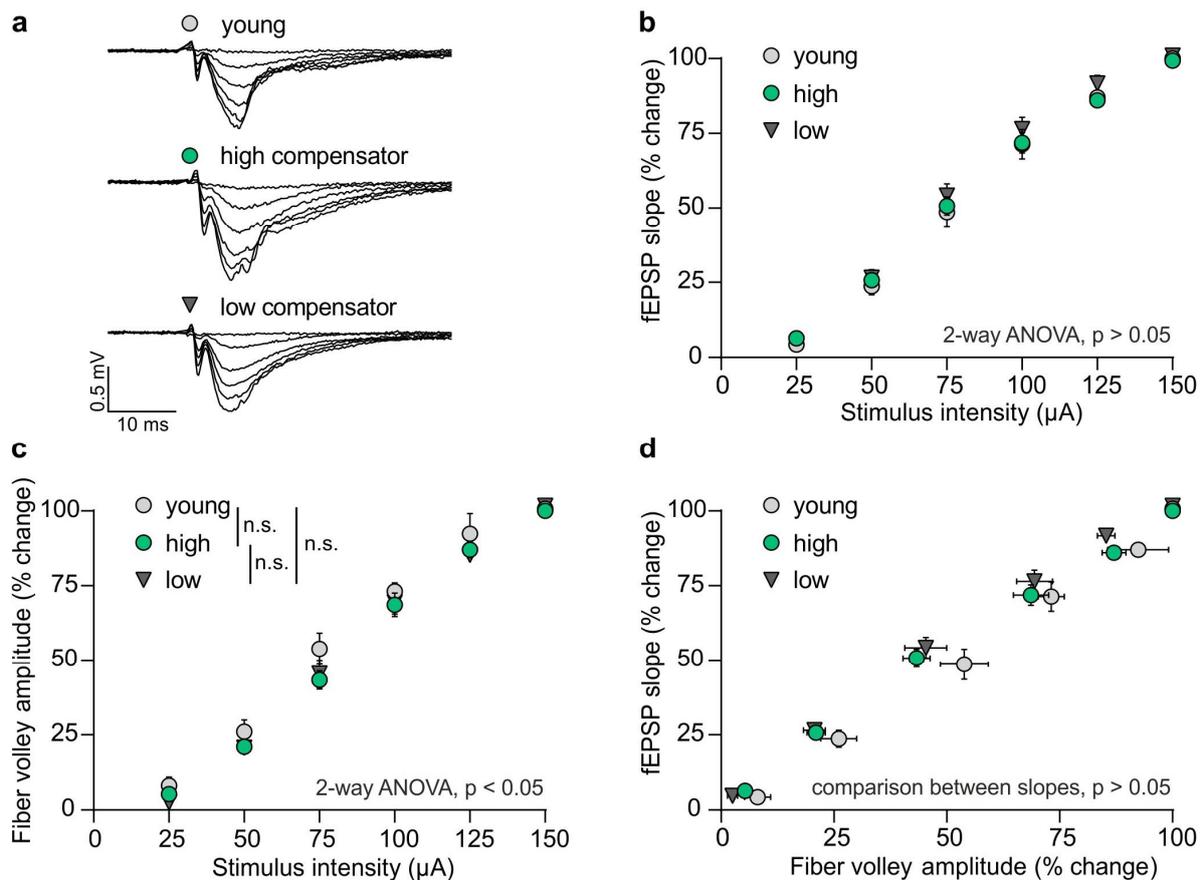
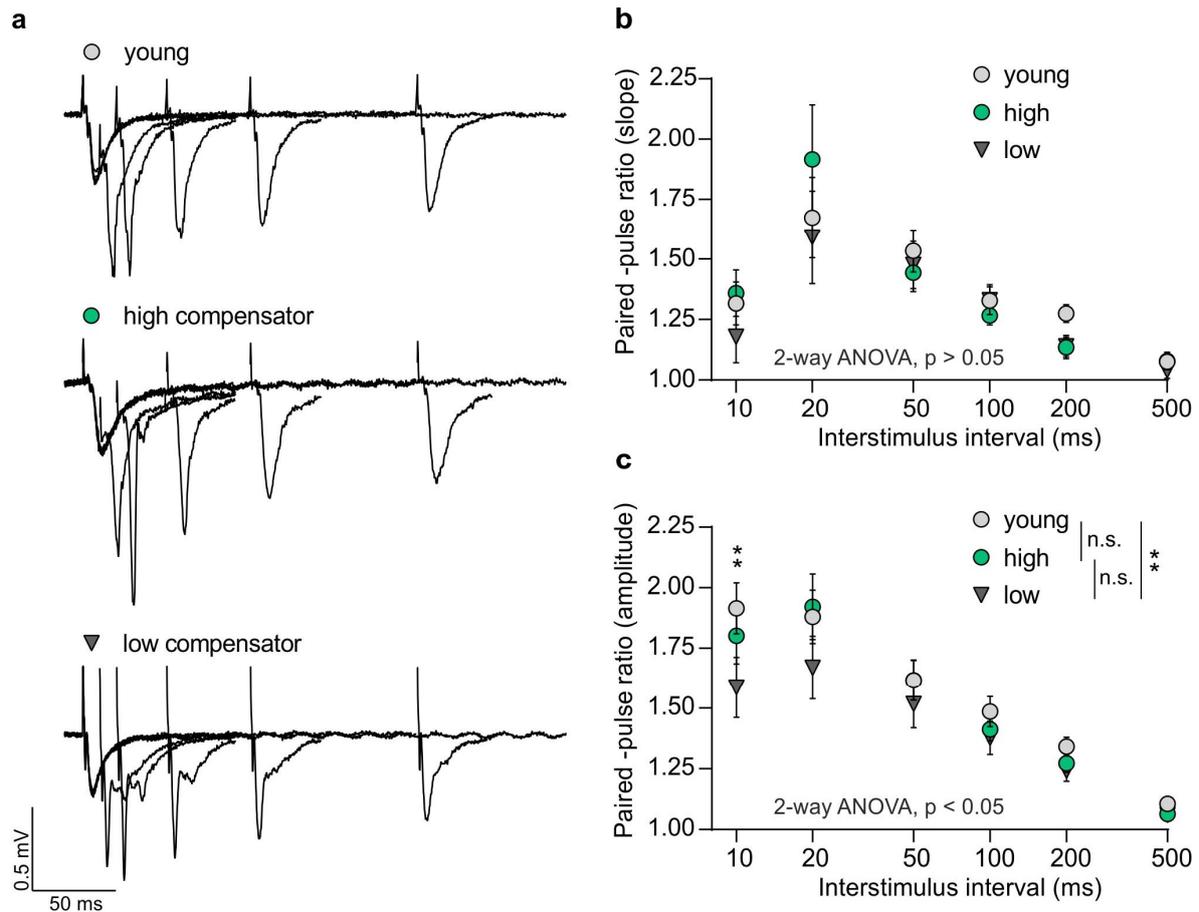


# Supplementary Materials: Age-Dependent Auditory Processing Deficits after Cochlear Synaptopathy Depend on Auditory Nerve Latency and the Ability of the Brain to Recruit LTP/BDNF

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**Supplementary Figure S1. Input-output relationship between fEPSP slope, fiber volley amplitude and stimulus intensity.** (a) Representative traces of fEPSPs with increasing stimulus intensity (from 25  $\mu\text{A}$  to 150  $\mu\text{A}$  in 25  $\mu\text{A}$  steps). (b) Changes in fEPSP slope and (c) fiber volley amplitude were normalized within each slice (% from the maximal response at the highest stimulus strength) and averaged values for each group were plotted against the stimulus intensity. Both, changes of fEPSPs slopes (2-way ANOVA,  $F(2, 300) = 1.446$ ,  $p > 0.05$ ) and fiber volley amplitudes (2-way ANOVA,  $F(2, 300) = 4.127$ ,  $p < 0.05$ ; with two-stage linear step-up procedure of Benjamini, Krieger and Yekutieli: high compensator vs. low compensator,  $p > 0.05$ ; young vs. high compensator,  $p > 0.05$ ; young vs. low compensator,  $p > 0.05$ ) showed no differences between the low and highly compensating animals as well as young control animals. (d) Changes in fEPSP slopes were consistent with changes in fiber volley amplitudes within all groups, displaying stable synaptic transmission (simple linear regression analysis, comparison between slopes of lines,  $F(2, 323) = 0.69$ ,  $p > 0.05$ ). Mean  $\pm$  SEM. n animals/slices: young 7/21, high compensator 7/20, low compensator 5/12.



**Supplementary Figure S2. Paired-pulse facilitation (PPF) as an indicator of short-term plasticity.**

(a) Representative traces of fEPSPs with increasing interpulse interval at the stimulation strength equal to respective LTP recordings. Applied interstimulus intervals: 10 ms, 20 ms, 50 ms, 100 ms, 200 ms, 500 ms (not shown). (b) Paired-pulse ratio of EPSP2/EPSP1 slope (2-way ANOVA,  $F(2, 330) = 0.9445$ ,  $p > 0.05$ ) and (c) paired-pulse ratio of EPSP2/EPSP1 amplitude (2-way ANOVA,  $F(2, 330) = 4.487$ ,  $p < 0.05$ ; with two-stage linear step-up procedure of Benjamini, Krieger and Yekutieli: high compensator vs. low compensator,  $p > 0.05$ ) showed no prominent difference between highly compensating and low compensating animals at any applied interstimulus interval, indicating similar short-term potentiation between these groups. Paired-pulse ratio of EPSP2/EPSP1 amplitude was significantly different between young ( $1.88 \pm 0.11$ ;  $n = 7/21$  animals/slices) and low compensating ( $1.66 \pm 0.14$ ;  $n = 5/16$  animals/slices) animals only at the 10 ms interpulse interval. Otherwise paired-pulse facilitation was similar in young mice compared to highly or low compensating animals (2-way ANOVA,  $F(2, 330) = 4.487$ ,  $p < 0.05$ ; with two-stage linear step-up procedure of Benjamini, Krieger and Yekutieli: young vs. high compensator,  $p > 0.05$ ; young vs. low compensator,  $p < 0.01$  only at 10 ms interpulse interval; otherwise, young vs. low compensator,  $p > 0.05$ ). EPSP1 was calculated as an average of EPSP1s from all interstimulus intervals for each single slice. Mean  $\pm$  SEM.  $n$  animals/slices: young 7/21, high compensator 7/20, low compensator 5/16.