

Improved optogenetic modification of the spiral ganglion neurons for future optical cochlear implants

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Supplementary information

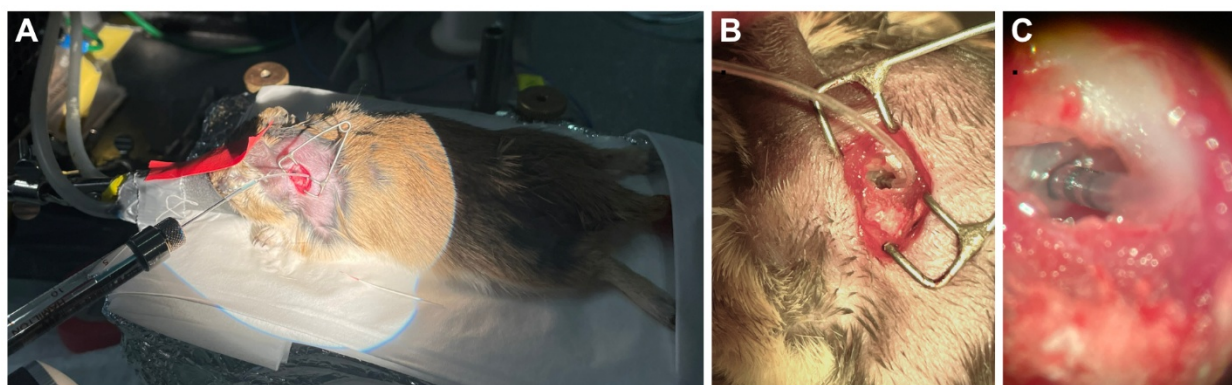


Figure S1. Procedure to perform catheter viral suspension delivery into the gerbil cochlea.

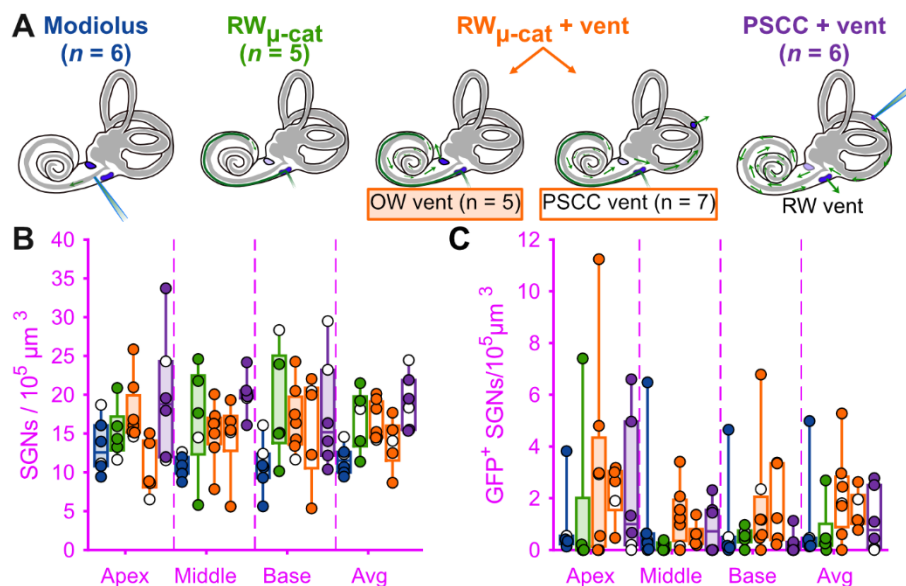


Figure S2. Comparison of viral administration approaches in the adult gerbil cochlea. **A.** Schematic representation of the different administration approaches (see Materials and methods for details). **B-C.** Quantification of the SGN density (B) and GFP⁺ SGN density (C) from the injected cochleae with the different administration approaches presented in A. Filled markers were used when positive oABRs were measured and an open-marker for the negative oABRs. Box plots show minimum, 25th percentile, median, 75th percentile, and maximum. Averaged \pm SEM. Kruskal-Wallis test followed by Tukey-Kramer post-hoc test (*, $P \leq 0.05$; **, $P \leq 0.01$).

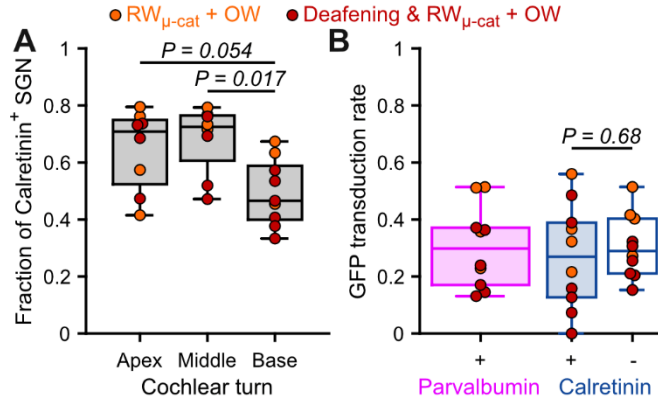


Figure S3. Subtypes unspecific optogenetic modification of the SGNs using AAV-PHP.S-hSyn-CatCh-eYFP. **A.** Quantification of the fraction of Calretinin-positive SGNs ('type Ia SGNs'), i.e., the ratio of the number of Calretinin- and Parvalbumin-positive cells, at the 3 cochlear turns following RW_{μ-cat} + OW administration. Kruskal-Wallis test followed by a multi-comparison test. The markers filled in orange correspond to normal-hearing and in red to deafened cochleae. **B.** Quantification of the ChR-expression rate from Parvalbumin-positive SGNs (magenta), and from Calretinin-positive (+, blue filling) and -negative (-, blue, white filling). Wilcoxon rank sum test. Box plots show minimum, 25th percentile, median, 75th percentile, and maximum.

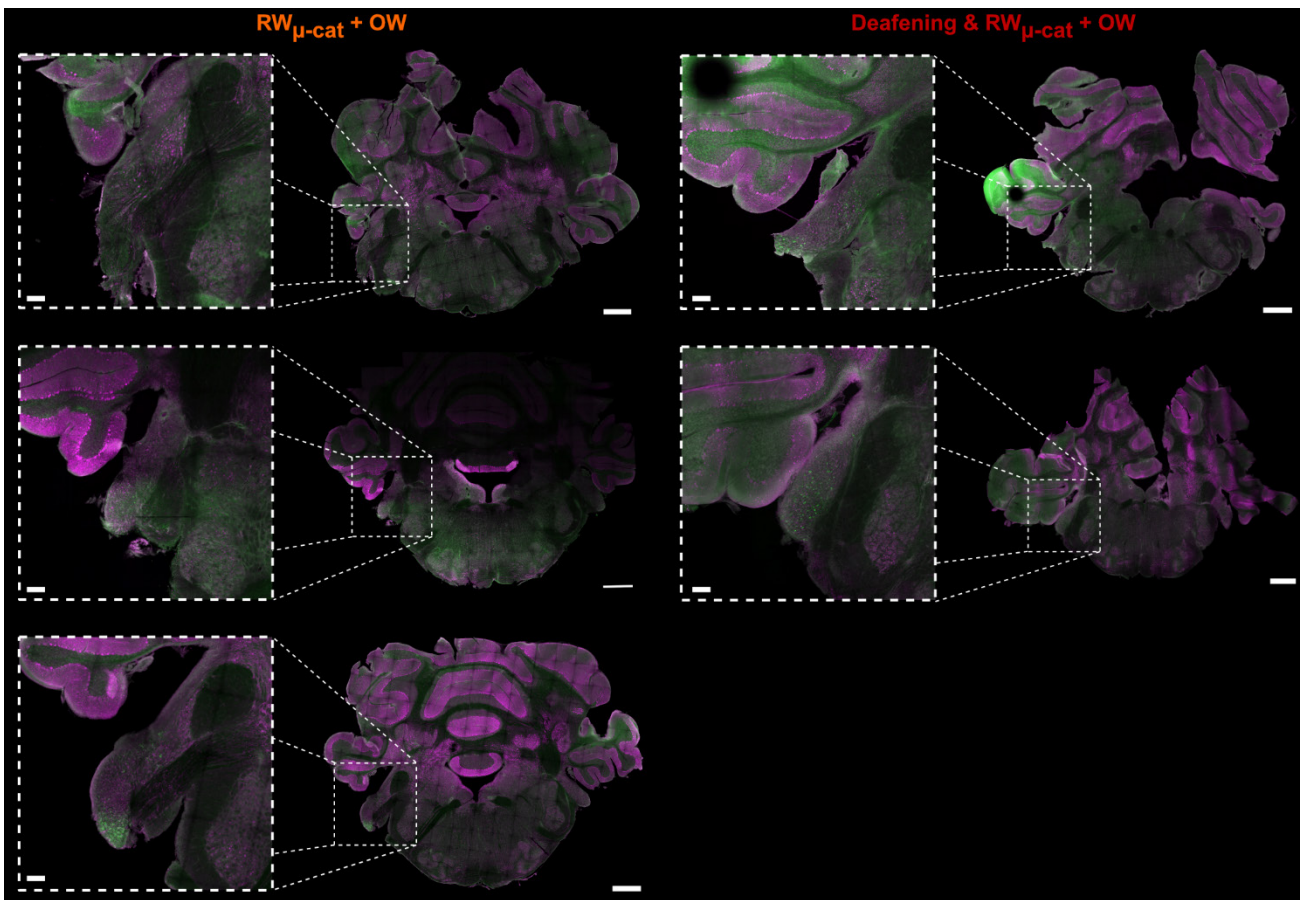


Figure S4. Absence of transduction in the central nervous system following RW_{μ-cat} + vent AAV-administration. Coronal slices of 5 gerbil brains following RW_{μ-cat} + vent AAV-administration. Slices were stained for parvalbumin (purple) and GFP (green), scale bar = 1 mm. The insert shows a magnification of the antero-ventral cochlear nucleus where GFP signal is found in axons of the SGNs but not in the neurons on which they project (scale bar = 0.2 mm).

