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Figure S1. Whole genome linkage analysis of the *loop* mutation. The C57Bl/6 genetic background was used as the outcross strain. A linkage study including low and high resolution mapping was performed on 21 N2 *loop/loop* (C3HeB/FeJ backcross) mutant mice, utilizing polymorphic markers between C57Bl/6 and C3HeB/FeJ inbred strains. Following a whole genome scan, the *loop* mutation was found to be linked to mouse chromosome 12. The linkage interval is flanked by two polymorphic markers *D12Mit215* and *D12Mit112*. The black colored squares refer to linked markers and the white colored squares refer to unlinked markers. N=21.

Figure S2. Pendrin localization in the inner ear is not affected by the S408F mutation. *A & B.* In the vestibule, pendrin is expressed in the transitional cell layer surrounding the sensory epithelium of the gravity receptors and the cristae. No difference in pendrin expression was found in *Slc26a4*^{loop} mutant inner ears. Scale bars equal 25 μm in *A*, *B* and *D*. N=4.

Figure S3. Micro-Raman spectroscopy of the aberrant giant minerals in *Slc26a4*^{loop} mutants. Normalized Raman spectra of minerals extracted from the saccule of *Slc26a4*^{loop} mutants at different developmental stages. *A.* Spectrum of the mineral extracted from the utricle in newborn *Slc26a4*^{loop} mice, showing the typical calcite vibrations at 713 and 1087 cm^{-1}. *B.* Spectrum of the mineral extracted from the saccule in *Slc26a4*^{loop} mice at 10 months of age. Vibrations at 1478 and 912 are typical of weddelite crystals**.** N=8.

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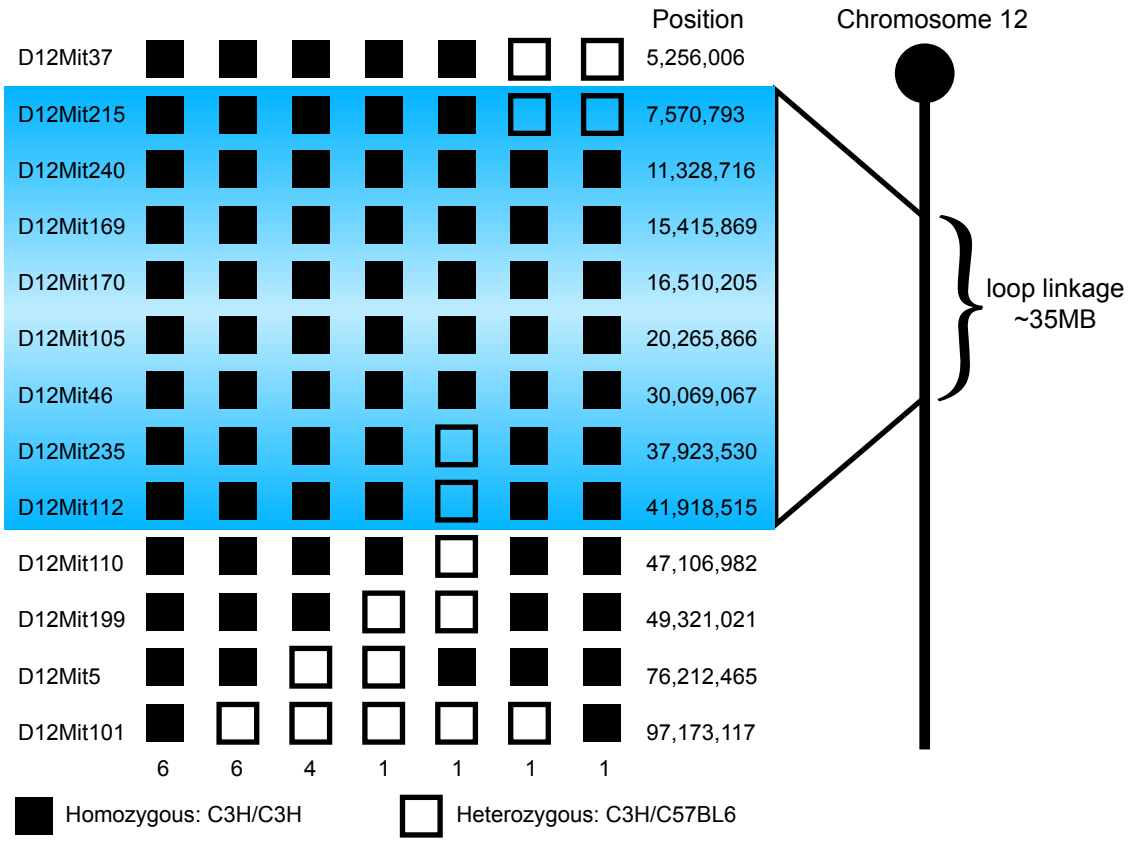

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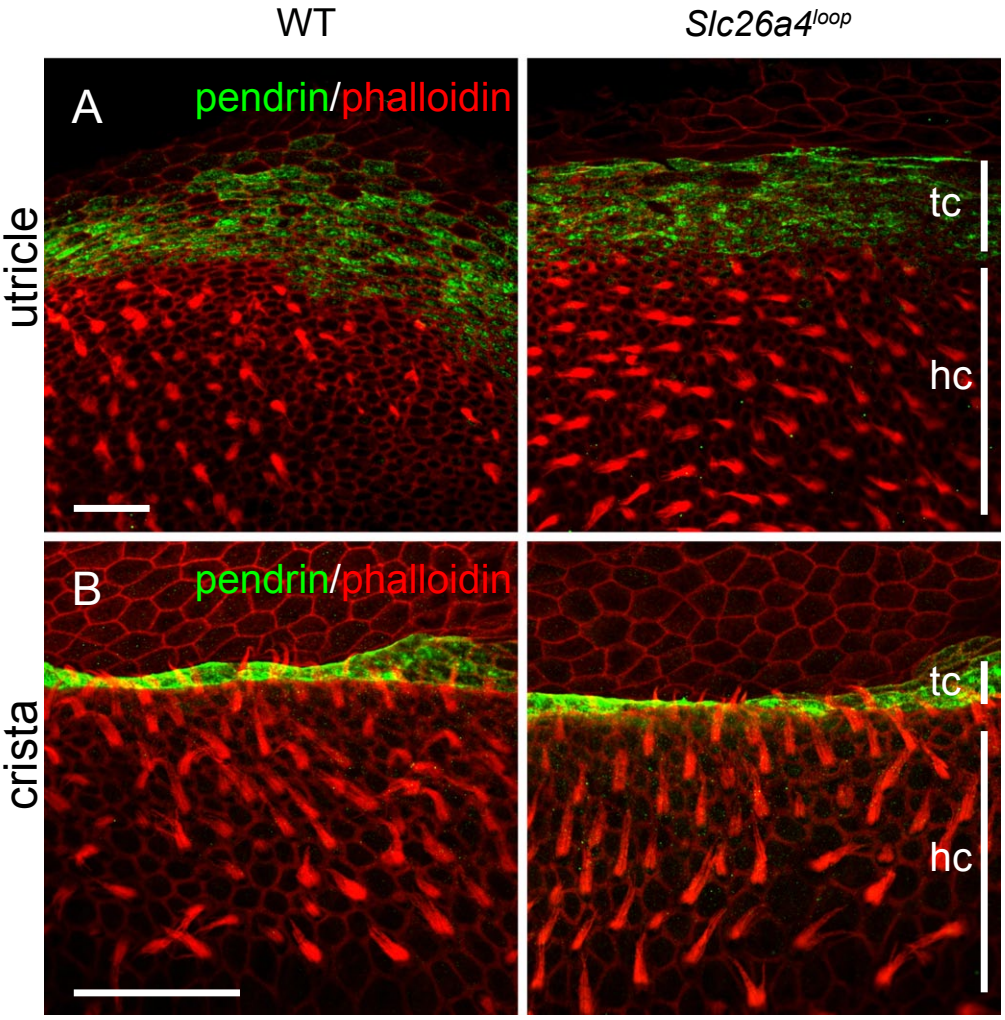

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