

TMC1 stands for Transmembrane Channel-Like 1, which is a [gene](#) that codes for a [protein](#) involved in [hearing](#) and auditory function. [Mutations](#) in the TMC1 gene have been linked to various forms of [deafness](#).

The mechano-electrical [transduction](#) (MET) [channel](#) of the [inner ear](#) receptor cells, termed [hair cells](#), is a protein complex that enables our senses of hearing and balance. Hair cell MET requires an elaborate interplay of multiple [proteins](#) that form the MET channel. One of the MET complex components is the [transmembrane protein LHFPL5](#), which is required for [hair cell](#) MET and [hearing](#). LHFPL5 is thought to form a multi-protein complex with other MET channel proteins, such as [PCDH15](#), [TMIE](#), and [TMC1](#). Despite localizing to the plasma membrane of stereocilia, the mechanosensing organelles of hair cells, LHFPL5 requires its binding partner within the MET complex, PCDH15, to localize to the stereocilia tips in hair cells and to the plasma membrane in heterologous cells. Using the Aquaporin 3-tGFP reporter (AGR) for plasma membrane localization, Soler et al from the [University Hospitals Cleveland Medical Center](#), found that a region within extracellular loop 1, which interacts with PCDH15, precludes the trafficking of AGR reporter to the plasma membrane in heterologous cell lines. Our results suggest that the presence of protein partners may mask endoplasmic reticulum retention regions or enable the proper folding and trafficking of the MET complex components, to facilitate the expression of the MET complex at the stereocilia membrane ¹⁾.

¹⁾

Soler DC, Ballesteros A, Sloan AE, McCormick TS, Stepanyan R. Multiple plasma membrane reporters discern LHFPL5 region that blocks trafficking to the plasma membrane. Sci Rep. 2023 Feb 13;13(1):2528. doi: 10.1038/s41598-023-28045-w. PMID: 36781873.

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