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Piezo channels in GtoPdb v.2025.4

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Abstract

PIEZO proteins are the pore-forming subunits of trimeric ion channels that open rapidly in response to mechanical stimuli such as membrane stretch, allowing positively charged ions such as the calcium ion to flow into the cell to change cellular structure and function. The proteins are eukaryotic, not prokaryotic, and lack sequence or structural homology to other proteins. There are two main types: In humans, there is PIEZO1 of 2521 amino acids and PIEZO2 of 2752 amino acids, which can form homomeric PIEZO1 and PIEZO2 channels. Membrane stretching causes complex changes in the channels that include a reduced inward curvature, an expansion of the N-terminal transmembrane helical units and an opening of the central ion pore region comprising the last two C-terminal helices. When there is sustained membrane stretching, the channels may adapt by inactivating at various rates depending on the cell type and context. There are many roles of the channels in diverse organ systems including cardiovascular, gastrointestinal, haematological, hepatobiliary, immune, integumental, musculoskeletal, neuronal, reproductive, respiratory and urinary systems as well as adipose tissue and cancers. The expression and functions of PIEZO1 are broad and diverse across many cell types and organs, whereas PIEZO2 is more restricted.

Contents

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Please note that the database version for the citations given in GtoPdb are to the most recent preceding version in which the family or its subfamilies and targets were substantially changed. The links below are to the current version. If you need to consult the cited version, rather than the most recent version, please contact the GtoPdb curators.

Database links

Piezo channels
https://www.guidetopharmacology.org/GRAC/FamilyDisplayForward?familyId=967
- Channels and Subunits
  - Piezo1
    https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=2945
  - Piezo2
    https://www.guidetopharmacology.org/GRAC/ObjectDisplayForward?objectId=2946

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