PSENEN gene

presenilin enhancer, gamma-secretase subunit

Normal Function

The *PSENEN* gene provides instructions for making a protein called gamma-secretase subunit PEN-2 (shortened to PEN-2). This protein is one part (subunit) of a complex called gamma- (γ-) secretase. PEN-2 processes another subunit of the complex, presenilin 1, which is produced from the *PSEN1* gene. This step is necessary for the γ-secretase complex to be functional.

The γ-secretase complex is located in the membrane that surrounds cells, where it cuts apart (cleaves) many different proteins that span the cell membrane (transmembrane proteins). This cleavage is an important step in several chemical signaling pathways that transmit signals from outside the cell into the nucleus. One of these pathways, known as Notch signaling, is essential for the normal maturation and division of hair follicle cells and other types of skin cells. Notch signaling is also involved in normal immune system function.

Health Conditions Related to Genetic Changes

Hidradenitis suppurativa

Several variants (also known as mutations) in the *PSENEN* gene have been found to cause hidradenitis suppurativa, a chronic skin disease characterized by recurrent boil-like lumps (nodules) under the skin that develop in hair follicles. The nodules tend to become inflamed and painful, and they produce significant scarring as they heal.

PSENEN gene variants reduce the amount of functional PEN-2 produced in cells, so less of this protein is available to act as part of the γ-secretase complex. The resulting shortage of normal γ-secretase impairs cell signaling pathways, including Notch signaling. Although little is known about the mechanism, studies suggest that abnormal Notch signaling may promote the development of recurrent nodules in hair follicles and trigger inflammation in the skin.

Dowling-Degos disease

MedlinePlus Genetics provides information about Dowling-Degos disease

Other Names for This Gene

- gamma-secretase subunit PEN-2
- hematopoietic stem/progenitor cells protein MDS033
- MDS033
- MSTP064
- PEN-2
- PEN2
- PEN2_HUMAN
- presenilin enhancer 2 homolog
- presenilin enhancer gamma secretase subunit
- presenilin enhancer gamma-secretase subunit

Additional Information & Resources

Tests Listed in the Genetic Testing Registry

- Tests of PSENEN (https://www.ncbi.nlm.nih.gov/gtr/all/tests/?term=55851[geneid])

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28PSENEN%5BTIAB%5D%29+OR+%28%28PEN2%5BTIAB%5D%29+OR+%28PEN-2%5BTIAB%5D%29%29+AND+%28%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1800+days%22%5Bdp%5D)

Catalog of Genes and Diseases from OMIM

- PRESENILIN ENHANCER, GAMMA-SECRETASE SUBUNIT; PSENEN (https://omim.org/entry/607632)

Gene and Variant Databases

- NCBI Gene (https://www.ncbi.nlm.nih.gov/gene/55851)
- ClinVar (https://www.ncbi.nlm.nih.gov/clinvar?term=PSENEN[gene])

References

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Genomic Location

The *PSENEN* gene is found on chromosome 19 (https://medlineplus.gov/genetics/chromosome/19/).

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