TGM5 gene

transglutaminase 5

Normal Function

The *TGM5* gene provides instructions for making an enzyme called transglutaminase 5. This enzyme is found in many of the body's tissues, although it seems to play a key role in the outer layer of skin (the epidermis). In the epidermis, transglutaminase 5 is involved in the formation of a structure called the cornified cell envelope, which surrounds epidermal cells and helps the skin form a protective barrier between the body and its environment. Specifically, transglutaminase 5 forms strong bonds, called cross-links, between the structural proteins that make up the cornified cell envelope. This cross-linking provides strength and stability to the epidermis.

Health Conditions Related to Genetic Changes

Peeling skin syndrome 2

Several variants (also called mutations) in the *TGM5* gene have been found to cause peeling skin syndrome 2. This condition is characterized by painless peeling of the top layer of skin. The peeling is most apparent on the hands and feet, but it can also affect the arms and legs.

Most of the variants that cause the condition change single protein building blocks (amino acids) in transglutaminase 5. The most common variant in people of European ancestry, written as Gly113Cys or G113C, replaces the amino acid glycine with the amino acid cysteine at a certain position in the enzyme. This and other *TGM5* gene variants reduce the activity of transglutaminase 5 or prevent cells from making any of this enzyme. A shortage of transglutaminase 5 function impairs protein cross-linking, which weakens the cornified cell envelope and allows the outermost cells of the epidermis to separate easily from the underlying skin and peel off. The peeling may be most noticeable on the hands and feet because those areas are more often exposed to moisture and friction.

Other Names for This Gene

- protein-glutamine gamma-glutamyltransferase 5
- protein-glutamine gamma-glutamyltransferase 5 isoform 1
- protein-glutamine gamma-glutamyltransferase 5 isoform 2

- TG(X)
- TGase X
- TGase-5
- TGASE5
- TGASEX
- TGM5_HUMAN
- TGM6
- TGMX
- TGX
- transglutaminase V
- transglutaminase X
- transglutaminase-5

Additional Information & Resources

Tests Listed in the Genetic Testing Registry

- Tests of TGM5 (https://www.ncbi.nlm.nih.gov/gtr/all/tests/?term=9333[geneid])

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28%28TGM5%5BTIAB%5D%29+OR+%28transglutaminase+5%5BTIAB%5D%29+OR+%28TG5%5BTIAB%5D%29%29+OR+%28%28TGASE5%5BTIAB%5D%29+OR+%28transglutaminase-5%5BTIAB%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D)

Catalog of Genes and Diseases from OMIM

- TRANSGLUTAMINASE 5; TGM5 (https://omim.org/entry/603805)

Gene and Variant Databases

- NCBI Gene (https://www.ncbi.nlm.nih.gov/gene/9333)
- ClinVar (https://www.ncbi.nlm.nih.gov/clinvar?term=TGM5[gene])

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Genomic Location

The *TGM5* gene is found on chromosome 15 (https://medlineplus.gov/genetics/chromosome/15/).

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