PDCD10 gene
programmed cell death 10

Normal Function

The *PDCD10* gene (also known as *CCM3*) provides instructions for making a protein that appears to play a role in the structure of blood vessels. While the exact function of the PDCD10 protein is unclear, studies suggest that it works with other proteins to help strengthen the interactions between cells and limit leakage from blood vessels. This protein is also thought to be involved in pathways that signal cells to self-destruct (undergo apoptosis) when they have completed a certain number of cell divisions or accumulated errors in their DNA.

Health Conditions Related to Genetic Changes

Cerebral cavernous malformation

More than a dozen mutations in the *PDCD10* gene have been identified in families with cerebral cavernous malformations, which are collections of blood vessels in the brain that are weak and prone to leakage. These mutations include a deletion of the entire gene, deletion of small segments of DNA, and changes in single DNA building blocks (nucleotides). These mutations result in an abnormal or absent PDCD10 protein. It is unclear how mutations in the *PDCD10* gene lead to the formation of cerebral cavernous malformations.

Mutations in the *PDCD10* gene account for approximately 10 percent of familial cerebral cavernous malformation cases.
**Chromosomal Location**

Cytogenetic Location: 3q26.1, which is the long (q) arm of chromosome 3 at position 26.1

Molecular Location: base pairs 167,683,298 to 167,735,810 on chromosome 3 (Homo sapiens Updated Annotation Release 109.20200228, GRCh38.p13) (NCBI)

**Other Names for This Gene**

- apoptosis-related protein 15
- CCM3
- cerebral cavernous malformation 3
- PDC10_HUMAN
- TFAR15

**Additional Information & Resources**

**Clinical Information from GeneReviews**

- Familial Cerebral Cavernous Malformation
  https://www.ncbi.nlm.nih.gov/books/NBK1293

**Scientific Articles on PubMed**

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28PDCD10%5BTIAB%5D%29+OR+%28programmed+cell+death+10%5BTIAB%5D%29+OR+%28TFAR15%5BTIAB%5D%29+AND+%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29+AND+human%5Bmh%5D+AND+%22last+3600+days%22+AND+english%5Bla%5D+AND+human%5Bmh%5D

**Catalog of Genes and Diseases from OMIM**

- PROGRAMMED CELL DEATH 10
  http://omim.org/entry/609118
Research Resources

- Atlas of Genetics and Cytogenetics in Oncology and Haematology
  http://atlasgeneticsoncology.org/Genes/PDCD10ID43399ch3q26.html
- ClinVar
  https://www.ncbi.nlm.nih.gov/clinvar?term=PDCD10%5Bgene%5D
- HGNC Gene Symbol Report
- Monarch Initiative
  https://monarchinitiative.org/gene/NCBIGene:11235
- NCBI Gene
- UniProt
  https://www.uniprot.org/uniprot/Q9BUL8

Sources for This Summary

- OMIM: PROGRAMMED CELL DEATH 10
  http://omim.org/entry/609118
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/16380626

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17657516

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