KRIT1 gene

KRIT1 ankyrin repeat containing

Normal Function

The *KRIT1* gene (also known as *CCM1*) provides instructions for making a protein that strengthens the interactions between cells that form blood vessels and limits leakage from the vessels. The KRIT1 protein interacts with a number of other proteins to form a complex that is found in the junctions that connect neighboring cells. As part of this complex, the KRIT1 protein helps turn off (suppress) a signaling molecule known as RhoA-GTPase. This molecule plays a role in regulating the actin cytoskeleton, which is a network of fibers that makes up the cell's structural framework. When turned on, RhoA-GTPase stimulates the formation of actin fibers, which has been linked to weakened junctions between cells and increased leakage from blood vessels.

Health Conditions Related to Genetic Changes

Cerebral cavernous malformation

More than 100 *KRIT1* gene mutations 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. Virtually all of these mutations place a premature stop signal in the instructions for making the KRIT1 protein, preventing adequate KRIT1 protein production. A shortage of this protein likely impairs the function of the complex. As a result, RhoA-GTPase signaling is turned on abnormally, weakening cellular junctions and increasing the permeability of blood vessel walls. The increased leakage into the brain can cause health problems such as headaches, seizures, and bleeding in the brain (cerebral hemorrhage) in some people with cerebral cavernous malformations.

Mutations in the *KRIT1* gene account for up to 50 percent of all familial cerebral cavernous malformation cases. One particular mutation is responsible for up to 70 percent of cases in people of Hispanic heritage. This mutation changes a single DNA building block (nucleotide) at position 1363 in the KRIT1 gene, written as 1363C>T.

Other Names for This Gene

- ankyrin repeat-containing protein Krit1
- CAM
- CCM1

- cerebral cavernous malformations 1
- krev interaction trapped 1
- KRIT1_HUMAN

Additional Information & Resources

Tests Listed in the Genetic Testing Registry

- Tests of KRIT1 (https://www.ncbi.nlm.nih.gov/gtr/all/tests/?term=889[geneid])

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28%28CCM1%5BTIAB%5D%29+OR+%28cerebral+cavernous+malformations+1%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

- KRIT1 ANKYRIN REPEAT-CONTAINING PROTEIN 1; KRIT1 (https://omim.org/entry/604214)

Gene and Variant Databases

- NCBI Gene (https://www.ncbi.nlm.nih.gov/gene/889)
- ClinVar (https://www.ncbi.nlm.nih.gov/clinvar?term=KRIT1[gene])

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Genomic Location

The *KRIT1* gene is found on chromosome 7 (https://medlineplus.gov/genetics/chromosome/7/).

Last updated November 1, 2012