



## F8 gene

coagulation factor VIII

### Normal Function

The *F8* gene provides instructions for making a protein called coagulation factor VIII. Coagulation factors are a group of related proteins that are essential for the formation of blood clots. After an injury, clots protect the body by sealing off damaged blood vessels and preventing further blood loss.

Coagulation factor VIII is made chiefly by cells in the liver. This protein circulates in the bloodstream in an inactive form, bound to another molecule called von Willebrand factor, until an injury that damages blood vessels occurs. In response to injury, coagulation factor VIII is activated and separates from von Willebrand factor. The active protein (sometimes written as coagulation factor VIIIa) interacts with another coagulation factor called factor IX. This interaction sets off a chain of additional chemical reactions that form a blood clot.

### Health Conditions Related to Genetic Changes

#### Hemophilia

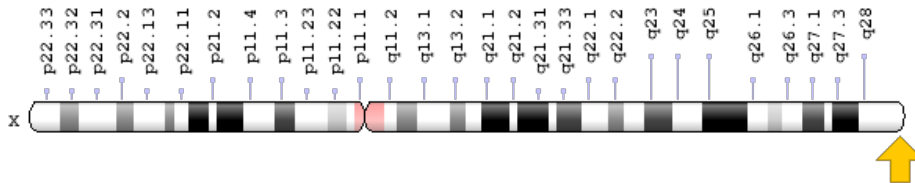
Mutations in the *F8* gene cause hemophilia A, the most common form of this bleeding disorder. More than 1,300 alterations in this gene have been identified. Some of these mutations change single DNA building blocks (base pairs) in the gene, while others delete or insert multiple base pairs. The most common mutation in people with severe hemophilia A is a rearrangement of genetic material called an inversion. This inversion involves a large segment of the *F8* gene.

Mutations in the *F8* gene lead to the production of an abnormal version of coagulation factor VIII or reduce the amount of this protein. The altered or missing protein cannot participate effectively in the blood clotting process. As a result, blood clots cannot form properly in response to injury. These problems with blood clotting lead to excessive bleeding that can be difficult to control. Some mutations, such as the large inversion described above, almost completely eliminate the activity of coagulation factor VIII and result in severe hemophilia. Other mutations reduce but do not eliminate the protein's activity, resulting in mild or moderate hemophilia.

## Chromosomal Location

Cytogenetic Location: Xq28, which is the long (q) arm of the X chromosome at position 28

Molecular Location: base pairs 154,835,788 to 155,022,723 on the X chromosome (Homo sapiens Annotation Release 109, GRCh38.p12) (NCBI)



Credit: Genome Decoration Page/NCBI

## Other Names for This Gene

- AHF
- antihemophilic factor
- coagulation factor VIII, procoagulant component
- coagulation factor VIII, procoagulant component (hemophilia A)
- DXS1253E
- FA8\_HUMAN
- Factor VIIF8B
- FVIII
- HEMA
- procoagulant component

## Additional Information & Resources

### Educational Resources

- Biochemistry (fifth edition, 2002): Diagram of the blood clotting cascade  
<https://www.ncbi.nlm.nih.gov/books/NBK22589/?rendertype=figure&id=A1401>

### Clinical Information from GeneReviews

- Hemophilia A  
<https://www.ncbi.nlm.nih.gov/books/NBK1404>

### Scientific Articles on PubMed

- PubMed  
<https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28F8%5BTIAB%5D%29+OR+%28coagulation+factor+VIII%5BTI%5D%29+OR+%28factor+VIII%5BMAJR%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+720+days%22%5Bdp%5D>

### Catalog of Genes and Diseases from OMIM

- COAGULATION FACTOR VIII  
<http://omim.org/entry/300841>

### Research Resources

- Atlas of Genetics and Cytogenetics in Oncology and Haematology  
[http://atlasgeneticsoncology.org/Genes/GC\\_F8.html](http://atlasgeneticsoncology.org/Genes/GC_F8.html)
- ClinVar  
<https://www.ncbi.nlm.nih.gov/clinvar?term=F8%5Bgene%5D>
- HGNC Gene Symbol Report  
[https://www.genenames.org/data/gene-symbol-report/#!/hgnc\\_id/HGNC:3546](https://www.genenames.org/data/gene-symbol-report/#!/hgnc_id/HGNC:3546)
- Monarch Initiative  
<https://monarchinitiative.org/gene/NCBIGene:2157>
- NCBI Gene  
<https://www.ncbi.nlm.nih.gov/gene/2157>
- UniProt  
<https://www.uniprot.org/uniprot/P00451>

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<https://ghr.nlm.nih.gov/gene/F8>

Reviewed: May 2010  
Published: June 11, 2019

Lister Hill National Center for Biomedical Communications  
U.S. National Library of Medicine  
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Department of Health & Human Services