

# Leiden Mutation

**English:** *Leiden mutation, Factor V Leiden, Activated protein C resistance, APC resistance*



Leiden mutation is autosomal dominant hereditary mutation on chromosome 1, in the gene for clotting factor V. Consequence of this mutation is a blood clotting disturbance. For blood coagulation we need factor Xa and factor V (co-factor) which activate thrombin the enzyme needed to cleave fibrinogen to fibrin to form the clot. Protein C acts as a regulator for the clotting. It does so by inhibiting in case of need factor V. By inhibiting factor V coagulation is halted since factor Xa cannot activate thrombin by its self. In case of Leiden mutation of factor V, factor V is resistant to inhibition by Protein C (aPC resistance) which leads to thrombosis.

Mutation is based on substitution of a single nucleotide (position 1691, exon 10) which in turn leads to change of the amino acid sequence. Instead of Arginine the amino acid Glutamine is present in the polypeptide chain.

Clinical manifestation is thrombophilia with its complications:

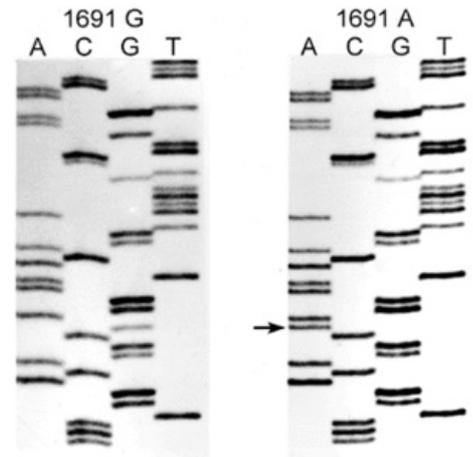
- **deep vein thrombosis,**
- **pulmonary embolism,**

and higher risk of:

- abortions,
- premature childbirth.

Heterozygotes have 5-10 times higher risk of thrombosis than common population sample, homozygotes even 80-100 times higher risk. There is possible advantage of lower risk of massive bleeding after childbirth. The risk of thrombophilia can be enhanced by using hormonal contraception in woman population, which is not recommended to use. Leiden mutation is the most often genetic disturbance of blood clotting, prevalence is 5% in European population. In the opposite side it is quite rare polymorphism in Asia and Africa.

Diagnostic is based on RFLP, PCR and DNA electrophoresis.



Guanine replaced by adenine.

## Treatment

To prevent abortions in pregnant women low molecular heparins (Anti Xa) are prescribed daily subcutaneously until the end of the pregnancy.

## Links

### Related Articles

- Deep Vein Thrombosis

### Bibliography

- WikiSkripta.eu. *Leidenská mutace* [online]. ©2012. The last revision 2012-01-05, [cit. 2012-02-11]. <[http://www.wikiskripta.eu/index.php/Leidensk%C3%A1\\_mutace](http://www.wikiskripta.eu/index.php/Leidensk%C3%A1_mutace)>.