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Lessons from snake venom: new insights into the structural and functional aspects of factor V and factor X

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Machtig zijn de werken van de Heer, wie ze liefheeft, onderzoekt ze.
(Psalm 111:2)

Preamble

Hemostasis

It's late at night and you are walking home after a good evening among friends. You are very tired and as you are strolling along you fail to notice that your shoestring has come untied. The outcome is inevitable: you stumble and hit the pavement, hard. The fall has badly hurt your knee, and to make matters worse there is a nasty cut in the palm of your hand that starts to bleed instantly. Fortunately, you are just ten minutes away from home and your fully stocked first-aid kit. However, by the time you reach home the cut in your hand has stopped bleeding completely and so therefore bandages are not required. Alas, your bruised knee is not so lucky. There's a burning sensation that seems to get worse and the site of injury has turned into a blaze of purple and red. Surely, that will be sore for quite a while.

Hemostasis seems to be straightforward: upon vascular injury blood congeals to form a protective barrier that prevents further blood loss. In fact, hemostasis is a delicately organized and intrinsically complex process which can easily become disrupted by genetic defects, use of medication, infections, detrimental lifestyle, and natural toxins like snake venom. So, while the painful narrative above may appear harmless, it can have dire consequences to individuals with genetic bleeding disorders such as hemophilia or to individuals that are being treated with anticoagulant drugs.

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