Methods and Devices to Model Veins and Associated Blood Vessel Components

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Technology description

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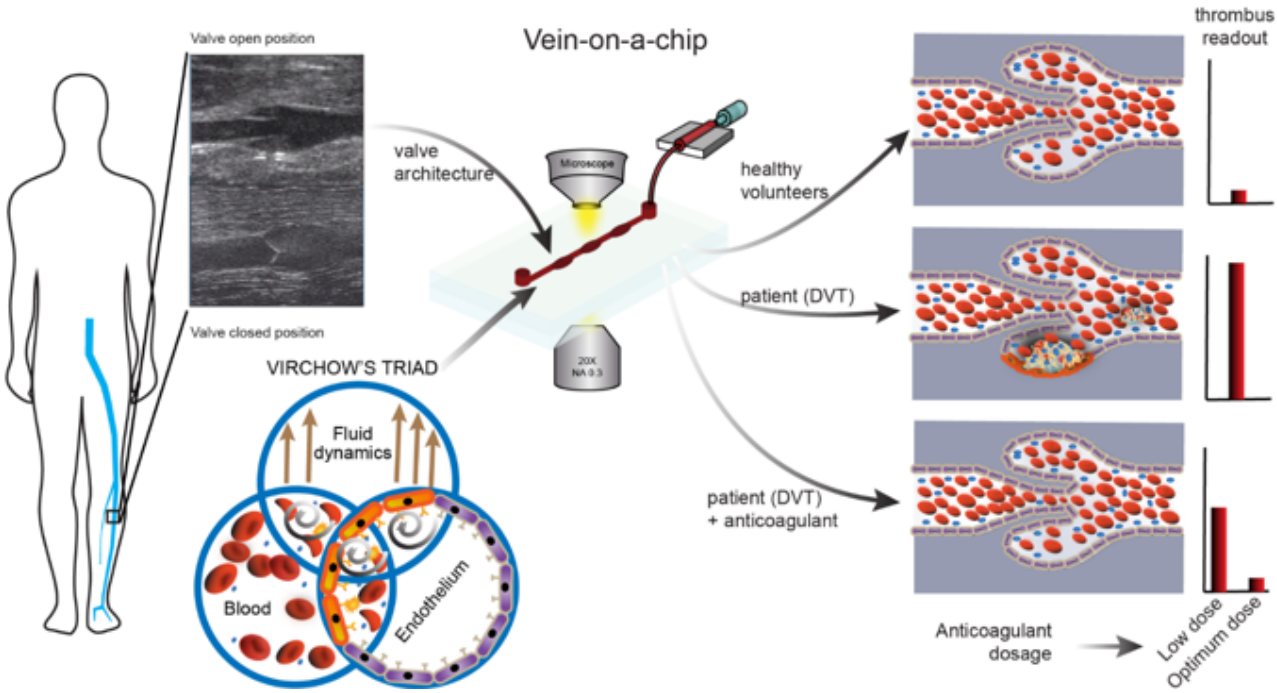
Overview

Venous diseases (such as venous thrombosis) are ranked amongst the top cardiovascular causes of death worldwide. At the same time, they are relatively poorly understood and drugs that exist or are in development to treat venous disorders are very limited. These inadequacies are attributed primarily to the fact that discovery and therapeutic programs rely heavily on results from animal models, whereas these models (particularly mouse models) of venous diseases perform poorly in terms of predicting human pathophysiology and drug responses. The current invention provides a solution to this problem.

Technology

We have developed a medical device that serves as a model of the human vein that includes its design and biological complexity. We have leveraged the 3D printing fabrication technique to create the venous architecture that has same dimensions as an in vivo human vein (length of the printed vein's side equals the diameter of in vivo veins). We have integrated this 3D printed vein to a pneumatic instrument that can actuate, modulate and predict the contractile phenomena of the veins as well as pulsatile blood flow.



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