

A Collaborative Online System Dedicated to the Study of the Intracranial Aneurysms

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Very little is known about the healing mechanism of an intracranial aneurysm (IA), namely the formation of a clot (Thrombus) inside the cavity (Lumen) after insertion of a stent. The multiscale interaction between biological and hemodynamic processes is the central ingredient of the THROMBUS project (<http://www.thrombus-vph.eu>).

The core of the project THROMBUS is to develop and validate a biological model of spontaneous or stent-induced thrombosis within IA. From this model we will compute quantitative stent efficiency score by its capability to induce clotting in aneurysms. In medical practice the choice of which stent to deploy is left to the medical doctor and remains intuitive to date.

The project will develop a multiscale computational modeling and simulation framework based on the triptych In Vitro – In Vivo – In Silico - rule of three for the thrombosis. The associated technological aim of the project is to deliver software with an interactive end-user interface, providing a virtual simulation of the thrombosis leading to the optimal stent for a specific patient's aneurysm.

This goal will be achieved by integrating some of the leading open source software and VPH toolkit software in the area of computational bioengineering. Also a collaborative online system will be adapted allowing partners of THROMBUS to correlate any type of data in case simultaneous multidisciplinary analysis by distant partners is required.

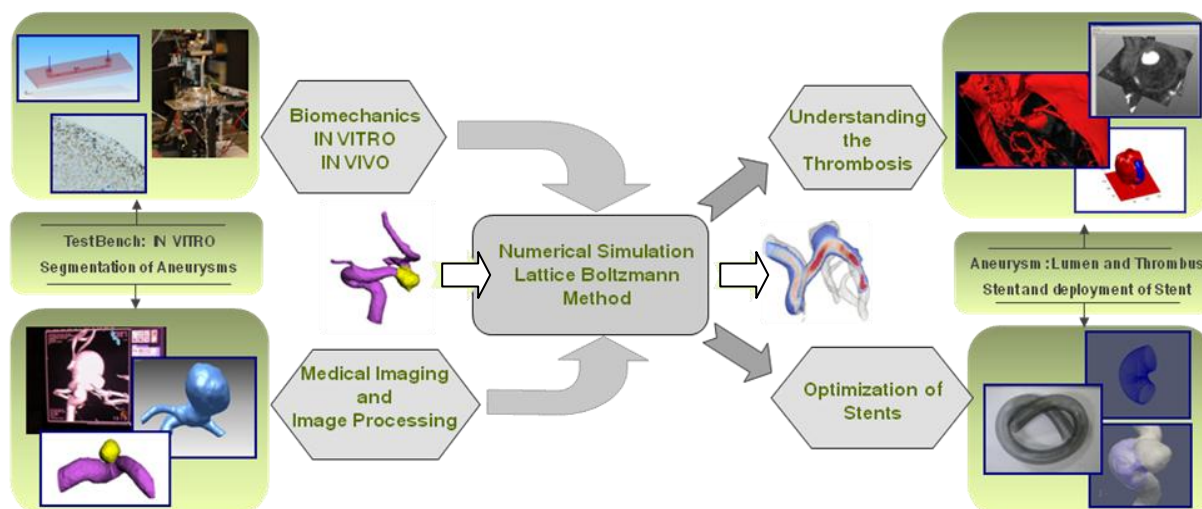


Figure 1: Objectives of Thrombus

The objective of the Collaborative Online System is to provide clinicians and scientists with an interactive end-user tool developed via CREATOOLS (VPH Toolkit: <http://www.vphnoe.eu>) coupled to a telemedicine software COVOTEM (<http://www.covalia.com>), allowing the simultaneously exchange of information with other hospital sites and research laboratories.

The goal is to bring together all the components of the THROMBUS project in order to achieve the two following objectives:

- (1) Offer to the scientific and medical community a validated multiscale model of thrombosis in cerebral aneurysms.
- (2) Provide the VPH community with new computer tools and models that can be used, further developed and that will be the basis on which an aid to decision and treatment recommendations can be built.

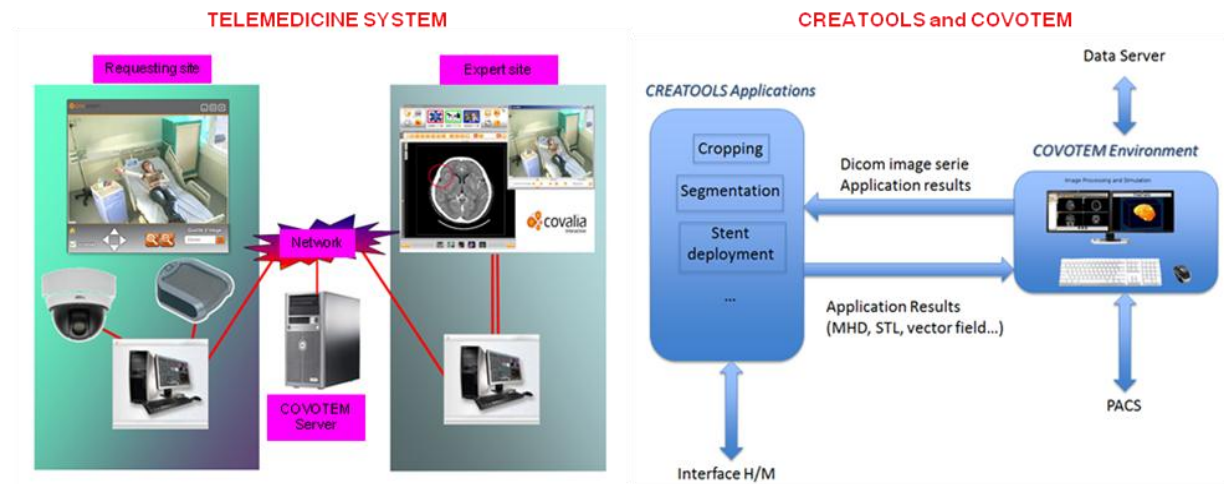


Figure 2: Collaborative Online System

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