Resource Summary Report

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SimVascular

RRID:SCR_002686
Type: Tool

Proper Citation

SimVascular (RRID:SCR_002686)

Resource Information

URL: https://simtk.org/home/simvascular

Proper Citation: SimVascular (RRID:SCR_002686)

Description: Open source software suite for cardiovascular simulation. It includes code for reading 3D images, segmenting structures, generating models and meshes, and modeling blood flow in deformable vessels. The suite also includes tools for physiologic boundary conditions, fluid structure interaction, and an accurate and efficient finite element Navier-Stokes solver. Commercial components have been used in the simulation process, and for these components, the project attempts to provide interfaces that allow substitution of open source components. The SimVascular project is derived from the ASPIRE2 software project and includes modified portions of PHASTA from RPI/SCOREC.

Synonyms: SimVascular: Cardiovascular Modeling and Simulation

Resource Type: simulation software, software application, software resource

Defining Citation: PMID:31446517

Keywords: simulation software, fluid dynamics, blood flow, cardiovascular, image-based geometric modeling, image segmentation, mesh generation, vascular, bio.tools

Availability: Free, Available for download, Freely available

Resource Name: SimVascular

Resource ID: SCR_002686

Alternate IDs: nif-0000-23311, BioTools:SimVascular, biotools:SimVascular

Alternate URLs: https://bio.tools/SimVascular, https://bio.tools/SimVascular, https://bio.tools/SimVascular

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Record Last Update: 20260912T195544+0000

Ratings and Alerts

No rating or validation information has been found for SimVascular.

No alerts have been found for SimVascular.

Data and Source Information

Source: SciCrunch Registry

Usage and Citation Metrics

We found 81 mentions in open access literature.

Listed below are recent publications. The full list is available at SPARC SAWG .

Tran K, et al. (2026) Patient-Specific Computational Flow Simulation Reveals Adverse Hemodynamic Factors Associated With Occlusion of Directional Branches After Fenestrated-Branched Endovascular Aneurysm Repair. Journal of the American Heart Association, 15(3), e044790.

Nair PJ, et al. (2026) MRI-Based Pressure Gradient Mapping in Patient-Specific Models of Coarctation of the Aorta. medRxiv : the preprint server for health sciences.

Zhao YC, et al. (2026) Rapid Glass-Substrate Digital Light 3D Printing Enables Anatomically Accurate Stroke Patient-Specific Carotid Artery-on-Chips for Personalized Thrombosis Investigation. Advanced materials (Deerfield Beach, Fla.), 38(5), e08890.

Zhu M, et al. (2026) Glycoursodeoxycholic acid 3 sulfate sodium links hemodynamics and bile acid metabolism in aortic stenosis. Journal of advanced research, 84, 639.

Zhang D, et al. (2026) 3D vascular quantitation with application to computational modeling: a pre-clinical light sheet microscopy, high resolution ultrasound, nano-computed tomography comparison study. bioRxiv : the preprint server for biology.

Yin Z, et al. (2026) CT - derived fractional flow reserve can predict recurrent ischemia in patients with MCA stenosis. Frontiers in neurology, 17, 1838968.

Kazik HB, et al. (2026) Patient-Informed Fluid-Structure Interaction Simulations of Bicuspid Aortic Valve in Young Adults Reveal Regionalized Differences in Mechanical Stress. Annals of biomedical engineering, 54(3), 679.

Khunatorn Y, et al. (2026) The utility of 4D flow MRI and computational fluid dynamics in developing the fontan model enhances presurgical planning and ensures better outcomes: the first case report in Thailand. Journal of cardiothoracic surgery, 21(1).

van de Velde L, et al. (2026) In Vivo Validation of Computational Fluid Dynamics for Determining the Pressure Gradient for Multi-segmental Femoropopliteal Disease.

Cardiovascular and interventional radiology, 49(6), 1190.

Lisasi R, et al. (2026) Computed Fluid Dynamics-Based Blood Pressure Prediction for Coronary Artery Disease Diagnosis Using Coronary Computed Tomography Angiography. Journal of imaging, 12(5).

Dwivedi KK, et al. (2026) Alterations in ascending aortic hemodynamics and aortic length correlate with sex-specific thoracic aortic aneurysm dilation and lifespan in a mouse model of severe Marfan syndrome. Computers in biology and medicine, 205, 111594.

Bantwal AS, et al. (2025) Importance of Considering Temporal Variations in Pulse Wave Velocity for Accurate Blood Pressure Prediction. Annals of biomedical engineering, 53(5), 1080.

Du P, et al. (2025) AI-powered automated model construction for patient-specific CFD simulations of aortic flows. Science advances, 11(36), eadw2825.

Roopnarinesingh R, et al. (2025) Understanding thromboembolus transport patterns in the brain for stroke in the presence of carotid artery stenosis. PLoS computational biology, 21(9), e1013269.

Garcha A, et al. (2025) Sensitivity of coronary hemodynamics to vascular structure variations in health and disease. Scientific reports, 15(1), 3325.

Blum KM, et al. (2025) Oversized Conduits Predict Stenosis in Tissue Engineered Vascular Grafts. JACC. Basic to translational science, 10(7), 101248.

Thompson EW, et al. (2025) Pulmonary Artery Shear Stress and Oscillatory Shear Index are Associated with Right Ventricular Remodeling in Repaired Tetralogy of Fallot. Annals of biomedical engineering, 53(9), 2206.

Majee S, et al. (2025) Understanding embolus transport and source to destination mapping of thromboemboli in hemodynamics driven by left ventricular assist device. Scientific reports, 15(1), 12150.

Brown AL, et al. (2025) Personalized biventricular mechanics and sensitivity to model morphology. bioRxiv : the preprint server for biology.

Mirgolbabaee H, et al. (2025) Ultrasound Particle Image Velocimetry to Investigate Potential Hemodynamic Causes of Limb Thrombosis After Endovascular Aneurysm Repair With the Anaconda Device. Journal of endovascular therapy : an official journal of the International Society of Endovascular Specialists, 32(6), 2223.