Resource Summary Report

Generated by NIF on Jul 31, 2026

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 resource, software application

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

Record Creation Time: 20220129T080214+0000

Record Last Update: 20260731T042639+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 70 mentions in open access literature.

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

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.

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

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.

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.

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.

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.

Park WY, et al. (2025) Hemodynamic Analysis in Aortic Dilatation after Arterial Switch Operation for Patients with Transposition of Great Arteries Using Computational Fluid Dynamics. Journal of cardiovascular translational research, 18(1), 79.

Bazzi MS, et al. (2025) Ascending aortic aneurysm growth in the Fbln4SMKO mouse is consistent with uniform growth laws. Biomechanics and modeling in mechanobiology, 24(5), 1485.

Wu W, et al. (2025) Virtual Coronary Artery Bypass Grafting. Research square.

McCarthy RP, et al. (2025) Influence of boundary conditions and blood rheology on indices of wall shear stress from IVUS-based patient-specific stented coronary artery simulations. Scientific reports, 15(1), 15868.

Baek SM, et al. (2025) Quantitative comparisons of pulmonary artery hemodynamics before and after Pulsta valve implantation in patients with Tetralogy of Fallot using computational fluid dynamics. Frontiers in cardiovascular medicine, 12, 1586134.

Ceserani V, et al. (2025) The impact of stenosis treatment on the hemodynamic crosstalk between carotid arteries. Scientific reports, 15(1), 20442.

Kizilski SB, et al. (2025) Preclinical Validation of a Patient-Specific Patch-Planning Workflow for Congenital Cardiovascular Reconstruction. Annals of biomedical engineering, 53(12), 3505.

Martin T, et al. (2024) Computational hemodynamic pathophysiology of internal carotid artery blister aneurysms. Biomedical engineering online, 23(1), 118.

Hu W, et al. (2024) Effects of pedicle subtraction osteotomy on aortic morphology and hemodynamics in ankylosing spondylitis with kyphosis: a finite element analysis study. Scientific reports, 14(1), 25456.

Laudenschlager S, et al. (2024) Estimation of pulmonary vascular resistance for Glenn physiology. PloS one, 19(7), e0307890.

El Sayed R, et al. (2024) Subjects with carotid webs demonstrate pro-thrombotic hemodynamics compared to subjects with carotid atherosclerosis. Scientific reports, 14(1), 10092.