# Publications bioMMeda 2019

## A1

- **Alessio Ielapi, Nicolas Lammens, Wim Van Paepegem, Malcolm Forward, Jan Patrick Deckers, Miguel Vermandel and Matthieu De Beule**: A validated computational framework to evaluate the stiffness of 3D printed ankle foot orthoses. COMPUTER METHODS IN BIOMECHANICS AND BIOMEDICAL ENGINEERING. 22(8). p.880-887.
- **Annelore Sacreas, Jan H. von der Thüsen, Thierry P. P. van den Bosch, Birgit Weynand, Erik K. Verbeken, Charlotte Debbaut, Dirk E. Van Raemdonck, Robin Vos and Stijn E. Verleden**: The pleural mesothelium and TGF-β1 pathways in restrictive allograft syndrome: a pre-clinical investigation. JOURNAL OF HEART AND LUNG TRANSPLANTATION . 38(5). p.570-579.
- **Bram Trachet, Mauro Ferraro, Goran Lovric, Lydia Aslanidou, Gerlinde Logghe, Patrick Segers and Nikolaos Stergiopulos**: Synchrotron-based visualization and segmentation of elastic lamellae in the mouse carotid artery during quasi-static pressure inflation. JOURNAL OF THE ROYAL SOCIETY INTERFACE. 16(155).
- **Daimé Campos Arias, Nikos Stergiopulosi, Tania Rodríguez Moliner and Patrick Segers**: Mapping the site-specific accuracy of loop-based local pulse wave velocity estimation and reflection magnitude: a 1D arterial network model analysis. PHYSIOLOGICAL MEASUREMENT. 40(7).
- **Daniela Tommasin, Annette Caenen, Benedict Verhegghe, Steve Greenwald and Patrick Segers**: Physics of within-tissue wave propagation generated by pulse propagation in the carotid artery. APPLIED SCIENCES-BASEL. 9(14).
- **F. Vanden Eynden, Patrick Segers, Thierry Bové, Filip De Somer, B. El Oumeiri and Guido Van Nooten**: Use of a right ventricular continuous flow pump to validate the distensible model of the pulmonary vasculature. PHYSIOLOGICAL RESEARCH. 68(2). p.233-243.
- **Federico Canè, Matteo Selmi, Gianluca De Santis, Alberto Redaelli, Patrick Segers and Joris Degroote**: Mixed impact of torsion on LV hemodynamics: a CFD study based on the Chimera technique. COMPUTERS IN BIOLOGY AND MEDICINE. 112.
- **Frank Dewaele, Tim De Pauw, Alain Kalmar, Piet Pattyn, Isabelle Van Herzeele, Alexandre Mottrie, Yves Van Nieuwenhove and Dirk Van Roost**: Is the human brain capable of controlling seven degrees of freedom? JOURNAL OF SURGICAL RESEARCH. 238. p.1-9.
- **Frank Dewaele, Tim De Pauw, Nicolaas Lumen, Elke Van Daele, Tjalina Hamerlynck, Steven Weyers, Ine Strubbe, Filip Van den Broeck, Thibaut Van Zele, Dirk Van Roost, et al.**: Articulated instruments and 3D visualization: a synergy? Evaluation of execution time, errors, and visual fatigue. SURGICAL INNOVATION. 26(4). p.456-463.

- **Frédéric Vanden Eynden, Bachar El-Oumeiri, Thierry Bové, Guido Van Nooten and Patrick Segers**: Proximal pressure reducing effect of wave reflection in the pulmonary circulation disappear in obstructive disease: insight from a rabbit model. AMERICAN JOURNAL OF PHYSIOLOGY-HEART AND CIRCULATORY PHYSIOLOGY. 316(5). p.H992-H1004.
- **Giorgia Rocatello, Gianluca De Santis, Sander De Bock, Matthieu De Beule, Patrick Segers and Peter Mortier**: Optimization of a transcatheter heart valve frame using patient-specific computer simulation. CARDIOVASCULAR ENGINEERING AND TECHNOLOGY. 10(3). p.456-468.
- **Giorgia Rocatello, Nahid El Faquir, Ole De Backer, Martin J. Swaans, Azeem Latib, Luca Vicentini, Patrick Segers, Matthieu De Beule, Peter de Jaegere and Peter Mortier**: The impact of size and position of a mechanical expandable transcatheter aortic valve: novel insights through computational modelling and simulation. JOURNAL OF CARDIOVASCULAR TRANSLATIONAL RESEARCH. 12(5). p.435-446.
- **Håkan Roos, Amith Balusubramanya, Srdjan Sasic, Valery Chernoray and Håkan Nilsson**: Fluid pressure derived force is the main contributor to iliac limb displacement forces – shear force and redirection of flow are negligible. EUROPEAN JOURNAL OF VASCULAR AND ENDOVASCULAR SURGERY. 58(6). p.e18-e19.
- **Hicham Saaid, Jason Voorneveld, Christiaan Schinkel, Jos Westenberg, Frank Gijsen, Patrick Segers, Pascal Verdonck, Nico de Jong, Johan G. Bosch, Sasa Kenjeres, et al**.: Tomographic PIV in a model of the left ventricle: 3D flow past biological and mechanical heart valves. JOURNAL OF BIOMECHANICS . 90. p.40-49.
- **Hooman Salavati and M. Soltani**: The impact of endothelial cells proliferation in a multiscale realistic reproduction of angiogenesis. BIOCHEMICAL ENGINEERING JOURNAL. 142. p.74-83.
- **Joseph Maria Jebamalai, Kurt Marlein, Jelle Laverge, Lieven Vandevelde and Martijn van den Broek**: An automated GIS-based planning and design tool for district heating: scenarios for a Dutch city. ENERGY. 183. p.487-496.
- **Julio Alonso Chirinos Medina, Patrick Segers, Timothy Hughes and Raymond Townsend**: Large-artery stiffness in health and disease JACC state-of-the-art review. JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY. 74(9). p.1237-1263.
- **Julio Alonso Chirinos Medina, Priyanka Bhattacharya, Anupam Kumar, Elizabeth Proto, Prasad Konda, Patrick Segers, Scott R. Akers, Raymond R. Townsend and Payman Zamani**: Impact of diabetes mellitus on ventricular structure, arterial stiffness, and pulsatile hemodynamics in heart failure with preserved ejection fraction. JOURNAL OF THE AMERICAN HEART ASSOCIATION. 8(4).
- **Julio Alonso Chirinos Medina, Scott R. Akers, Erik Schelbert, Bradley S. Snyder, Walter R. Witschey, Ron M. Jacob, Carlos Jamis-Dow, Bilal Ansari, Jonathan Lee, Patrick Segers, et al.**: Arterial properties as determinants of left ventricular mass and fibrosis in

severe aortic Stenosis: findings from ACRIN PA 4008. JOURNAL OF THE AMERICAN HEART ASSOCIATION. 8(1).
- **Julio Chirinos Medina, Mayank Sardana, Vaibhav Satija, Thierry Gillebert, Marc De Buyzere, Jugal Chahwala, Dirk De Bacquer, Patrick Segers and Ernst Rietzschel**: Effect of obesity on left atrial strain in persons aged 35−55 years (The Asklepios Study). AMERICAN JOURNAL OF CARDIOLOGY. 123(5). p.854-861.
- **Laurent De Moerloose, Liesbeth Taelman, Patrick Segers, Jan Vierendeels and Joris Degroote**: Analysis of several subcycling schemes in partitioned simulations of a strongly coupled fluid-structure interaction. INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN FLUIDS . 89(6). p.181-195.
- **Lisse Vera, Daimé Campos Arias, Sofie Muylle, Nikos Stergiopulos, Patrick Segers and Gunther van Loon**: A 1D computer model of the arterial circulation in horses: an important resource for studying global interactions between heart and vessels under normal and pathological conditions. PLOS ONE. 14(8).
- **Margo Steuperaert, Charlotte Debbaut, Charlotte Carlier, Olivier De Wever, Benedicte Descamps, Christian Vanhove, Wim Ceelen and Patrick Segers**: A 3D CFD model of the interstitial fluid pressure and drug distribution in heterogeneous tumor nodules during intraperitoneal chemotherapy. DRUG DELIVERY. 26(1). p.404-415.
- **Mathias Peirlinck, F. Sahli Costabal, K. L. Sack, J. S. Choy, G. S. Kassab, J. M. Guccione, M. De Beule, Patrick Segers and E. Kuhl**: Using machine learning to characterize heart failure across the scales. BIOMECHANICS AND MODELING IN MECHANOBIOLOGY. 18(6). p.1987-2001.
- **Mathias Peirlinck, Kevin L. Sack, Pieter De Backer, Pedro Morais, Patrick Segers, Thomas Franz and Matthieu De Beule**: Kinematic boundary conditions substantially impact in silico ventricular function. INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN BIOMEDICAL ENGINEERING. 35(1).
- **Michael A. Quail, Patrick Segers, Jennifer A. Steeden and Vivek Muthurangu**: The aorta after coarctation repair: effects of calibre and curvature on arterial haemodynamics. JOURNAL OF CARDIOVASCULAR MAGNETIC RESONANCE. 21.
- **Sander Lefere, Frederique Van de Velde, Anne Hoorens, Sarah Raevens, Sanne Van Campenhout, Astrid Vandierendonck, Sara Neyt, Bert Vandeghinste, Christian Vanhove, Charlotte Debbaut, et al**.: Angiopoietin-2 promotes pathological angiogenesis and is a therapeutic target in murine nonalcoholic fatty liver disease. HEPATOLOGY. 69(3). p.1087-1104.
- **Stamatia Z. Pagoulatou, Vasiliki Bikia, Bram Trachet, Theodore G. Papaioannou, Athanase D. Protogerou and Nikolaos Stergiopulos**: On the importance of the nonuniform aortic stiffening in the hemodynamics of physiological aging. AMERICAN JOURNAL OF PHYSIOLOGY - HEART AND CIRCULATORY PHYSIOLOGY. 317(5). p.H1125-H1133.

- **Viviana Mancini, Aslak W. Bergersen, Jan Vierendeels, Patrick Segers and Kristian Valen-Sendstad**: High-frequency fluctuations in post-stenotic patient specific carotid stenosis fluid dynamics: a computational fluid dynamics strategy study. CARDIOVASCULAR ENGINEERING AND TECHNOLOGY. 10(2). p.277-298.
- **Viviana Mancini, Daniela Tommasin, Yanlu Li, Jonathan Reeves, Roel Baets, Steve Greenwald and Patrick Segers**: Detecting carotid stenosis from skin vibrations using Laser Doppler Vibrometry: an in-vitro proof-of-concept. PLOS ONE. 14(6).

## A2

- **Bram Trachet, Goran Lovric, Pablo Villanueva-Perez, Lydia Aslanidou, Mauro Ferraro, Gerlinde Logghe, Nikolaos Stergiopulos and Patrick Segers**: Synchrotron-based phase contrast imaging of cardiovascular tissue in mice-grating interferometry or phase propagation? BIOMEDICAL PHYSICS & ENGINEERING EXPRESS . 5(1).
- **Francisco Javier Londoño Hoyos, Patrick Segers, Zeba Hashmath, Garrett Oldland, Maheshwara Reddy Koppula, Khuzaima Javaid, Rachana Miller, Rushikkumar Bhuva, Izzah Vasim, Ali Tariq, et al**.: Non-invasive intraventricular pressure differences estimated with cardiac MRI in subjects without heart failure and with heart failure with reduced and preserved ejection fraction. OPEN HEART. 6(2).

## C3

- **Bram Trachet, Mauro Ferraro, Goran Lovric, Lydia Aslanidou, Gerlinde Logghe, Nikolaos Stergiopulos and Patrick Segers**: Synchrotron-based pressure inflation experiments to model the mouse carotid artery microstructure in 3D. 25th Congress of the European Society of Biomechanics: abstracts. p.84-84.
- **Bram Trachet, Mauro Ferraro, Goran Lovric, Lydia Aslanidou, Gerlinde Logghe, Patrick Segers and Nikolaos Stergiopulos**: Synchrotron-based quasi-static pressure inflation of the mouse carotid artery. Biomechanics in Vascular Biology and Cardiovascular Disease, 14th International Symposium, Abstracts.
- **Carlos Alejandro Silvera Delgado, Ghazal Adeli Koudehi, Matthias Van Impe, Charlotte Debbaut and Patrick Segers**: A 2D axisymmetric computational model for the study of mass transport into lymphatic capillaries and pre-collector vessels. Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C 2019): posters.
- **Daimé Campos Arias, Nikos Stergiopulos, Tania Rodríguez Moliner and Patrick Segers**: Impact of inaccuracy in local pulse wave velocity estimation on wave separation analysis. 25th Congress of the European Society of Biomechanics: abstracts. p.68-68.
- **Daniela Tommasin, Annette Caenen, Benedict Verhegghe, Steve Greenwald and Patrick Segers**: Modeling skin and soft tissue vibrations generated by pressure pulse propagation in the common.

CMBBE 2019, Computer Methods in Biomechanics and Biomedical Engineering, 16th International symposium: abstract book. p.60-60.

- **Gerlinde Logghe, Markus Wagenhäuser, Philip Dueppers, Daniel Devos, Isabelle Van Herzeele, Frank Vermassen, Julie De Backer, Hubert Schelzig, Patrick Segers and Bram Trachet**: Multi-center study on false lumen patency and thrombosis in type B aortic dissection patients: importance of (minor) side branches. ESVS, 33rd Annual meeting, Abstracts.
- **Ghazal Adeli Koudehi, Benedicte Descamps, Christian Vanhove, Charlotte Debbaut, Christophe Casteleyn, Pieter Cornillie and Patrick Segers**: Acquiring 3D morphological data of the lymphatic system in healthy mice: a feasibility study. Lymphatic Forum 2019, Abstracts.
- **Ghazal Adeli Koudehi, Matthias Van Impe, Carlos Alejandro Silvera Delgado, Christophe Casteleyn, Pieter Cornillie, Charlotte Debbaut and Patrick Segers**: Modelling lymph propulsion in a series of contracting lymphangions immersed in the interstitium. Lymphatic Forum 2019, Abstracts.
- **Hicham Saaid, Jason Voorneveld, Christiaan Schinkel, Frank Gijsen, Patrick Segers, Pascal Verdonck, Nico de Jong, Johan Bosch, Sasa Kenjeres, Jos Westenberg, et al**.: Validation of 4D flow MRI in a left ventricle phantom.
- **Hicham Saaid, Jason Voorneveld, Christiaan Schinkel, Sasa Kenjeres, Johan Bosch, Jos Westenberg, Frank Gijsen, Patrick Segers, Pascal Verdonck, et al.**: Tomographic PIV in left ventricular phantom for 4D flow MRI and 4D ECHO-PIV validation.
- **Hicham Saaid, Matteo Novara, Jason Voorneveld, Christiaan Schinkel, Jos Westenberg, Frank Gijsen, Patrick Segers, Pascal Verdonck, Johan Bosch, Sasa Kenjeres, et al.**: In vitro volumetric lagrangian particle tracking and 4D pressure field in a left ventricle model. Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C 2019): proceedings.
- JOURNAL OF HYPERTENSION. 37. p.E88-E88.
- **L. Marais, H. Khettab, Yanlu Li, Patrick Segers, Roel Baets, K. Reesink, S. Aasmul, M. De Melis and Pi. Boutouyrie**: Measurement of aortic stiffness by laser doppler vibrometry: the cardis study
- **Lisse Vera, Daimé Campos Arias, Sofie Muylle, Nikos Stergiopulos, Patrick Segers and Gunther van Loon**: A computer model of the equine arterial circulation to gain deeper insights into equine arterial haemodynamics. EQUINE VETERINARY JOURNAL. 51(suppl. 53). p.20-20.
- **Matthias Van Impe, Patrick Sips, Julie De Backer and Patrick Segers**: Mechanics of the bulbus arteriosus in zebrafish: why the shape of the P-D loop is crucial. Proceedings of the 2019 summer biomechanics, bioengineering and biotransport conference. p.932-933.
- **Mohammad Rahimi Gorji, Charlotte Debbaut, Leen Van de Sande, Wouter Willaert, Patrick Segers and Wim Ceelen**: Computational model of pressurized intraperitoneal chemotherapy (PIPAC) for carcinomatosis treatment. OncoPoint, 7th Research seminar, Abstracts.

- **Mohammad Rahimi Gorji, Charlotte Debbaut, Wouter Willaert, Patrick Segers, Ghader Ghorbaniasl and Wim Ceelen**: A numerical simulation of pressurized intraperitoneal aerosol chemotherapy (PIPAC): validation part. Biomedical Engineering, 18th National Day, Abstracts. p.12-12.
- **Mohammad Rahimi Gorji, Leen Van de Sande, Charlotte Debbaut, Patrick Segers, Wouter Willaert and Wim Ceelen**: Computational fluid dynamics model of pressurized intraperitoneal aerosol chemotherapy: gravity matters! Proceedings of the 2019 summer biomechanics, bioengineering and biotransport conference.
- **Stamatia Pagoulatou, Mauro Ferraro, Bram Trachet, Vasiliki Bikia, Dionysios Adamopoulos and Nikos Stergiopulos**: Can we neglect the effect of the elongation of the aorta during systole when estimating aortic wall stiffness. 25th Congress of the European Society of Biomechanics: abstracts. p.72-72.
- **Tim Bomberna, Ghazal Adeli Koudehi, Patrick Segers and Charlotte Debbaut**: Targeted drug delivery for liver cancer: the impact of cancer burden on the particle distribution in a patient-specific geometry. 18th National Day on Biomedical Engineering: Artificial Intelligence in Medicine, Abstracts.
- **Vasiliki Bikia, Stamatia Pagoulatou, Bram Trachet, Dimitrios Soulis, Athanase Protogerou, Theodore Papaioannou and Nikolaos Stergiopulos**: Estimation of patient-specific central hemodynamic indices from brachial pressure and pulse wave velocity. 25th Congress of the European Society of Biomechanics: abstracts. p.198-198.
- **Viviana Mancini, Aslak W. Bergersen, Kristian Valen-Sendstad and Patrick Segers**: Comparing apples to oranges: measured skin vibrations correlate phenotypically with computed post-stenotic flow instabilities: a pragmatic but robust tool for early detection of carotid stenoses? CMBBE 2019, Computer Methods in Biomechanics and Biomedical Engineering, 16th International symposium: abstract book. p.3-3.
- **Viviana Mancini, Aslak W. Bergersen, Kristian Valen-Sendstad and Patrick Segers**: Intensity of stenosis-induced flow instabilities of the internal carotid artery: a computational approach. Proceedings of the 2019 summer biomechanics, bioengineering and biotransport conference.

## D1

- **Alessio Ielapi**: Virtual design of modular 3D printed ankle foot orthoses
- **Giorgia Rocatello**: Patient-specific numerical modeling in transcatheter aortic valve replacement: towards a more effective treatment
- **Hicham Saaid**: Multimodality analyses of 3D flow in a phantom model of the left ventricle
- **Margo Steuperaert**: Modeling of drug delivery and transport during intraperitoneal chemotherapy

- **Mathias Peirlinck**: Bridging spatiotemporal scales in biomechanical models for living tissues: from the contracting Esophagus to cardiac growth

## P1

- **Annette Caenen, Anna E. Knight, Ned C. Rouze, Nick B. Bottenus, Patrick Segers and Kathryn R. Nightingale**: Measuring elastic nonlinearity in a soft solid using a tilted acoustic radiation force for shear wave excitation. 2019 IEEE International Ultrasonics Symposium (IUS). In IEEE International Ultrasonics Symposium p.221-223.
- **Lana B.H. Keijzer, Jason Voorneveld, Dan J. Bowen, Mihai Strachinaru, Antonius F.W. van der Steen, Nico de Jong, Johan G. Bosch, Hendrik J. Vos and Annette Caenen**: A comparison of natural and acoustic radiation force induced shear wave propagation speed measurements in open-chest pigs. 2019 IEEE INTERNATIONAL ULTRASONICS SYMPOSIUM (IUS). In IEEE International Ultrasonics Symposium p.2110-2113.
- **Ned C. Rouze, Annette Caenen and Kathryn R. Nightingale**: Wave speeds and Green's tensors for shear wave propagation in incompressible, hyperelastic materials with uniaxial stretch. 2019 IEEE International Ultrasonics Symposium (IUS). In IEEE International Ultrasonics Symposium p.427-430.

## U

- **Federico Canè**: Influence Of Ventricular Torsion On Left Ventricular Hemodynamics: A Patient-Specific Model Using The Chimera Technique.
- **Federico Canè**: Patient-Specific Modeling of The Left Ventricular Hemodynamics Using The Chimera Mesh Technique.
- **Lise Gheysen**: Uncertainty characterization of the multi-body reconstruction of real-life bicycle accidents. p.1-1.
- **Mohammad Rahimi Gorji, Susmita Basak, Charlotte Debbaut, Benedicte Descamps, Pim Pullens, Patrick Segers, Steven Sourbron and Wim Ceelen**: validation of a computational fluid dynamics model of drug delivery and interstitial fluid pressure in ovarian cancer xenografts. In Proceedings of the 5th ISSPP Workshop on Basic Science.
- **Pieter De Backer, Sarah Vandenbulcke, Maryse Lejoly, Stefanie Vanderschelden, Charles Van Praet, Danilo Babin, Charlotte Debbaut and Karel Decaestecker**: Virtual Clamping Tool for RAPN. p.1-1.
- **Sarah Vandenbulcke, Pieter De Backer, Danilo Babin, Patrick Segers, Karel Decaestecker and Charlotte Debbaut**: Development of a planning tool for robot-assisted partial nephrectomy surgery based on 3D reconstructions of kidneys.

# V

- **Michael A. Quail, Patrick Segers (UGent) , Jennifer A. Steeden and Vivek Muthurangu**: The aorta after coarctation repair: effects of calibre and curvature on arterial haemodynamics (vol 21, 22, 2019). JOURNAL OF CARDIOVASCULAR MAGNETIC RESONANCE. 21.
- **Patrick Segers**: MRI-enabled noninvasive wave intensity analysis: an exciting tool for cardiovascular (patho)physiology research (in absence of local reflections). JOURNAL OF HYPERTENSION. 37(2). p.287-289.