Professor Stéphane Avril,

Degrees
2007 : Habilitation à Diriger les Recherches, *Université de Technologie de Compiègne*, France.
2002: PhD with honors in mechanical and civil engineering, *Ecole Nationale Supérieure des Mines, Saint-Etienne*, France.
1999: Engineering Graduate School, *Ecole Nationale Supérieure des Mines*, Saint-Étienne, France.
1999: MSc with honors in mechanical and civil engineering, University of Clermont- Ferrand, France.
1998: Bachelor in mathematics, University of Saint-Etienne, France.

Positions
2018 (July-August): Visiting Professor, Yale University, USA.
2017 (July-August): Visiting Professor, Yale University, USA.
Since 2017: Professeur de Classe exceptionnelle, Mines St-Etienne, France.
2016 (April-May & October-November): Visiting Professor, Yale University, USA.
Since 2014: Professeur de première classe, Mines St-Etienne, France.
2014 (May- August): Visiting Professor, Yale University, USA.
Since 2010: Full Professor, Ecole Nationale Supérieure des Mines, St-Etienne, France.
2008 (July-August): Visiting Fellow, University of Michigan, Ann Arbor, USA.
2008-2010 : Associate professor, Ecole Nationale Supérieure des Mines, St-Etienne.
2006 (January-September): Visiting Scholar, Loughborough University, UK
2003-2007 : Assistant Professor, Arts et Métiers Paris Tech, France.
2002-2003 : ATER, Arts et Métiers Paris Tech, France.

Responsabilities
2017: Coordinator of the 2nd CISM Advanced School on Material Parameter Identification and Inverse Problems in Soft Tissue Biomechanics (Udine, Italy)
2017: cofounder of the spin-off company Predisurge (www.predisurge.com) proposing a preoperative planning service designed to validate and customize the choice of the stent-graft depending on the patient. This service is based on the results of our research which lead to the innovative technology of predictive and patient-specific numerical simulation.
2016: cochair of ESB2016 conference, Lyon, France (850 delegates).
2016: guest editor for *Strain*
Since 2016: Deputy-Head of the U1059 INSERM unit (120 people)
2015: Coordinator of the 1st CISM Advanced School on Material Parameter Identification and Inverse Problems in Soft Tissue Biomechanics (Udine, Italy)
2012: Chair of the Euromech534.emse.fr colloquium, Saint-Etienne, France.
2013: guest editor for *Journal of the Mechanical Behavior of Biomedical Materials*
2011 guest editor for *Computer Methods in Biomechanics and Biomedical Engineering*
2010-now: **Director** of the Center for Biomedical and Healthcare Engineering (70 people)

Distinctions & Honors
- Rhône Alpes council CIBLE2008 grant laureate (2008)
- ANR Young Investigator grant laureate (2008)
- ANR TecSan grant laureate (2014)
- Rhône Alpes council CMIRA travel grant laureate (2014)
- BSSM 50th Anniversary Plenary Speaker (2014)
- ESB best poster award (2015)
- ERC consolidator grant laureate (2015)
- Editor's Choice Paper Finalist – ASME Journal of Biomechanical Engineering (2016)
- ICCB best communication award (2017)

Grants

1. Grant from the French National Research Agency on “Predictive and patient-specific numerical simulations of endovascular interventions” – 600k€. I am PI. Started 2014, ended 2017. It funded equipments, PhD and post-doc fellowships (David Perrin, Víctor Acosta) and travels.
2. Grant from Conseil Régional Rhône Alpes on “3D in vivo elastography of the human leg and inverse numerical modeling for the development of patient-specific elastic compression” – 150k€. Started 2008, ended 2012. I was PI. It funded a PhD fellowship (Laura Dubuis) and equipment.
3. Grant from Conseil Régional Rhône Alpes on “Optimization of the microstructure of aortic stent grafts for an improved durability” – 100k€. Started 2009, ended 2012. I was PI. It funded a PhD fellowship (Nicolas Demanget) and travels.
4. Grant from the French National Research Agency on “In vivo mechanical identification of tissues using medical imaging” – 208k€. I was PI. Started 2008, ended 2012. It funded equipments, PhD and post-doc fellowships (Alexandre Franquet, Romain Rieger) and travels.
5. Contract with Pôle des Technologies Médicales on "Characterization and modeling of the mechanical actions of knee braces” – 30k€. I was PI. Started 2009, ended 2012. It funded a PhD fellowship (Baptiste Pierrat) and travels.
6. Grant from Saint-Etienne Métropôle on “Development of methods to characterize the spatial variability of mechanical properties in soft biological tissues” – 100k€. Started 2010, ended 2012. I was PI. It funded a post-doc fellowship (Jin Kim).
7. Contract with company Sigvaris on "Modeling of the mechanical actions of elastic compression” – 120k€. I was PI. Started 2011, ended 2014. It funded a PhD fellowship (Pierre-Yves Rohan) and travels.
8. Contract with company Ormihl Danet on "Modeling of the mechanical actions of lumbar braces” – 21k€. I was PI. Started 2010, ended 2013.
9. Contract with company Covidien Sofradim on "biomechanical behavior of the linea alba” – 60k€. I was PI. Started 2012, ended 2014.
10. Grant from Conseil Régional Rhône Alpes on “Assistance to EVAR using numerical simulation” – 100k€. Started 2012, ended 2015. I was PI. It funded a PhD fellowship (David Perrin) and travels.
11. Grant from CNRS (bourse BDI) on “Ultrasound elastography of the human leg under elastic compression” – 100k€. I was PI. Started 2012, ended 2015. It funded a PhD fellowship (Fanny Frauziols)
12. Grant from Conseil Régional Rhône Alpes on funding my sabbatical stay at Yale.
13. Contract with company ANSYS on "numerical simulation of TAVI” – 30k€. I am PI. Started 2014, ends 2017. Funds a PhD fellowship (CIFRE).
14. Contract with company Medtronic Sofradim on "characterization and modelling of the mechanical behavior of textiles used for hernia repair” – 40k€. I am PI. Started 2016, ends 2018.
15. Contract with company Thales on "Augmented reality during EVAR interventions using numerical simulations” – 54k€. I am PI. Started 2016, ends 2019. Funds a PhD fellowship (CIFRE).
16. Grant from Conseil Régional Rhône Alpes on “Multiscale modeling of blood vessels” – 100k€. Starts 2014, ends 2017. I am PI. It funds a PhD fellowship.
17. Grant from Conseil départemental de la Loire funding scientific equipments for the Center of Biomedical and Healthcare engineering. – 1700k€. Started 2010, ends 2019. I am PI.
18. Grant from the European Research Council (ERC consolidator grant) about “localization in biomechanics and mechanobiology of aneurysms: towards personalized medicine” – 2000k€. Starts 2015, ends 2020. I am PI. It funds equipments, PhD and post-doc fellowships and travels.
19. Grant from the French National Research Agency on “Biomechanics of a synthetic elastic protein” – 600k€. I am coPI. Started 2018, ends 2021. It funds equipments, PhD fellowship and travels.
20. Grant from Conseil Régional Rhône Alpes on “Skin Bio-3DPrinting for Regenerative Medicine: Mechanobiology and Stress Culture”. – 250k€. I am coPI. Started 2018, ends 2021. It funds equipments and PhD fellowship.

Publication-Track-Record

- **120 publications** in peer-reviewed international journals & book chapters (including 3 editorials).

- **3100** citations; **hindex = 28** (http://scholar.google.fr).
- **28** invited plenary or keynote lectures in national and international conferences.
- **1 book**
- **2 patents**.

Current PhD students:

- Laure Tsimba: Study of the correction of static foot disorders on venous return in the case of chronic venous insufficiency
- Salvatore Campisi: Longitudinal follow-up of aneurysm growth using 4D MRI and biomechanical analyses
- Claudie Petit: Multiscale characterization of proteolytic remodeling and its biomechanical effects in the aortic wall
- Joan Laubrie: Finite-element modeling and patient-specific predictions of the growth and rupture of aneurysms of the ascending thoracic aorta
- Mohsen Nakhaei: Micromechanical approach of remodeling in vascular mechanobiology
- Aymeric Pionteck: Coupling 3D numerical simulations and intraoperative imaging for computer aided endovascular surgery
- Guillaume Daniel: Numerical simulations of stent-graft deployment in dissected aneurysms of the thoracic aorta
- Sabrina Ben Ahmed: Computer fluid dynamics analysis of blood flows in bifurcated stent grafts
- Solmaz Farzaneh: Preoperative evaluation of local mechanical properties of aortic aneurysms
- Nanjappa Manjunathan: Functional imaging of vasospasm: Quantitative evaluation of new multi-modal imaging biomarkers

Past PhD students:

As Junior Advisor:

- Hocine CHALAL (2005): Experimental identification of a damage model for composites using the grid technique coupled to the virtual fields method
- Yannick PANNIER (2006): Identification of elasto-plastic constitutive parameters from statically undetermined tests using the virtual fields method
- José XAVIER (2007): Experimental approach for stiffness characterization of clear wood using a single test.
- Bao Qiao GUO (2008): Identification of stiffness and damping material parameters using the virtual fields method.
- Jin KIM (2008): Identification of damage distribution in impacted composite plates using the virtual fields method.
- Vinh TRAN (2008): Refined approach for the identification of elasto-plastic constitutive parameters using the virtual fields method

As Senior Advisor:

- Laura BOUTEN (2009): Identification of mechanical properties of the leg's constitutive tissues for the mechanical study of the elastic compression.
- Laura DUBUIS (2011): Measurement of deformations in the calf using MRI and FE modelling of the effects of compression stocking.
- Tristan BELZACQ (2012): Modelling of the blood flow in the stenosed carotid: Model updating using velocity profiles measured with MRI
- Alexandre FRANQUET (2012): Identification of heterogeneous hyperelastic properties of human soft tissues using medical imaging.
- Nicolas DEMANGET (2012): Optimization of the structure of aortic stent grafts for improving their durability.
- Fabien Munoz (2013): Intradiscal pressure assessment from a finite element model and radiographs
- Guenaelle BOUET (2013): Optimization of the in vitro conditions of 3D culture for osteogenesis: perfusion and mechanical stress.

- Pierre-Yves ROHAN (2013): Biomechanical study of veins in the compressed human legs
- Baptiste PIERRAT (2013): Biomechanical effects of knee orthoses: experimental characterization and modelling.
- Aaron ROMO (2014): In vivo mechanical properties of the aorta.
- Laurianne IMBERT (2014): Effect of osteoporosis on the mechanical behaviour of the bone tissue
- Fanny FRAUZIOLS (2015): Elastographic and biomechanical studies of soft tissues of the leg – Application to elastic compression.
- David PERRIN (2015): Patient-specific predictive simulations of endovascular interventions.
- Catherine KOLLIA (2016): Characterization of morphological diversity using 3D analyses
- Ambroise DUPREY (2016): Biomechanical analysis of aneurysms of the ascending thoracic aorta
- Bilal Merei (2016): Computational Modeling of Atherosclerotic Plaque Delamination Mechanisms and Rupture
- Sareh Behdadfar (2017): Image based inverse identification of material parameters in cardiac mechanics
- Witold Krasny (2017): Characterization and multiscale modeling of the arterial mechanics
- Phuoc Vy (2018): Numerical simulation of aortic valve implantation

List of books

1. Material Parameter Identification and Inverse Problems in Soft Tissue Biomechanics (S Avril and S Evans, eds.), Springer, 2016

List of invited plenary or keynote lectures in national and international conferences

1. S Avril, S Drapier, L Bouten, S Couzan, Étude mécanique des articles de contention et de leurs effets sur la jambe humaine, Mécanique des matériaux fibreux et souples, Journées AUM / AFM 2008 - Mulhouse - 27 / 29 Août 2008
2. S. Avril, identification of hyperelastic properties of an artery using full-field optical measurements, BSSM seminar on “Experimental Mechanics in Biological Tissues”, Loughborough (UK), 23 June 2009
3. S. Avril, Identification methods for characterizing the mechanical behaviour of human arteries in vitro, Workshop Biomathematics & biomechanics, Tozeur (Tunisia), September 2009
4. S. Avril, Identification of mechanical properties of human arteries in vitro, Rhône Alpes research cluster MACODEV Workshop, Annecy (France), February 2009
5. S. Avril, Modélisation de la jambe humaine sous compression élastique, Rencontres Textiles Santé, Saint-Etienne (France), March 2010
6. S. Avril, Utilisation de l'imagerie pour identifier les propriétés élastiques des tissus mous du corps humain, CANUM mathematics workshop, Carcans (France), June 2010
7. S. Avril, Full-field measurements and identification for biological soft tissues: application to arteries in vitro, workshop of the COST action FP0802 entitled “Experimental and computational characterization techniques in wood mechanics”, VilaReal (Portugal), 27 April 2011
8. S. Avril, What do we know about aortic arch arterial wall biomechanical properties?, European Society of Vascular Biomaterials workshop, Strasbourg (France), October 2011
9. S. Avril, Full-field strain measurements and material identification in soft tissue biomechanics, 9th International Conference on Advances in Experimental Mechanics, Cardiff, September 2013
10. S. Avril, N Demanget, P Badel, D Perrin, L Orgéas, C Geindreau, A Duprey, JP Favre, JN Albertini, Computational comparison of the bending behavior of stent grafts, European Society of Vascular Biomaterials workshop, Strasbourg (France), October 2013
11. S. Avril, Peut-on optimiser le sizing grâce à la modélisation des endoprothèses aortiques ? Challenges and Innovation in Vascular World workshop, Paris (France), December 2014
12. S. Avril, Soft tissue biomechanics and its challenges for experimental mechanics, BSSM 50th anniversary workshop, London (UK), 4th November 2014

13. S. Avril, O Trabelsi, A Duprey, Reconstruction of strain energy functions in biological membranes from full-field strain measurements, BSSM colloquium, Southampton (UK), 3rd March 2015
14. S. Avril, P Badel, D Perrin, JN Albertini, Simulation des endoprothèses en phase de planning, Rencontres Ingénierie Santé, Saint-Etienne (France), October 2014
15. S. Avril, O Trabelsi, A Duprey, Reconstruction of strain energy functions in biological membranes from full-field strain measurements, Flexible Materials and Large Deformations Workshop, Rennes (France), May 2015
16. S. Avril, Imagerie médicale et biomécanique des anévrismes de l'aorte thoracique ascendante, Rencontres Imagerie et Technologies pour la santé (RITS), Dourdan (France), March 2015
17. S. Avril, Comportement à la rupture des artères, Mecamat winter workshop, Aussois (France), January 2016
18. S Avril, MR Bersi, C Bellini, P Di Achille, K Genovese, JD Humphrey, Inverse characterization of regional, nonlinear and anisotropic properties of arteries, ECCOMAS congress 2016, Crete, June 2016
19. S Avril, Biomécanique et mécanobiologie au service de la Médecine Vasculaire, Collège des Enseignants de Médecine Vasculaire, Saint-Étienne (France), 25 novembre 2016
20. S Avril, Rupture risk estimation in thoracic aortic Aneurysms, Seventh International Conference on Multiscale Modelling and Methods: Upscaling in Engineering and Medicine Santiago, Chile, January 16-17, 2017
21. S Avril, MR Bersi, C Bellini, P Di Achille, JD Humphrey, Inverse characterization of regional, nonlinear and anisotropic properties of arteries, EUROMECH Colloquium 585 - Advanced experimental methods in tissue biomechanics, Burg Warberg (Germany), February 12-16, 2017
22. S Avril, Rupture risk estimation in thoracic aortic Aneurysms, International Symposium Biomechanics in Vascular Biology and Cardiovascular Disease, Rotterdam (Netherlands), April 4-5, 2017.
23. S Avril, Rupture risk estimation in thoracic aortic aneurysms using biomechanics and mechanobiology, 5th European and Francophone aorta masterclass, Corte (Corsica, France), September 29, 2017.
24. S Avril, Characterization of the mechanical properties of arteries, ESVB, Strasbourg (France), October 12-14, 2017.
25. S Avril, Identification of regional, nonlinear and anisotropic material properties in soft tissue biomechanics using 2D and 3D full-field measurements, Photomechanics, Toulouse (France), March 20-22, 2018.
26. S. Avril, Finite-element predictions of human aortic root dilatation based on the homogenized constrained mixture model, World Congress on Computational Mechanics, New York (USA), 23-27 July 2018.
27. S Avril, Biomécanique de l'aorte et paramètres extraits de l'IRM 4D, 9èmes Journées Francophones d'Imagerie Cardio-Vasculaire diagnostique et interventionnelle, Beaune (France), June 23, 2018.
28. S Avril, Biomechanical Modelling of the Human Leg under Elastic Compression, Congress on Advanced Treatments and Technologies in Wound Care (ATTWC2018), London (UK), November 2018.
29. S Avril, Critical issues in mechanical testing and quantification of material properties in cardiovascular biomechanics, International Symposium of Biomechanics and Mechanobiology in Cardiovascular System, Nanjing (China), 18-20 Dec 2018.

List of Publications in peer-reviewed international journals & book chapters

1 S. Avril, A. Vautrin, P. Hamelin, 'Mechanical behavior of cracked beams strengthened with composites : application of a full-field measurement method', Materials and Structures - 2003, Vol. 36 - N° 260.
2 E. Ferrier, S. Avril, P. Hamelin, A. Vautrin, 'Cracking Behavior Improvement of RC Beams by bonding externally CFRP Sheets', Materials and Structures - 2003, Vol. 36 - N° 262.

3 S. Avril, A. Vautrin, Y. Surrel, 'Grid Method : Application to the Characterization of Cracks', Experimental Mechanics - 2004, Vol. 44 - N° 1, 37-43.
4 S. Avril, E. Ferrier, P. Hamelin, Y. Surrel, A. Vautrin. 'Experimental analysis of reinforced-concrete beams repaired with CFRP sheets'. Composite Part A - 2004, Vol. 35, 873-884.
5 S. Avril, M. Grédiac, F. Pierron. 'Sensitivity of the virtual fields method to noisy data'. Computational Mechanics – 2004, Vol. 34, N° 6, 439-452.
6 S. Avril, A. Vautrin, P. Hamelin, Y. Surrel. 'A multi-scale approach for crack width prediction in reinforced-concrete beams repaired with composite materials'. Composite Science and Technology – 2005, Vol. 65, 445-453.
7 H. Chalal, S. Avril, F. Pierron, Characterization of the nonlinear shear behaviour of UD composite materials using the Virtual Fields Method, Applied Mechanics and Materials – 2005 Vol. 3-4, pp. 185-190.
8 R. Moulart, S. Avril, F. Pierron, Identification of the through-thickness orthotropic stiffness of composite tubes from full-field measurements, Applied Mechanics and Materials – 2005 Vol. 3-4, pp. 161-166.
9 Y. Pannier, R. Rotinat, S. Avril and F. Pierron, Experimental application of the Virtual Fields Method to elasto-plastic behaviour, Applied Mechanics and Materials – 2005 Vol. 3-4, pp. 33-38.
10 R. Moulart, S. Avril, F. Pierron. 'Identification of the through-thickness rigidities of a thick composite laminated tube'. Composite Part A – 2006, Vol. 37, pp. 326-336.
11 H. Chalal, S. Avril, F. Pierron, F. Meraghni. 'Experimental identification of a damage model for composites using the grid technique coupled to the virtual fields method'. Composite Part A – 2006, Vol. 37, pp. 315-325.
12 Y. Pannier, S. Avril, R. Rotinat, F. Pierron, 'Identification of elasto-plastic constitutive parameters from statically undetermined tests using the virtual fields method', Experimental Mechanics – 2006, Vol. 46, N°6, pp. 735-755.
13 M. Grédiac, F. Pierron, S. Avril, E. Toussaint, 'The virtual fields method for extracting constitutive parameters from full-field measurements: a review', Strain – 2006, Vol. 42, pp. 233-253.
14 F. Pierron, G. Vert, R. Burguete, S. Avril, R. Rotinat, M. Wisnom, Optimization of the unotched Iosipescu test on composites for identification from full-field measurements, Applied Mechanics and Materials – 2006 Vol. 5-6, pp. 125-134.
15 S. Avril, F. Pierron, 'General framework for the identification of constitutive parameters from full-field measurements in linear elasticity', International Journal of Solids and Structures – 2007, Vol. 44, pp. 4978-5002.
16 F. Pierron, G. Vert, R. Burguete, S. Avril, R. Rotinat, M.R. Wisnom, 'Identification of the orthotropic elastic stiffnesses of composites with the virtual fields method: sensitivity study and experimental validation', Strain – 2007, Vol. 43, pp. 250-259.
17 J. Xavier, S. Avril, F. Pierron, J. Morais, 'Novel experimental approach for LR stiffnesses characterization of clear wood using a single test', Holzforschung – 2007, Vol. 61, pp. 573-581.
18 K. Syed Muhammad, E. Toussaint, M. Grédiac, S. Avril, 'Characterization of composite plates using the Virtual Fields Method with optimized loading conditions'. Composite and Structures – 2007, Vol. 85, pp. 70-82.
19 V. Tran, S. Avril and F. Pierron, Software implementation of the virtual fields method, Applied Mechanics and Materials – 2007 Vol. 7-8, pp. 57-62.
20 20. S. Avril, F. Pierron, Y. Pannier, R. Rotinat, 'Stress reconstruction and constitutive parameter identification in plane-stress elastoplastic problems using surface measurements of deformation fields', Experimental Mechanics -2008, Vol. 48, N°5, pp. 403-420.
21 S. Avril, J.M. Huntley, F. Pierron, and D.D. Steele. 3D heterogeneous stiffness identification using MRI and the virtual fields method. Experimental Mechanics -2008, Vol. 48, N°5, pp. 479-494.
22 M.A. Sutton, J. Yan, S. Avril, F. Pierron, S. Adeeb. Identification of heterogeneous constitutive parameters in a welded specimen: Uniform stress and virtual fields methods for material property estimation. Experimental Mechanics -2008, Vol. 48, N°5, pp. 451-464.
23 S. Avril, F. Pierron, J. Yan, M.A. Sutton. Identification of viscoplastic parameters and characterization of Lüders behavior using Digital Image Correlation and the Virtual Fields Method. Mechanics of Materials – 2008, Vol. 40, N°9, pp. 729-742.

24 S. Avril, J.M. Huntley, R. Cusack. In-Vivo measurements of blood viscosity and wall stiffness in the carotid using PC-MRI. European Journal of Computational Mechanics – 2009, Vol 18, N°1, pp. 9-20.
25 S. Avril, M. Bonnet, A.-S. Bretelle, M. Grédiac, F. Hild, P. Ienny, F. Latourte, D. Lemosse, S. Pagano, E. Pagnacco et F. Pierron. Identification from measurements of mechanical fields. Experimental Mechanics, -2008, Vol. 48, N°5, pp. 381-402.
26 S. Avril, P. Feissel, F. Pierron, P. Villon. Estimation of the strain field from full-field displacement noisy data. European Journal of Computational Mechanics – 2008, Vol 17, N°5-7, pp. 857-868.
27 S. Avril, P. Feissel, F. Pierron, P. Villon. Comparison of two approaches for controlling the uncertainty in data differentiation: application to full-field measurements in solid mechanics. Measurement Science and Technology – 2010, Vol 21, N°1, pp. 15703-15713.
28 J. Kim, F. Pierron, M.R. Wisnom, S. Avril. Local stiffness reduction in impacted composite plates from full-field measurements. Composites Part A – 2009, Vol 40, N°12, pp. 1961-1974.
29 J. Xavier, S. Avril, F. Pierron, J. Morais. Variation of radial and shear stiffness properties of wood in a tree. Composites Part A – 2009, Vol 40, N°12, pp. 1953-1960.
30 S. Avril, S. Drapier, L. Bouten, S. Couzan. Mechanical investigation of compression stockings and of their effects on the human leg. Mechanics and Industry – 2009, Vol 10, pp. 7-13.
31 F. Pierron, S. Avril, V. Tran. Extension of the virtual fields method to elasto-plastic material identification with cyclic loads and kinematic hardening. International Journal of Solids and Structures, -2009, Vol 47, N° 22-23, pp 2993-3010.
32 S. Avril, L. Bouten, L. Dubuis, S. Drapier, JF Pouget. Mixed experimental and numerical approach for characterizing the biomechanical response of the human leg under elastic compression. ASME Journal of Biomechanical Engineering -2010, 132, 031006.
33 A. Duprey, K. Khanafer, M. Schlicht, S. Avril, D. Williams, R. Berguer. Ex vivo Characterization of Biomechanical Behavior of Ascending Thoracic Aortic Aneurysm Using Uniaxial Tensile Testing. European Journal of Vascular and Endovascular Surgery – 2009, Vol 39, N°6, pp. 700-707.
34 S. Avril, P. Badel, A Duprey. Anisotropic and hyperelastic identification of in vitro human arteries from full-field measurements. Journal of Biomechanics -2010, vol 43, N°15, pp 2978-2985.
35 A. Franquet, S. Avril, R. Leriche, P. Badel. Identification of heterogeneous elastic properties in stenosed arteries: a numerical plane strain study. Computer Methods in Biomechanics and Biomedical Engineering, 2011, 14(12) pp 1-10.
36 S. Avril, F. Schneider, C. Boissier, ZY Li. In vivo velocity vector imaging and time-resolved strain rate measurements in the wall of blood vessels using MRI. Journal of Biomechanics, 2010, 44(5) pp 979-983.
37 L. Dubuis, S. Avril; J. Debayle, P. Badel. Identification of the material parameters of soft tissues in the compressed leg. Computer Methods in Biomechanics and Biomedical Engineering, 2012, 15(1) pp 3-11.
38 T. Belzacq, S. Avril, E. Leriche, A. Delache. Modelling of fluid structure interactions in stenosed arteries: effect of plaque deformability. Computer Methods in Biomechanics and Biomedical Engineering, 2010, 13(S1)25-26.
39 P. Badel, S. Avril, S. Lessner, M. Sutton. Mechanical identification of layer-specific properties of mouse carotid arteries using 3D-DIC and a hyperelastic anisotropic constitutive model, . Computer Methods in Biomechanics and Biomedical Engineering, 2012, 15(1) pp 37-48.
40 T. Belzacq, S. Avril, E. Leriche, A. Delache. Plaque deformation in axisymmetric stenosed arteries: numerical study of the blood action. Medical Engineering and Physics, 2012, in press.
41 S. Avril, What do we know about aortic arch arterial wall biomechanical properties?, in “New endovascular technologies, from bench test to clinical practice”, edited by Nabil Chakfé, GEPROVAS, 2011.
42 S. Avril, P Badel, L Dubuis, J Debayle, S Couzan, JF Pouget, Patient specific modeling in venous deficiency, in “Patient-Specific modeling in tomorrow's medicine” (Studies in mechanobiology, tissue engineering and biomaterials), Edited by Amit Gefen, Springer-Verlag, 2012, 09, 217-238, ISBN 978-3-642-24618-0.

43 N. Demanget, S. Avril; P. Badel, L. Orgéas, C. Geindreau; J.-N. Albertini, J.-P. Favre, Computational comparison of the bending behaviour of aortic stent-grafts Journal of the Mechanical Behavior of Biomedical Materials. 2012, 5(1) pp 272-282.
44 J. Kim, S. Avril, A Duprey, JP Favre. Experimental characterization of rupture in human aortic aneurysms using full-field measurement technique. Biomechanics and Modeling in Mechanobiology. 2012, 11(6) pp 841-854.
45 J Kim, S. Avril, P Badel, A Duprey, JP Favre. Characterization of failure in human aortic tissue using digital image correlation. Computer Methods in Biomechanics and Biomedical Engineering, 2011, 14(S1)73-74.
46 T. Belzacq, S. Avril, E. Leriche, A. Delache. Mechanical action of the blood onto atheromatous plaques: influence of the stenosis shape and morphology. Computer Methods in Biomechanics and Biomedical Engineering, 2014, 17 (5), pp 527-538
47 S. Evans, S. Avril. Identification of material parameters through inverse finite element modelling (editorial). Computer Methods in Biomechanics and Biomedical Engineering, 2012, 15(1) pp 1-2.
48 P. Badel, K. Genovese, S. Avril. 3D residual stress field in arteries: novel method based on optical full-field measurements. Strain, 2012, 48 (6), pp 528-538.
49 N. Demanget, P. Latil, L. Orgéas, P. Badel, S. Avril, C. Geindreau, J.N. Albertini, J.P. Favre, Severe Bending of Two Aortic Stent-Grafts: an Experimental and Numerical Mechanical Analysis. Annals of biomedical engineering, 2012, 40(12)2674-2686
50 A Franquet, S. Avril, R. Le Riche, P. Badel, A new method for the in vivo identification of mechanical properties in arteries from cine MRI images: theoretical framework and validation. IEEE transactions on medical imaging, 2013, 32(8) pp 1448-1461.
51 S. Avril, P. Badel, M. Gabr, M. Sutton, S. Lessner, Biomechanics of porcine renal arteries and role of axial stretch. Journal of Biomechanical Engineering, 2013, 135 pp 081007.
52 P.Y Rohan, P. Badel, S. Avril, D. Rastel, B. Lun, Biomechanical response of varicose veins to elastic compression: a numerical study. Journal of Biomechanics, 2013, 46(3), pp 599-603.
53 M. Grédiac, F. Pierron, S. Avril, E. Toussaint, M. Rossi. The Virtual Fields Method. In Full-Field Measurements and Identification in Solid Mechanics, chap. 11, pp. 301-326. Edited by Michel Grédiac and François Hild, Wiley 2012.
54 A Franquet, S. Avril, R. Le Riche, P. Badel, Identification of the in vivo elastic properties of common carotid arteries from MRI: study on healthy subjects and patients with atherosclerosis. Journal of the Mechanical Behavior of Biomedical Materials 2013, 27 pp 184-203.
55 N. Demanget, P. Badel, S. Avril, L. Orgéas, C. Geindreau, J.N. Albertini, JP Favre, Mechanical performances of stent grafts within tortuous abdominal aortic aneurisms. Journal of biomechanics, 2012, 45 (S311).
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Patents

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