

# CURRICULUM VITAE - DIEGO GALLO, PhD

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ASSISTANT PROFESSOR – POLITECNICO DI TORINO

POLITO<sup>BIO</sup>MED LAB, DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

CORSO DUCA DEGLI ABRUZZI 24, 10129 TURIN - ITALY

## PROFILE

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PhD in Biomedical Engineering and researcher. After a double MSc degree in Biomedical Engineering from Politecnico di Torino and Politecnico di Milano (110/110 *cum laude*) in the framework of Alta Scuola Politecnica, Diego was admitted to the PhD course in Biomedical Engineering at Scuola Interpolitecnica di Dottorato, a special joint PhD program of high qualification of the three largest Italian technical universities, i.e. Politecnico di Torino, Politecnico di Milano and Politecnico di Bari. In 2013, he co-founded the spin-off company “Bioexpansys”, that operates in the sector of devices for dynamic cell culture. In addition, in September 2013 and June 2015 Diego was elected in the Executive Board of the Italian Chapter of the European Society of Biomechanics (ESB-ITA), a society with more than 100 participants gathering the Italian members of the European Society of Biomechanics working all over the world. He has been Guest Editor for the *Annals of Biomedical Engineering* for the two Special Issues “Computational Hemodynamics: development of clinical tools for decision making, patient specific treatment and clinical management”, published in January 2015 and June 2015. He authored more than 35 articles in peer-reviewed journals.

## EDUCATION

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<b>Ph.D. in Biomedical Engineering &amp; Biomechanics</b> Politecnico di Torino and Scuola Interpolitecnica di Dottorato (Turin, Italy).	<b>2009 - 2011</b>
<b>M.Sc. in Biomedical Engineering (110 e lode / 110)</b> Politecnico di Torino (Turin, Italy).	<b>2006 - 2008</b>
<b>M.Sc. in Biomedical Engineering (110 e lode / 110) and Alta Scuola Politecnica Diploma</b> Politecnico di Milano and Alta Scuola Politecnica (Milan, Italy).	<b>2006 - 2008</b>
<b>B.Sc. in Biomedical Engineering (110 e lode / 110)</b> Politecnico di Torino (Turin, Italy).	<b>2003 - 2006</b>

## RESEARCH EXPERIENCE

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<b>Tenured Assistant Professor (RTD-L240/2010-b), Politecnico di Torino (Turin, Italy)</b> Department of Mechanical and Aerospace Engineering, Polito <sup>BIO</sup> Med Lab.	<b>2017 - present</b>
<b>Marie Skłodowska Curie fellow, University of Toronto (Toronto, ON Canada)</b> Department of Mechanical and Industrial Engineering, Biomedical Simulation Laboratory.	<b>2016</b>
<b>Post-doctoral fellow, Politecnico di Torino (Turin, Italy)</b> Department of Mechanical and Aerospace Engineering, Laboratory of Industrial Bioengineering.	<b>2012 - 2016</b>
<b>Visiting Post-doctoral fellow, University of Toronto (Toronto, ON Canada)</b> Department of Mechanical and Industrial Engineering, Biomedical Simulation Laboratory.	<b>2015</b>
<b>Co-founder, Bioexpansys (Turin, Italy)</b> Start-up, I3P-Incubatore Imprese Innovative Politecnico (Politecnico di Torino incubator) established company.	<b>2013 - 2015</b>
<b>PhD Visiting Student, University of Toronto (Toronto, ON Canada)</b> Department of Mechanical and Industrial Engineering, Biomedical Simulation Laboratory	<b>2011</b>

## TEACHING EXPERIENCE

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### Lecturer

“Biofluid Mechanics”, MSc Degree in Biomedical Engineering, Politecnico di Torino  
2013/2014, 2014/2015, 2016/2017, 2017/2018

### Co-lecturer

“Biofluid Mechanics”, MSc Degree in Biomedical Engineering, Politecnico di Torino 2012/2013, 2015/2016

### Teaching Assistant

“Biofluid Mechanics”, MSc Degree in Biomedical Engineering, Politecnico di Torino 2012/2013

“Cardiovascular System Biomechanics”, MSc Degree in Biomedical Engineering, Politecnico di Torino  
2009/2010, 2011/2012, 2012/2013, 2014/2015, 2015/2016, 2016/2017, 2017/2018

“Computer Aided Surgery”, MSc Degree in Biomedical Engineering, Politecnico di Torino 2009/2010

## PARTICIPATION IN RESEARCH PROJECTS

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MARIE SKŁODOWSKA CURIE ACTION Global Fellowship (2016-2019), Ageing aorta: from morphometry to hemodynamics (AGORAs). European Commission, Horizon 2020.

PRIN (2014-2016), A bioprocess for the optimization of 3D cardiosphere-based constructs for cardiac regenerative medicine. Italian Ministry of University and Research.

BBS (2011-2013), Bioactive Bone Substitutes. Piedmont Region, Regional Competitiveness and Employment.

BIOCENT (2009-2013), Bioactive highly porous and injectable scaffolds controlling stem cell recruitment, proliferation and differentiation and enabling angiogenesis for cardiovascular engineered tissues. Large-scale Integrated Collaborative Project, 7th EU Framework Programme.

PROBING (2012-2013), Prototype of Engineered Bioreactor. Italian Ministry of Economic Development.

PRIN (2011-2013), Development and validation of hybrid models for the implementation of patient specific hemodynamics analysis as a tool to support the clinical practice. Italian Ministry of University and Research.

ACTIVE (2009-2012), Advanced Cardiovascular Therapies. Piedmont Region, Regional Competitiveness and Employment.

NANOSTENT (2007-2013), Materials and technologies for new generation endovascular devices. bioPmed Innovation Cluster, ERDF-POR Piemonte 2007-2013 framework.

## AWARDS & SCHOLARSHIPS

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**Highly Cited Research in Journal of Biomechanics**, The Editors of Journal of Biomechanics for the paper “Inflow boundary conditions for image-based computational hemodynamics: Impact of idealized versus measured velocity profiles in the human aorta” 2017

**May 2016 Cover**, Proteins: Structure, Functions, and Bioinformatics (DOI: 10.1002/prot.25000) 2016

**Poster Presentation Award: 2<sup>nd</sup> placement**, Tissue Engineering & Regenerative Medicine International Society 2014

**ISMRM Merit Award Magna cum laude**, International Society for Magnetic Resonance in Medicine 2014

**ISMRM Trainee Stipend Award**, International Society for Magnetic Resonance in Medicine 2014

**Young Engineer Award: 3<sup>rd</sup> placement**, American Society of Mechanical Engineering - Swiss Section 2013

**Best Presentation Award**, Italian Chapter of the European Society of Biomechanics 2012

**Best PhD Thesis Award “Enzo Belardinelli”**, Italian National Bioengineering Group 2012

**TERMIS Travel Award**, Tissue Engineering & Regenerative Medicine International Society 2012

**ESB Travel Awards**, European Society of Biomechanics, sponsored by Taylor&Francis Group 2012

**Best 2008 Graduate**, Politecnico di Torino Alumni 2009

**OPTIME Award Best Young Graduate of the Year 2008**, Turin Industrial Society  
**Piero Mossino Scholarship**, FIAT Group  
**FIAT Scholarship**, FIAT Group

2009  
 2004, 2007  
 1997 – 2009

## PUBLICATIONS

Diego is author of about 80 publications among international Journal articles, books chapters and proceedings. A complete list is reported [at this link](#).

### Journal Articles

Total citations: 774, h-index: 15 [Source: [Google Scholar](#)]

- A1. U. Morbiducci\*, [D. Gallo](#)\*, D. Massai, F. Consolo, R. Ponzini, L. Antiga, C. Bignardi, M.A. Deriu, A. Redaelli. Outflow conditions for image-based haemodynamic models of the carotid bifurcation. implications for indicators of abnormal flow. *J. Biomech. Eng.* 132(091005):1-11, 2010. \* The two authors contributed equally. [Cited by: 40]
- A2. U. Morbiducci, [D. Gallo](#), R. Ponzini, D. Massai, L. Antiga, A. Redaelli, F.M. Montevocchi. Quantitative analysis of bulk flow in image-based haemodynamic models of the carotid bifurcation: the influence of outflow conditions as test case. *Ann. Biomed. Eng.* 38(12):3688-3705, 2010. [Cited by: 40]
- A3. U. Morbiducci, [D. Gallo](#), D. Massai, R. Ponzini, M.A. Deriu, L. Antiga, A. Redaelli, F.M. Montevocchi. On the importance of blood rheology for bulk flow in hemodynamic models of the carotid bifurcation. *J. Biomech.* 44:2427-2438, 2011. [Cited by: 48]
- A4. [D. Gallo](#), G. De Santis, F. Negri, D. Tresoldi, R. Ponzini, D. Massai, M.A. Deriu, P. Segers, B. Verheghe, G. Rizzo, U. Morbiducci. On the use of in vivo measured flow rates as boundary conditions for image-based hemodynamic models of the human aorta. implications for indicators of abnormal flow. *Ann. Biomed. Eng.* 40(3): 729-741, 2011. [Cited by: 51]
- A5. U. Morbiducci, R. Ponzini, G. Rizzo, M.E. Biancolini, F. Iannaccone, [D. Gallo](#), A. Redaelli. Synthetic dataset generation for the analysis and the evaluation of image-based hemodynamics of the human aorta. *Med. Biol. Eng. Comput.* 50(2):145-154, 2012. [Cited by: 11]
- A6. D. Massai, G. Soloperto, [D. Gallo](#), X.Y. Xu, U. Morbiducci. Shear-induced platelet activation and its relationship with blood flow topology in a numerical model of stenosed carotid bifurcation. *Eur. J. Mech. B Fluids* 35:92-101, 2012. [Cited by: 25]
- A7. P.B. Bijari, L. Antiga, [D. Gallo](#), B.A. Wasserman, D.A. Steinman. Improved prediction of disturbed flow via hemodynamically-inspired geometric variables. *J. Biomech.* 45(9):1632-1637, 2012. [Cited by: 21]
- A8. [D. Gallo](#), D.A. Steinman, P.B. Bijari, U. Morbiducci. Helical flow in carotid bifurcation as surrogate marker of exposure to abnormal shear. *J. Biomech.* 45(9):2398-2404, 2012. [Cited by: 59]
- A9. U. Morbiducci, R. Ponzini, [D. Gallo](#), C. Bignardi, G. Rizzo. Inflow boundary conditions for image-based computational hemodynamics: impact of idealized versus measured velocity profiles in the human aorta. *J. Biomech.* 46(1):102-109, 2013. [Cited by: 47]
- A10. F. Pennella, G. Cerino, D. Massai, [D. Gallo](#), G. Falvo D'Urso Labate, A. Schiavi, M.A. Deriu, A. Audenino, U. Morbiducci. A survey of methods for the evaluation of tissue engineering scaffold permeability. *Ann. Biomed. Eng.* 41(10): 2027-2041, 2013. [Cited by: 23]
- A11. C. Chiastra, S. Morlacchi, [D. Gallo](#), U. Morbiducci, R. Cardenes, I. Larrabide, F. Migliavacca. Computational fluid dynamics simulations of patient-specific stented coronary bifurcations. *J. R. Soc. Interface* 10(4): 20130193, 2013. [Cited by: 37]
- A12. D. Massai, G. Cerino, [D. Gallo](#), F. Pennella, M.A. Deriu, A. Rodriguez, F.M. Montevocchi, C. Bignardi, A. Audenino, U. Morbiducci. Bioreactors as engineering support to treat cardiac muscle and vascular disease. *J. Healthc. Eng.* 4(3):329-370, 2013. [Cited by: 8]
- A13. D. Massai, F. Pennella, P. Gentile, [D. Gallo](#), G. Ciardelli, C. Bignardi, A. Audenino, U. Morbiducci. Image-based three-dimensional analysis to characterize the texture of porous scaffolds. *Biomed. Research International* 2014: 161437, 2014. [Cited by: 5]
- A14. [D. Gallo](#), U. Gulan, A. Di Stefano, R. Ponzini, B. Luthi, M. Holzner, U. Morbiducci. Analysis of thoracic aorta hemodynamics using 3D particle tracking velocimetry and computational fluid dynamics. *J. Biomech.* 47:3149-3155, 2014. [Cited by: 4]
- A15. M.A. Deriu, G. Grasso, G. Licandro, A. Danani, [D. Gallo](#), J.A. Tuszynski, U. Morbiducci. Insights on Josephin domain protein-protein interaction by molecular dynamics. *PLoS One* 9(9):e108677, 2014. [Cited by: 7]

- A16. D. Gallo, D.A. Steinman, U. Morbiducci. An insight into the mechanistic role of the common carotid artery on the hemodynamics at the carotid bifurcation. *Ann. Biomed. Eng.* 43(1):1-2, 2015. [Cited by: 23]
- A17. D. Gallo, A. Anayiotos, U. Morbiducci. The evolution of computational fluid dynamics as a clinical tool in decision making, patient specific treatment and clinical management. *Ann. Biomed. Eng.* 43(1):68-81, 2015. [Editorial Note, cited by: 0]
- A18. T.W. Clark, G. Isu, D. Gallo, P. Verdonck, U. Morbiducci. Comparison of symmetric hemodialysis catheters using computational fluid dynamics. *J. Vasc. Interv. Radiol.* 26(2):252-259, 2015. [Cited by: 5]
- A19. U. Morbiducci, D. Gallo, S. Cristofanelli, R. Ponzini, M.A. Deriu, G. Rizzo, D.A. Steinman. A rational approach to defining principal axes of multidirectional wall shear stress in realistic vascular geometries, with application to the study of the influence of helical flow on wall shear stress directionality in aorta. *J. Biomech.* 48(6):899-906, 2015. [Cited by: 15]
- A20. D. Gallo, A. Anayiotos, U. Morbiducci. The evolution of computational fluid dynamics as a clinical tool in decision making, patient specific treatment and clinical management. Part II. *Ann. Biomed. Eng.* 43(6):1273-1274, 2015. [Editorial Note, cited by: 0]
- A21. G. Grasso, M.A. Deriu, J.A. Tuszyński, D. Gallo, U. Morbiducci, A. Danani. Conformal fluctuations of the AXH monomer of Ataxin-1. *Proteins* 84(1):52-59, 2016. [Cited by: 3]
- A22. M.A. Deriu, G. Grasso, J.A. Tuszyński, D. Gallo, U. Morbiducci, A. Danani. Josephin domain structural conformations explored by metadynamics in essential coordinates. *PLoS Comput. Biol.* 12(1):e1004699, 2016. [Cited by: 3].
- A23. D. Maffiodo, G. De Nisco, D. Gallo, A. Audenino, U. Morbiducci, C. Ferraresi. A reduced-order model-based study on the effect of intermittent pneumatic compression of limbs on the cardiovascular system. *Proc. Inst. Mech. Eng. Part H: J. Engineering in Medicine* 230(4):279-287, 2016. [Cited by: 0]
- A24. K.M. Meiburger, F. Molinari, J. Wong, L. Aguilar, D. Gallo, D.A. Steinman, U. Morbiducci. Validation of the carotid intima-media thickness variability (IMTV): Can manual segmentations be trusted as ground truth? *Ultrasound Med. Biol.* 42(7):1598-1611, 2016. [Cited by: 0].
- A25. D. Gallo, D.A. Steinman, U. Morbiducci. Insights into the co-localization of magnitude-based *versus* direction-based indicators of disturbed shear at the carotid bifurcation. *J. Biomech.* 48(12):2413-2419, 2016. [Cited by: 7].
- A26. M.A. Deriu, G. Grasso, J.A. Tuszyński, D. Massai, D. Gallo, U. Morbiducci, A. Danani. Characterization of the AXH domain of Ataxin-1 using enhanced sampling and functional mode analysis. *Proteins* 84(5):666-673, 2016. [Cited by: 2] - *Awarded with May 2016 issue cover*
- A27. D. Massai, G. Isu, D. Madeddu, G. Cerino, A. Falco, C. Frati, D. Gallo, M.A. Deriu, G. Falvo D'Urso Labate, F. Quaini, A. Audenino, U. Morbiducci. A versatile bioreactor for dynamic suspension cell culture. Application to the culture of cancer cell spheroids. *PLoS One* 11(5):e0154610, 2016. [Cited by: 1].
- A28. D. Gallo, A. Lefieux, S. Morganti, A. Veneziani, A. Reali, F. Auricchio, M. Conti, U. Morbiducci. A patient-specific follow up study of the impact of thoracic endovascular repair (TEVAR) on aortic anatomy and on post-operative hemodynamics. *Comput. Fluids* 141:54-61, 2016. [Cited by: 1].
- A29. M.O. Khan, C. Chnafa, D. Gallo, F. Molinari, U. Morbiducci, D.A. Steinman, K. Valen-Sendstad. On the quantification and visualization of transient periodic instabilities in pulsatile flows. *J. Biomech.* 52:179-182, 2017.
- A30. S. Bozzi, U. Morbiducci, D. Gallo, R. Ponzini, G. Rizzo, C. Bignardi, G. Passoni. Uncertainty propagation of PC-MRI derived inlet boundary conditions in computational hemodynamic models of thoracic aorta. *Comput. Methods Biomech. Biomed. Engin.* 20(19):1104-1112, 2017.
- A31. D. Gallo\*, O. Vardoulis\*, P. Monney, D. Piccini, P. Antiochos, J. Schwitter, N. Stergiopoulos, U. Morbiducci. Cardiovascular morphometry with high-resolution 3D magnetic resonance: first application to left ventricle diastolic dysfunction. *Med Eng. & Phys.* 47:64-71, 2017. \* The two authors contributed equally.
- A32. C. Chiastra\*, D. Gallo\*, P. Tasso, F. Iannaccone, F. Migliavacca, J.J. Wentzel, U. Morbiducci. Healthy and diseased coronary bifurcation geometries influence near-wall and intravascular flow: a computational exploration of the hemodynamic risk. *J. Biomech.* 58:79-88, 2017. \* The two authors contributed equally.
- A33. F. D'Ascenzo, R. Di Summa, M. Tebaldi, U. Barbero, F. Arslan, T.P. van de Hoef, A. Picchi, M. Lococo, G. Campo, P. Omedé, E. Cerrato, A. Montefusco, U. Morbiducci, S. Gili, D. Gallo, C. Moretti, M. D'Amico, F. Gaita. Incidence of revascularization after deferring coronary stenting according to values of fractional flow reserve: a meta-analysis of 32 studies and 5473 patients. Submitted to *Catheter. Cardio. Interv.*
- A34. D. Gallo, P.B. Bijari, U. Morbiducci, Y. Qiao, Y. Xie, M. Etesami, D. Haabets, E.G. Lakatta, B.A. Wasserman, D.A. Steinman. Distinct hemodynamic factors are associated with early atherosclerotic changes at the carotid bifurcation: An in vivo human study. Submitted to *Stroke*

## Book Chapters

- B1. F. Pennella, F. Mastrangelo, D. Gallo, D. Massai, M.A. Deriu, G. Falvo D'Urso Labate, C. Bignardi, F.M. Montevecchi, U. Morbiducci. A survey of microchannel geometries for mixing of species in biomicrofluidics. In: Single and Two-Phase Flows in Chemical and Biomedical Engineering, eds. R. Dias, R. Lima, A.A. Martins, T.M. Mata. Bentham Science Publishers, 548-578, 2012. [Cited by: 0]
- B2. D. Gallo, G. Isu, D. Massai, F. Pennella, M.A. Deriu, R. Ponzini, A. Audenino, G. Rizzo, U. Morbiducci. A survey of quantitative descriptors of arterial flows. In: Visualizations and Simulations of Complex Flows in Biomedical Engineering, R. Lima et al. (eds.), Springer Science+Business Media Dordrecht, 1-28, 2014. [Cited by: 2]

## INVITED TALKS

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11. "Computational hemodynamics for the study of cardiovascular pathology". Symposium on Biomedical Engineering for Adaptive Ageing, Turin, Italy, September 29th, 2012.
12. "Quantitative descriptors of arterial flows". 12th Summer School on Scientific Visualization, CINECA Milan, Italy, June 15th 2013.
13. "Visualization and description of flows in biomedical engineering". 13th Summer School on Scientific Visualization, CINECA Milan, Italy, June 13th 2014.
14. D. Gallo\*, M.G. Calmet, D.A. Steinman, U. Morbiducci. On the multidirectional nature of disturbed shear at the carotid bifurcation. World Congress of Biomechanics 2014.
15. D. Gallo, S. Cristofanelli, R. Ponzini, G. Rizzo, D.A. Steinman, U. Morbiducci\*. On the multidirectional nature of disturbed shear and its relationship with helical flow in aorta. Vulnerable Plaques: Data, Modeling, Predictions and Translation to Clinical Application Post-WCB Workshop 2014.
16. D. Gallo\*, M.E. Biancolini, R. Ponzini, L. Antiga, G. Rizzo, A. Audenino, U. Morbiducci. A virtual test bench for hemodynamic evaluation of aortic cannulation in cardiopulmonary bypass. World Congress on Computational Mechanics 2014 - Keynote Lecture.

## PATENTS

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- P1. \* G. Falvo D'Urso Labate, D. Massai, F. Pennella, D. Gallo, F.M. Montevecchi, U. Morbiducci, G. Cerino Abidin. Micro-gravity generating device. PCT/ITA2012/000090. \* Equally distributed intellectual property

## SERVICE

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### Professional Societies

American Society of Mechanical Engineering (ASME), European Society of Biomechanics (ESB), Italian Chapter of the European Society of Biomechanics (ESB-ITA). Diego has been **elected in the Executive Board of ESB-ITA**, a society with more than 100 participants gathering the Italian members of the European Society of Biomechanics working all over the world. He has been elected in the terms 2013-2015 and 2015-2017.

### Reviewer Activity (22 journals)

Annals of Biomedical Engineering, APL Bioengineering, Biomechanics and Modeling in Mechanobiology, Biomedical Engineering/Biomedizinische Technik, Cardiovascular Engineering & Technology, Computers and Fluids, Computers in Biology and Medicine, Computer Methods in Biomechanics and Biomedical Engineering, European Journal of Mechanics/B Fluids, Fluids, Lab on a Chip, International Journal of Cardiovascular Imaging, International Journal for Numerical Methods in Biomedical Engineering, Journal of Biomechanics, Journal of Cardiovascular Magnetic Resonance, Journal of the Royal Society Interface, Medical & Biological Engineering & Computing, Medical Engineering & Physics, Medical Physics, Medical Science Monitor, PLOS One, Proceedings of the iMeche, Part C: Journal of Mechanical Engineering Science, Scientific Reports.

### Guest Editorship

Guest Editor for the *Annals of Biomedical Engineering* Special Issues "COMPUTATIONAL HEMODYNAMICS: development of clinical tools for decision making, patient specific treatment and clinical management", published in January 2015. A second part of the Special Issue has been published in July 2015.

### **Conference Organization and Chairmanship**

Organizer of the session Multiphysics Characterization and Modeling of Biological Tissues and Biomaterials, XXI National Conference of Computational Mechanics (Lucca, June 27<sup>th</sup> 2016). Organizer of the VI ESB-ITA Meeting (Naples, June 22<sup>nd</sup> 2016). Organizer of the V ESB-ITA Meeting (Milan, June 5<sup>th</sup> 2015). Organizer of the IV ESB-ITA Meeting (Pavia, June 27<sup>th</sup> 2014). Member of the Scientific Committee for the Frontier: Biomechanical Challenges in Cardiovascular Physiopathology Symposium 2016. Chairman for Vulnerable Plaques: Data, Modeling, Predictions and Translation to Clinical Application, Post-WCB Workshop 2014.

Turin, May 10<sup>th</sup> 2018

