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UNIVERSITÉ DE FRIBOURG
UNIVERSITÄT FREIBURG

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Marie-Noëlle Giraud
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Reference: vacancy on the Board of Senior Investigators Council of the ISHR-European section.

Dear Council Members,

I am enthusiastic about joining the Council of the ISHR-European section. With an extensive background in experimental cardiology, I am committed to advancing cardiac research, mentoring the next generation of scientists, and fostering collaborations across Europe and beyond.

As the head of the leading preclinical research group in cardiology at the University of Fribourg, I have designed and managed interdisciplinary projects focused on cardiac tissue engineering and cell-based therapies. My current research explores paracrine extracellular cardiac cell communication and the Apelin-ACE2 axis in physical and pathological hypertrophy.

I have been an elected nucleus member of the ESC Working Group on Cardiovascular Regenerative and Reparative Medicine (CARE), where I contributed as communication coordinator. Although now a non-voting member, I continue to support CARE's mission through social media outreach and co-lead on a consensus paper. Additionally, I am a Fellow of the European Society of Cardiology.

At the national level, I am a board member of the Swiss Life Science Cardiovascular Biology (CVB), an intersection of the Swiss cardiology and life science communities. As vice president and then president, I successfully organised the CVB annual congress.

Beyond research, I have a strong record of education and mentorship. I have supervised numerous PhD students, postdoctoral fellows, and master's students, promoting their academic and professional growth. I have also organised international conferences and seminars to disseminate knowledge and cultivate global partnerships. My entrepreneurial initiatives have focused on translating scientific knowledge into practical solutions.

Joining your council aligns with my passion for advancing cardiac research and education. I have been a member of the ISHR and now aim to contribute to the Board's initiatives by promoting interdisciplinary collaborations, nurturing young talents, and increasing public engagement in cardiovascular science. I am eager to leverage my experience to support the council's goals across Europe and internationally.

Thank you for considering my application. I look forward to the opportunity to contribute meaningfully to the initiatives of the ISHR-European section.

Warm regards,

PD Dr. Marie-Noëlle Giraud, PhD, FESC

1. Personal information

Name and First name Giraud, Marie-Noëlle
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Languages: French (Native), English (Fluent), German (Basic)

2. Education

- MAS on Translational Medicine and Biomedical Entrepreneurship. University of Bern (ongoing)
- Habilitation, University of Fribourg (2017)
- CTI-Entrepreneurship Training: Business concept (2016)
- Privatdozent and habilitation in Experimental cardiology, University of Bern, Switzerland (2010)
- Ph.D. in Basic and Applied Biological Sciences, University of Auvergne, France (1997)
- Master of Biology, nutrition and cell biology, University of Auvergne, France (1993)
- Bachelor of Science in physiology, molecular and cellular biology, University of Auvergne, France (1990)
- Diploma in biology, University of Auvergne, France (1989)
- Baccalaureat in mathematics and sciences, Clermont-Ferrand. France (1987)

3. Employment History

- Since 11/2011: MA/MER, Endocrinology, Metabolism and Cardiovascular systems University of Fribourg, Fribourg, Switzerland
- 11/2011-12/2012: Guest scientist in Tissue engineering and stem cell, Cardiovascular Research department Inselspital, Bern, Switzerland
- 03/2003-10/2011: Group leader in Tissue engineering and stem cell, Cardiovascular Research department Inselspital, Bern, Switzerland.
- 08/2001-02/ 2003: Post-Doctoral fellow, Cardiology department, Inselspital, Bern, Switzerland.
- 09/1997 – 09/2000: University and hospital Assistant, Reproductive biology department, CHU Clermont-Ferrand-medical school, France
- 09/1994 – 08/1997: Ph.D. student, Department of integrative biology, pharmacology and physiology, University of Texas Medical School, Houston, US– Gastroenterology department, CHU Clermont-Ferrand, France
- 1993 – 1994: Graduate student, Laboratory of metabolic diseases. National Institute of Agronomic Research (INRA), Theix, France

5. Approved research projects

- 2021-2025: PI: Apelin-ACE2 axis fate in hypertension and macrophage syndrome as complications in COVID-19: focus on gender, age, and comorbidities.
- 2022-2023: PI:UniFr: The ACE/AT1 and ACE2/AT2 balance in B. diegensis regeneration and development: an explorative study to develop a new alternative research method to reduce animal experimentation
- 2016-2020:PI: Innosuisse/CTI: 3D-printed bioresorbable polymeric coronary scaffold (PriPoS)
- 2018-2019: PI:UniFr: Characterization of subpopulations of bone marrow-derived stem cell expressing PCSK9: a pilot study
- 2015-2017: co-host group SystemsX.ch - Transition Post-doc Fellowship - Modelling Mechano-biology of the artery to drive the design of novel bioresorbable stents
- 2015-2016: PI:UniFr: Bioresorbable coronary stents
- 2014-2017: PI:SNF: Reduction of left ventricle remodeling after cell-based therapy: a pre-clinical study
- 2014-2017: coPI: SNF: Topical delivery of photosensitizers to atherosclerotic plaques and intra-arterial photodynamic therapy: a pre-clinical study
- 2014: SNF: Implementation of the high frequency, high-resolution ultrasound imaging platform for preclinical imaging
- 2012-2013: co-PI:UniFr: Use of optical coherence tomography for characterization of atherosclerotic plaque after local delivery of photodynamic therapy
- 2009-2012: PI:SNF: Design of an artificial contractile muscle for cardiac repair using electrospun nanofibers
- 2010-2011: PI:FSC: Mechanical conditioning of myocardial biografts
- 2005-2008: co: PI SNF: Development and analysis of cell-based biodegradable scaffolds to repair myocardial defect
- 2008: PI:UniBe: Ex vivo investigation of the cardiac contractile function,
- 2008: PI:UNiBe: Assessment of cardiac function using pressure-volume loops

6. Supervision of junior researchers at the graduate and postgraduate level

Ph.D. Students: 6, Post-doctoral fellows: 8, Medical master and doctorate: 9, Biomedical Master students: 7, Bachelor theses: 32

7. Teaching activities

Teaching load (70% MA): 78h annually for regenerative medicine and cardiovascular system

8. Journals' associate editors and scientific reviewing activities

- Associate editor: International Journal of Cardiology and Frontiers in Bioengineering and Biotechnology
- Journals' reviewer: European Heart Journal, Basic research in Cardiology, Tissue Engineering, BMC Cardiovascular Disorders, Clinical and Applied Thrombosis/Hemostasis, Future Medicine, Molecular Biology Reports, Artificial Organs, Life Science, Transplantation, European Journal of Cardiovascular Surgery, Frontiers in cardiovascular medicine
- Reviewer for national grant foundations, including Israel Science Foundation, Fundamental Research Program, University of Mons, Medtrain project, Centre for Research in Medical Devices, Ireland. India Alliance Fellowship, India.
- Reviewer for congress abstracts: 7th TERMIS World Congress, European Society of Cardiology Annual Congresses, 87th European Atherosclerosis Society Congress, Swiss society of cardiology Annual Conferences, Cardiovascular Biology section of Swiss Life Science annual meetings

9. Active memberships in scientific societies, fellowships in renowned academies

- 2014-2016 member of the task force for regenerative medicine of the **Swiss Society of biomaterials and regenerative medicine**
- 2016-2018: **Vice president of the Cardiovascular Biology section** of Life Science Swiss and working group of the Swiss Society of Cardiology
- 2018-2020: **President of the Cardiovascular Biology section** of Life Science Swiss and working group of the Swiss Society of Cardiology
- Since 2016, Board member of the **Cardiovascular Biology section** of Life Science Swiss and working group of the Swiss Society of Cardiology
- Since 2018: Member of the **CABMM**, Zurich
- Since 2018: Member of the steering committee of the **Swiss Translational And Clinical BioManufacturing (TCBM) Platform**
- 2020-2024 **Elected nucleus member** of the **ESC Working Group on Cardiovascular Regenerative and Reparative Medicine**
- 2022-2024: **Communication coordinator** of **ESC Working Group on Cardiovascular Regenerative and Reparative Medicine**
- Since 2024: non-voting member of nucleus of the **ESC Working Group on Cardiovascular Regenerative and Reparative Medicine**
- Since 2024: Elected board member of the Swiss Academy of Sciences (SCNAT) · Biology Platform

10. Organisation of conferences

- First EACTS workshop on cardiac and pulmonary regeneration, 28-29 November 2009 at Hotel Bellevue, Bern
- Second EACTS workshop on cardiac and pulmonary regeneration, 4-5 December 2010, Vienna
- Special session organiser, BioMed2013 on cardiac regeneration, 13-15 February 2013, Innsbruck
- Cardiovascular and Metabolic Research Conference, January 14-15, 2014,2015, 2016, and 2017 Fribourg
- Research day in medicine, Fribourg 2015-2018
- Cardiovascular and Metabolic Research Conference, January14-15 2014, 2015, and 2016 Fribourg
- LS^2 Cardiovascular Section Annual Conference, March 2018, 2019, Fribourg
- LS2 annual conference 2020, Zurich as a member of the scientific committee
- Chairwoman of numerous sessions in international congresses
- SICT symposium on « cell therapy in Switzerland: clinical applications and manufacturing insights where do we stand? November 2st, 2024 Fribourg

11. NON-EXHAUSTIVE Publication list

Selection of 30 peer-reviewed original articles (excluding editorials, reviews, and case reports)

1. Flück M, Vaughan D, Rittweger J, Giraud MN. Post-translational dysregulation of glucose uptake during exhaustive cycling exercise in vastus lateralis muscle of healthy homozygous carriers of the ACE deletion allele. Frontiers in Physiology [Internet]. 2022;13. DOI: 10.3389/fphys.2022.933792
2. Jain M, Bouilloux J, Borrego I, Cook S, van den Bergh H, Lange N, Wagnieres G, Giraud MN. Cathepsin B-Cleavable Polymeric Photosensitizer Prodrug for Selective Photodynamic Therapy: In Vitro Studies. Pharmaceuticals (Basel). 2022 Apr 30;15(5):564.
3. Balaphas A, Meyer J, Gameiro C, Frobert A, Giraud MN, Egger B, Bühler LH, Gonelle-Gispert C. Optimized Isolation and Characterization of C57BL/6 Mouse Hepatic Stellate Cells. Cells. 2022 Apr 19;11(9):1379
4. Borrego I, Frobert A, Ajalbert G, Valentin J, Kaltenrieder C, Fellay B, Stumpe M, Cook S, Dengjel J, Giraud MN. Fibrin, Bone Marrow Cells and Macrophages Interactively Modulate Cardiomyoblast Fate. Biomedicines. 2022 Feb 23;10(3):527.
5. Araújo DC, Veloso AA, de Oliveira Filho RS, Giraud MN, Raniero LJ, Ferreira LM, Bitar RA. Finding reduced Raman spectroscopy fingerprint of skin samples for melanoma diagnosis through machine learning. Artif Intell Med. 2021 Oct;120:102161.

6. Kovalenko TA, Giraud MN, Eckly A, Ribba AS, Proamer F, Fraboulet S, Podoplelova NA, Valentin J, Panteleev MA, Gonelle-Gispert C, Cook S, Lafanechère L, Sveshnikova AN, Sadoul K. Asymmetrical Forces Dictate the Distribution and Morphology of Platelets in Blood Clots. Cells. 2021 Mar 6;10(3):584
7. Montanari E, Szabó L, Balaphas A, Meyer J, Perriraz-Mayer N, Pimenta J, Giraud MN, Egger B, Gerber-Lemaire S, Bühler L, Gonelle-Gispert C. Multipotent mesenchymal stromal cells derived from porcine exocrine pancreas improve insulin secretion from juvenile porcine islet cell clusters Xenotransplantation. 2021 Feb 4:e12666
8. Zellweger M, Xiao Y, Jain M, Giraud MN, Pitzschk, A, de Kalbermatten M, Berger E, van den Bergh H, Cook S, Wagnières G. Optical Characterization of an Intra-Arterial Light and Drug Delivery System for Photodynamic Therapy of Atherosclerotic Plaque. *Appl. Sci.* 2020, *10*, 4304.
9. Frobert A, Ajalbert G, Valentin J, Cook S, Giraud MN. High-Resolution Ultrasound Imaging System for the Evaluation of the Vascular Response to Stent or Balloon Injuries in the Rabbit Iliac Arteries. Animal Models in Medicine and Biology 2019 DOI: http://dx.doi.org/10.5772/intechopen.88656
10. Wenger R and Giraud MN. 3D Printing Applied to Tissue Engineered Vascular Grafts Appl. Sci. 2018, 8(12), 2631
11. Kröpf JM, Spengler CM, Frobert A, Ajalbert G. Manz M, Giraud MN. Myocardial infarction does not affect circulating hematopoietic stem and progenitor cell proliferative capacity in a rat myocardial infarction model. Exp Physiol. 2018 103:1-8
12. Melly LF, Cerino G, Frobert A, Cook S, Giraud MN, Carrel TP, Tevaearai HT, Eckstein FS, Rondelet B, Marsano A, Banfi A. Myocardial infarction stabilization by cell-based expression of controlled VEGF levels. J Cell Mol Med. 2018 DOI: 10.1111/jcmm.13511
13. Jain M, Frobert A, Valentin J, Cook S, Giraud MN. The Rabbit Model of Accelerated Atherosclerosis: A Methodological Perspective of the Iliac Artery Balloon Injury. J Vis Exp. 2017, 128: e55295
14. Jain M, Zellweger M, Frobert A, Valentin J, Van dem Berggh H, Wagnièers G, Cook S, Giraud MN. Photodynamic therapy for the treatment of atherosclerotic plaque: lost in translation? Cardiovasc Ther. 2017 Apr;35(2)
15. Giraud MN, Borrego I. Myocardial Tissue Engineering: a 5 year- update. Stem cells in Clinical Application vol3: Liver, Lung and heart regeneration. Editor: Phuc Van Pham. Springer 2017 pp197-209
16. Jain M, Zellweger M, Frobert A, Valentin J, Van dem Berggh H, Wagnièers G, Cook S, Giraud MN. Intra-arterial drug and light delivery for photodynamic therapy using Visudyne: implication for atherosclerotic plaque treatment. Front Physiol 2016, 27:400
17. Valentin J, Frobert A, Aljabert G, Cook S, Giraud MN. Histological quantification of chronic myocardial infarct in rodent. J Vis Exp 2016; 118, e54914
18. Frobert A, Valentin J, Magnin JL, Riedo E, Cook S, Giraud MN. Prognostic Value of Troponin I for Infarct Size to Improve Preclinical Myocardial Infarction Small Animal Models. Front Physiol. 2015 Nov 27;6:353
19. Lanvin T, Conkey DB, Frobert A, Valentin J, Goy JJ, Cook S, Giraud MN, Psaltis D. Subsurface ablation of atherosclerotic plaque using ultrafast laser pulses. Biomedical Optics Express 6(7) 2015. DOI: 10.1364/BOE.6.002552
20. Guex AG, Hegemann D, Giraud MN, Tevaearai HT, Popa AM, Rossi RM, Fortunato G. Covalent immobilisation of VEGF on plasma-coated electrospun scaffolds for tissue engineering applications. Colloids and surfaces B-Biointerfaces 2014:123:724-733 -
21. Guex AG, Frobert A, Cook S, Fortunato G, Körner E, Fouassier C, Valentin J, Carrel T, Tevaearai HT, Giraud MN. Plasma-functionalised electrospun matrix for biograft development and cardiac function stabilization. Acta Biomaterialia 2014 10:2993-3006
22. Hegemann D, Hanselmann B, Guimond S, Fortunato G, Giraud MN, Guex AG. Considering Degradation Effects of Amino-Functional Plasma Polymer Coatings for Biomedical Application Surface and Coatings Technology. Surf. Coat. Technol. 2014 ; 255:90-95.
23. Frobert A, Valentin J, Cook S, Giraud MN. Cell-based therapy for heart failure in rat: Double thoracotomy for myocardial infarction and epicardial implantation of cells and biomatrix. J Vis Exp 2014; 91:e51390
24. Tevaearai HT, Gazdhar A, Giraud MN, Flück M. In vivo electroporation-mediated gene delivery to the beating heart. Methods Mol Biol 2014; 1121:223-9.
25. Brinks H, Giraud MN, Segiser A, Ferrié C, Longnus S, Ullrich ND, Koch WJ, Most P, Carrel TP, Tevaearai HT Dynamic patterns of ventricular remodeling and apoptosis in hearts unloaded by heterotopic transplantation. J Heart Lung Transplant. 2014 Feb;33(2):203-10
26. Guex A, Fortunato G, Hegemann D, Tevaearai HT, Giraud MN General Protocol for the Culture of Cells on Plasma-Coated Electrospun Scaffolds. Methods in molecular biology 2013 DOI:10.1007/7651_2013_8
27. Guex G, Birrer DL, Fortunato G, tevaearai HT, Giraud MN. Anisotropically oriented electrospun matrices with an imprinted periodic micro-pattern: a new scaffold for engineered muscle constructs. Biomedical Materials 2013 8 (021001)
28. Melly LF, Marsano A, Frobert A, Boccardo S, Helmrich U, Heberer M, Eckstein FS, Carrel TP, Giraud MN, Tevaearai HT, Banfi A. (2012) Controlled angiogenesis in the heart by cell-based expression of specific vascular endothelial growth factor levels. Hum Gene Ther Methods. 23(5):346-56
29. Guex AG, Kocher FM, Fortunato G, Körner E, Hegemann D, Carrel TP, Tevaearai HT, Giraud MN Fine-tuning of substrate architecture and surface chemistry promotes muscle tissue development. Acta Biomaterialia 2012 Apr;8(4):1481-9
30. Giraud MN, Guex G, Tevaearai HT. Cell Therapies For Heart Function Recovery: Focus On Myocardial Tissue Engineering And Nanotechnologies. Cardiology research and practice 2012; :971614