

Sophie Le Cann

Multi-scale simulation and modelling (MSME) research laboratory
CNRS, East-Paris University, Créteil, France

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Age: 33 (15/02/1989)

PHD IN BIOMECHANICS

Current position: Permanent researcher (CR) at the French national center for scientific research (CNRS), Multi-scale simulation and modelling laboratory (MSME), Biomechanics team, East-Paris University (UPEC), Créteil, France.

APPOINTMENTS

- 2020-now** Permanent Researcher, CNRS, MSME, Biomechanics team, UPEC, Créteil, France.
- 2018-2020** MSCA Individual Fellowship in Biomechanics, MSME, CNRS, UPEC, France. European H2020 MCSA funding.
- 2015-2018** Post-doctoral researcher in Biomechanics, Dpt of Biomedical Engineering, Lund University (LU), Sweden.
- 2014-2015** Temporary teaching and research fellow, Science and technology of physical activities and sports. UFR (training and research unit) Sport Sciences, Aix-Marseille University (AMU), France
- 2011-2014** PhD in Biomechanics, ISM, GIBoc team, AMU, Marseille, France; Funding by EUROS society, La Ciotat, France.

EDUCATION

- 12/2014** PhD in Biomechanics, *Biomechanical study of a new spinal implant to preserve growth and mobility in the treatment of scoliosis*, AMU, Marseille, France.
- 09/2011** Biomedical Engineer, Superior School of Engineers of Luminy, Marseille, France.
- 06/2011** Research Master in Biomechanics, *Numerical modelling and experimental validation of the mechanical forces of primary stability in non-cemented acetabular cups*, AMU, Marseille, France.

TEACHING & SUPERVISION

- Teaching** Stand-in teacher in Imaging, UPEC (5h 2021). Stand-in teacher in Tissue Biomechanics, LU Sweden (7.5 ECTS, 2016&2017). Temporary teaching fellow in anatomy, mathematics for motion analysis and movement dynamics, AMU France (158h, 2014-2015). Stand-in teacher in fluid mechanics, AMU France (20h 2012).
- Postdocs (2)** Yoann Hériveaux (2021-2022), Elin Törnquist (2022-2023), UPEC France.
- PhD students (2)** Co-supervision of Manon Fraulob and Florian Guillaume (2017-2020), UPEC France.
- Master students (5)** Clothilde Hubert (M1, 2021, MSME France), Vally Candassamy (M1, MSME France), Aurore Cocrelle (M1, 2019, MSME France) Adam Urga, Isabella Silva Barreto (M2, 2018, LU Sweden), Molly McNeely (M1, 2017, LU Sweden), Lou Gual (2015, AMU France).
- Bachelor students (3)** Fabien Leberquier, Ouissam Mouzarine (2019, UPEC France), Clara Bouez (2020, UPEC France).

OVERVIEW OF RESEARCH ACTIVITIES

My research activities are focused on the **biomechanical** investigation of **bone**, mostly in the context of implants. I acquired solid skills in the development of **experimental** and **numerical** models to explore the **bone-implant interface**, with a special interest in **multi-scale imaging** to extract **structural**, **compositional** and **mechanical** properties of bone tissue. Such **multidisciplinary** approach can only be successful when based on national and **international collaborations**, and involving **multiple research fields**, including mechanics, materials engineering, high-resolution imaging, biomechanical modelling and medicine.

SCIENTIFIC PUBLICATIONS

- International journals with peer-review (18, 5 most important below). Conferences proceedings (18), seminars (12).**
- Le Cann et al. 2020. *Acta Biomater.* Spatio-Temporal Evolution of Hydroxyapatite Crystal Thickness at the Bone-Implant Interface. <https://doi.org/10.1016/j.actbio.2020.09.021> (IF 6.6).
- Le Cann et al. 2020. *Front. Bioeng. Biotechnol.* Bone damage evolution around integrated metal screws using x-ray tomography - in situ pullout and Digital Volume Correlation. doi: 10.3389/fbioe.2020.00934 (IF 4.2).
- Silva Barreto, Le Cann, et al. 2020 *Adv. Sci.* Multi-scale characterization of embryonic long bone mineralization in mice. <https://doi.org/10.1002/advs.202002524> (IF 15.8).
- Le Cann et al. 2017. *J Mech Behav Biomed Mater*, Digital Volume Correlation to characterize the bone-metal implant interface with in situ loading under neutron tomographic imaging. 2017. doi 10.1016/j.jmbbm.2017.07.001 (IF 3.4).
- Le Cann et al. 2016. *J Biomed Mater Res B Appl Biomater.* Tribology of a flexible spinal implant: development of experimental and numerical models. doi: 10.1002/jbm.b.33819 (IF 2.8).

FUNDINGS

2022	CNRS	Mission for transversal and interdisciplinary initiatives (MITI), « Modelling of life », 25k€, 12 months. MSME collab. CSPBAT, Paris 13.
	Parisian region	DIM RESPORE, 90k€, 18 months post-doct (2022-2023). MSME collab. MSSMat, Centrale-Supélec
2021	F2M	« Coup de Pouce » from Fédération Francilienne de Mécanique, 55k€, 12 months post-doct (2021-2022). MSME collab. MSSMat, Centrale-Supélec
	CNRS	Mission for transversal and interdisciplinary initiatives (MITI), « Modelling of life », 25k€, 12 months. MSME collab. CSPBAT, Paris 13.
	Journal Acta Biomaterialia	« Outsanding reviewer award »
2020	CNRS	Installation funding from INSIS and MSME, 25k€, 12 months
2018	EU grant	Marie Skłodowska-Curie Individual Fellowship, H2020, 173k€, 24 months (10/2018-2020), MSME.
2015-2017	Travel grants (4)	Maggie Stephens Foundation 1100€ (Sweden 2016 & 2018). European Society of Biomechanics Association 400€ (Ireland 2018). Faculty of Engineering of Lund 2800€ (Sweden 2017).
2013	AFM-Téléthon	Active participation in the 100k€ funded by the French Muscular Dystrophy Association (AFM-Téléthon).

SCIENTIFIC AND TECHNICAL INFORMATION

Associate Editor	Journal Materialia (Elsevier), from 05/2021.
Equality Sentinel	Contact person (with E. Mangaud, MCF UGE) for Equality associations (UGE, UPEC, CNRS), to promote a culture of equality for all, with a focus on women and men inequalities. Since 06/2021.
Conferences (3)	Help to organise ICTMS conference (Sweden, 2017), 38th conference of the French society of Biomechanics (Marseille, 2013) and Doctoral School Day (Marseille, 2013).
Research days (3)	Involved in outreach activities in Biomechanics in Sweden (2017) and in France (Fête de la science, 2012)
Reviewer	Acta Biomater., J Mech Behav Biomed Mater, Journal of Biomechanics, Medical Engineering & Physics, Journal of the American Association for Laboratory Animal Science Editorial Office.