CHIARA VILLA

Sorbonne Université ◇ Postdoc ◇ Mathematical Biology

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Website	https://chiaravilla.github.io/website/index.html
Languages	Italian, English, French
Programming	MATLAB, Python, LaTeX, Fortran90, COMSOL, Maple, R, HTML5
Memberships	European Society for Mathematical and Theoretical Biology, Society for Mathematical Biology, Société de Mathématiques Appliquées et Industrielles

ACADEMIC APPOINTMENTS

01/23 - today	**PRFP postdoc**, *Laboratoire Jacques-Louis Lions, Sorbonne Université*, Paris (FR) Laureate of the Paris Region Fellowship Programme (PR and EU MSCA funding) Project "Mechanistic modelling of cell migration and cancer invasion"
04/22 - 12/22	**Postdoc**, *Laboratoire Jacques-Louis Lions, Sorbonne Université*, Paris (FR) Postdoctoral researcher in the group of Prof Benoît Perthame (ERC ADORA funding)

EDUCATION & RESEARCH EXPERIENCE

09/18 - 03/22	**PhD, Mathematics**, *University of St Andrews*, St Andrews (UK) Supervisors: Prof Mark Chaplain, Dr Tommaso Lorenzi Thesis title: 'Partial differential equation modelling in cancer and development'
2014 - 2018	**MMaths, Applied Mathematics**, *University of St Andrews*, St Andrews (UK) Fast Track, First Class Honours awarded.
Summer 2017	Undergraduate Summer Research Internship, *University of St Andrews*
Summer 2016	Complex Systems Biology Research Internship, *Università degli Studi di Torino*

FUNDING, GRANTS AND PRIZES AWARDED

2023	**PEPS JCJC** funding for the project "Conservative numerical schemes for novel structured PDE models of cancer invasion" in collaboration with Alexandre Poulain (**€4900**).
2023	**UFR funding** for the organisation to the workshop "Mathematical challenges in modelling cancer dynamics" in Paris in October 2023 (**€1500**).
2022	**Junior Fellowship** for the participation to the workshop "Parabolic and kinetic models in population dynamics" in Toulouse in September 2022.
2022	**Paris Region Fellowship Programme** laureate (second call, start date in 01/2023) with a proposed project on "Mechanistic models of cell migration and cancer invasion: analysis, numerics, validation" (**€257760**).
2021	**IHP financial support** awarded by the Institute Henri Poincaré for the participation to the "Mathematical modeling of organization in living matter" thematic program in Paris during 10/01-01/04 2022 (**€4500**).
2020	**SMBdevBio Poster Prize 1** awarded by the Society for Mathematical Biology, Developmental Biology subgroup, at the online SMB2020 meeting (**$250**)
2020	**LMS ECR Travel Grant** awarded by the London Mathematical Society to attend the 12th European Conference on Mathematical and Theoretical Biology (**£500**)
2018	**PhD funding** awarded by the School of Mathematics and Statistics, UoStA (**£49124.25**)
2018	**The Principal's Scholarship for Academic Excellence**, prize awarded to the top 50 academically performing students in their final year at the UoStA(**£1000**)
2014 - 2018	**The Deans' list**, annual award for academic excellence by the Deans of the UoStA
2017	**Research scholarship** awarded by the UoStA to participate in the Undergraduate Summer Research Internship (**£1684.29**)

PROFESSIONAL RESPONSIBILITIES AND OUTREACH

School of Mathematics and Statistics, University of St Andrews

01/23 - today	**Member of 'Comité Parité'**, *Laboratoire Jacques-Louis Lions, Sorbonne Université*
10/22 - today	**Postdoctoral Research Rep**, *Laboratoire Jacques-Louis Lions, Sorbonne Université*
03/21 - 12/22	**Journal Peer Reviewer**, *Frontiers in Ecology and Evolution* (Special issue: From Ecology to Cancer Biology and Back Again), *European Control Conference 2022*, *International Journal of Non-Linear Mechanics*, *Mathematical Biosciences* , *iScience*
09/20 - 12/21	**StAMBio seminar organiser***, Weekly talks by internal and guest speakers, online
11/20	**Piscopia Society***, PhD testimonial to encourage female/non-binary students who are considering a PhD in mathematics, promoting equality and diversity in STEM
01/20	**Postgraduate Interdisciplinary Mathematics Symposium organiser***,*Edzell*
09/18 - 09/19	**Postgraduate Research Rep & Postgraduate Research Executive Rep***
09/18 - 09/19	**University of St Andrews Student Rep**, *SMSTC*
11/18	**Outreach event***, Organiser and speaker at the event 'MT234 Research and Party'

MENTORING, TEACHING AND MARKING

All activities of 2017-2022 undertaken with the School of Mathematics and Statistics, University of St Andrews. Teaching activities undertaken with groups of 50 (demonstrating) or 11 (tutoring) students. Feedback on Explanation (E), Organisation (O) and Availability (A) on a scale of 1 (excellent) to 5 (poor).

01/23 - today	**Master thesis supervision** of Federica Padovano (ETH Zhuric), at LJLL (SU)
09/18 - 06/22	**Mentor in Peer Mentoring scheme** of 4 Undergraduate, 3 Master, 2 PhD students
Autumn 2020	**MT2000 Computing Workshop**, Demonstrator of computing in Python
Autumn 2019	**MT2000 Computing Workshop**, Demonstrator of computing in Python
Autumn 2019	**MT2501 Linear Mathematics**, Tutor of 2 groups (E=1.44, O=1.33, A=1.33)
Spring 2019	**MT2507 Mathematical Modelling**, Tutor of 2 groups (E=1.45, O=1.85, A=1.45), Demonstrator of 3 groups
Autumn 2018	**MT2503 Multivariate Calculus**, Tutor of 2 groups (E=1.17, O=1.5, A=1.17)
Autumn 2018	**MT2504 Combinatorics and Probability**, Marking of 100 computing projects
Autumn 2017	**UK Undergraduate Ambassadors Scheme**, weekly teaching assistance and activities with secondary school pupils (S1, S3, Advanced Higher Maths), UoSA module ID4001 - Communication and Teaching in Science, *Waid Academy, Anstruther (UK)*

SELECTED SCIENTIFIC MEETINGS

Scientific meetings where I was invited to present my research (full list of meetings attended on my website)

Feb 2023	**Multiscale analysis and methods for PDEs Workshop** *Institute for Mathematical Sciences*, Singapore
Nov 2022	**Synthsys Seminar** *Centre for Synthetic and Systems Biology*, Edinburgh
Oct 2022	**Modelling cell and tissue biomechanics Workshop** *Sorbonne University (LJLL)*, Paris
Sep 2022	**12th European Conference for Mathematical and Theoretical Biology** Minisymposium, *ESMTB*, Heidelberg
Jun 2021	**SoftMech Workshop** *University of St Andrews*, Online
May 2021	**Mathematical Biology on the Mediterranean Coast** *Sorbonne University (LJLL)*, Online
Jun 2020	**Interplay between Oncology, Mathematics and Numerics** *Sorbonne University (LJLL), Inserm, University of Poitiers*, Online conference
Dec 2019	**Scottish Mathematical Biology Forum** *Maxwell Institute for Mathematical Sciences*, Edinburgh

RESEARCH INTERESTS AND PUBLICATIONS

I am an applied mathematician interested in mathematical models for the dynamics of living systems, with expertise in continuum, deterministic models describing the spatio-temporal dynamics of cell populations aimed at addressing open problems in cancer and development. These models comprise of systems of nonlinear, and often nonlocal, partial differential equations, which pose interesting analytical and numerical challenges, and may complement experimental research by providing a theoretical framework for *in silico* investigations.

Preprints

[**1**] L. Almeida, J.A. Denis, N. Ferrrand, T. Lorenzi, M. Sabbah, C. Villa, Evolutionary dynamics of glucose-deprived cancer cells: insights from experimentally-informed mathematical modelling, *ArXiv preprint arXiv:2301.08023*, 2023

Papers published in peer-reviewed journals

[**2**] C. Villa, M.A.J. Chaplain, T. Lorenzi, Modelling phenotypic heterogeneity in vascularised tumours, *SIAM Journal on Applied Mathematics*, 81, 434–453, 2021

[**3**] C. Villa, M.A.J. Chaplain, T. Lorenzi, Evolutionary dynamics in vascularised tumours under chemotherapy: Mathematical modelling, asymptotic analysis and numerical simulations, *Vietnam Journal of Mathematics*, 49, 143–167, 2021

[**4**] C. Villa, M.A.J. Chaplain, A. Gerisch, T. Lorenzi, Mechanical models of pattern and form in biological tissues: the role of stress-strain constitutive equations, *Bulletin of Mathematical Biology*, 83:80, 2021

[**5**] F. Mottes, C. Villa, M. Osella, M. Caselle, The impact of whole genome duplications on the human gene regulatory networks, *PLOS Computational Biology*, 17(12):e1009638, 2021

[**6**] C. Villa, A. Gerisch, M.A.J. Chaplain, A novel nonlocal partial differential equation model of endothelial progenitor cell cluster formation during the early stages of vasculogenesis, *Journal of Theoretical Biology*, 534(1):110963, 2022

Conference proceedings

[**7**] T. Lorenzi, F.R. Macfarlane, C. Villa, Discrete and continuum models for the evolutionary and spatial dynamics of cancer: a very short introduction through two case studies, (pp. 359-380) in *Trends in Biomathematics: Modeling Cells, Flows, Epidemics, and the Environment*, Ed. R. Mondaini, Springer, Cham, 2019