Curiculum Vitae

Tomás Alarcón

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PERSONAL

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ACADEMIC DEGREES

- BSc in Theoretical Physics, 1996, Universitat de Barcelona, Spain, 1991-1996
- PhD in Physics, 2000, Universitat de Barcelona, Spain

CURRENT STATUS

- ICREA Research Professor, October 2015 – Present.
- Principal Investigator, Cancer Modelling Group, Computational & Mathematical Biology Group, Centre de Recerca Matemàtica (Centre for Mathematical Research), Barcelona, Spain, November 2010 – Present.
- Affiliated Professor (*Professor Vinculat*), Department of Mathematics, Universitat Autònoma de Barcelona, Barcelona, Spain, September 2013 – Present

PREVIOUS POSITIONS

- Graduate Student, Department of Fundamental Physics, University of Barcelona, October 1997 – December 2000. Supervised by Dr. Agustín Pérez-Madrid. Funded by the DGICYT (Ministerio de Educación y Cultura, Spain).
- Research Associate, Mathematical Institute, University of Oxford, UK, January 2001 – November 2003.
  Subject: Mathematical modelling of tumour growth and angiogenesis.
  Supervisors: Prof. Philip Maini (Oxford) and Prof. Helen Byrne (Nottingham).
  Position funded by the European Community under the program *Using mathematical modelling and computer simulation to improve cancer therapy.*
- Research Fellow, Department of Computer Science, University College London, UK, December 2003 – August 2006.
  Subject: Mathematical modelling of tumour immunotherapy and dormancy.
  Supervisor: Dr. Karen Page.
  Position funded by the EPSRC.
- Research Associate, Department of Mathematics, Imperial College, UK, December 2006 – November 2009.
  Subject: Emergence and evolution of hierarchical structures in complex systems.
  Supervisor: Prof. Henrik J. Jensen.
  Position funded by EPSRC.

- BCAM Senior Researcher and Group Leader of the Mathematical Biology Group, Basque Centre for Applied Mathematics, Bilbao, Spain, December 2009 – October 2010

PARTICIPATION IN RESEARCH NETWORKS

- Member (CRM coordinator), Dynamical Systems and Computational Virology, "Unidad Asociada", Instute for Integrative Systems Biology (CSIC) – Centre de Recerca Matemàtica
- Member (CRM coordinator), DANCE (Dynamics, Attractors, chaos and Stability) Network, "Red Temática", Coordinated by Joan Torregrosa, Universitat Autonòma de Barcelona

VISITING APPOINTMENTS AND EXTENDED RESEARCH STAYS

- Distinguished Visitors Programme, Department of Applied Mathematics, Universidad Complutense de Madrid, Spain, September 2006 – November 2006.
- Visiting Fellow, Centre for Mathematical Research, Programme in Mathematical Biology, Autonomous University of Barcelona, Spain. January 2009 – Feberuary 2009.
- Visiting Scientist, IIMAS – Instituto de Invesitigaciones en Matemática Aplicada y Sistemas, National Autonomous University of Mexico (UNAM), Mexico. February 2012.
- OCCAM Visiting Fellow, Oxford Centre for Collaborative Applied Mathematics, Mathematical Institute, University of Oxford, UK. May 2012 – June 2012.
- "Salvador de Madariaga" Fellowship to visit the Wolfson Centre of Mathematical Biology, Mathematical Institute, University of Oxford, UK. April 2016 – September 2016.
- Invited Participant, MBI Emphasis semester on Growth and Morphogenesis, Mathematical Biology Institute, Columbus, Ohio, USA, March 2017
- Visiting Scientist, Canfranc Subterranean Laboratory, Canfranc, Huesca, Spain. September 2021 – December 2021.
- "Salvador de Madariaga" Fellowship to visit the Wolfson Centre of Mathematical Biology, Mathematical Institute, University of Oxford, UK. September 2022 – December 2022.
- Invited Participant, Programme on *Mathematics of movement: an interdisciplinary approach to mutual challenges in animal ecology and cell biology*, Isaac Newton Instiute, Cambridge, UK, September 2023 – November 2023.

MEMBERSHIPS

- Member of the Societat Catalana de Matemàtiques (Catalan Mathematical Society)
- Member of OCCAM Global Network

TEACHING EXPERIENCE (UNDERGRADUATE COURSES)

- Advanced Mathematical Methods (Linear Algbera and Calculus, Examples Class). Department of Computer Science, University College London.
- Undergraduate Research Seminars, Department of Computer Science, University College London.
- Preliminary Mathematics (tutorials) for first year Chemical Engineering undergraduates. Department of Mathematics, Imperial College London.
- Mathematics (tutorials) for first year Civil and Biomedical Engineering undergraduates. Department of Mathematics, Imperial College London.
- Mathematics (tutorials) for second year Electrical Engineering undergraduates. Department of Mathematics, Imperial College London.

TEACHING EXPERIENCE (GRADUATE COURSES)

- Module on Stochastic Modelling in Population Dynamics as part of the course on Mathematical Models in Biology of the Master in Advanced Mathematics & Mathematical Engineering, Universitat Politecnica de Catalunya (2012-2013)

- T. Alarcón, A. Corral, and A. Roxin. *A short introduction to Statistical Physics.* Graduate course for the CRM Doctoral Training Unit, Centre de Recerca Matemàtica, Barcelona, Spain, May 2014
- Applied Stochastic Processes, Master on Modelling in Science & Engineering, Universitat Autonoma de Barcelona (2014–2015, 2015–2016, 2016–2017, 2017–2018, 2018–2019, 2019–2020, 2020–2021)

COMMITTEE MEMBERSHIP

- Member of the Scientific Committee of the Catalan Mathematical Society. March 2015–February 2019 and May 2019–Present.
- Member of the Scientific Committee of the Barcelona Graduate School of Mathematics (BGSMath). September 2014–September 2021.

ADMINISTRATIVE DUTIES

- Deputy Director, Centre de Recerca Matemàtica, March 2016 – Present.
- Coordinator of the CRM Doctoral Training Unit. January 2014 – February 2016.
- Graduate student representative to the Departmental Council from October 1997 to December 2000, Department of Fundamental Physics, University of Barcelona, Spain.

ORGANISATION OF MEETINGS, WORKSHOPS ETC.

- Co-organiser (jointly with Giullermo Abramson, Centro Atómico de Bariloche (Argentina), and Sarah AM Loos, University of Cambridge (UK)) of the workshop *Modelling non-Markov Movement Processes*, November 2023, Isaac Newton Institute, Cambridge, UK
- Co-organiser (jointly with Juan Calvo, David Poyato, y Juan Soler, Universidad de Granada (Spain)) of the MNAT-CRM summer school *Biomat 2023: Multiscale Methods at the Frontier Between Data and Mathematical Models*, June 2023, Centre de Recerca Matemàtica, Barcelona
- Co-organiser (jointly with Santiago F. Elena, Susanna C. Manrubia, Jordi Garcia-Ojalvo, Josep Sardanyés) of the Advanced Course on Applied Dynamics in Systems and Synthetic Biology, September 2021, Centre de Recerca Matemàtica, Barcelona, Spain
- Co-organiser (jointly with Santiago F. Elena, Susanna C. Manrubia, Jordi Garcia-Ojalvo, Josep Sardanyés) of the International Conference on Dynamics in Systems and Synthetic Biology, June 2021, Centre de Recerca Matemàtica, Barcelona, Spain.
- Co-organiser (jointly with Santiago F. Elena, Institute for Integrative Systems Biology, Valencia, and Josep Sardanyés, Centre de Recerca Matemática, Barcelona) of the Intensive Research Programme *Dynamical Systems meet Systems and Synthetic Biology*, June–October 2021, Centre de Recerca Matemàtica, Barcelona, Spain.
- Member of the Scientific Committe of the Summer School and Workshop on Mathematical Biology to be held at Samos, Greece, September 2019 organised by Jean Clairambault (INRIA, Paris)
- Co-organiser (jointly with Jean Clairambault, INRIA, France, and Thomas Hillen, University of Alberta, Canada), of the workshop on *Mathematical challenges in the analysis of continuum models for cancer growth, evolution and therapy*, November 2018, BIRS, Casa Matemática de Oaxaca, Oaxaca, México.
- Co-organiser (jointly with Jose Antonio Carrillo, Imperial College London, UK, Silvia Cuadrado, Universitat Autonoma de Barcelona, and Antoni Guillamon, Universitat Politecnica de Catalunya) of the Intensive Research Programme *Current developments in Mathematical Biology*, April–June 2018, Centre de Recerca Matemàtica, Barcelona, Spain.
- Co-organiser (jointly with Jose Antonio Carrillo, Imperial College London, UK, Silvia Cuadrado, Universitat Autonoma de Barcelona, and Antoni Guillamon, Universitat Politecnica de Catalunya) of the workshop on *New trends in Mathematical Modelling* within the Intensive Research Programme *Current developments in Mathematical Biology*, held at the Centre de Recerca Matemàtica, Barcelona, Spain April 3-6, 2018.

- Co-organiser (jointly with Jose Antonio Carrillo, Imperial College London, UK, Silvia Cuadrado, Universitat Autonoma de Barcelona, and Antoni Guillamon, Universitat Politecnica de Catalunya) of the school on *Mathematical Modelling of Tumour Growth and Therapy* within the Intensive Research Programme *Current developments in Mathematical Biology*, held at the Centre de Recerca Matemàtica, Barcelona, Spain June 4-8, 2018.

- Co-organiser (jointly with Helen Byrne, Oxford, and James Glazier, Indiana) of the Workshop on *Hybrid Multi-scale modelling and validation*, MBI Emphasis Semester on *Growth and Morphogenesis*, held at the Mathematical Biology Institute, Columbus, Ohio, USA, March 27-31, 2017.

- Co-organiser (jointly with Philip Maini, Oxford, Fred Nijhout, Duke, and Pablo Padilla, UNAM) of the MBI Emphasis Semester on *Growth and Morphogenesis*, held at the Mathematical Biology Institute, Columbus, Ohio, USA, Spring Term, 2017.

- Co-organiser (jointly with Ruben Perez-Carrasco, University College London, UK, Pilar Guerrero, University College London, UK, and Juan Calvo, Granada) of the mini-symposium *Dynamics of stochastic molecular systems* within the ECMTB 2016, Nottingham, July 2016.

- Co-organiser (jointly with Ruben Perez-Carrasco, University College London, UK, Pilar GUerrero, University College London, UK, and Juan Calvo, Granada) of the mini-symposium *Analysis of stochastic multi-scale and hybrid models* within the ECMTB 2016, Nottingham, July 2016.

- Member of the organising committee (jointly with Alvaro Corral, CRM, and Francesc Font, CRM) of the Fifth Gefenol Summer School in Statistical Physics and Small and Complex Systems, Centre de Recerca Matematica, July 2015.

- Co-organiser (jointly with Juan Soler, Universidad de Granada) of the special session on *Mathematics in the Life Science* within the conference Barcelona Mathematical Days 2014, to be held in Barcelona, Spain, November 2014

- Member of the organising committee of the workshop on Virus Dynamics & Evolution, Centre de Recerca Matemàtica, Bellaterra, Barcelona, Spain, June 2014

- Organiser (jointly with Álvaro Corral, CRM) and member of the scientific committee of the Joint CRM–Imperial College Advanced Course on Complex Systems. Centre de Recerca Matemàtica, Bellaterra, Barcelona, Spain, April 2013

- Organiser of the *CRM Colloquim on Mathematical Biology and Biophysics*, Centre de Recerca Matemàtica, December 2012.

- Member of the scientific committee of the workshop on *Mathways into cancer*, Almagro, Spain, June 2012

- Member of the scientific committee of the *School on emerging infectious diseases and mathematical modelling*, Centre de Recerca Matemàtica, Bellaterra, Barcelona, Spain, July 2011

- Member of the organising committee of *Biomat 2011 – Perspectives in Mathematics and Life Sciences*, University of Granada, Spain, June 2011

- Co-organiser (with Fátima Núñez and Álex Sánchez, Vall d'Hebrón Hospital Research Institute) of the workshop on *Mathematical modelling for the health sciences*, Vall d'Hebrón Hospital, Barcelona, Spain, April 2011

- Co-organiser (with Vahid Shahrezaei and Henrik J. Jensen, Imperial College) of the meeting on *From genotype to phenotype*, Institute for Mathematical Sciences, Imperial College, London, UK, April 2010

- Co-organiser (with Nicholas Jones, Oxford, and Renaud Lambiotte, Imperial College) of the COXIC meeting, joint Oxford-Imperial College meeting on Complexity Sciences, Institute for Mathematical Sciences, Imperial College, London, UK, April 2009

- Co-organiser (with Henrik J. Jensen, Imperial College) of the meeting on *Modelling Complexity in Cancer*, Institute for Mathematical Sciences, Imperial College, London, UK, June 2008

- Collaboration with the organisation of the XVth Sitges Conference on *Statistical mechanics of biocomplexity*, Sitges (Spain), June 1998, the XVIth Sitges Conference on *Statistical and dynamical aspects of mesoscopic systems*, Sitges (Spain), June 1999, and the XVIIth Sitges Conference on *Coherent structures in classical systems*, Sitges (Spain), June 2000

- Collaboration with the organisation of the summer course *Statistical and dynamical aspects of complex systems* held at the University of Barcelona, July 1999.

EDITORIAL DUTIES

- Review editor, Biophysics (specialty section of Frontiers in Physics, Frontiers in Physiology and Frontiers in Molecular Biosciences). October 2015 – Present.

REVISION FOR PEER-REVIEWED JOURNALS AND FUNDING AGENCIES

- Peer-reviewed journals: *Physical Review E*, *Mathematics in Biology and Medicine*, *Cancer Research*, *Journal of the Royal Society Interface*, *SIAM Journal on Scientific Computing*, *Journal of Theoretical Biology*, *British Journal of Cancer*, *Cell Proliferation*, *PLoS Computational Biology*, *PLoS One*, *Biophysical Chemistry*, *IEEE Transactions in Medical Imaging*, *Journal of Mathematical Biology*, *Biophysical Journal*, *Philosophical Transactions of the Royal Society*, *Blood*, *Publicacions Matemàtiques*, *BMC Systems Biology*, *NPJ Systems Biology & Applications*, *Bioinformatics*.
- Conference proceedings: Joint ESMTB/SMB Meeting (Dresden, July 2005)
- Archives: Mathematical Reviews
- Funding agencies:
  1. Dutch Research Council (The Netherlands)
  2. Biotechnology and Biological Sciences Research Council (BBSRC, United Kingdom)
  3. European Research Council (Starting grants)
  4. Agencia Nacional de Evaluación y Prospectiva (ANEP, Spain)
  5. Human Frontiers Science Project (HFSP)
  6. Fundació Obra Social La Caixa (Programa de becas de "la Caixa")
  7. The Marsden Fund of the Royal Society of New Zealand
  8. INSERM (France)
  9. Spanish Agency for Research (AEI, Proyectos I+D+i (Area of Mathematics, Area of Engineering), Ramón y Cajal Programme, Juan de la Cierva Programme, Regional projects (Castilla-La Mancha, Comunitat Valenciana))

OTHER MERITS

- Member of the Interview Pannel for the Postgraduate Scholarship Programme of the foundation Obra Social LaCaixa (2016)
- Guarantor (one of six) of the Barcelona Graduate School of Mathematics *Maria de Maeztu Unit of Excellence*
- Research line leader, Mathematics & Statistics for the Life Sciences, Barcelona Graduate School of Mathematics *Maria de Maeztu* Unit of Excellence, Barcelona, Spain, July 2015–June 2019

INTERNSHIP & UNDERGRADUATE PROJECT SUPERVISION

- Nuria Folguera-Blasco, Departament of Mathematics, Universitat Autònoma de Barcelona. September 2012 – November 2012
- Roger Domingo-Roca, Departament of Physics, Universitat Autònoma de Barcelona. April 2014 – July 2014
- Carles Raich-Bros, Departament of Applied Mathematics and Analysis, Universitat de Barcelona. February 2017 – June 2017. Co-supervised by Josep Sardanyés (CRM)
- Rasa Giniunaite, Mathematical Institute, University of Oxford, project student co-supervised with Philip K. Maini and Helen M. Byrne. April 2017 – July 2017
- Andreu Arderiu-Romero, Departments of Physics and Mathematics, Universitat Autònoma de Barcelona. September 2017
- Roberto Franco, Universitat Nacional Autónoma de México. BGSMath internship. June 2018 – July 2018

- Laia Domingo, Departments of Physics and Mathematics, Universitat Autònoma de Barcelona. February 2018 – February 2019
- Sara Martínez-Buera, Departments of Physics and Mathematics, Universitat Autònoma de Barcelona. February 2019 – June 2019. Co-supervised by Aurora Hernandez-Machado (School of Physics, Universitat de Barcelona)
- Andreu Arderiu-Romero, Departments of Physics and Mathematics, Universitat Autònoma de Barcelona. February 2019 – June 2019. Co-supervised by Josep Sardanyés (CRM)
- Alejandra de Lara, Department of Physics, Universitat Autònoma de Madrid. June 2019 – July 2019. Co-supervised by Josep Sardanyés (CRM)
- Elisabet Roda-Salichs, Departments of Physics and Mathematics, Universitat Autònoma de Barcelona. September 2019 – August 2020. Co-supervised by Josep Sardanyés (CRM)
- Fernando Davó-Miralles, Departments of Physics and Chemistry, Universitat Autònoma de Barcelona. March 2020 – August 2020. Co-supervised by Daria Stepanova (CRM)
- Meritxell Brunet-Guasch, Departments of Mathematics and Biology, University of Edinburgh. June 2020 – July 2020. Co-supervised by Daria Stepanova (CRM)
- Simon Syga, Dresden Technical University, Germany. October 2023 – December 2023. Co-supervised by Daria Stepanova (CRM), William D Martinson (Oxford), and Helen Byrne (Oxford)

MASTER THESIS SUPERVISION

- Daniel Sánchez-Taltavull
  Title: Stability of stochastic models of hierarchical cell populations
  Date of viva: July 2011
- Daria Stepanova
  Title: Hybrid and adaptive methods for simulation of stochastic reaction-diffusion systems
  Date of viva: September 2017
- Louisiane Lemaire
  Title: Mathematical modelling of metabolic symbiosis in anti-angiogenic therapy
  Date of viva: July 2018
- Ruth Kristianingsih. Co-supervised with Josep Sardanyés (CRM)
  Title: Stochastic modelling of virus dynamics
  Date of viva: September 2018
- Sara Martínez-Buera. Co-supervised with Aurora Hernandez-Machado (School of Physics, Universitat de Barcelona)
  Title: Front microrheology beyond the power-law model
  Date of viva: June 2020
- Sergi Domènech-Miñarro. In collaboration with Gillian Pearce (Birmingham) and Philip K Maini (Oxford).
  Title: Mathematical modelling of internalisation of nanoparticles for cancer therapy
  Date of viva: July 2023

PhD SUPERVISION (COMPLETED)

- Esther Ibáñez-Marcelo (CRM). Funded by the Centre de Recerca Matemàtica. Subject: Dynamics of cell populations with genotype-phenotype map. January 2011 – December 2014 (Date of Viva: December 19th 2014)
- Daniel Sánchez-Taltavull (CRM). Funded by the Centre de Recerca Matemàtica. Subject: Stochastic modelling of cellular populations: Effects of latency and feedback. January 2011 – December 2014 (Date of Viva: December 12th 2014)
- Roberto de la Cruz (CRM). Funded by a scholarship of the Generalitat de Catalunya (FI-AGAUR). Subject: Stochastic multi-scale models of tumour growth. January 2013 – September 2017 (Date of Viva: September 8th 2017). Co-supervised by Pilar Guerrero (Dep. Mathematics, University College London, UK).

- Núria Folguera-Blasco. Funded by Obra Social LaCaixa through the CRM-LaCaixa programme in Collaborative Mathematics. Subject: Stochastic modelling of epigenetic regulation: analysis of its heterogeneity and its implications in cell plasticity. November 2014 – September 2018 (Date of Viva: November 2nd 2018). Co-supervised by Javier A. Menendez (ProCURE (Program Against Cancer Therapeutic Resistance), Metabolism and Cancer Group, Catalan Institute of Oncology)

- Elisa Beltran-Sáez. Funded by a FPU (Spanish Government) scholarship. Subject: Information transmission through a non linear molecular signaling system: ErbB as a case study. October 2014 – March 2019 (Date of Viva: May 17th 2019)

- Ana Victoria Ponce Bobadilla. Based at and funded by the Institute of Applied Mathematics, University of Heidelberg. Subject: Mathematical models of cell migration and proliferation in scratch assays. September 2016 – August 2019 (Date of Viva: December 6th 2019). Co-supervised by Helen M. Byrne (Oxford), Thomas Carraro (Heidelberg), and Philip K. Maini (Oxford)

- Daria Stepanova. Funded by Obra Social LaCaixa through the CRM-LaCaixa programme in Collaborative Mathematics. Subject: Mathematical modelling of angiogenesis as an integrated multicellular process. November 2017 – December 2021 (Date of Viva: March 30th 2022). Co-supervised by Helen M. Byrne and Philip K. Maini (Oxford)

PhD SUPERVISION (IN PROGRESS)

- Stefano Pedarra. Funded by a FI scholarship awarded by AGAUR-Generalitat de Catalunya.
  Subject: Mathematical modelling of metabolic aspects of cancer immunotherapy
  September 2020 – Present. In collaboration with Josep Sardanyés (CRM) and Javier A Menendez (ICO-IDIBGI)

- Juan Arellano-Tintó. Funded by a María de Maeztu–FPI scholarship.
  Subject: Mathematical modelling of anatomosis in angiogenesis: A mechanical approach
  September 2022 – Present. Co-supervised by Daria Stepanova (Laboratorio Subterráneo de Canfranc) and in collaboration with Helen M. Byrne and Philip K. Maini.

- Amaia Vielba-Trillo. Funded by FPI scholarship (HENOCANDYN project PID2021-127896OB-I00).
  Subject: Mathematical modelling of cancer therapy by oncolytic viruses
  November 2023 – Present. Co-supervised by Josep Sardanyés (CRM).

INDUSTRIAL DOCTORATE SUPERVISION (COMPLETED)

- Lourdes Méndez-Mora. Industrial Doctorate at Rheo Diagnostics SL. Co-supervised by Aurora Hernandez-Machado (School of Physics, Universitat de Barcelona). Title: Rheological characterization of healthy and non-healthy blood using electronic dection of the fluid front. Viva held on November 28th 2023

POST-DOC SUPERVISION

- Pilar Guerrero (CRM). Funded by the Centre de Recerca Matemàtica.
  Subject: Stochastic multi-scale modelling of micro-metastases in tumour dormancy
  Juanuary 2011 – July 2013

- Yukhihiko Nakata (BCAM). Funded by the Basque Centre for Applied Mathematics (BCAM).
  Subject: Structured population models
  Co-supervised by Philipp Getto (BCAM). June 2010 – November 2010

- Ivón Rodríguez-Villareal (CRM). Funded by the Centre de Recerca Matemàtica.
  Subject: Microrheology of biofluids
  Co-supervised by Aurora Hernández-Machado (School of Physics, University of Barcelona). March 2013 – February 2016

- Juan Calvo (CRM). Funded by Obra Social LaCaixa through the CRM-LaCaixa programme in Collaborative Mathematics.
  Subject: Hybrid multi-scale modelling of tumour growth
  April 2015 – March 2016

- Josep Sardanyés (CRM). Funded by Obra Social LaCaixa through the CRM-LaCaixa programme in Collaborative Mathematics.
  Subject: Multi-scale and evolutionary modelling of tumour growth
  January 2017 – February 2019

- Giovanni Dalmasso (CRM). Funded by the María de Maeztu award, Centre de Recerca Matemàtica (2022–2025).
  Subject: Mathematical modelling of early vascular network formation during limb development
  November 2022 – December 2023

- Ielyaas Cloete (CRM). Funded by the María de Maeztu award, Centre de Recerca Matemàtica (2022–2025).
  Subject: Mathematical modelling of the BCL-2 networ
  July 2023 – Present

- Daria Stepanova (CRM). Funded by the HENOCANDYN project PID2021-127896OB-I00.
  Subject: Mathematical modelling of epigenetic regulation and chromatin structure
  Co-supervised by Helen M. Byrne (University of Oxford, UK) and Josep Sardanyés (CRM). September 2023 – Present

PUBLICATIONS IN PEER-REVIEWED JOURNALS

1. T. Alarcón, A. Pérez-Madrid and J. M. Rubí. *Low Temperature Viscosity in Elongated Ferrofluids*. J. Chem. Phys. **107**, 10253 (1997).

2. T. Alarcón, A. Pérez-Madrid and J. M. Rubí. *Stochastic Resonance in Nonpotential Systems*. Phys. Rev. E. **57**, 4979 (1998).

3. T. Alarcón, A. Pérez-Madrid and J. M. Rubí. *Periodic Modulation Induced Increase of Reaction Rates in Autocatalytic Systems*. J. Chem. Phys. **108**, 7367 (1998).

4. A. Pérez-Madrid, T. Alarcón, J.M.G. Vilar and J. M. Rubí. *A Mesoscopic Approach to the "Negative" Viscosity Effect in Ferrofluids* . Physica A **270**, 403 (1999).

5. T. Alarcón, A. Pérez-Madrid and J. M. Rubí. *Energy transduction in periodically driven non-Hermitian systems*. Phys. Rev. Lett. **85**, 3995 (2000).

6. T. Alarcón and A. Pérez-Madrid. *Stochastic resonance in a suspension of magnetic dipoles under shear flow*. Phys. Rev. E. **63** 041112 (2001).

7. A. Pérez-Madrid, T. Alarcón, and J. M. Rubí. *Vorticity ratchet*. Physica A. **325**, 55-61 (2003).

8. T. Alarcón, H.M. Byrne, and P.K. Maini. *A cellular automaton model for tumour growth in an inhomogeneous environment*. J. theor. Biol. **225**, 257-274 (2003).

9. T. Alarcón, H.M. Byrne, and P.K. Maini. *Towards a whole-organ model of tumour growth*. Progr. Biophys. Mol. Biol. **85**, 451-472 (2004).

10. T. Alarcón, H.M. Byrne, and P.K. Maini. *A mathematical model of the effects of hypoxia on the cell-cycle of normal and cancer cells*. J. theor. Biol. **229**, 395-411 (2004).

11. B. Ribba, T. Alarcón, K. Marron, P.K. Maini, and Z. Agur. *The use of hybrid cellular automata for improving cancer therapy*. Lecture Notes in Computer Science. **3305**, 44-453 (2004). NOTE: This article was awarded the price to the best contributed paper at the 6th International Conference on Cellular Automata for Research and Industry, Amsterdam, 2004.

12. B. Ribba, K. Marron, Z. Agur, T. Alarcón, and P.K. Maini. *A mathematical model of Doxorubicin treatment efficacy on non-Hodgkin lymphoma: investigation of current protocol through theoretical modelling results*. Bull. Math. Biol. **67**, 79-99 (2005).

13. T. Alarcón, H.M. Byrne, and P.K. Maini. *A multiple scale model of tumour growth*. Multiscale Model. Sim. **3**, 440-475 (2005).

14. T. Alarcón, H.M. Byrne, and P.K. Maini. *A design principle for vascular beds: the role of complex blood rheology*. Microvasc. Res. **69**, 156-172 (2005).

15. T. Alarcón, and K.M. Page. *Stochastic models of receptor oligomerisation by bivalent ligand*. J. R. Soc. Interface. **3** 545-559, (2006). DOI: 10.1098/rsif.2006.0116. (2006).

16. T. Alarcón, R. Marches and K.M. Page. *Mathematical models of the fate of lymphoma B-cells after antigen receptor ligation with specific antibodies*. J. theor. Biol. **240** 54-71, (2006).

17. H.M. Byrne, T. Alarcón, M.R. Owen, S.D. Webb and P.K. Maini. *Modelling aspects of cancer dynamics: a review*. Phil. Trans. Roy. Soc. A. **364** 1563-1568, (2006). DOI: 10.1098/rsta.2006.1786.

18. H.M. Byrne, M.R. Owen, T. Alarcón, J. Murphy and P.K. Maini. *Modelling the response of vascular tumours to anticancer therapies: a multiscale approach.* Math. Mod. Meth. App. Sci. **16**(7), 1-25 (2006).

19. R. Betteridge, M.R. Owen, H.M. Byrne, T. Alarcón and P.K. Maini. *The impact of cell crowding and active cell movement on vascular tumour growth.* Networks and Heterogeneous Media. **1**, 515-535. (2006).

20. T. Alarcón, M.R. Owen, H.M. Byrne and P.K. Maini. *Multiscale modelling of tumour growth and therapy: the influence of vessel normalisation on chemotherapy.* Computational Mathematical Methods in Medicine. **7**, 85-119 (2006). DOI:10.1080/10273660600968994.

21. T. Alarcón and M.J. Tindall. *Modelling cell growth and its modulation of the G1/S transition.* Bull. Math. Biol. **69**, 197-214 (2007). DOI: 10.1007/s11538-006-9154-0.

22. T. Alarcón and K.M. Page. *Mathematical models of the VEGF receptor and its role in cancer therapy.* J. R. Soc. Interface. **4**, 283-304 (2007). DOI: 10.1098/rsif.2006.0170.

23. M.R. Owen, T. Alarcón, H.M. Byrne, and P.K. Maini. *Angiogenesis and vascular remodelling in normal and cancerous tissues.* J. Math. Biol. **58**, 689-721 (2009). DOI: 10.1007/s00285-008-0213-z.

24. T. Alarcón. Modelling tumour-induced angiogenesis: A review of individual-based models and multiscale approaches. AMS Contemporary Mathematics, **492**, 45-74 (2009).

25. L. Willis, T. Alarcón, G. Elia, J.L. Jones, N. Wright, T.A. Graham, I.P.M. Tomlinson, K.M. Page. *Breast cancer dormancy can be maintained by a small number of micrometastases.* Cancer Res. **70**, 4310-4317 (2010).

26. T. Alarcón and H.J. Jensen. *Quiescence: a mechanism for escaping the effects of drug on cell populations.* J. R. Soc. Interface. **8**, 99-106 (2010).

27. H. Perfahl, H.M. Byrne, T. Chen, V. Estrella, T. Alarcon, A. Lapin, R.A. Gatenby, R.J. Gillies, M.C. Lloyd, P.K. Maini, M. Reuss, M.R. Owen. *Multiscale modelling of vascular tumour growth in 3D: The roles of domain size and boundary conditions.* PLoS ONE **6**(4), e14790 (2011).

28. T. Alarcón, Ph. Getto, A. Marciniak-Czochra, MdM. Vivanco. *A model for stem cell population dynamics with maturation-regulated delay.* Disc. Cont. Dyn. Sys. B. Special Issue 2011, 32-43 (2011).

29. T. Alarcón and H.J. Hensen. *Invasion in multi-type populations: The role of robustness and fluctuations.* IMA J. Math. Med. Biol. **29**, 3-20 (2012). Invited contribution to the special issue on *Computational Cancer Modelling*, A.R.A. Anderson and K. Rejniak, eds.

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PATENTS

1. I. Rodriguez-Villarreal, T. Alarcon, J. Colomer, A. Hernandez-Machado, P. Miribel. *Method and apparatus for measuring viscosity of Newtonian and Non-Newtonian fluids.* Number 15/574,021, national phase US priority of the PCT/EP2016/060835. Reference 16-0005736, regional phase of the PCT/EP2016/060835. Licensed to Rheo Diagnostics SL.

BOOK CHAPTERS

1. T. Alarcón, H.M. Byrne, P.K. Maini and J. Panovska. *Mathematical modelling of angiogenesis and vascular adaptation* in *Multidisciplinary approaches to theory in medicine.* Studies in multidisciplinarity Vol. 3. Eds. Ray Patton and Laura McNamara. Elsevier, ISBN: 0-444-51806-1,(2005).

2. P.K. Maini, T. Alarcón, H.M. Byrne, M.R. Owen and J. Murphy. *Structural adaptation in normal and cancerous vasculature* in *Math Everywhere. Deterministic and Stochastic Modelling in Biomedicine, Economics and Industry.* Eds. G. Aletti, M. Burger, A. Micheletti and D. Morale. Springer, Heidelberg, (2007).

3. H.M. Byrne, I.M.M. Van Leeuwen, M.R. Owen, T. Alarcón, P.K. Maini. *Multiscale modelling of solid tumour growth* in *Selected topics on cancer modelling: Genesis, evolution, immune competition, therapy.* Modelling and Simulation in Science, Engineering and Technology. Eds. N. Bellomo, M.A.J. Chaplain, E. De Angelis. Birkhauser, Boston (2008).

4. T. Alarcón, K.M. Page. *Mathematical modelling of the VEGF receptor.* Modeling Tumor Vasculature: Molecular, Cellular, and Tissue Level Aspects and Implications. Ed. Trachette Jackson. Springer-Verlag. (2011).

5. H. Perfahl, H.M. Byrne, T. Chen, V. Estrella, T. Alarcón, A. Lapin, R.A. Gatenby, R.J. Gillies, M.C. Lloyd, P.K. Maini, M. Reuss, M.R. Owen. *3D Multiscale Modelling of Angiogenesis and Vascular Tumour Growth.* Nano and Micro Flow Systems for Bioanalysis. Eds. M.W.Collins & C.S.König. Springer-Verlag. (2013).

6. C. Panella, T. Alarcón, J. Sardanyés. *Spatiotemporal Dynamics of Cancer Phenotypic Quasispecies Under Targeted Therapy.* Multidisciplinary Mathematical Modelling: Applications of Mathematics to the Real World. Eds. F. Font & T. Myers. Springer-Verlag. (2021).

PEER-REVIEWED PROCEEDINGS

1. P.K. Maini, T. Alarcón, H.M. Byrne. *Modelling aspects of vascular cancer development.* BIOMAT 2005. International symposium on mathematical and computational biology. December 3-8, 2005. Petropolis, Brazil. R.P. Mondaini and R. Dilão. World Scientific (2006).

2. H.M. Byrne, M.R. Owen, T. Alarcón, P.K. Maini. *Cancer Disease: Integrative Modelling Approaches.* 2006 IEEE International Symposium on Biomedical Imaging: From Nano to Macro. IEEE, 2006.

3. C.A. Trejo-Soto, E. Costa-Miracle, A.I. Rodriguez-Villarreal,J. Cid, M. Castro, T. Alarcon and A. Hernandez-Machado. Front Microrheology of Biological Fluids. J. Phys: Conference Series. **1043**, 012058 (2018).

ABSTRACTS

1. H.M. Byrne, T. Alarcón, P.K. Maini. *Cancer modelling: Getting to the heart of the problem.* J. Physiol. 561P, SA9 (2005).

INVITED TALKS AND SEMINARS (SINCE 2010)

1. T. Alarcón. *Robustness, phenotypical variability and their role in the progression to cancer.* Invited talk at the MIR@W/COSYDY day on the Mathematics of Evolutionary Dynamics, Mathematical Institute, University of Warwick UK. February 2010.

2. T. Alarcón. *From gene regulatory networks to population dynamics: robustness, diversity and their role in progression to cancer.* Seminar at the Department of Differential Equations and Numerical Analysis, University of Sevilla, Sevilla, Spain. Fberuary 2010.

3. T. Alarcón. *From gene regulatory networks to population dynamics: robustness, diversity and their role in progression to cancer.* Seminar at the Institute for Mathematical Sciences, Imperial College, London UK. March 2010.

4. T. Alarcón. *Multiscale modelling of tumour growth.* Invited talk at the International Workshop on Multiphysics, Multiscale, and Optimization Problems, BCAM, Bilbao, Spain. June 2010.

5. T. Alarcón. *Multiscale modelling of biological systems.* Seminar at the Department of Mathematics, School of Sciences, University of the Basque Country, Leioa Campus, Vizcaya, Spain. October 2010.

6. T. Alarcón. *Integrative modelling of biological systems.* Invited talk at the Joint CRG-CRM meeting, Centre de Regulació Genòmica, Barcelona, Spain. October 2010.

7. T. Alarcón. *Multiscale modelling of biological systems.* Industrial Mathematics Seminar, Centre de Recerca Matemàtica, Barcelona, Spain. November 2010.

8. T. Alarcón. *Competition dynamics in populations with complex structure.* Seminar at the Department of Applied Mathematics, School of Mathematics, University of Granada, Spain. November 2010.

9. T. Alarcón. *Competition dynamics in populations with complex structure.* Seminar at the Department of Structure and Constituents of Matter, School of Physics, University of Barcelona, Spain. November 2010.

10. T. Alarcón. *Integrative mathematical modelling of biological systems.* Colloquium talk at the Mathematics Applications Consortium for Science & Industry (MACSI), University of Limerick, Limerick, Republic of Ireland. January 2011.

11. T. Alarcón. *Multiscale modelling of tumour-induced angiogenesis.* Seminar at the Mathematics Applications Consortium for Science & Industry (MACSI), University of Limerick, Limerick, Republic of Ireland. January 2011.

12. T. Alarcón. *Competition dynamics in populations with complex structure.* Seminar at the Department of Mathematics (PDE discussion group), Autonomous University of Barcelona, Barcelona, Spain, February 2011.

13. T. Alarcón. *Stochastic multi-scale modelling of small metastasis.* Invited talk at the Meeting on PDEs and Applications. University of Girona, Girona, Spain, June 2011.

14. T. Alarcón. *Mathematical modelling of VEGF receptors.* Invited mini-symposium talk at the European Conference of Theoretical & Mathematical Biology, Kracow, Poland, July 2011.

15. T. Alarcón. *Stochastic multi-scale modelling of small metastasis.* Invited talk at the Feza Gürsey Institute - Imperial College Summer school and workshop on Complexity. Istanbul, Turkey, September 2011.

16. T. Alarcón. *Robustness and evolvability of gene regulatory networks.* Invited talk at the 2nd Meeting of the Catalan Mathematical Society. Barcelona, Spain, October 2011.

17. T. Alarcón. *Mathematical modelling of population dynamics in biomedical problems.* Seminar at the Department of Mathematics, Politecnico di Torino, Turin, Italy, November 2011.

18. T. Alarcón. *Tackling biomedical problems using mathematical models of cell population dynamics.* Joint seminar of the Department of Physics and the Institute for Biomedical Research in Light & Image (IBILI), School of Medicine, University of Coimbra, Portugal, December 2011.

19. T. Alarcón. *Stochastic multi-scale modelling of small metastasis.* Invited talk at the Mathematical Biology session of the joint meeting of the Royal Spanish Mathematical Society and the Mexican Mathematical Society, Málaga, Spain, January 2012.

20. T. Alarcón. *Tackling biomedical problems using mathematical models of cell population dynamics.* Seminar delivered at the Institute for the Research on Applied Mathematics and Systems (IIMAS), National Autonomous University of Mexico, March 2012.

21. T. Alarcón. *Stochastic multi-scale modelling of cell populations.* Seminar delivered at the Lyon Biomathematics Working Group Seminar, Lyon, France, June 2012.

22. T. Alarcón. *Hybrid τ-leaping methods for simulation of multiscale stochastic models of cell populations.* Invited talk at the Mathematical Biology session of the 4th Iberian Mathematical meeting (joint meeting of the Royal Spanish Mathematical Society and the Portuguese Mathematical Society) Valladolid, Spain, October 2012.

23. T. Alarcón. *From invasion to latency: Intracellular noise and cell motility as key controls of the competition between resource-limited cellular populations.* Invited talk at the Workshop on Cancer Modelling: Evolutionary issues and Radiotherapy Methods, University of Granada, Spain, December 2012.

24. T. Alarcón. *Stochastic multiscale modelling of cell populations.* Invited talk at the Workshop on Tumour Growth, Oxford Centre for Collaborative and Applid Mathematics, University of Oxford, UK, January 2013.

25. T. Alarcón. *From invasion to latency: Intracellular noise and cell motility as key controls of the competition between resource-limited cellular populations.* Invited talk at the Biannual Conference of the Royal Spanish Society for Mathematics (RSME). Santiago de Compostela, Spain, February 2013.

26. T. Alarcón. *Muti-scale modelling of tumour growth and therapy.* Invited talk for the students of the MathMods master course, Universitat Autònoma de Barcelona, Barcelona, Spain, May 2013.

27. T. Alarcón. *Stochastic multiscale modelling of cell populations.* Invited talk at the conference Mathways into Cancer II, Sevilla, Spain, May 2013.

28. T. Alarcón. *Stochastic multiscale modelling of tumour growth.* Seminar delivered at the Centre for Systems Biology, University of Stuttgart, Stuttgart, Germany, June 2013.

29. T. Alarcón. *Are viral blips in HIV-1-infected patients clinically relevant?* Invited talk at the Workshop on Emergence, Spread and Control of Infectious Diseases, Barcelona, Spain, June 2013.

30. T. Alarcón. *Computational & Mathematical Biology at the CRM* Seminar delivered at the Universidad de La Coruña, La Coruña, Spain, July 2013.

31. T. Alarcón. *Metabostemness: The link between metabolism and cellular reprogramming.* Invited talk at the workshop on Patterning, Segregation and Differentiation in Complex Networks held at the Institute of Physics, UNAM, Mexico City, Mexico, January 2014.

32. T. Alarcón. *Stochastic modelling of gene regulatory networks: Matobolic regulation of cellular reprogramming.* Seminar delivered at the Centre for Genomic Regulation (CRG), Barcelona, Spain, January 2014.

33. T. Alarcón. *Stochastic multiscale modelling of tumour growth.* Invited talk at the conference Biomat 2014, University of Granada, June 2014.

34. T. Alarcón. *Stochastic multiscale modelling of tumour growth.* Invited talk at the workshop on Virus Dynamics & Evolution, Centre de Recerca Matematica, Barcelona, June 2014.

35. T. Alarcón. *Multiple scales in stochastic modelling in Biology.* Invited talk at the Research and Inovation Topics module of the Master on Modelling in Science and Engineering, Universitat Autònoma de Barcelona, October 2014.

36. T. Alarcón. *Introduction to stochastic modelling in Biology.* Invited talk at the "Introduction to ..." series, Universitat Politècnica de Catalunya, November 2014.

37. T. Alarcón. *Current challenges in Mathematical Biology.* Invited talk at the IEMath (Spanish Institute for Mathematics) Presentation Meeting, February 2015.

38. T. Alarcón. *Evolutionary dynamics of systems with genotype-phenotype map.* Invited talk at the mini-symposium on *Molecular Evolution and Fitness Landscapes* within the conference *Modelling Biological Evolution 2015* Leicester, UK, April 2015.

39. T. Alarcón. *Stochastic multi-scale modelling of cell populations.* Seminar at the Angiogenesis & Vascular Tumour Growth Working Group, Mathematical Institute, University of Oxford, UK, May 2015.

40. T. Alarcón. *Mathematical modelling of drug resistance.* Advanced Topics Seminar, MSc on Modelling in Science and Engineering, Universitat Autonoma de Barcelona, Spain, October 2015.

41. T. Alarcón. *Stochastic multi-scale modelling of tumour growth.* Current Trends in Mathematics Undergraduate Seminar, Universitat Autonoma de Barcelona, Spain, October 2015.

42. T. Alarcón. *Gene regulatory systems under epigenetic regulation: robustness, noise-enabled bifurcations, and cellular reprogramming.* Seminar, Department of Applied Mathematics, Universidad de Granada, Spain, December 2015.

43. T. Alarcón. *Population and evolutionary dynamics of tumour growth.* Invited talk at the Workshop on "Mathematical Perspectives in Biology", ICMAT (Institute for Mathematical Sciences), Madrid, Spain, February 2016.

44. T. Alarcón. *Optimal path theory of stochastic processes and its applications to robustness of gene regulatory circuits* Joint UB-UPC seminar on dynamical systems, Barcelona, Spain, February 2016.

45. T. Alarcón. *Gene regulatory systems under epigenetic regulation: robustness, noise-enabled bifurcations, and cellular reprogramming.* Seminar, Mathematical Biology & Ecology Seminar, Mathematical Institute, University of Oxford, Oxford, UK, April 2016.

46. T. Alarcón. *Stochastic multi-scale modelling of cell populations: Numerical methods, mean-field approximation, and hybrid simulation methods.* Seminar at the Angiogenesis & Vascular Tumour Growth Working Group, Mathematical Institute, University of Oxford, UK, May 2016.

47. T. Alarcón. *Stochastic modelling of somatic cell reprogramming* Biomathematics seminar, Imperial College London, UK, June 2016.

48. T. Alarcón. *Stochastic modelling of somatic cell reprogramming* Seminar at the Institute for the Physics of Living Systems, University College London, UK, July 2016.

49. T. Alarcón. *Oncometabolic nuclear reprogramming of cancer stemness* Invited talk at the Conference "Bridging scales in models of cell to tissue behaviour: recent progress and future challenges", Society for Experimental Biology–Mathematical Institute, University of Oxford, UK, September 2016.

50. T. Alarcón. *Plasticity and heterogeneity of epigenetic states: the roles of oncometabolic transformation and aging.* Seminar at the Basque Centre for Applied Mathematics (BCAM), Bilbao, Spain, November 2016.

51. T. Alarcón. *Mathematics for oncology: multi-scale modelling of tumour growth* Seminar at the Department of Media Technologies, La Salle School of Engineering, Universitat Ramón Llull, Barcelona, Spain, April 2017.

52. T. Alarcón. *Plasticity and heterogeneity of epigenetic states: the roles of oncometabolic transformation and aging.* Seminar at the Aragón Institute for Studies in Engineering (IA3E), Zaragoza, Spain, May 2017.

53. T. Alarcón. *Mathematics for oncology: multi-scale modelling of tumour growth.* Plenary talk, Joint Meeting the Swedish, Catalan, and Spanish Mathematical Societies, Umea, Sweden, June 2017.

54. T. Alarcón. *Stochastic modelling of gene regulatory networks under epigenetic regulation: oncometabolic nuclear reprogramming of cancer stemness.* Invited talk, 9th International Conference Engineering of Chemical Complexity, Vilanova i la Geltru, Barcelona, Spain, June 2017.

55. T. Alarcón. *Mathematics for oncology: multi-scale modelling of tumour growth.* Plenary talk, Conference on Differential Equations and Applications/Conference on Applied Mathematics (CEDYA/CAM) 2017, Cartagena, Spain, June 2017.

56. T. Alarcón. *Mathematics for oncology: multi-scale modelling of tumour growth.* Invited talk, Workshop on Dynamical Systems in Biology 2017, Basque Centre for Applied Mathematics (BCAM), Bilbao, Spain, July 2017.

57. T. Alarcón. *Unlocking the pluripotent phenotype: A multiscale model of the epigenetic regulation of cell fate and plasticity.* Invited Talk, Workshop on Mathematical Models for Health Sciences, The Henri Lebesgue Centre for Mathematics, Nantes, France, June 2018

58. T. Alarcón. *Heterogeneity in epigenetic regulatory systems: Epigenetic plasticity in aging and cancer.* Invited Talk, Workshop on Mathematical Perspectives in Biology and Therapeutics of Cancer, CIRM, Marseilles, France, July 2018

59. T. Alarcón. *Heterogeneity in epigenetic regulatory systems: Epigenetic plasticity in aging and cancer.* Invited Talk, II Julio Palacios International Symposium: Synergies in the Biosciences, A Coruña, Spain, July 2018

60. T. Alarcón. *Heterogeneity in epigenetic regulatory systems: Epigenetic plasticity in aging and cancer.* Invited Talk, Workshop on Differential Equations arising from Organising Principles in Biology, Mathematiches Forshunginstitut Oberwolfach, Oberwolfach, Germany, September 2018

61. T. Alarcón. *Dysregulation of phenotypic plasticity in cancer and aging.* Invited Talk, Real Academia de las Ciencias Exactas, Fisicas, y Naturales, Madrid, Spain, November 2018

62. T. Alarcón. *Heterogeneity in epigenetic regulatory systems: Epigenetic plasticity in aging and cancer.* Invited Talk, Workshop on Mathematical Challenges in the Analysis of Continuum Models for Cancer Growth, Evolution and Therapy, Banff Institute Research Station-Casa Matemática de Oaxaca, Oaxaca, México, November 2018

63. T. Alarcón. *Plastic behaviour of genes with bivalent epigenetic regulation*, Seminar, Universite Joseph Fourier, Grenoble, France, April 2019

64. T. Alarcón. *Plastic behaviour of genes with bivalent epigenetic regulation*, Invited Mini-Symposium Talk, Coupled 2019, Sitges, Spain, June 2019

65. T. Alarcón. *A multiscale model of complex endothelial cell dynamics during angiogenesis.* Invited Talk, Biomat 2019: Patterns in Life and Social Sciences, Universdad de Granada, Granada, Spain, June 2019

66. T. Alarcón. *Plastic behaviour of genes with bivalent epigenetic regulation*, Invited Mini-Symposium Talk, ICIAM 2019, Valencia, Spain, July 2019

67. T. Alarcón. *Coarse-graining and hybrid methods for efficient simulation of stochastic multi-scale models of tumour growth*, Seminar, Aragón Instute for Engineering Research, Universidad de Zaragoza, Zaragoza, Spain, July 2019

68. T. Alarcón. *Multiscale methods in Systems Biology*, Invited Talk, Symposium of the Research Unit on Dynamical Systems and Computational Virology, Institute for Integrative Systems Biology, CSIC, Valencia, Spain, October 2019

69. T. Alarcón. *Quantitative characterisation of epigenetic landscapes in cell reprogramming*, Seminar, ICO-ProCure, IDIBELL, Barcelona, Spain, February 2020

70. T. Alarcón. *Mathematical modelling of large-scale transitions in chromatin structure*, Invited Talk, First Retreat of the Research Unit on Dynamical Systems and Computational Virology, Canfranc Underground-Laboratory (LSC), Canfranc, Spain, March 2020

71. T. Alarcón. *A multiscale model of complex endothelial cell dynamics during angiogenesis.* Invited Talk, Online Workshop on Mathematical Modeling and Simulation of Tumour Angiogenesis, American Institute of Mathematics, January 2021

72. T. Alarcón. *Microfluidics in tumour growth.* Online seminar, RheoTalks (seminar series organised by RheoDiagnostics S.L.), June 2021

73. T. Alarcón. *Recent advances in mathematical modelling of tumour-induced angiogenesis.* Plenary Talk, Joint meeting of the Mexican Mathematical Society and the Royal Spanish Mathematical Society. Held online. June 2021.

74. T. Alarcón. *Recent advances in mathematical modelling of tumour-induced angiogenesis.* Invited Symposium Talk, 17th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Bonn, Germany, held online. September 2021.

75. T. Alarcón & H.M. Byrne. *Approaches to modelling angiogenesis.* Joint invited talk, BIRS-CMO Workshop on Modeling and Computational Approaches to Individual and Collective Cell Movement in Complex Environments, held online. September 2021.

76. T. Alarcón. *Ageing in biological systems.* Seminar at the Canfranc Underground Laboratory (LSC), Canfranc, Spain, September 2021

77. T. Alarcón. *Front mircrorheology: A new framework to study non-Newtonian fluids.* Invited talk, SEIO 2022 (Conference of the "Sociedad Española de Estadística e Investigación Operativa"), Mini-symposium on Industrial Mathematics at CRM, Granada, Spain, June 2022

78. T. Alarcón. *Microvascular haemodynamics in tumour growth.* Invited talk, BIOMAT 2022, University of Granada, Spain, June 2022

79. T. Alarcón. In silico *assessment of targeted combination therapies: Bivalent chromatin as a case study.* Invited Mini-symposium talk (online), CEDYA 2022 (Conference on Differential Equations and Applications), University of Zaragoza, Spain, July 2022

80. T. Alarcón. *Bivalent chromatin as a therapeutic target in cancer: An* in silico *approach for combining epigenetic drugs.* Plenary talk (online), IV International Course on Theoretical and Applied Aspects of Systems Biology – 2022, Rio de Janeiro, Brazil, July 2022

81. T. Alarcón. *A multiscale model of complex endothelial cell dynamics in early angiogenesis.* Seminar, University of Oxford, November 2022

82. T. Alarcón. *Transitions in epigenetic landscapes in response to accumulation of DNA damage.* Seminar, CRG–EMBL Collaboratorium, Barcelona, June 2023

83. T. Alarcón. *Transitions in epigenetic landscapes in response to accumulation of DNA damage.* Invited Talk, NoLineal2023, Centre de Recerca Matemàtica, Barcelona, June 2023

84. T. Alarcón. *Individual-based modelling of the metabolic regulation of the interaction between T cells and cancer cells.* Seminar, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, September 2023

85. T. Alarcón. *Coarse-graining for complex biological models.* Applied Mathematics Seminar, University College London, UK, October 2023

86. T. Alarcón. *Coarse-graining for complex biological models.* Biomathematics Seminar, Imperial College London, UK, October 2023

87. T. Alarcón. *Modelling mechanical cues for cell-to-cell communication.* Invited talk at the Workshop on Modelling Non-Markovian Movement Processes Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, November 2023

88. T. Alarcón. *Tackling heterogeneous behaviour in multiscale models of multicellular systems.* Seminar, Systems Medicine Unit, AstraZeneca, Cambridge, UK, December 2023

ADVANCED & SUMMER SCHOOL COURSES AND OTHER LECTURES

1. T. Alarcón. *Multiscale modelling of tumour growth and therapy.* Advanced course (2 lectures) delivered at Biomat 2008. Mathematics and Life Sciences: Tumour dynamics, pattern formation & signalling pathways, Universdad de Granada, Spain. June, 2008.

2. T. Alarcón. *Structure, dynamics and efficiency of tumour vascular networks.* Advanced course (2 lectures) delivered at Biomat 2009. Mathematics and Life Sciences: Biology & mechanics, Universdad de Granada, Spain. June, 2009.

3. T. Alarcón. *Dynamics of cell populations with genotype-phenotype map.* Advanced course (2 lectures) delivered at Biomat 2010. Mathematics and Life Sciences: Mathematical models in biology, Universdad de Granada, Spain. July, 2010.

4. T. Alarcón. *Stochastic modelling and Master Equations.* Advanced course (10 hours) delivered at the Master on Applied Mathematics and Mathematical Engineering, Politechnical University of Catalonia, Barcelona, Spain. November 2011.

5. T. Alarcón. *An introduction to stochastic modelling in Mathematical Biology.* Undergraduate seminar within the course Mathematical Modelling of Technological Problems, Politechnical University of Catalonia, Barcelona, Spain. September 2012.

6. T. Alarcón. *An introduction to stochastic modelling in Mathematical Biology.* Advanced course (4 lectures) delivered at Biomat 2013, Universdad de Granada, Spain. July, 2013.

7. T. Alarcón. *Mathematical modelling of tumour growth and therapy.* Lecture for the undregraduate course on Current Topics in Mathematics, Departament de Matemàtiques, Universitat Atònoma de Barcelona, Spain, November 2013.

8. T. Alarcón, A. Corral, and A. Roxin. *A short introduction to Statistical Physics.* Graduate course for the CRM Doctoral Training Unit, Centre de Recerca Matemàtica, Barcelona, Spain, May 2014

9. T. Alarcón. *An Introduction to Mathematical Biology.* Advanced course (2 lectures) delivered at the Advanced Course on Mathematical Methods of Biological Evolution, Centre de Recerca Matematica, Barcelona, June 2014.

10. T. Alarcón. *Stochastic and hybrid multiscale modeling of tumor growth.* Advanced course delivered at the CIMPA Summer Research School in "Mathematical modeling in Biology and Medicine", Santiago de Cuba, 8-17 June, 2016.

11. T. Alarcón. *Applied stochastic processes: Simulation and model reduction techniques.* Advanced course delivered at the University of Coruna, Coruna, Spain, October 2017.

12. T. Alarcón. *Introduction to mathematical modelling of epigenetic regulation.* Advanced course delivered at Biomat 2019: Patterns in Life and Social Sciences, University of Granada, Granada, Spain, June 2019.

13. T. Alarcón. *Introduction to stochastic modelling in Mathematical Biology.* International School on Dynamical Systems & Applications, Rio de Janeiro, Brasil, December 2021. Course delivered online.

OUTREACH ACTIVITIES

1. T. Alarcón. *Are mathematics an effective tool to help us cure cancer?* given within the programme for the popularisation of Mathematics *Els dissabtes de les Matemàtiques* ran by the Department of Mathematics of the Universitat Autònoma de Barcelona. April 2014.

2. T. Alarcón. Supervision of the research project of Natalia Jiménez-Castro.

RESEARCH GRANTS AS PI

PROJECT TITLE: *Dynamical systems and computational mathematics towards the optimization of Therapeutic Interfering ParticleS as AntiVIRal therapy (TIPSAVIR)*
FUNDING BODY: Proyectos Prueba de Concepto, Agencia Española de Investigación.
GRANT NUMBER: PDC2022-133020-I00
PIs: Josep Sardanyés & Tomás Alarcón
DURATION: 2 years (from 01-12-2022 to 30-11-2024)
BUDGET: 115000 Euros (including overheads)

PROJECT TITLE: *Heterogeneity and noise as engines of cancer evolution: A multiscale dynamical systems approach (HENOCANDYN)*
FUNDING BODY: Proyectos de Generación de Conocimiento, Agencia Española de Investigación.
GRANT NUMBER: PID2021-127896OB-I00
PIs: Tomás Alarcón & Josep Sardanyés
DURATION: 3 years (from 01-09-2022 to 31-08-2025)
BUDGET: 169400 Euros (including overheads)

PROJECT TITLE: *Mathematical modelling of the effects of extra-cellular matrix mechanics on angiogenesis*
FUNDING BODY: "Estancias de profesores e investigadores senior en centros extranjeros" programme, Ministery of Education & Professional Education, Spanish Government.

GRANT NUMBER: PRX21/00171
PIs: Tomás Alarcón
DURATION: 4 months (from 01-09-2022 to 31-12-2022)
BUDGET: 13820 Euros

PROJECT TITLE: *The mathematical underpinnings of integrative systems biology*
FUNDING BODY: "Retos de la Sociedad" programme, Ministery of Economy & Competitivity (MINECO), Spanish Government.
GRANT NUMBER: RTI2018-098322-B-I00
PIs: Tomás Alarcón & Josep Sardanyés
DURATION: 3 years (from 01-01-2019 to 31-12-2021)
BUDGET: 35332 Euros (including overheads)

PROJECT TITLE: *Multiscale modelling and analysis in systems biology and biomedicine (Coordinated project CRM-UPC)*
FUNDING BODY: "Retos de la Sociedad" programme, Ministery of Economy & Competitivity (MINECO), Spanish Government.
GRANT NUMBER (CRM Branch): MTM2015-71509-C2-1-R
GRANT NUMBER (UPC Branch): MTM2015-71509-C2-2-R
PI of the coordinated project: Tomás Alarcón
PIs of the CRM branch: Tomás Alarcón & Andrei Korobeinikov
PI of the UPC branch: Antoni Guillamón
DURATION: 3 years (from 01-01-2016 to 31-12-2018). Extended for a further year until 31-12-2019.
BUDGET OF THE COORDINATED PROJECT: 86700 Euros
BUDGET OF THE CRM BRANCH: 68300 Euros
BUDGET OF THE UPC BRANCH: 18400 Euros

PROJECT TITLE: *Numerical methods in hybrid stochastic modelling of tumour growth and its applications in radiotherapy*
FUNDING BODY: Ministery of Economy & Competitivity (MINECO), Spanish Government.
GRANT NUMBER: PR2015–00486
PI: Tomás Alarcón
DURATION: 6 months (from 01-04-2016 to 30-09-2016).
VALUE: 19620 Euros

PROJECT TITLE: *Mathematical modelling of biological populations with complex structure*
FUNDING BODY: Ministery or Science and Innovation (MCINN), Spanish government.
GRANT NUMBER: MTM2011-29342
PI: Tomás Alarcón
DURATION: 3 years (from 01-01-2012 to 31-12-2014). Extended for a further year, finalising on 31-12-2015.
VALUE: 25000 Euros

PROJECT TITLE: *Mathematical models of population dynamics with complex structure*
FUNDING BODY: Ministery or Science and Innovation (MCINN), Spanish government.
GRANT NUMBER: MTM2010-18318-E
PI: Tomás Alarcón
DURATION: 1 year (from 01-01-2011 to 31-12-2011).
VALUE: 10000 Euros

PROJECT TITLE: *Mathematical modelling and analysis of discrete and continuous structured population dynamics*
FUNDING BODY: Ministery or Science and Innovation (MCINN), Spanish government.
GRANT NUMBER: MTM2010-18318
PI when awarded: Tomás Alarcón (No longer a member of the project)
Current PI: Philipp Getto, BCAM
DURATION: 3 years (from 01-01-2011 to 31-12-2013).
VALUE: 36900 Euros

PROJECT TITLE: *Mathematical modelling of vessel morphogenesis.*
FUNDING BODY: Grupo Santander and Universidad Complutense de Madrid.
PI: Tomás Alarcón
DURATION: 3 months (from 01-09-2006 to 30-11-2006).
VALUE: 10600 Euros

RESEARCH GRANTS AS PARTNER/COLLABORATOR

PROJECT TITLE: *Modificaciones postraduccionales de PD-L1 en la inmunoterapia del cáncer: Desarrollo de nuevas estrategias terapéuticas y fármaco-diagnósticas*
FUNDING BODY: Instituto de Salud Carlos III
GRANT NUMBER: PI22/00297
PI: Javier A Menendez and Elisabet Cuyás Navarro (IDIBGI, Girona, Spain)
DURATION: 3 years. from 01-01-2023 to 31-12-2025
VALUE: 123420 Euros

PROJECT TITLE: *DINAMICA, ATRACTORES, NO LINEALIDAD, CAOS Y ESTABILIDAD (DANCE)*
FUNDING BODY: Agencia Española de Investigación, convocatoria de "Redes de Investigación"
GRANT NUMBER: RED2022-134273-T
PI: Joan Torregrosa (Universitat Autònoma de Barcelona)
DURATION: 2 years 01-01-20 to 31-12-22)(from 01-06-23 to 30-05-25)
VALUE: 24000 Euros

PROJECT TITLE: *GLIOMAT: Modelos matemáticos en comunicación celular mediada por citonemas y dinámica de glioblastomas*
FUNDING BODY: Junta de Andalucía, PAIDI - Modalidad "Retos Consolidado"
GRANT NUMBER: P18-RT-2422
PI: Juan Soler and Juan José Nieto (Universidad de Granada)
DURATION: 3 years (from 01-01-20 to 31-12-22)
VALUE: 134750 Euros

PROJECT TITLE: *Understanding blood flow and sprouting angiogenesis in tumours via a multidisciplinary approach based on mathematical modelling and 3D in vivo imaging*
FUNDING BODY: Cancer Research UK
GRANT NUMBER: CRUKDF 0715 – BM
PI: Bostian Markelc (Department of Oncology, University of Oxford, UK)
DURATION: 1 year (from 1-08-2015 to 31-07-2016).
VALUE: 17748 Euros

PROJECT TITLE: *Grup de recerca en matematica col.laborativa del CRM (CRM research group on collaborative mathematics)*
FUNDING BODY: AGAUR (Catalan government)
GRANT NUMBER: 2014SGR1307
PI: Alvaro Corral (CRM)
DURATION: 3 years.
VALUE: 25800 Euros

PROJECT TITLE: *Kidney integration software: developing a new tool for diagnostic and decision making treatments for kidney tumours*
FUNDING BODY: MINECO (Spanish government)
GRANT NUMBER: EUIN2013-51201
PI: Anna Messeguer (Vall d'Hebron Institute of Research)
DURATION: 2 year.
VALUE: 23000 Euros

PROJECT TITLE: *Vascular tissue modelling environment*
FUNDING BODY: European Union under the Virtual Physiological Human program (7th framework).
GRANT NUMBER: Tba
PI: Markus R. Owen, University of Nottingham, UK
DURATION: 1 year.
VALUE: 69000 Euros

PROJECT TITLE: *Angiogenesis in Diabetic Retinopathy: Integrating Experiment into Modelling dynamics*
FUNDING BODY: Portuguese government.
GRANT NUMBER: PTDC/SAU-ENB/110354/2009
PI: Rui Travasso, University of Coimbra, Portugal
DURATION:.
VALUE: 135340 Euros

PROJECT TITLE: *Modelización y análisis matemático de fenómenos no-lineales en teoría cinética de EDPs* con origen en bio-medicina (dinámica tumoral y vías de señalización) y astrofísica
FUNDING BODY: Spanish Government. Ministerio de Ciencia en Innovación (MICINN)
GRANT NUMBER: MTM2008-05271
PI: Juan Soler Vizcaíno, Departament of Applied Mathematics, Universidad de Granada
DURATION: 01-01-2009 to 31-12-2011
VALUE:

PROJECT TITLE: *Grup de Recerca Consolidat en Equacions en Derivades Parcials i Applicacions de la UAB-UPC-UdG*
FUNDING BODY: Catalan government within the program: Grup de recerca consolidat en el marco del IV Pla de Recerca de Catalunya (2009-2013), 2009SGR345,
GRANT NUMBER: 2009SGR345
PI: José Antonio Carrillo de la Plata, Departament of Mathematics, Universitat Autonòma de Barcelona
DURATION:.
VALUE: 83200 Euros
