Dr Claire Miller

Aotearoa Fellow
Auckland Bioengineering Institute, University of Auckland

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Qualifications

PhD
Feb. 2016–Feb. 2020
Completion date: Jul. 2020
Conferral date: Dec. 2020

Mathematics and Statistics, University of Melbourne, Australia
Thesis: Understanding the regulation of epidermal tissue thickness by cellular and subcellular processes using multiscale modelling.
Supervisors: A/Prof. James Osborne, Prof. Edmund Crampin.

Bachelor of Engineering
2009–2012

University of Adelaide, Australia
(Computational and Mechanical) with First Class Honours

Research Appointments

Aotearoa Fellow
Aug. 2022–Current

Auckland Bioengineering Institute, University of Auckland, New Zealand
Project: Multiscale modelling of endometriosis lesion onset and growth

Postdoctoral Researcher
Apr. 2020–Apr. 2022

University of Amsterdam, Netherlands (remote from Australia)
In silico clinical trials for acute ischemic stroke (INSIST Project), Computational Science Lab

CSIRO Graduate Fellow
Jul. 2013–Jan. 2016

CSIRO, Melbourne, Australia
Bushfire spread prediction, computational modelling and software group

Fellowships and Awards

Aotearoa Fellowship
2022

Auckland Bioengineering Institute | Four-year fellowship as listed under research appointments.

Early Career Researcher Travel Grant
2023

Society for reproductive biology | Co-recipient with Dr Meaghan Griffiths. Travel grant to fund a visit with Dr Griffiths in Melbourne.

Lift-off Fellowship
2020

Australian Mathematical Society | Funding to cover six weeks of writing PhD papers between thesis submission and the start of postdoctoral position.

T.M. Cherry Prize
2017

ANZIAM Conference | Award for the best student presentation at ANZIAM.

RTP PhD Scholarship
2016–2019
University of Melbourne, Australia
Australian Government Research Training Program (RTP) Scholarship.

Teaching

Tutoring
2018 Sem. 1/2
University of Melbourne | Mathematics for Biomedicine course, School of Mathematics and Statistics, The University of Melbourne.

Computer Lab. Demonstrator
2017 Sem. 2/2018 Sem. 1
University of Melbourne | Systems Biology course, Biomedical Engineering, The University of Melbourne.

Supervision

PhD
2023-Current
Primary Supervisor
Co-supervisor: A/Prof. Alys Clark, Auckland Bioengineering Institute
Project: Using agent-based modelling to understand vascular-tissue coupling in endometrium and endometriosis lesions.

Masters
2023-Current
Co-Supervisor
Primary supervisor: A/Prof. Alys Clark, Auckland Bioengineering Institute
Project: Variation in form and function of the non-pregnant uterus.

Masters
2022-2023
Co-Supervisor
Primary supervisor: A/Prof. James Osborne, University of Melbourne
Project: A multicellular model of the endometrium.

Summer research student
2023-2024
Primary Supervisor
Co-supervisor: A/Prof. Alys Clark, Auckland Bioengineering Institute
Project: Mathematical modelling of epithelial cell polarity in the endometrium.

Peer Reviewed Journal Articles

[1] Anthony W. Waddle, Simon Clulow, Amy Aquilina, Erin L. Sauer, Shannon W. Kaiser, **Claire Miller**, et al. “Hotspot shelters enable frogs to survive chytridiomycosis and stimulate resistance”. In: *Under Review, Nature* (2024).

[2] **Claire Miller**, Praneeta Konduri, Sara Bridio, Giulia Luraghi, Nerea Arrarte Terreros, Nikki Boodt, et al. “In Silico Thrombectomy Trials for Acute Ischemic Stroke”. In: *Computer Methods and Programs in Biomedicine* 228 (2023), p. 107244. ISSN: 0169-2607. DOI: 10.1016/j.cmpb.2022.107244.

[3] **Claire Miller**, Edmund Crampin, and James M. Osborne. “Multiscale modelling of desquamation in the interfollicular epidermis”. In: *PLOS Computational Biology* 18.8 (Aug. 29, 2022), e1010368. DOI: 10.1371/journal.pcbi.1010368.

[4] Giulia Luraghi, Sara Bridio, **Claire Miller**, Alfons Hoekstra, Jose Felix Rodriguez Matas, and Francesco Migliavacca. “Applicability Analysis to Evaluate Credibility of an in Silico Thrombectomy Procedure”. In: *Journal of Biomechanics* 126 (Sept. 2021), p. 110631. DOI: 10.1016/j.jbiomech.2021.110631.

[5] **Claire Miller**, Edmund Crampin, and James M. Osborne. “Maintaining the Proliferative Cell Niche in Multicellular Models of Epithelia”. In: *Journal of Theoretical Biology* 527 (Oct. 2021), p. 110807. DOI: 10.1016/j.jtbi.2021.110807.

[6] **Claire Miller**, Raymond M. Padmos, Max van der Kolk, Tamás I. Józsa, Noor Samuels, Yidan Xue, et al. “In Silico Trials for Treatment of Acute Ischemic Stroke: Design and Implementation”. In: *Computers in Biology and Medicine* 137 (Oct. 2021), p. 104802. DOI: 10.1016/j.compbiomed.2021.104802.

[7] **Claire Miller**, Matt Plucinski, Andrew Sullivan, Alec Stephenson, Carolyn Huston, Kay Charman, et al. “Electrically Caused Wildfires in Victoria, Australia Are over-Represented When Fire Danger Is Elevated”. In: *Landscape and Urban Planning* 167 (Nov. 2017), pp. 267–274. DOI: 10.1016/j.landurbplan.2017.06.016.

[8] Mahesh Prakash, James Hilton, **Claire Miller**, Vincent Lemiale, Raymond Cohen, and Yunze Wang. “Remote Sensing and Physical Modeling of Fires, Floods, and Landslides”. In: *Oxford Research Encyclopedia of Natural Hazard Science* (Oct. 2017). DOI: 10.1093/acrefore/9780199389407.013.27.

[9] James E. Hilton, **Claire Miller**, Jason J. Sharples, and Andrew L. Sullivan. “Curvature Effects in the Dynamic Propagation of Wildfires”. In: *International Journal of Wildland Fire* 25.12 (Oct. 2016), pp. 1238–1251. DOI: 10.1071/WF16070.

[10] James E. Hilton, **Claire Miller**, and Andrew L. Sullivan. “A Power Series Formulation for Two-Dimensional Wildfire Shapes”. In: *International Journal of Wildland Fire* 25.9 (July 2016), pp. 970–979. DOI: 10.1071/WF15191.

[11] James E. Hilton, **Claire Miller**, Andrew L. Sullivan, and Chris Rucinski. “Effects of Spatial and Temporal Variation in Environmental Conditions on Simulation of Wildfire Spread”. In: *Environmental Modelling & Software* 67 (May 2015), pp. 118–127. DOI: 10.1016/j.envsoft.2015.01.015.

Peer Reviewed Conference Proceedings

[1] **Claire Miller**, Max van der Kolk, Raymond Padmos, Tamás Józsa, and Alfons Hoekstra. “Uncertainty Quantification of Coupled 1D Arterial Blood Flow and 3D Tissue Perfusion Models Using the INSIST Framework”. In: *Computational Science – ICCS 2021*. Lecture Notes in Computer Science. Cham: Springer International Publishing, 2021, pp. 691–697. DOI: 10.1007/978-3-030-77980-1_52.

[2] Max van der Kolk, **Claire Miller**, Raymond Padmos, Victor Azizi, and Alfons Hoekstra. “Des-Ist: A Simulation Framework to Streamline Event-Based In Silico Trials”. In: *Computational Science – ICCS 2021*. Lecture Notes in Computer Science. Cham: Springer International Publishing, 2021, pp. 648–654. DOI: 10.1007/978-3-030-77967-2_53.

[3] James Hilton, **Claire Miller**, Matt Bolger, Lachlan Hetherton, and Mahesh Prakash. “An Integrated Workflow Architecture for Natural Hazards, Analytics and Decision Support”. In: *Environmental Software Systems. Infrastructures, Services and Applications*. IFIP Advances in Information and Communication Technology. Springer International Publishing, 2015, pp. 333–342. DOI: 10.1007/978-3-319-15994-2_33.

[4] **Claire Miller**, James Hilton, Andrew Sullivan, and Mahesh Prakash. “SPARK – A Bushfire Spread Prediction Tool”. In: *Environmental Software Systems. Infrastructures, Services and Applications*. Vol. 448. Cham: Springer International Publishing, 2015, pp. 262–271. DOI: 10.1007/978-3-319-15994-2_26.

[5] Gary W. Delaney, James E. Hilton, Paul W. Cleary, and **Claire Miller**. “The Role of Inter-Grain Friction in Determining the Mechanical and Structural Properties of Superellipsoid Packings”. In: vol. 1542. 1. American Institute of Physics, June 2013, pp. 361–364. DOI: 10.1063/1.4811942.

Invited talks

[1] Keynote Frontiers of Mathematical Biology: A workshop honouring Prof Edmund Crampin, November 2022.
[2] Melbourne Mathematical Biology Seminar Series, University of Melbourne, July 2022.
[3] Minisymposia talk Annual Meeting of the Society for Mathematical Biology (SMB) 2021.

Community Engagement and Outreach

ECM Rep, ANZIAM Exec. Committee 2023-Current	I am currently the Early Career Mathematician Representative on the ANZIAM Executive Committee. In this role I organised a 2 half-day early career researcher workshop at the 2024 ANZIAM conference.
Memberships	I am a member of the following scientific communities: - New Zealand Mathematical Society (NZMS) - Australia and New Zealand Industrial and Applied Mathematics (ANZIAM) - European Society for Mathematical and Theoretical Biology (ESMTB)
Science Outreach	I actively participate in many science outreach activities including: - An interview with Ready Steady Learn, 95bFM, a student radio station at the University of Auckland (2023). - Presenting on Mathematical Biology at the University of Melbourne micro-mathematicians: a program for high achieving school-aged children (2022). - Developing/running a workshop in Mathematical Biology for international high school students as part of the World Mathematics Championships (2019). - Presenting at epidemiology workshop for the ConocoPhilips Science Program. - Presenting at the University of Melbourne CHOOSEMATHS Day (2018). - Other presentations at grad expos, high school workshops, interviews in university webinars, filming for undergraduate course planning videos, and career panels.