Clinton H. Durney

675 West 10th Ave., Vancouver, BC, V5Z 1L3
cdurney@bccrc.ca https://clintondurney.github.io

EDUCATION

The University of British Columbia, Vancouver, BC, Canada

Ph.D. Applied Mathematics, 2020

Dissertation: *Applications of vertex modelling to epithelial morphogenesis*

Advisor: Prof. James J. Feng

The Ohio State University, Columbus, OH, USA

M.S. Mathematics, 2013

Thesis: *A two-component model for bacterial chemotaxis*

Virginia Polytechnic and State University (Virginia Tech), Blacksburg, VA, USA

B.S. Physics, 2011

B.S. Mathematics, 2011

RESEARCH EXPERIENCE

BC Cancer Research Institute, Vancouver, BC, Canada

Research Methodologist, Integrative Oncology 2023–

University of Michigan, Ann Arbor, MI, USA

Affiliate Scientist, School of Public Health, Epidemiology Department 2023–

John Innes Centre, Norwich, UK

Visiting Research Scientist, Computational and Systems Biology 2023–2024

Postdoctoral Scientist, Computational and Systems Biology 2020–2023

The University of British Columbia, Vancouver, BC, Canada

Graduate Research Assistant, Department of Mathematics 2015–2020

The Ohio State University, Columbus, OH, USA

Graduate Research Assistant, Department of Mathematics 2011-2013

Virginia Tech, Blacksburg, VA, USA

Research Assistant, Department of Physics 2010-2011

RESEARCH GRANTS

- 2U54CA229974 (09/01/2024 - 08/31/2025) $40,000 USD
  National Institutes of Health (NIH), National Cancer Institute and Food and Drug Administration (FDA)
  Understanding the Role of Social Network Dynamics on Adolescent Tobacco and Nicotine Use
  Role: Principal Investigator

TEACHING EXPERIENCE

University of British Columbia, Department of Mathematics

Graduate Teaching Assistant 2015–2020

· Facilitated and taught workshops in calculus, multivariable calculus, vector calculus, differential equations, and mathematical computing (Python and Matlab)

· Developed and coded WebWork questions for applied linear algebra

MATH 599 Mathematics Teaching Techniques - Participant in graduate level course specialized for teaching mathematics at the post-secondary level 2018

Instructional Skills Workshop - Certificate (accredited by UBC) obtained through participating in workshop on teaching practice, theory application, and topical sessions aimed at those teaching mathematics. 2017

Varee International School, Chiang Mai, Thailand

Instructor, A and AS Level Physics and Mathematics 2013–2015

· Taught to the Cambridge International Examinations (CIE) qualifications

· Taught Pure Mathematics 1-3, Statistics 1, and Mechanics 1 syllabi

· Managed a multicultural and internationally diverse classroom

The Ohio State University, Department of Mathematics

Graduate Teaching Assistant 2011-2013

· Recitation leader for calculus, business calculus and mathematical modeling for the life sciences

· Tutor in the Mathematics Learning Center

AWARDS

- Stanley M. Grant Scholarship in Mathematics, UBC, 2019
- International Tuition Award, UBC, 2015-2020
- Faculty of Science PhD Tuition Award, UBC, 2015-2020
- Daniel C. And Delia F. Grand Scholarship, Virginia Tech, 2009
- Richard C. Coleman Scholarship, Virginia Tech, 2008

PROFESSIONAL TRAINING

- Simulation Modeling of Tobacco Use, Summer Session in Epidemiology, University of Michigan, July, 2024
- Multiscale Modeling of Plant Growth, Pattern Formation and Actuation, BIRS Casa-Matemática Oaxaca (BIRS-CMO) Workshop, 2022
- Early Career Researchers Peer Review Program, Nature Publishing Group, 2021
- Bridging Cellular and Tissue Dynamics from Normal Development to Cancer: Mathematical, Computational, and Experimental Approaches, BIRS Workshop, 2019
- Stochastic and Deterministic Modelling with PDEs, Pacific Institute for the Mathematical Sciences (PIMS) Workshop, 2017
- Stochastics Applied to Biological Systems, Mathematical Biosciences Institute (MBI-NIMBioS-CAMBAM) Workshop, 2012
- Evolution Equations: A Workshop in honor of Terence Tao, Northwestern University, 2012
- SAMSI Undergraduate Workshop, The Statistical and Applied Mathematical Sciences Institute (SAMSI), 2011

PUBLICATIONS (* indicates equally contributing authors)

1. **Durney, C.H.**, Meza, R., Xu, K., Levy D.T., Friedman, A., Recent Trends in Nicotine Product Use by Flavor. *Submitted* (2024)
2. Wilson, M.J., McGregor, S., **Durney, C.H.**, Tomkins, M., Armand, J., Smith, R.S., Gray, J.E., Morris, R.J., Fleming, A.J., Symplastic guard cell connections buffer pressure fluctuations to promote stomatal function in grasses. *The New Phytologist* 246.1 (2025)

3. ***Durney, C.H.**, *Wilson, M.J., McGregor, S., Armand, J., Smith, R.S., Gray, J.E., Morris, R.J., Fleming, A.J. Grasses exploit geometry to achieve improved guard cell dynamics. *Current Biology* 33.13 (2023)
4. Ashour, D.J., **Durney, C.H.**, Herrero, V.J.P., Stevens, T.J., Feng, J.J., and Röper, K. Zasp52 strengthens whole embryo tissue integrity through supracellular actomyosin networks. *Development* 201238 (2023)
5. Carrol, S. Amsbury, S., **Durney, C.H.**, Smith, R.S., Morris, R.J., Gray, J.E., and Fleming, A.J. Altering arabinans increases *Arabidopsis* guard cell flexibility and stomatal opening. *Current Biology* 32.14 (2022)
6. **Durney, C.H.**, and Feng J.J. A three-dimensional vertex model for *Drosophila* salivary gland invagination. *Physical Biology* 18 046005 (2021)
7. **Durney, C.H.**, Harris T.J.C, and Feng J.J. Dynamics of PAR proteins explain the oscillation and ratcheting mechanisms in dorsal closure. *Biophysical journal* 115.11 (2018)
8. **Durney, C.H.**, Case, S.O., Pleimling, M., and Zia, R.K.P. Stochastic evolution of four species in cyclic competition. *Journal of Statistical Mechanics: Theory and Experiment* 2012.06 (2012)
9. **Durney, C.H.**, Case, S.O., Pleimling, M., and Zia, R.K.P. Saddles, arrows, and spirals: deterministic trajectories in cyclic competition of four species. *Physical Review E* 83.5 (2011)
10. Case, S.O., **Durney, C.H.**, Pleimling, M., and Zia, R.K.P. Cyclic competition of four species: Mean-field theory and stochastic evolution. *EPL (Europhysics Letters)* 92.5 (2011)

SELECTED PRESENTATIONS (* indicates invited)

- *Recent trends in nicotine product use by flavor*, Society for Research on Nicotine and Tobacco (SRNT) Annual Meeting, New Orleans, LA, 2025
- **Practical implementation of outdoor air pollution exposure measurement for lung cancer risk assessment*, 2024 World Conference on Lung Cancer, San Diego, CA, 2024
- **Grasses exploit geometry to achieve improved guard cell dynamics*, John Innes Centre-The Sainsbury Laboratory Annual Science Meeting, Norwich, UK, October, 2023
- **The mechanics of biological valves – how plants regulate photosynthesis in grasses*, UBC Botany Seminar, Vancouver, BC, April, 2023
- *An imaging and FEM study into the mechanics of biological valves – how plants regulate photosynthesis in grasses*, Physics of Life, Harrogate, UK, March, 2023
- **Revisiting the "mechanical advantage" of subsidiary cells in grass stomata*, BIRS-CMO, Oaxaca, MX and Virtual, 2022
- *Shape-Shifting Stomata: Mechanical Interactions of Grass Stomata*, Plant Biomechanics Conference, Lyon, France 2022
- *Mechanical interactions of graminoid (grass) stomata*, Computational and Systems Biology Seminar, JIC, Norwich, UK, 2022
- **Quantifying cellular contributions to Drosophila salivary gland invagination*, Society for Mathematical Biology (SMB) Annual Meeting, Virtual Conference, 2020
- *3D modelling of Drosophila salivary gland invagination*, Mathematical Biology Seminar, University of British Columbia, Vancouver, BC, 2020
- *Dynamics of PAR proteins explain oscillation and ratcheting mechanisms in Drosophila dorsal closure*, Society for Mathematical Biology (SMB) Annual Meeting, Montreal, Quebec, 2019
- *Dynamics of PAR proteins explain oscillation and ratcheting mechanisms in Drosophila dorsal closure*, Frontiers in Biophysics, Simon Fraser University, Vancouver, BC, 2019
- *Translocation and interaction of PAR proteins explain oscillation and ratcheting mechanisms during Drosophila dorsal closure*, APS March Meeting, Los Angeles, CA, 2018
- *A proposed mechanochemical process for Drosophila dorsal closure*, UBC Mathematical Biology Seminar, University of British Columbia, Vancouver, BC, 2017
- *Four species in cyclic competition: mean-field and stochastic results*, Workshop for Young Researchers in Mathematical Biology, Mathematical Biosciences Institute, Columbus, OH, 2011

- *Mean-field theory of four species in cyclic competition*, APS March Meeting, Dallas, TX, 2011
- *Mean-field Theory (MFT) predictions for four species in cyclic competition*, 104th Statistical Mechanics Conference, Rutgers University, New Brunswick, NJ, 2010

REVIEWER

- Canada Research Chairs
- PLOS Computational Biology
- Biophysical Journal
- The Plant Journal
- PLOS One
- Quantitative Plant Biology
- Bioinspiration & Biomimetics

PROFESSIONAL MEMBERSHIP

- Society for Research on Nicotine and Tobacco
- International Association for the Study of Lung Cancer (IASLC)