

Kathleen Mary Curtius

Curriculum Vitae

University of California, San Diego
Division of Biomedical Informatics
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Areas of Expertise

- General:** Mathematical and Computational Biology, Stochastic Processes,
Data Science, Biostatistics, Cancer Evolution and Epidemiology
- Emphasis:** Multiscale Cancer Modeling, Translational Bioinformatics,
Cancer Screening, Early Detection, Epigenetic Aging

Qualifications

- Ph.D. in Applied Mathematics, University of Washington, Seattle *Aug 2015*
Thesis: *Multiscale Modeling of Esophageal Adenocarcinoma*
Advisor: E. Georg Luebeck
- M.S. in Applied Mathematics, University of Washington, Seattle *June 2011*
Graduated Magna Cum Laude
Master's Presentation: *Period Three Implies Chaos*
- B.S. in Mathematics with Highest Honors, University of California, Los Angeles *June 2010*
Graduated Summa Cum Laude
Thesis: *Geographic Profiling of Criminal Activity in Los Angeles using Lévy Flights*
Advisor: George Mohler

Academic Position History

University of California, San Diego

- Assistant Professor, Department of Medicine, *Biomedical Informatics* *July 2020 - Present*
- Associate Member, Moores Cancer Center, *Cancer Control Program* *Aug 2020 - Present*

Centre for Genomics & Computational Biology, Barts Cancer Institute

- UK Research Initiative (UKRI) Rutherford Research Fellow *Feb 2018 – June 2020*
- Postdoctoral Research Fellow
Evolution and Cancer Laboratory, Supervisor: Trevor A. Graham *May 2016 – Feb 2018*

Division of Gastroenterology, Department of Medicine, University of Washington

- Senior Research Fellow, Supervisor: John M. Inadomi *2015 – 2016*

Public Health Sciences Division, Fred Hutchinson Cancer Research Center

- Postdoctoral Research Fellow Affiliate, Supervisor: E. Georg Luebeck *2015 – 2016*

Department of Applied Mathematics, University of Washington

- National Science Foundation (NSF) Graduate Research Fellow *2011 – 2014*
- Teaching Assistant *Fall 2010*

Funding and Fellowship History

- American Gastroenterological Association Research Scholar Award (PI) *July 2022 - July 2025*
Project title: *Optimizing gastrointestinal cancer screening and surveillance using mathematical modeling*
- Amy Sobel Foundation Award (PI) *Jan 2022 - Dec 2023*
Project title: *Developing biomarkers of colorectal cancer risk in North American patients with inflammatory bowel disease using shallow whole genome sequencing.*
- San Diego Digestive Disease Research Center Pilot & Feasibility Award (PI) *Jan 2022 - Jan 2023*
Project title: *Molecular biomarkers for colitis-associated colorectal cancer in patients with inflammatory bowel disease*
- UCSD Health Sciences Academic Senate Grant (PI) *Jan 2022 - Jan 2023*
Project title: *Impact of microbial and genomic evolution on cancer risk in Barrett's esophagus*
- Cancer Research UK (CRUK) Early Detection Primer Award (co-PI) *Oct 2020 - Oct 2021*
Project title: *Understanding the molecular age of Barrett's oesophagus in a population-representative sample of patients spanning paediatric to older age groups*
Co-PI: Prof. Helen Coleman, Queen's University Belfast, Northern Ireland, UK
- CRUK Early Detection Project Award (co-I) *Mar 2020 - Mar 2023*
Project title: *Molecular biomarkers to predict progression of Barrett's Oesophagus (BO) to Oesophageal Adenocarcinoma (OAC)*
PI: Dr. Richard Turkington, Queen's University Belfast, Northern Ireland, UK
- CRUK City of London Centre Development Fund Award (co-I) *Mar 2020 - Mar 2021*
Project title: *Tracing and timing pre-cancerous clonal dynamics in normal tissues*
PI: Dr. Marnix Jansen, University College London
- UKRI/Health Data Research UK Rutherford Research Fellowship *Feb 2018 - Nov 2021*
- National Institutes of Health (NIH) T32 Postdoctoral Gastroenterology Fellowship *2016*
* awarded at UW GI, declined to accept Barts Cancer Institute postdoctoral offer
- NSF Graduate Research Fellowship *2011 - 2014*
- NSF Research Experience for Undergraduates (REU) Fellowship *Summer 2009*

Awards

- QMUL Life Sciences Initiative - Centre for Computational Biology Showcasing Award *2017*
- Society for Experimental Biology (SEB) Cell Symposium Early Career Travel Award *2016*
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) R13 Travel Award *2016*
- Society of Industrial and Applied Mathematics (SIAM) Life Sciences Poster Award *2012*

Publications

Preprints

27. Lu B, **Curtius K**, Graham TA, Yang Z, Barnes CP. (2022) CNETML: Maximum likelihood inference of phylogeny from copy number profiles of spatio-temporal samples, bioRxiv doi:10.1101/2022.03.18.484889 (under review)
26. Ghosh P, Laub D, Campos VJ, Vo DT, Guccione C, et al. (2022) AI-assisted Discovery of an Ethnicity-influenced Driver of Cell Transformation in Esophageal and Gastroesophageal Junction Adenocarcinomas. bioRxiv doi: 10.1101/2022.01.30.478408 (in revision)
25. Talwar J, Laub D, Pagadala M, Castro A, Lewis M, et al. (2021) Autoimmune Alleles at the Major Histocompatibility Locus Modify Melanoma Susceptibility. bioRxiv doi: 10.1101/2021.08.12.456166 (submitted)

Journal Articles

24. Ma SD, Guccione C, Linnemeyer K, Weissbrod PA, **Curtius K**, et al. (2022) Oral Microbiome Diversity Between Patients with Normal vs Elevated Salivary Pepsin Levels and its Implication in Gastroesophageal Reflux Disease. Foregut (provisionally accepted)
23. Guo Q, Lakatos E, Al Bakir I, **Curtius K**, Graham TA, et al. (2022) The mutational signatures of formalin fixation on the human genome. Nat Commun (in press)
22. **Curtius K***, Kabir M*, Al Bakir I, Choi CHR, Hartono J et al. (2022) Multi-centre derivation and validation of a colitis-associated colorectal cancer risk prediction web-tool. Gut 71(4):705-715. * joint first authors
21. Sepich-Poore GD, Guccione C, Laplace L, Pradeu T, **Curtius K**, et al. (2022) Cancer's second genome: Microbial cancer diagnostics and redefining clonal evolution as a multispecies process. BioEssays e2100252. doi: 10.1002/bies.202100252.
20. **Curtius K**, Gupta S, Boland CR. (2022) Lynch Syndrome- a mechanistic and clinical practice update. Aliment Pharmacol Ther 00: 1–18. doi: 10.1111/apt.16826
19. Guccione C, Yadlapati R, Shah S, Knight R, **Curtius K**. (2021) Challenges in determining the role of microbiome evolution in Barrett's esophagus and progression to esophageal adenocarcinoma. Microorganisms 9(1):2003
18. **Curtius K**, Rubenstein JH, Chak A, Inadomi JM. (2021) Computational modelling suggests that Barrett's oesophagus may be the precursor of all oesophageal adenocarcinomas. Gut 70(8):1435-1440
17. Luebeck GE, Vaughan TL, **Curtius K**, Hazelton WD. (2021) Modeling historic incidence trends implies early field cancerization in esophageal squamous cell carcinoma. PLoS Comput Biol 17(5):e1008961
16. **Curtius K**, Dewanji A, Hazelton WD, Rubenstein JH, Luebeck GE. (2021) Optimal timing for cancer screening and adaptive surveillance using mathematical modeling. Cancer Res 81(4):1123-1134
15. Tamura N, Shaikh N, Muliaditan D, McGuinness J, Moralli D, Durin MA, Green CM, Bowtell D, Balkwill FR, **Curtius K**, McClelland SE. (2020) Mechanisms of Chromosomal Instability in High-grade Serous Ovarian Carcinoma. Cancer Res 80(22):4946-4959
14. Saunderson EA, Baker AM, Williams M, **Curtius K**, Jones JL, et al. (2020) A novel method of single strand library preparation for whole genome sequencing of formalin-fixed paraffin-embedded tissue samples. NAR Genomics and Bioinformatics 2(1); doi: <https://doi.org/10.1093/nargab/lqz017>

13. Baker AM*, Cross WC*, **Curtius K***, Al Bakir I*, Choi CHR*, et al. (2019) The evolutionary history of human colitis-associated colorectal cancer. *Gut* 68(6):985-995 *joint first authors
12. Rockne R, Hawkins-Daarud A, Swanson K, Sluka J, Glazier J, et al. (2019) The 2019 Mathematical Oncology Roadmap. *Phys Biol* 16:041005
11. Luebeck EG, Hazelton WD, **Curtius K**, Maden S, Yu M, et al. (2019) Implications of Epigenetic Drift in Colorectal Neoplasia. *Cancer Res* 79(3):495-504
10. Al Bakir I, **Curtius K**, Graham TA. (2018) From Colitis to Cancer: An Evolutionary Trajectory That Merges Maths and Biology. *Front Immunol* 9:2368
9. **Curtius K**, Wright NA, Graham TA. (2018) An evolutionary perspective on field cancerization. *Nat Rev Cancer* 18:19-32
8. Luebeck EG, **Curtius K**, Hazelton WD, Maden SK, Yu M, et al. (2017) Identification of a key role of widespread epigenetic drift in Barrett’s esophagus and esophageal adenocarcinoma. *J Clin Epigenet* 9(113):1-10
7. Kroep S*, Heberle C*, **Curtius K***, Lansdorp-Vogelaar I, Hazelton WD, et al. (2017) Radiofrequency Ablation of Barrett’s Esophagus Reduces Esophageal Adenocarcinoma Incidence and Mortality in a Comparative Modeling Analysis. *Clin Gastroenterol Hepatol* 15(9):1471-1474 *joint first authors
6. **Curtius K**, Wong C, Hazelton WD, Kaz AM, Chak A, et al. (2016) A Molecular Clock Infers Heterogeneous Tissue Age Among Patients with Barrett’s Esophagus. *PLoS Comput Biol* 12(5):e1004919
5. Hazelton WD, **Curtius K**, Inadomi JM, Vaughn TL, Meza R, et al. (2015) The role of gastroesophageal reflux and other factors during progression to esophageal adenocarcinoma. *Cancer Epidemiol Biomarkers Prev* 24(7):1012-1023
4. **Curtius K**, Hazelton WD, Jeon J, Luebeck EG. (2015) A Multiscale Model Evaluates Screening for Neoplasia in Barrett’s Esophagus. *PLoS Comput Biol* 11(5):e1004272
3. Kong CY, Kroep S, **Curtius K**, Hazelton WD, Jeon J, et al. (2014) Exploring the Recent Trend in Esophageal Adenocarcinoma Incidence and Mortality Using Comparative Simulation Modeling. *Cancer Epidemiol Biomarkers Prev* 23(6):997-1006
2. Luebeck EG, **Curtius K**, Jeon J, Hazelton WD. (2013) Impact of Tumor Progression on Cancer Incidence Curves. *Cancer Res* 73(3):1086-1096

Book Chapters

1. **Curtius K**, Wright NA, Graham TA. (2017) Evolution of Premalignant Disease, in *Cancer Evolution*, Swanton C, Bardelli A, Polyak K, Shah S, Graham TA, editors, Cold Spring Harbor Press.

Presentations (post PhD)

Invited Seminars

24. “Multistage models of cancer: making evolutionary sense of epidemiological data.” Centre International de Rencontres Mathématiques (CIRM), Marseille, FR *June 2022*
23. “Predicting future risk of colorectal cancer in patients with ulcerative colitis.” Digestive Diseases Center seminar, University of Chicago, Chicago, IL (virtual) *Mar 2022*

22. “Molecular biomarkers for colitis-associated colorectal cancer in patients with inflammatory bowel disease” San Diego Digestive Diseases Research Center Annual Symposium (virtual) *Feb 2022*
21. “Predicting future risk of colorectal cancer in patients with ulcerative colitis.” UCSD Biostatistics Quarterly Seminar (virtual) *Dec 2021*
20. “Copy number alterations predict colitis-associated colorectal cancer in patients with ulcerative colitis.” CRUK Grand Challenge Key Concepts (virtual) *Oct 2021*
19. “Tracking genomic biomarkers of pre-cancer evolution.” UCSD Moores Cancer Center: Cancer Control Program Annual Retreat, San Diego (virtual) *Sept 2021*
18. “Determining the age of Barrett’s esophagus using stochastic multiscale modeling and epigenetic clocks.” CRUK Cambridge Institute Quantitative Biology Seminar Series, Cambridge UK (virtual) *April 2021*
17. “Computational modeling of field cancerization to improve cancer control.” UCSD Moores Cancer Center Structural and Functional Genomics Cross-lab Meeting, San Diego (virtual) *Dec 2020*
16. “Inference of field cancerization using stochastic models to improve cancer control.” Computational Oncology Seminar Series, Memorial Sloan Kettering Cancer Center (virtual) *Dec 2020*
15. “Modeling field cancerization and tissue aging to improve screening and surveillance.” Biomathematics Seminar Series, UCLA Department of Computational Medicine (virtual) *Nov 2020*
14. “Quantitative Cancer Control Laboratory.” DBMI Annual Retreat, San Diego (virtual) *Oct 2020*
13. “Quantifying copy number evolution to predict colitis-associated cancer risk.” Moores Cancer Center Annual Retreat, UCSD Moores Cancer Center, San Diego (virtual): *Oct 2020*
12. “Making sense of the numbers: using math to improve early cancer prevention.” UCSD Moores Cancer Center Cancer Control Program Meeting, San Diego (virtual) *Oct 2020*
11. “Computational modeling of cancer evolution to optimize screening and surveillance.” Integrative Mathematical Oncology Seminar, Moffitt Cancer Center, FL (virtual) *Sept 2020*
10. “Quantifying and communicating colitis-associated cancer risk to patients and clinicians.” IBD City Wide Meeting, San Diego, CA (virtual) *Aug 2020*
9. “Catching cancer in the act: biologically-based models to optimize screening and surveillance.” UC Riverside Interdisciplinary Center for Quantitative Modeling in Biology (virtual) *May 2020*
8. “How did that get there? Modelling tissue age evolution of Barrett’s esophagus.” Mathematical Biology and Ecology Seminar Series, Oxford Mathematical Institute, Oxford, UK *Feb 2019*
7. “Spatial evolution of Barrett’s esophagus: insights from molecular clocks and mechanistic modelling.” Life Sciences Initiative Centre for Computational Biology Workshop, Queen Mary University of London, London UK *Nov 2018*
6. “Optimal adaptive design for cancer screening and surveillance using multiscale modelling.” Oslo Centre for Biostatistics and Epidemiology Seminar, University of Oslo, Norway *Feb 2018*
5. “Methylomic drift: a molecular clock for hidden biological aging.” Program for Evolutionary Dynamics Seminar, Harvard University, Cambridge, MA *May 2016*
4. “Beyond Chronological Age: using Bayesian Inference for hidden biological aging.” Spring Speaker Series 2016, Nathan Schock Center of Excellence in the Basic Biology of Aging, UW Healthy Aging and Longevity (HALo) Research Institute, Seattle, WA *April 2016*

3. “Bayesian inference of Barrett’s esophagus tissue age using a molecular clock.” Stochastic Modeling Group meeting, UW Department of Statistics, Seattle, WA *April 2016*
2. “Beyond Chronological Age: using Bayesian Inference for hidden biological aging.” Data Science Affinity Group Seminar, Fred Hutchinson Cancer Research Center, Seattle, WA *Mar 2016*
1. “Biological vs. Chronological Aging: a biomathematical study of Barrett’s esophagus.” Research Information Management Seminar, Department of Information Sciences, Beckman Research Institute, City of Hope, Duarte, CA *Feb 2016*

Conference Presentations

19. Session Talk: “Quantitative Cancer Control as a strategy for assessing and managing GI cancer risk.” Digestive Disease Week, San Diego, CA *May 2022*
18. Minisymposium Talk (invited): “Predicting Risk of Progression to Advanced Neoplasia in Patients with Ulcerative Colitis” in Mathematical approaches to advance clinical studies in oncology minisymposium. Society for Mathematical Biology Annual Meeting, UC Riverside (virtual) *June 2021*
17. Poster of Distinction: “Multi-centre validation of risk stratification for colitis patients with low grade dysplasia using UC-CaRE: a predictive clinical decision support tool.” Digestive Disease Week, Chicago, IL (virtual) *May 2020*
16. Talk: “Understanding and communicating colitis cancer risk to patients and clinicians.” European Union - Colitis cAncer Risk Estimation consortium (EU-CaRE), Vienna, Austria *Feb 2020*
15. Talk: “Shallow whole genome sequencing predicts future colorectal cancer risk in ulcerative colitis.” New Horizons in Genomics conference, London, UK *July 2019*
14. Talk (invited): “Optimal adaptive design for cancer screening using mathematical modeling: a case study in Barrett’s esophagus.” Cancer Intervention and Surveillance Modeling Network (CISNET) Mid-year Meeting, Seattle, WA *May 2019*
13. Distinguished Abstract Plenary Talk: “Quantifying evolution of early dysplastic lesions in ulcerative colitis predicts future colorectal cancer risk.” Digestive Disease Week, San Diego, CA *May 2019*
12. Future Leaders Proffered Talk: “Single Cell Clonal Diversity Predicts Progression to Esophageal Adenocarcinoma in Patients with High Risk Barrett’s Esophagus.” International Symposium on Oesophageal Cancer 2019, London, UK *May 2019*
11. Talk: “Spatial evolution of Barrett’s esophagus: insights from molecular clocks and mechanistic modelling.” BIRS-CMO Workshop: Mathematical challenges in the analysis of continuum models of cancer growth, evolution and treatment, Casa Matematica Oaxaca, Oaxaca, MX *Nov 2018*
10. Poster: “Quantifying evolution of early dysplastic lesions in ulcerative colitis predicts future colorectal cancer risk.” Early Detection of Cancer, Oregon Health Sciences University, Portland, OR *Oct 2018*
9. Minisymposium Talk (invited): “Optimal cancer screening regimes in gastrointestinal evolution using mathematical modelling” in Data-driven mechanistic cancer models minisymposium. Society for Mathematical Biology/ Japanese Society for Mathematical Biology Annual Meeting, University of Sydney, Australia *July 2018*
8. Talk: “Optimal adaptive design for Barrett’s esophagus screening and surveillance using multiscale modelling.” UK Conference on Multiscale Biology, University of Nottingham, UK *April 2018*
7. Talk (invited): “Mapping phenotype and genotype during colitis-associated neoplastic progression.” Centre for Computational Biology Networking Day, Queen Mary University of London, UK *July 2017*

6. Future Leaders Preferred Talk: “Widespread Epigenetic Drift in Barrett’s Esophagus: molecular clock and evolutionary force.” Cancer Research UK International Symposium on Oesophageal Cancer, Cambridge, UK *April 2017*
5. Talk: “Tissue Ageing and Cancer Risk: lessons from the methylome.” Society for Experimental Biology Cell Symposium, Oxford, UK *Sept 2016*
4. Poster: “Beyond Chronological Age: methylomic drift and biological aging in intestinal metaplasia.” James W. Freston Conference 2016, Chicago, IL *Aug 2016*
3. Talk: “Bayesian inference of Barrett’s esophagus tissue age using a molecular clock.” European Society for Mathematical and Theoretical Biology (ESMTB)/ SMB Meeting 2016, Nottingham, UK *July 2016*
2. Talk: “Methylomic Drift in EAC Progression.” Multiscale Modeling Mid-year Meeting, Massachusetts General Hospital, Boston, MA *May 2016*
1. Talk: “Barrett’s Esophagus Dwell Time: a new candidate biomarker.” CISNET Annual Meeting, National Cancer Institute, Rockville, MD *Nov 2015*

Professional Societies and Groups

- San Diego Digestive Diseases Research Center (SDDRC) member *2021 – Present*
- American Medical Informatics Association (AMIA) Member *2021 – Present*
- American Association for Cancer Research (AACR) Associate Member *2019 – Present*
- American Gastroenterology Association (AGA) Member *2018 – Present*
- Society for Mathematical Biology (SMB) Member *2010 – Present*
- QMUL Life Sciences Initiative Centre for Computational Biology (CCB) Member *2018 – 2020*
- NCI CISNET Esophagus Group Member *2011 – 2016*
- SIAM Student Chapter Member, University of Washington *2010 – 2015*
- Phi Beta Kappa National Honor Society Member *2010 – Present*

Professional Activities and Service

Conference Committees/Organizer

9. Organizing committee member: “Evolutionary Biology and Ecology of Cancer.” Wellcome Connecting Science Courses, Hinxton, UK *June 2022*
8. Course co-organizer: “Dynamics and Statistics of Cancer Evolution Research School.” Centre International de Rencontres Mathématiques (CIRM), Marseille, FR *June 2022*
7. Session organizer/moderator: Digestive Disease Week 2022, San Diego, CA *May 2022*
6. Organizing committee member: UCSD Moores Cancer Center: Cancer Control program retreat 2021. (virtual) *Sept 2021*
5. Program committee member: International Symposium on Mathematical and Computational Oncology. (virtual) *Oct 2020, 2021*

4. Symposium co-organizer : “Models of Cancer Evolution and Ecology.” Mathematical Models in Ecology and Evolution (MMEE), Lyon, France *July 2019*
3. Conference co-organizer: “New Horizons in Genomics.” QMUL, London, UK *1 - 5 July, 2019*
2. Minisymposium co-organizer: “Forecasting cancer evolution I & II: combining mathematical modelling and experimental/clinical data.” MMEE, London, UK *July 2017*
1. Minisymposium organizer: “Barrett’s Esophagus: biology, etiology, and cancer risk.” European Conference for Mathematical and Theoretical Biology (ECMTB), Nottingham, UK *July 2016*

Invited Journal Referee

- Nature Genetics, Gastroenterology, Cancer Research, American Journal of Gastroenterology, Nature Reviews Cancer, Clinical Gastroenterology and Hepatology, Risk Analysis, PLoS Computational Biology, Evolutionary Applications, Cancer Epidemiology Biomarkers and Prevention, Annals of the New York Academy of Sciences, European Biophysics Journal

Invited Grant Referee

- Veteran Affairs Special Emphasis Panel Ad-Hoc Reviewer *June 2021*
- Moores Cancer Center/Padres Pedal the Cause Team Science Award (\$250K each) *Dec 2020*
- UCSD KL2 Training Awards (up to \$360K each) *Fall 2020*
- CRUK City of London Center Development Fund Awards (\$33,000 each) *March 2019*

Departmental Leadership and Career Development

- Member, UCSD Bioinformatics and Systems Biology steering committee *April 2022 – Present*
- Member, UCSD Health Sciences EDI Ambassadors *Nov 2021– Present*
- Participant, UCSD National Center of Leadership in Academic Medicine (NCLAM) program *2021*
- Member, UCSD Bioinformatics and Systems Biology Admissions committee *July 2020 – Present*
- Member, UCSD Bioinformatics Diversity, Equity, and Inclusion committee *July 2020 – Present*
- Member, QMUL Institute of Applied Data Science Colloquia organizing committee *2018 – May 2020*
- Lab meeting leader: Evolution and Cancer Laboratory, Barts Cancer Institute *Oct 2016 – Feb 2018*
- Journal club leader: UW Mathematical Biology Journal Club *Sept 2011 – Winter 2014*
- Treasurer: SIAM Student Chapter, University of Washington *Sept 2010 – 2014*

Teaching Experience

- Instructor: MED 263 “Bioinformatics Applications to Human Disease”, UCSD *Winter 2022*
- Co-instructor: MED 278 “Cancer Genomics Journal Club”, UCSD *Fall 2021 – Present*
- Course lecturer: “ ‘Omics with an evolutionary perspective”, UCSD - DBMI Summer Internship Program *Summer 2021, 2022*

- Course lecturer: “Prediction Modeling and Clinical Decision Support”, UCSD
- CLRE 266: Comparative Effectiveness Research *Spring 2021, 2022*
- Guest Faculty reviewer, topic: “Cancer genomics and genetics”, UCSD
- MED 276: Grant Writing Course *Spring 2021*
- Course lecturer: “Cancer Genomics and Evolution”, UCSD
- MED 264: Principles of Biomedical Informatics *Fall 2020, 2021*
- Tutor (UK Instructor), Barts and The London School of Medicine and Dentistry, London:
- Problem-Based Learning: Human Science and Public Health Module *Spring 2019, Spring 2020*
- MRes course lecturer: “Cancer Modelling”, King’s College London:
- Molecular pathology of cancer, application in cancer diagnosis, screening and treatment *Jan 2019*
- Invited Tutor, Evolutionary Biology and Ecology of Cancer Advanced Course,
Wellcome Genome Campus Conference Centre, Hinxton, Cambridge, UK:
- “Evolutionary prognostics: Introduction to Multistage Models” *Summer 2018*
- Tutor, Barts and The London School of Medicine and Dentistry, London:
- Problem-Based Learning: Human Science and Public Health Module *Spring 2017, Spring 2018*
- MRes course lecture: “Math in cancer research”, King’s College London:
- Molecular pathology of cancer, application in cancer diagnosis, screening and treatment *Nov 2017*
- Teaching Assistant, University of Washington, Seattle:
- MATH 125: Calculus with Analytic Geometry II *Fall 2010*
- Academics in the Commons, Math/Science Tutor, University of California, Los Angeles:
-MATH 31A: Differential & Integral Calculus *Fall 2008*
-MATH 31B: Integration & Infinite Series *Winter 2009*

Students Supervised

- Brian Johnson: Bioinformatics and Systems Biology PhD student, UCSD (current)
PhD lab member (2022-Present)
Research rotation, Biomedical Informatics
Project: “*Neutral tumor evolution to date genetic clones*” *Fall 2021, Spring 2022*
- Phillip Pham: DBMI Summer Intern/ Summer Training Academy for Research Success (STARS)
Program student, UCSD
Project: “*Determining whole genome doubling in low-pass sequencing of ulcerative colitis*”
-Fullbright Scholarship *Summer 2021*
- Caitlin Guccione: Bioinformatics and Systems Biology PhD student, UCSD (current)
PhD lab member (co-advised with Dr. Rob Knight, 2021-Present)
Research rotation (co-advised with Dr. Rob Knight, Winter-Spring 2021)
Project: “*Modeling Evolution of Microbiome in Premalignant Barrett’s Esophagus*” *Spring 2021*
- McKenna Lewis: Computer Science major undergraduate, UCSD
CSE 199: “*Building molecular clocks in gastrointestinal precancers*” *Fall 2020*
- UCSD URS Chancellor’s Research Scholarship for Science and Engineering Award *Summer 2021*
- Daniel Muliaditan: MSc Cancer & Molecular and Cellular Biology, Barts and The London
Thesis: “*Exploring copy-number alterations in colitis-associated carcinogenesis*” *Summer 2018*
- Barts and the London Principal’s Prize for academic excellence
- Drapers’ Company Postgraduate Prize
- Current position: PhD student in Biomedical Engineering at A*star Genome Institute of Singapore

- Kristiana Grigoriadis: Oxford undergraduate math summer student, Barts and The London
Project: “*Mathematical modelling of the development of Barrett’s esophagus*” *Summer 2017*
- Wellcome Trust Biomedical Vacation Scholarship
- E J Ball Research Scholarship
- Current position: PhD student in Charles Swanton lab at the Francis Crick Institute, London, UK

Research Institutes and Workshops

- HDR-UK Propensity Score Workshop participant, University College London *Sept 2018*
- National Biomarker Development Alliance participant, Biodesign Institute, Tempe AZ *Oct 2017*
- Think Tank: Evolutionary Biomarkers: A Key Strategy for Precision Medicine
- UW Summer Institute in Statistics and Modeling in Infectious Diseases participant *July 2015*
- Stochastic Epidemic Models with Inference
- Markov Chain Monte Carlo I & II for Infectious Diseases

Professional Skills

- Proficient in Unix-based programming, High Performance Computing cluster use, bioinformatics script development, R, Shiny, MATLAB, Github, Maple, Mathematica, LaTeX, Microsoft Excel
- Proficient in Spanish reading and writing

Outreach and Engagement

- Bowel Cancer Awareness Month Article: “IBD and bowel cancer: Predicting patient risk,”
BCI News Article *April 2019*
- Kew Science Fair staff volunteer, London, UK *Aug 2017*
- Math Fair leader: UW student volunteer program for local elementary, Seattle, WA *Fall 2013*