

JEFFREY B. WEST

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RESEARCH INTERESTS

- Develop clinically-relevant evolutionary mathematical models of multiple drug adaptive cancer therapies.
- Develop agent-based models to better understand the impact of spatial competition in tumor heterogeneity.

CURRENT

H. Lee Moffitt Cancer Center & Research Institute Aug. 2017 - Present

Postdoctoral Researcher in Integrated Mathematical Oncology

- Advisor: Dr. A. R. A. Anderson

Mathematical Oncology Email Newsletter Dec. 2017 – Present

Founding Editor

The purpose of this weekly email is to consolidate the important updates in the field of mathematical oncology into one, distilled form of communication. These might be tweets, preprints, post-prints, or even blog posts.

EDUCATION

University of Southern California Aug. 2012 - Aug. 2017

Ph.D. & M.S. in Mechanical Engineering

- Advisor: Paul K. Newton
- *Computational tumor ecology: a model of tumor evolution, heterogeneity, and chemotherapeutic response*

Ohio Northern University Aug. 2008 - May 2012

B.S. in Mechanical Engineering

PREPRINTS

6. **J. West**, A. Anderson, 2020, “IsoMaTrix: a framework to visualize the isoclines of matrix games and quantify uncertainty in structured populations,” *BioRxiv*.
5. M. Damaghi, **J. West**, M. Robertson-Tessi, L. Xu, M. Ferrall-Fairbanks, P. Stewart, E. Persi, B. Fridley, P. Altrock, R. Gatenby, P. Sims, A. Anderson, R. Gillies, 2020, “Conditions Present in Early Breast Cancer Select for a Warburg Phenotype,” *BioRxiv*.
4. M. Strobl, **J. West**, J. Brown, R. Gatenby, P. Maini, A. Anderson, 2020, “Turnover modulates the need for a cost of resistance in adaptive therapy,” *BioRxiv*.
3. C. Gatenbee, **J. West***, M. Robertson-Tessi, A. Baker, N. Guljar, T. Graham, A. Anderson, 2018, “Macrophage-mediated immunoediting drives ductal carcinoma evolution: Space is the game changer,” *BioRxiv*.
2. R. Schenk, E. Kim, R. Bravo, **J. West**, D. Shibata, A. Anderson, 2019, “How Homeostasis Limits Keratinocyte Evolution,” *BioRxiv*.

1. **J. West**, R. Schenck, C. Gatenbee, M. Robertson-Tessi, A. Anderson, 2019 “Tissue structure accelerates evolution: premalignant sweeps precede neutral invasion.,” *BioRxiv*.

PEER REVIEWED JOURNALS

10. R. Bravo, E. Baratchart, **J. West**, R. Schenck, A. Miller, J. Gallaher, C. Gatenbee, D. Basanta, M. Robertson-Tessi, A. Anderson, 2018, “Hybrid Automata Library: A flexible platform for hybrid modeling with real-time visualization,” *PLOS Comp. Bio.*
9. **J. West**, L. You, J. Zhang, R.A. Gatenby, J. Brown, P.K. Newton, A. Anderson, 2020, “Towards multi-drug adaptive therapy,” *Cancer Research*.
8. **J. West**, M. Dinh, J. Brown, J. Zhang, A. Anderson, R. Gatenby, 2018, “Multidrug cancer therapy in metastatic castrate-resistant prostate cancer: An evolution-based strategy,” *Clinical Cancer Research*.
7. **J. West**, P.K. Newton, 2019, “Cellular interactions constrain tumor growth,” *Proceedings of the National Academy of Sciences*.
6. **J. West**, M. Robertson-Tessi, K. Luddy, D. Park, D. Williamson, C. Harmon, H. Khong, J. Brown, A. Anderson, 2018, “The immune checkpoint kick start: Optimization of neoadjuvant combination therapy using game theory,” *Journal of Clinical Oncology: Clinical Cancer Informatics*.
5. **J. West**, Y. Ma, P.K. Newton, 2017, “Capitalizing on Competition: An Evolutionary Model of Competitive Release in Metastatic Castrate Resistant Prostate Cancer Treatment,” *Journal of Theoretical Biology*.
4. **J. West**, P.K. Newton, 2017, “Chemotherapeutic dose scheduling based on tumor growth rates provides a case for low-dose metronomic high-entropy therapies,” *Cancer Research*.
3. **J. West**, Z. Hasnain, P.K. Newton, 2016, “The prisoner’s dilemma as a cancer model,” *Convergent Science: Physical Oncology*.
2. **J. West**, Z. Hasnain, P.K. Newton, 2016, “An evolutionary model of tumor cell kinetics and the emergence of molecular heterogeneity driving Gompertzian growth,” *SIAM Review*.
1. John-David Yoder, **J. West**, E. Baumgartner, M. Perrollaz, M. Seelinger, M. Robinson, 2013, “Experiments comparing precision of stereo-vision approaches for control of an industrial manipulator,” *Spring Tracts in Advanced Robotics Vol. 88 pp 245-256*.

TECHNICAL REPORTS

6. **J. West**, D. Park, C. Harmon, D. Williamson, P. Ashcroft, D. Maestrini, A. Ardaseva, R. Bravo, P. Sahoo, H. Khong, K. Luddy, M. Robertson-Tessi, 2017, “Evolutionary exploitation of PD-L1 expression in hormone receptor positive breast cancer,” *Biorxiv*.
5. E. Kim, R. Schenck, **J. West**, W. Cross, V. Harris, J. McKenna, H. Cho, E. Coker, S. Lee-Kramer, K. Tsai, E. Flores, C. Gatenbee, 2017, “Targeting the Untargetable: Predicting Pramlintide Resistance Using a Neural Network Based Cellular Automata,” *Biorxiv*.

4. **J. West**, P.K. Newton, 2017, "Optimizing chemo-scheduling based on tumor growth rates," *Mathematical Oncology Handbook*.
3. Y. Ma, **J. West**, P.K. Newton, 2017, "Competitive release in tumors," *Mathematical Oncology Handbook*.
2. **J. West**, M. Hromatka, M. Holt, S. Biaz., 2012, "A Fuzzy Logic approach to collision avoidance in smart UAVs," *Technical Report #CSSE12-05, Auburn University*.
1. **J. West**, P. Ling, P. Grewal, 2010, "Urban Food Production season extension techniques," *Internship Program (ORIP) Technical Report*.

* indicates co-first authorship

AWARDS

Body Engineering Los Angeles GK-12 Fellowship 2016
 Fellows improve their communication, teaching, teamwork, and public outreach skills through active collaboration with master teachers in local middle schools, advancing the education efforts relating to science, technology, engineering and math (STEM) education.

Tau Beta Pi Graduate Fellowship 2012
 Awarded on the basis of high scholarship, strong faculty recommendations, definite extracurricular contributions, unusual promise of substantial achievement through a definite plan or purpose, and a program through which accomplishment will advance the interest of the engineering profession.

TEACHING

Courses

USA 101: The United States: An American Culture Series Fall 2012, 2013, 2014

Lectures

AME 526: Engineering Analytical Methods February 9, 2015

AME 341b: Compressible Flow Dynamics April 7, 2014

AME 341b: Compressible Flow Dynamics April 1, 2013

Teaching Assistant

AME 525: Engineering Analytical Methods I Fall 2015

AME 525: Engineering Analytical Methods II Spring 2015, Fall 2016

AME 341b: Mechoptronics, Laboratory Part A Fall 2012, 2014

AME 341b: Mechoptronics, Laboratory Part B Spring 2013, 2014

CONFERENCES/TALKS

Mathematical Biology Seminar

- Invited Speaker: "Tissue structure accelerates evolution"

Duke University, Durham, North Carolina
 Oct 2019

- Society of Mathematical Biology Meeting** University of Montreal, Montreal, Canada
 • Talk: “Tissue structure accelerates evolution: premalignant sweeps precede neutral expansion” July 2019
- Mathematical Oncology Meeting** Oregon Health & Science University, Portland
 • Talk: “Tissue structure accelerates evolution: premalignant sweeps precede neutral expansion” May 2019
- Moffitt Scientific Symposium** Moffitt Cancer Center
 • Selected Speaker: “Tissue structure accelerates evolution” May 2019
- European Society for Math. and Theoretical Bio.** Univ. Lisbon, Portugal
 • Talk: “Cellular cooperation shapes tumor growth: a statistical mechanics approach” July 2018
 • Talk: “The immune checkpoint kick start: optimization of combination therapy”
- Mathematics of Life Colloquium** Mathematikon, Heidelberg, Germany
 • Invited Speaker: “Modeling the evolution of cancer from a game theoretic perspective” Feb. 2018
- Computational Genomics Summer Institute** UCLA, Los Angeles, CA
 • Flash talk: “Modeling evolutionary principles in anticancer therapy” Dec. 2017
- Biology and Medicine through Mathematics Conference** Virginia Commonwealth Univ., Richmond, VA
 • Talk: “Adaptive therapy: modeling evolutionary principles in anticancer therapy” May 2017
- Integrated Math Oncology Seminar** Moffitt Cancer Center, Tampa, FL
 • Postdoctoral Interview: “The Prisoner’s dilemma in cancer: chemotherapeutic dose scheduling” May 2017
- Center for Applied Molecular Medicine Departmental Seminar** Univ. of Southern California, CA
 • Talk: “The Prisoner’s dilemma in cancer: chemotherapeutic dose scheduling” April 2017
- European Society for Math. and Theoretical Bio.** Univ. Nottingham, Nottingham, U.K.
 • Talk: “The Prisoner’s dilemma as a cancer model” July 2016
- Southern California Applied Mathematics Symposium** Claremont Grad. Univ., Claremont, CA
 • Talk: “The Prisoner’s dilemma in cancer” June 2016
- Convergent Science Initiative in Cancer** Scripps Research Institute, La Jolla, CA
 • Talk: “The Prisoner’s dilemma in cancer” April 2016
- The Kuhn Laboratory Research Circle Seminar** The Bridge@USC, Los Angeles, CA
 • Talk: “The Prisoner’s dilemma in cancer” May 2016

CONFERENCE POSTERS

- Evolutionary Biology and Ecology of Cancer** Wellcome Genome Campus, Cambridge, UK
 • Flash talk / poster: “The immune checkpoint kick start: optimization of combination therapy” June 2018

Cancer Evolution and Ecology: Theory and Clinical Practice

St. Petersburg, FL

- Poster: “The immune checkpoint kick start: optimization of combination therapy”

May 2018

Understanding Cancer through Evolutionary Game Theory

Lorentz Center, Leiden, Netherlands

- Flash talk / poster: “The trade off between metastatic risk and tumor progression”

Jan. 2018

International Society for Evolution, Ecology and Cancer

Arizona State University, Tempe, AZ

- Flash talk / poster: “Sweeping through resistance: the impact of genetic instability on fixation”

Dec. 2017

RESEARCH EXPERIENCE

Auburn University

June - August, 2012

Research Intern, Computer Science Department

- *Supervisor*: Dr. Saad Biaz
- UAV Collision avoidance algorithms; ROS; fuzzy logic control

Ohio Northern University

April - June, 2012

Independent Research, Mechanical Engineering Department

- *Supervisor*: Dr. John-David Yoder
- Robotic arm manipulation; computer vision; error analysis

University of Southern California

June - August, 2011

Research Intern, Computer Science Department

- *Supervisor*: Dr. Maja Matari
- Human-robot-interaction; ROS; python; state machine controller

The Ohio State University

June - August, 2010

Research Intern, Ohio Agricultural Research and Development Center

- *Supervisor*: Dr. Peter Ling
- Local food production; growing season extension; energy storage; community gardens

The Ohio State University

June - August, 2009

Research Intern, Ohio Agricultural Research and Development Center

- *Supervisor*: Dr. Peter Ling
- Machine vision; error analysis; crop yield prediction
- Best Undergraduate Intern Summer Research Award