

Jeff Maltas, PhD

ASSITANT PROFESSOR OF BIOLOGY · UNIVERSITY OF MARYLAND

College Park, MD 20742

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Education

University of Michigan

Ann Arbor, MI

PHD BIOPHYSICS

2014 - 2020

Thesis title: “*The impact of collateral evolution on optimal dosing strategies and evolution on paired fitness landscapes.*”

Advisor: Kevin Wood

Miami University

Oxford, OH

MS PHYSICS

2012 - 2014

Thesis title: “*The spectral phasor approach as a tool for monitoring the autofluorescence of mitochondrial metabolism and its application to high pressure studies.*”

Advisor: Paul Urayama

Marquette University

Milwaukee, WI

BS PHYSICS

2008 - 2012

Advisor: Andrew Kunz

Employment and Research Experience

University of Maryland, College Park

College Park, MD

ASSISTANT PROFESSOR OF BIOLOGY

2026 - Present

Case Western Reserve University

Cleveland, OH

POSTDOCTORAL FELLOW, DEPARTMENT OF PHYSICS

2022 - 2026

Advisor: Michael Hinczewski

Cleveland Clinic Foundation

Cleveland, OH

POSTDOCTORAL FELLOW, TRANSLATIONAL HEMATOLOGY & ONCOLOGY RESEARCH

2020 - 2026

Advisor: Jacob Scott

University of Michigan

Ann Arbor, MI

GRADUATE STUDENT, DEPARTMENT OF BIOPHYSICS

2014-2020

Advisor: Kevin Wood

Miami University

Oxford, OH

GRADUATE STUDENT, DEPARTMENT OF PHYSICS

2012-2014

Advisor: Paul Urayama

Marquette University

Milwaukee, WI

UNDERGRADUATE RESEARCHER, DEPARTMENT OF PHYSICS

2010-2011

Advisor: Andrew Kunz

Publications

**co-first*; †*corresponding*;

PUBLICATIONS

- Schlachter, N.M., Guardiola Flores, K., Wood K., and **Maltas, J.**† Linezolid and levofloxacin: an uncommon pairing that suppresses evolution of resistance in *E. faecalis*. *FEMS Microbes*, **7**: xtaf020.
- King E.S., Stacy A.E., Weaver, D.T., **Maltas J.**, Barker-Clarke, R., Pelesko, J., Dolson, E., and Scott, J.G. Fitness seascapes are necessary for realistic modeling of the evolutionary response to drug therapy. *Science Advances*, **11-24**: eadv1268.

15. **Maltas, J.†**, Huynh, A., and Wood K. (2025). Dynamic collateral sensitivity profiles highlight opportunities and challenges for optimizing antibiotic sequences. *PLoS Biology*, **23** (1): e3002970.
14. **Maltas, J.†**, Tadele, D.S., Durmaz, D., McFarland, C.D., Hinczewski, M., and Scott, J.G.† (2024). Frequency-dependent ecological interactions increase the prevalence, and shape the distribution, of pre-existing drug resistance. *PRX Life* **2**, **023010** (2024). [Selected for quarterly cover image.](#)
 Selected for a Physics Magazine Viewpoint: Drug-Resistance Mutations Find Strength in Small Numbers (authored by Kirill Korolev).
13. Weaver, D.T., King, E.S., **Maltas, J.†**, and Scott, J.G.† (2024). Reinforcement Learning informs optimal treatment strategies to limit antibiotic resistance. *Proceedings of the National Academy of Sciences*, **121** (16) e2303165121.
12. ***Maltas, J.**, *Killarney, S.T., *Singleton, K.R., Strobl, M.A.R., Wood, K.C.†, and Wood K.† (2024). Drug dependence in cancer is exploitable by optimally constructed treatment holidays. *Nature Ecology & Evolution*, **8**: 147-162.
11. *Farrokhian, N., ***Maltas, J.**, Dinh, M., Durmaz, A., Ellsworth, P., Hitmoi, M., McClure, E., Marusyk, A., Kaznatcheev, A.†, and Scott, J.C.† (2022). Measuring competitive exclusion in non-small cell lung cancer. *Science Advances*, **8-26**: eabm7212.
10. **Maltas, J.**, McNally, D., and Wood, K. (2021). Evolution in alternating environments with tunable inter-landscape correlations. *Evolution*, **75-1**: 10-24.
9. Dean, Z., **Maltas, J.**, and Wood, K. (2020). Antibiotic interactions shape short-term evolution of resistance in *E. faecalis*. *PLoS Pathogens*, **16** (3): e1008278.
8. **Maltas, J.**, Krasnick, B., and Wood, K. (2019). Using selection by nonantibiotic stressors to sensitize bacteria to antibiotics. *Molecular Biology and Evolution*, doi:10.1093/molbev/msz303.
7. **Maltas, J.**, and Wood, K. (2019). Pervasive and diverse collateral sensitivity profiles inform optimal strategies to limit antibiotic resistance. *PLoS Biology*, **17** (10).
6. ***Maltas, J.**, *Palo, D., Wong, C.K., Stefan, S., O'Connor, J., Al Aayed, N., Gaire, M., Kinn, D., and Urayama, P. (2018). A metabolic interpretation for the response of cellular autofluorescence to chemical perturbations assessed using spectral phasor analysis. *RSC Advances*, **8**: 41526-41535.
5. Palo, D., **Maltas, J.**, Risal, L., and Urayama, P. (2017). Sensing NADH conformation using phasor analysis on fluorescence spectra. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, **186**: 105-111.
4. Karslake, J., **Maltas, J.**, Brumm, P., and Wood K. (2016) Population density modulates drug inhibition and gives rise to potential bistability of treatment outcomes for bacterial infections. *PLoS Computational Biology* **12** (10).
3. **Maltas, J.**, Amer, L., Long, Z., Palo, D., Oliva A., Folz, J., and Urayama, P. (2015). Autofluorescence from NADH conformations associated with different metabolic pathways monitored using nanosecond-gated spectroscopy and spectral phasor analysis. *Analytical Chemistry*, **87**: 5117-5124.
2. Long, Z., **Maltas, J.**, Zatt, M.C., Cheng, J., Alquist, E.J., Brest, A., and Urayama, P. (2015). The real-time quantification of autofluorescence spectrum shape for the monitoring of mitochondrial metabolism. *Journal of Biophotonics*, **8**:247-257.
1. **Maltas, J.**, Long, Z., Huff, A., Maloney, J., Ryan, J., and Urayama, P. (2014). A micro-perfusion system for use during real-time physiological studies under high pressure. *Review of Scientific Instruments*, **85**: 106106.

SUBMITTED

18. Huynh, A., Wood K., and **Maltas, J.†** Heterogeneous collateral effects in daptomycin-resistant *E. faecalis*. [Preprint link.](#)
19. Chen, P., Krishnan, N., Stacy, A., Weaver, D.T., Barker-Clarke, R., Hinczewski, M., **Maltas, J.†**, and Scott, J.G. Inverted topologies in sequential fitness landscapes enable evolutionary control. [Preprint link.](#) **Under revision: GENETICS**

Awards, Fellowships, & Grants

- 2020-2023 **NIH T32 Computational Genomic Epidemiology of Cancer Postdoctoral Fellowship**
- 2016 **Summer q-Bio Conference Travel Award**
- 2014 **Outstanding Graduate Student Researcher Award**
- 2013 **Golden Key International Honor Society Inductee**
- 2013 **Outstanding Graduate Student Teaching Award**
- 2012 **Sigma Pi Sigma National Physics Honors Society Inductee**
- 2010-2012 **Wisconsin Space Grant Consortium Undergraduate Scholarship**

Presentations

TALKS AND POSTERS

- 2023. Indian Creek Upper School STEM Seminar Series. Remote. (Talk + Q & A).
- 2021. Society for Mathematical Biology. Remote due to COVID-19. (Talk).
- 2018. Departmental Seminar. Ann Arbor, MI. (Talk).
- 2016. Summer Q-BIO. Vanderbilt, TN. (Talk).
- 2016. Summer Q-BIO. Vanderbilt, TN. (Poster).
- 2015. The Ohio-Region Sections of the American Physical Society. Detroit, MI. (Talk).
- 2015. The Biophysical Society's 59th Annual Meeting. Baltimore, MD. (Poster).
- 2014. The Biophysical Society's 58th Annual Meeting. San Francisco, CA. (Poster).
- 2013. The Ohio-Region Sections of the American Physical Society. Cincinnati, OH. (Poster).

Teaching Experience

- Fall 2013 **Introductory Physics I Lab**, Instructor, Outstanding Graduate Student Teaching Award
- Spring 2013 **Introductory Physics II Lab**, Instructor
- Fall 2012 **Introductory Physics I Lab**, Instructor
- Spring 2012 **Undergraduate Quantum Mechanics**, Teaching Assistant

Mentoring

† *led to co-authored paper*

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|-------------|------------------------------------------|-----------|------------------------------------------------------------------|
| 2024 - 2026 | † Peng Chen , Graduate Student | 2020-2022 | Julia Pelesko , Undergraduate and Post-Bacc |
| 2022 - 2026 | Donovan Wu , Undergraduate | 2018-2022 | † Anh Huynh , Graduate student |
| 2021 - 2024 | † Davis Weaver , Graduate Student | 2018-2019 | Parmida Davarmanesh , Undergraduate |
| 2021 - 2024 | † Eshan King , Graduate Student | 2014-2018 | † Brian Krasnick , Post-Bacc |
| 2021 - 2024 | Jackson Morris , Undergraduate | 2014-2015 | Zander Galluppi , Undergraduate, led to oral presentation |
| 2021-2022 | Matthew Froid , Post-Bacc | 2014-2015 | Victoria Wobser , Undergraduate, led to oral presentation |
| 2020-2022 | Kahjin Yap , High school | 2013-2014 | † Lana Amer , Undergraduate |

Outreach & Professional Development

REFEREE FOR

Proceeding of the National Academy of Sciences
eLife

PLoS Pathogens
PLoS Computational Biology
Molecular Biology and Evolution
Evolution Medicine and Public Health
Blood Cancer Research
Computational and Systems Oncology
Bulletin of Mathematical Biology
Nature Communications
Journal of Mathematical Biology

EDUCATIONAL AND SCIENTIFIC OUTREACH

Invited presentation: Indian Creek Upper School STEM Seminar Series. On the use of mathematics in biology research.
American Cancer Society Fight Back speech highlighting importance of scientific research.
Hosted free physics review sessions before every introductory physics exam. Over 100 attendees per session!
Volunteer at Hope House in Milwaukee, non-profit homeless shelter tutoring children of homeless parents.
Traveled to Milwaukee Public Schools performing physics experiments to generate scientific enthusiasm.