Christina Kelliher, Ph.D.

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Professional Appointments

2023 – Assistant Professor, University of Massachusetts Boston (UMB), Boston, MA

2022 Adjunct Professor (Fall Semester), Merrimack College, Andover, MA

2021 – 22 Teaching Fellow (Fall Semesters), Harvard University, Cambridge, MA

Education

2017 – 22 Postdoctoral Fellow, Geisel School of Medicine at Dartmouth, Hanover, NH
Advisors: Jay Dunlap and Jennifer Loros
Department of Molecular & Systems Biology

2011 – 17 Ph.D., Duke University, Durham, NC
Advisor: Steve Haase
University Program in Genetics & Genomics (UPGG)

2007 – 11 B.Sc., Gettysburg College, Gettysburg, PA
Advisor (3 years): Steve James
Biochemistry & Molecular Biology Major (*summa cum laude*)

Research

Independent Laboratory: University of Massachusetts Boston

- Model systems: *Neurospora crassa*; mammalian tissue culture
- Nutritional compensation, post-transcriptional regulation over circadian clock time, gene regulatory networks

Postdoctoral Research: Dunlap and Loros laboratories, Dartmouth

- Model systems: *Neurospora crassa*; mammalian tissue culture
- Discovered new mechanisms for how ~24-hour circadian rhythms are buffered from different nutrient levels in the environment
- Characterized multiple pathways for post-transcriptional regulation of a key circadian gene, Casein Kinase I

Graduate Research: Haase laboratory, Duke

- Model systems: *Saccharomyces cerevisiae*; *Cryptococcus neoformans*; *Plasmodium falciparum* and *Plasmodium vivax*
- Provided evidence for a functional circadian clock during infection cycles of human malaria parasites (*Plasmodium* species)

- Profiled cell division cycle gene expression using RNA-Sequencing and targeted mass spectrometry

Undergraduate Research: James laboratory, Gettysburg

- Model system: *Aspergillus nidulans*

Computational Skills: github.com/cmk35/

- Proficient in R, UNIX/Linux
- Conversant in Python, MATLAB, ImageJ macro scripting

Grant Support

R35GM157067 (NIGMS), Role: PI, 02/01/2025 – 01/31/2030

"Deciphering metabolic and cellular effectors of nutritional compensation in the circadian clock"

3 U54 CA156734-13S2 (NCI), Role: Co-PI, 09/2023 – 08/2025

"Administrative Supplements to Enhance Institutional Data Science Capacity"

Joseph P. Healey Research Grant Program (UMB), Role: PI, 07/01/2023 – 12/31/2024

"Mitochondrial function over circadian time in a model fungus"

JGI JBEI User Project 509670 (Dept. of Energy), Role: Co-PI, 03/27/2023 – 02/26/2026

"Understanding the depolymerized lignin utilization in fungi"

F32GM128252 (NIGMS), Role: PI, 11/22/2021 – 02/21/2022

Funded extension / administrative supplement to existing NIH grant (PA-20-272)

F32GM128252 (NIGMS), Role: PI, 11/22/2018 – 11/21/2021

"Genetic and Molecular Dissection of Regulatory Mechanisms Underlying Temperature and Nutritional Compensation of the Circadian Clock in *N. crassa*"

EMSL User Project 51318 (Dept. of Energy), Role: Co-PI, 10/01/2020 – 09/30/2022

"Towards a systems model of circadian control of gene function to regulate metabolic phenotype and cellulase production in *Neurospora crassa*"

EMSL User Project 50173 (Dept. of Energy), Role: Co-PI, 10/01/2018 – 09/30/2020

"Towards a metabolic model of circadian clock control of metabolism in *N. crassa*"

Professional Awards & Honors

2022	Society for Research on Biological Rhythms (SRBR) Merit Award
2021	Perkins Award: in recognition of trainees with exceptional scientific contributions using *Neurospora crassa* as a model organism
2020	Society for Research on Biological Rhythms (SRBR) Abstract Excellence Award
2020	Best Talk (runner-up), Dept. of Molecular & Systems Biology Virtual Retreat
2017	F1000 Prime Microbiology Recommendation for publication PMID: 27918582
2011	Biochemistry & Molecular Biology Award for Excellence in Research
2010	Phi Beta Kappa (Junior Year Inductee)

External Service

2021 – Review Editor, Frontiers in Fungal Biology: Fungal Physiology and Metabolism

Reviewer for: PNAS, Nature Communications, iScience, Microbiology Spectrum, Frontiers in Fungal Biology, Genetics, G3: Genes|Genomes|Genetics, Molecular Biology of the Cell, PLoS Genetics, Current Genetics, Molecular Microbiology, Philosophical Transactions of the Royal Society B, PLoS ONE, Fungal Biology, Mycologia

Internal Service

2024 – 26 Member, College of Science & Mathematics (CSM) Senate
2024 – 25 Reviewer and Committee Member, Joseph P. Healey Research Grant Program
2017 Co-Organizer, 1st Annual EPIC Symposium at Duke University (May 26th)
2016 – 17 Co-Recipient, Duke School of Medicine Interdisciplinary Colloquia Initiative Grant: Duke Eukaryotic Pathogens Investigators Club (EPIC) Seminar Series
2016 – 17 Member, Office of Biomedical Graduate Education Student Advisory Board
2013 – 17 Member, UPGG Distinguished Lecturer Series Student Committee
2012 – 14 Student Co-Chair, University Program in Genetics & Genomics (UPGG)

Publications (* corresponding author)

Kelliher CM*, Dunlap JC*. 2025. *Individual peroxiredoxin or Tor pathway components are not required for circadian clock function in Neurospora crassa*. Fungal Biology. 129(6): 101619.

Campione SA, Kelliher CM, Roth C, Cho CY, Deckard A, Motta F, Haase SB. 2025. *Identification and correction of time-series transcriptomic anomalies*. Nucleic Acids Research. 53(12): gkaf524. PMID: 40586306.

Stevenson EL, Mehalow AK, Loros JJ, Kelliher CM*, Dunlap JC*. 2024. *A Compensated Clock: Temperature and Nutritional Compensation Mechanisms Across Circadian Systems*. Bioessays. 47(3): e202400211. PMID: 39696884.

Campione SA, Kelliher CM, Orlando DA, Tran TQ, Haase SB. 2023. *Alignment of Synchronized Time-Series Data Using the Characterizing Loss of Cell Cycle Synchrony Model for Cross-Experiment Comparisons*. Journal of Visualized Experiments. 196. PMID: 37358275.

Motta FC, McGoff K, Moseley RC, Cho CY, Kelliher CM, Smith LM, Ortiz MS, Leman AR, Campione SA, Devos N, Chaorattanakawee S, Uthaimongkol N, Kuntawunginn W, Thongpiam C, Thamnurak C, Arsanok M, Wojnarski M, Vanchayangkul P, Boonyalai N, Smith PL, Spring MD, Jongsakul K, Chuang I, Harer J, Haase SB. 2023. *The parasite intraerythrocytic cycle and human circadian cycle are coupled during malaria infection*. Proceedings of the National Academy of Sciences of the United States of America. 120 (24): e2216522120. PMID: 37279274.

Kelliher CM*, Stevenson EL, Loros JJ, Dunlap JC*. 2023. *Nutritional compensation of the circadian clock is a conserved process influenced by gene expression regulation and*

mRNA stability. PLoS Biology. 21(1): e3001961. PMID: 36603054.

Kelliher CM, Lambreghts R, Xiang Q, Baker CL, Loros JJ, Dunlap JC. 2020. *PRD-2 directly regulates casein kinase I and counteracts nonsense-mediated decay in the Neurospora circadian clock*. Elife. 9: e64007. PMID: 33295874.

Kelliher CM, Loros JJ, Dunlap JC. 2020. *Evaluating the circadian rhythm and response to glucose addition in dispersed growth cultures of Neurospora crassa*. Fungal Biology. 124(5): 398-406. PMID: 32389302.

Alder-Rangel A, Idnurm A, Brand AC, Brown AJP, Gorbushina A, Kelliher CM, Campos CB, Levin DE, Bell-Pedersen D, Dadachova E, Bauer FF, Gadd GM, Braus GH, Braga GUL, Brancini GTP, Walker GM, Druzhinina I, Pócsi I, Dijksterhuis J, Aguirre J, Hallsworth JE, Schumacher J, Wong KH, Selbmann L, Corrochano LM, Kupiec M, Momany M, Molin M, Requena N, Yarden O, Cordero RJB, Fischer R, Pascon RC, Mancinelli RL, Emri T, Basso TO, Rangel DEN. 2020. *The Third International Symposium on Fungal Stress - ISFUS*. Fungal Biology. 124(5): 235-252. PMID: 32389286.

Smith LM, Motta FC, Chopra G, Moch JK, Nerem RR, Cummins B, Roche KE, Kelliher CM, Leman AR, Harer J, Gedeon T, Waters NC, Haase SB. 2020. *An intrinsic oscillator drives the blood stage cycle of the malaria parasite Plasmodium falciparum*. Science. 368(6492): 754-759. PMID: 32409472.

Cho CY, Kelliher CM, Haase SB. 2019. *The Cell-Cycle Transcriptional Network Generates and Transmits a Pulse of Transcription Once Each Cell Cycle*. Cell Cycle. 18(4): 363-378. PMID: 30668223.

Kelliher CM, Foster MW, Motta FC, Deckard A, Soderblom EJ, Moseley MA, Haase SB. 2018. *Layers of regulation of cell-cycle gene expression in the budding yeast Saccharomyces cerevisiae*. Molecular Biology of the Cell. 29(22): 2644-2655. PMID: 30207828.

Cho CY, Motta FC, Kelliher CM, Deckard A, Haase SB. 2017. *Reconciling Conflicting Models for Global Control of Cell-Cycle Transcription*. Cell Cycle. 16(20): 1965-1978. PMID: 28934013.

Kelliher CM, Haase SB. 2017. *Connecting Virulence Pathways to Cell-Cycle Progression in the Fungal Pathogen Cryptococcus neoformans*. Current Genetics. 63(5): 803-811. (Invited Review). PMID: 28265742.

Kelliher CM, Leman AR, Sierra CS, Haase SB. 2016. *Investigating Conservation of the Cell-Cycle-Regulated Transcriptional Program in the Fungal Pathogen, Cryptococcus neoformans*. PLoS Genetics. 12(12): e1006453. PMID: 27918582.

McGoff KA, Guo X, Deckard A, Kelliher CM, Leman AR, Francey LJ, Hogenesch JB, Haase SB, Harer JL. 2016. *The Local Edge Machine: inference of dynamic models of gene regulation*. Genome Biology. 17(1): 214. PMID: 27760556.

James SW, Banta T, Barra J, Ciraku L, Coile C, Cuda Z, Day R, Dixit C, Eastlack S, Giang A, Goode J, Guice A, Huff Y, Humbert S, Kelliher C, Kobie J, Kohlbrenner E, Mwambutsa F, Orzechowski A, Shingler K, Spell C, Anglin SL. 2014. *Restraint of the G2/M*

Transition by the SR/RRM family mRNA Shuttling Binding Protein SNXA^{HRB1} in Aspergillus nidulans. Genetics. 198(2): 617-633. PMID: 25104516.

Teaching Experience

2025	iTCGA workshop (summer), UMB
2025	BIOL 664: Bioinformatics for Molecular Biologists (Spring), UMB
2025	iTCGA workshop (winter), UMB
2024 –	BIOL 360 & 361: Bioinformatics with lab (Fall), UMB
2024	Integrated Training in Computational Genomics and Data Sciences (iTCGA) workshop (summer), UMB
2024	BIOL 360 & 361: Bioinformatics with lab (Spring), UMB
2022	BIO 3038/5038: Molecular Biology & Biotechnology (Fall), Merrimack
2021 – 22	Teaching Fellow for GenEd 1038: Sleep (Fall), Harvard
2013 – 17	Certificate in College Teaching Program, Duke University
2015 – 17	BIO 218 (Teaching Assistant): Clocks & Oscillators (Spring), Duke University
2016	BIO 201 (Teaching Assistant): Molecular Biology (Fall), Duke University
2016	10th q-bio Summer School (TA; 7/11 – 7/23), Colorado State University
2010	BIO 351 (Teaching Assistant): Molecular Genetics (Fall), Gettysburg College
2008 – 11	Student Tutor for CHEM 107 & 108 (General Chemistry), Gettysburg College

Mentoring Record

2025 –	Sharon Veron Akisa, UMB, graduate MCOB Ph.D. thesis
2025	Karen Coelho, MassBay Community College, summer NSF REU project
2025 –	Katelyn Diune, UMB, graduate MCOB Ph.D. thesis
2025 –	Lonna Johnson, UMB, undergraduate summer NIH U54 project
2025 –	Priya Pabla, UMB, Oracle Undergraduate Fellowship project
2024 –	Daniella Antoine, UMB, undergraduate McNair Fellow project
2024 –	Sam Mejia, UMB, undergraduate McNair Fellow research project and summer 2024 NSF REU project
2023 – 24	Asiris Castillo, UMB, undergraduate McNair Fellow project
2023 –	Isaac Hounain, UMB, graduate MCOB Ph.D. thesis
2023 – 24	Lily Tran, UMB, Oracle Undergraduate Research Fellowship project
2019 – 22	Elizabeth-Lauren (Lizzy) Stevenson, Dartmouth, mentored graduate rotation project, presently F31-supported graduate student in the Dunlap & Loros labs
2017	Madison Rogers, Ph.D., Duke, senior thesis project in Biology, former F31-supported grad student at CU Anschutz Medical Campus, presently industry
2016	Mary (Hayden) Walcott, Duke, independent study project
2015	Brian Weil, Duke, independent study project, presently an MBA in industry
2014	Cullen Roth, Ph.D., Duke, mentored graduate rotation project, presently a postdoc at Los Alamos National Laboratory

Invited Talks (^ session chair)

2025 Biological Rhythms and Timing (BRaT) Group, UMass Amherst, MA: "Assaying the circadian clock and mRNA regulation across nutrient environments"

2024 MassMyco^, Clark University, Worcester, MA: "Interactions between the fungal circadian clock, cellular metabolism, and the nutrient environment"

2024 32nd Fungal Genetics Conference, Asilomar, Pacific Grove, CA: "Genome-wide regulation of mRNA polyadenylation"

2024 MicroBREW: Integrating Bioinformatics into the Undergraduate Classroom, Genetics Society of America (GSA) & Bridging Research and Education with Model ORganisms (BREWMOR), Virtual: "Bridging the (annotation) gap, 3' untranslated regions and alternative polyadenylation in a filamentous fungus"

2023 *Neurospora* Meeting^, Camp Allen, Navasota, TX: "Genome-wide regulation of mRNA polyadenylation across nutrient environments and over circadian time"

2022 Society for Research on Biological Rhythms (SRBR) "People's Choice" Global Talk Series Highlights, Amelia Island, FL: "Nutritional compensation of the circadian clock" (Voted in Top 4)

2022 31st Fungal Genetics Conference, Asilomar, Pacific Grove, CA: "A role for gene expression and mRNA stability in the mechanism underlying circadian nutritional compensation in *Neurospora crassa*"

2022 Society for Research on Biological Rhythms (SRBR) Global Talk Series, virtual: "Nutritional compensation of the circadian clock"

2021 *Neurospora* Meeting Perkins Award presentation, Camp Allen, Navasota, TX: "Nutritional compensation of the *Neurospora* circadian clock is achieved at the levels of transcription and mRNA regulation"

2019 3rd International Symposium on Fungal Stress^, São José dos Campos, Brazil: "Cross-talk between metabolism and the circadian clock in *N. crassa*"

2018 *Neurospora* Meeting, Asilomar, Pacific Grove, CA: "Regulators of the circadian period length in a low glucose environment"

2015 Yeast Cell Biology Meeting, Cold Spring Harbor Laboratories, NY: "Dynamic proteins drive ordered cell-cycle oscillations in *Saccharomyces cerevisiae*"

2015 ASCB Cell Biology of Eukaryotic Pathogens, Clemson University, SC: "Periodicity and conservation of cell-cycle-regulated transcription"