Christina Kelliher, Ph.D.

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Professional Appointments

2023 – Assistant Professor, University of Massachusetts Boston, 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.S., Gettysburg College, Gettysburg, PA
Advisor (3 years): Steve James
Biochemistry & Molecular Biology Major (*summa cum laude*)

Research Experience

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

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, 10/1/2020 – 9/30/2022

"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, 10/1/2018 – 9/30/2020

"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
2017	Biomedical Advances Editors' Picks 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, Molecular Biology of the Cell, PLoS Genetics, PLoS ONE, Fungal Biology

Internal Service

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*, 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): p. 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): p. 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): p. 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): p. 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): p. 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): p. 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): p. 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): p. 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): p. 617-633. PMID: 25104516.

Teaching Experience

2022	Instructor of record for 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	Teaching Assistant for BIO 218: Clocks & Oscillators (Spring), Duke University
2016	Teaching Assistant for BIO 201: Molecular Biology (Fall), Duke University
2016	TA for 10th q-bio Summer School (7/11 – 7/23), Colorado State University
2015 – 16	Guest Seminar for UPGEN 701: Adv. Topics in Genetics & Genomics, Duke
2010	Teaching Assistant for BIO 351: Molecular Genetics (Fall), Gettysburg College
2008 – 11	Student Tutor for CHEM 107 & 108 (General Chemistry), Gettysburg College

Mentoring Record

2019	Elizabeth-Lauren (Lizzy) Stevenson, Dartmouth, mentored graduate rotation project, presently F31-supported graduate student in the Dunlap & Loros labs
2017	Madison Rogers, Duke, mentored senior thesis project in Biology, presently F31-supported graduate student at CU Anschutz Medical Campus
2016	Mary (Hayden) Walcott, Duke, mentored independent study
2015	Brian Weil, Duke, mentored independent study, 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

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"