

Katherine E. L. Cox

katherinecox@jhu.edu

Appointments

C-MOOR Director / Postdoctoral Fellow, Biology Department **2018-present**
Carnegie Institution for Science / Johns Hopkins University

Supervisors: Frederick J. Tan, PhD (Carnegie), Joel F. Schildbach, PhD (JHU)
Developed online tutorials teaching R and RNA-seq analysis for the Carnegie Massive Open Online Research platform. Collaborated to develop the C-MOOR website and managed web-content.
Collaborated with Clovis Community College faculty to develop and deliver RNA-seq tutorials for Introductory Biology students (Fall 2018). Submitted grants and annual reports.

Postdoctoral Teaching Fellow, Biology Department **2017-2018**

Johns Hopkins University, Baltimore, MD

PI: Joel F. Schildbach, PhD

50% Research: Follow-up experiments on thesis work, investigating co-evolution of conjugative plasmids and bacterial hosts

50% teaching: Designed and taught a laboratory course based on thesis work, see "Teaching Experience" for details.

Education

PhD, Biology **2010-2017**

Johns Hopkins University, Baltimore, MD

Thesis Advisor: Joel F. Schildbach, PhD

Thesis Title: Effects of Conjugative Plasmids on Bacterial Hosts, and Coevolution of Hosts and Plasmids

Graduate level courses: Advanced Molecular Biology; Advanced Cell Biology; Genomes and Development; Graduate Biophysical Chemistry; Introduction to Computing; Pathogenesis of Bacterial Infections; Immunology, Infection and Disease

Bachelor of Science, Biological Sciences *magna cum laude* with Distinction in Research **2007-2009**

Cornell University, Ithaca, NY

Thesis Advisor: Bik-Kwoon Tye, PhD

Postdoctoral Mentor: Ivan Liachko, PhD

Thesis Title: Isolation and Sequence Analysis of ARSs and Flanking Elements from *Saccharomyces kluyveri*

Associate of Science, Biological Science **2007**

West Valley Community College, Saratoga, CA

Teaching & Mentoring

C-MOOR Director, Carnegie Institution for Science

Among other responsibilities, developed online tutorials teaching R and RNA-seq analysis for the Carnegie Massive Open Online Research platform. Collaborated with Clovis Community College faculty to develop and deliver RNA-seq tutorials for Introductory Biology students (Fall 2018).

Instructor (Postdoctoral Teaching Fellow), Johns Hopkins University

Bacterial Evolution Project Lab: Fall 2018, undergraduates **AS.020.131**

Designed and delivered syllabus, lectures, active-learning exercises, homework assignments, laboratory assignments, and assessments for a 2-credit, semester long Project Laboratory teaching wet-lab skills (bacterial culture and plate-based assays) and computational techniques (sequence analysis to identify DNA mutations). Students conducted original research on bacterial fitness and evolution.

Co-Instructor, Johns Hopkins University

Introductory RNA-seq Analysis using R: Interession 2017, undergraduates (primarily freshmen) **AS.020.235**

Developed and delivered syllabus, lectures, homework assignments, and assessments in partnership with collaborators at the Carnegie Institution for Science.

Teaching Assistant, Johns Hopkins University / Carnegie Institution for Science

Practical Genomics Workshop: August 2016, 2017, grad students, postdocs and faculty
Assisted in development of learning objectives and active learning exercises. Aided students with installation of bioinformatics software through online interactions. Monitored the classroom during lectures and assisted struggling students. Provided guidance and answered questions during problem solving sessions.

Teaching Assistant, Johns Hopkins University

Biochemistry: Fall 2016, undergraduates **AS.020.305**
Monitored the classroom and answered student questions during problem solving sessions. Proctored and graded exams.

Lead Teaching Assistant, Johns Hopkins University

Phage Hunters: Fall 2011, Spring 2012, Fall 2012, Spring 2013, Fall 2013, Spring 2014, Fall 2014, Spring 2015, first-year undergraduates **AS.020.135, AS.020.136**
Responsible for many of the practical aspects of implementing HHMI's SEA-PHAGES course during its inaugural year. Ongoing responsibilities included guiding students through laboratory procedures, acting as lab manager, training and supervising undergraduate TAs, and adapting protocols for use in the classroom.

Guest Lecturer, Johns Hopkins University

Microbiology: Summer 2013, Fall 2014, Fall 2015, Fall 2016, upper-level undergraduates **AS.020.329**
Developed and delivered guest lectures on "Horizontal Gene Transfer" and "Antibiotics and Antibiotic Resistance". Developed active learning exercise on mechanisms of

horizontal gene transfer. Revised lectures each year to incorporate feedback provided by the lead instructor.

Undergraduate Student Research Mentor, Johns Hopkins University

Fall 2014, Spring 2015, Summer 2015

Trained and supervised 2 Hopkins undergraduate students working on my thesis project. Provided feedback on student posters and presentations.

BioREU Student Research Mentor, Johns Hopkins University

Summer 2012, Summer 2013, Summer 2015

Trained and supervised 3 visiting summer undergraduate students working on my thesis project and/or on independent projects. Provided feedback on student posters and presentations.

Teaching Assistant, HHMI

SEA-PHAGES *In Situ* Workshop, Summer 2013

Invited by HHMI to assist with training new faculty to implement the SEA-PHAGES program at their institutions. Assisted with preparing reagents and laboratory materials, answered faculty questions, and discussed strategies for implementing protocols in the classroom.

Teaching Workshops & Training

Preparing Future Faculty Teaching Academy Certificate of Completion, Johns Hopkins University **2018**

Teaching with Technology, CIRTL **Fall 2016**

ASM Conference for Undergraduate Educators, American Society for Microbiology **July 2016**

Creating Assessments and Evaluation Plans, CIRTL **Fall 2015**

Preparing Future Faculty Summer Teaching Institute, Johns Hopkins University **May 2015**

SEA-PHAGES *In Silico* Workshop, HHMI **December 2011**

Teaching Assistant Training, Johns Hopkins University **August 2011**

SEA-PHAGES *In Situ* Workshop, HHMI **July 2011**

Research Experience

Graduate Research Assistant, Johns Hopkins University

2010-present

Thesis:

Experimental coevolution of conjugative plasmids and *E. coli* hosts, followed by plate-based phenotypic assays and whole-genome sequencing to assess changes

Skills and Techniques: Bacterial Culture, Molecular Cloning, Illumina library preparation (DNA), Whole-Genome Resequencing and Mutation Analysis (*E. coli*), Python Scripting, Data Analysis

Rotations:

Joseph Gall, PhD: fluorescence microscopy (antibody staining and FISH) to investigate breakdown of the nucleolus and histone locus body in developing *Drosophila* oocytes

Beverly Wendland, PhD: quikchange, cloning and analysis of point mutants in the yeast endocytic protein PAN1

David Zapulla, PhD: reconstituting yeast telomerase in vitro and assaying effects of Mg²⁺ concentration on telomerase activity

Undergraduate Research Assistant, Cornell University **2008-2009**
Isolation of autonomously replicating sequences from *Saccharomyces kluyveri*
Skills and Techniques: Bacterial and Yeast Culture, Molecular Cloning

Peer-reviewed publications

Cox, K. E. L. & Schildbach, J. F. (2017). "Sequence of the R1 plasmid and comparison to F and R100." *Plasmid*, 91:53-60.

Liachko, I., Tanaka, E., **Cox, K.**, Chung, S. C. C., Yang, L., Seher, A., Hallas, L., Cha, E., Kang, G., Pace, H. Barrow, J., Inada, M., Tye, B.-K., Keich, U. (2011). "Novel features of ARS selection in budding yeast *Lachancea kluyveri*." *BMC Genomics* 12:633.

Posters & Presentations

Cox, K. E., Tan, F., and Schildbach, J. F. "Investigating Coevolution of Conjugative Plasmids and *E. coli* Hosts". 2nd *ASM Conference on Experimental Microbial Evolution*. Washington, D. C. August 2016.
Student speaker.

Cox, K. E. L., Roberts, A., and Schildbach, J. F. "Investigating Coevolution of Conjugative Plasmids and their Hosts through Experimental Evolution". *International Society for Plasmid Biology Conference*. Palm Cove, Australia. October 2014. Poster.

Cox, K. E. L., Roberts, A., and Schildbach, J. F. "Investigating Coevolution of Conjugative Plasmids and their Hosts through Experimental Evolution". *Johns Hopkins Cellular, Molecular, and Developmental Biology and Biophysics Retreat*. Fairfield, PA. October 2014. Poster.

Cox, K. E., and Schildbach, J. F. "Investigating Coevolution of Conjugative Plasmids and their Hosts through Experimental Evolution". *ASM Conference on Experimental Evolution*. Washington, D. C. June 2014. Poster.

Honors & Awards

Dean's list 4 semesters , Cornell University	Fall 2007 – Spring 2009
Golden Key Honor Society , Cornell University	2008-2009
Ho-Nun-De-Kah Honor Society , Cornell University	2008-2009
Dean's list 4 semesters , West Valley College	Fall 2005 – Spring 2007
Alpha Gamma Sigma Honor Society , West Valley College	2005-2007

Academic Societies

American Society for Microbiology	2016-2017
International Society for Plasmid Biology	2014-present