November 1st, 2022

CURRICULUM VITAE

Scott Bailey

PERSONAL DATA

Business Address:	615 North Wolfe Street, Room W8308, Baltimore MD 21205
Phone:	443-756-6791
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Website:	www.thebaileylab.org

EDUCATION AND TRAINING

1998	B.Sc. Biochemistry University of Sheffield (UK)
2002	Ph.D. Biophysics Mentor: John Rafferty, Ph.D. University of Sheffield (UK)
2002-2008	HHMI Postdoctoral Fellow Mentor: Thomas A. Steitz, Ph.D. Yale University

PROFESSIONAL EXPERIENCE

Johns Hopkins University

2017 - present	Joint Appointment in the Johns Hopkins Oncology Center SOM
2016 - present	Secondary Appointment SOM Department of Biophysics and Biophysical Chemistry (BBC)
2014 - present	Associate Professor Department of Biochemistry and Molecular Biology (BMB), JHSPH
2008 - 2014	Assistant Professor Department of Biochemistry and Molecular Biology (BMB), JHSPH

Takeda EX1079

PROFESSIONAL ACTIVITIES

Society Memberships:

2022 - present	Association for the Advancement of Science
2011 - present	The American Society for Biochemistry and Molecular Biology American

Leadership:

2022 – 2024	Co Vice Chair: Maryland Stem Cell Commission
2015	Session Chair: CRISPR conference (Rockefeller University)
2011	Session Chair: Steitz symposium (Yale University).

Participation on Advisory Panels and Boards:

2018 - present	Maryland Stem Cell Research Commission
2015 - present	BioSAXS advisory committee (JHU, SOM)

Expert Witness:

2018 – 2022	Sterne, Kessler, Goldstein & Fox P.L.L.C.

EDITORIAL ACTIVITIES

Journal Peer Review activities (30+ journals, including:)
Cell, Science, Nature, Molecular Cell, Nature Structural and Molecular Biology, eLife, Proceedings of the National Academy of Sciences, Nature Biotechnology, Nature Chemical Biology, Nature Communications, Genes and Development, PLoS Biology, Acta Crystallographica Section F, Biochemistry, Chemical Research in Toxicology, Crystals, EMBO Reports, FEBS Open Bio, Journal Biological Chemistry (ad hoc), Journal of Structural Biology, mBio, Methods, Nature Reviews Microbiology, Nucleic Acids Research, PLoS One, RNA, RNA Biology, Structure, Trends in Biochemical Sciences, Methods in Enzymology, CRISPR Journal.

Proposal Reviewing Activities:

2022	NIH Study Section: MSFB
2021	DFG German Research Foundation - study section
2021	NIH NIAID Resource-related research projects - mail in
2020	NIH The New Innovator Award Program (DP2) - mail in
2019	Biotechnology and Biological Sciences Research Council (UK) - mail in
2018, 2019	The Netherlands Organization for Scientific Research - mail in
2018	Swiss National Science Foundation - mail in
2018, 2017	NIH Study Section: PCMB
2016	NIH Study Section: ZRG1 IMM-S (10) B
2016	NIH Study Section: MSFB
2016	NIH Study Section: ZGM1 TWD-B (KR) - mail in
2015	HHMI International Student Fellowships (internal review for JHU)
2015	NIH Director's Early Independence Award - mail in
2014	Fonds de recherché du Quebec - mail in
2010 – 2011	Czech Science Foundation - mail in

Editorial Activities:

2021 - present	Associate Editor for Frontiers in Genome Editing Genome Editing Tools and Mechanisms
2020	Guest Editor for eLife
2019	Methods in Enzymology, Editor of "CRISPR-Cas proteins" edition
2016	Guest Editor for Proceedings of the National Academy of Sciences, USA

HONORS and AWARDS

Honors:

2018	Keynote address, BMB annual retreat, JHU (student invited)
2016	Johns Hopkins Presidents Frontier Award - Winner
2015	Johns Hopkins Presidents Frontier Award - Finalist
2015	Keynote address, CBI Retreat, JHU (student invited)

Excellence in Teaching Recognition (based on student evaluations):

2017, 2020, 2021	Concepts in Molecular Biology (120.602.01)
2017, 2020, 2021	Introduction to Molecular Biology (120.604.81)
2019, 2021, 2022	Gene Editing, Therapy and Manipulation (120.608.01)

Awards:

2019	Walder Family Foundation Research Award
2019	Walder Family Foundation Communications Award
2015	JHSPH Shikani/El Hibri Prize for Discovery and Innovation
2010	JHSPH Ho-Ching Yang Memorial Faculty Award

PUBLICATIONS (* *Bailey Lab mentored students or post-doctoral fellows*)

Journal Articles (peer reviewed):

38. Wang Y, Cottle WT, Wang H*, Gavrilov M, Zou RS, Bailey S, Ha T (2022) Achieving single nucleotide sensitivity in direct hybridization genome imaging. *In revision*.

37. Wang Y, Cottle WT, Wang H*, Feng XA, Mallon J*, Gavrilov M, **Bailey S**, Ha T (2021) Genome oligopaint via local denaturation fluorescence in situ hybridization. *Mol. Cell* 81(7): 1566-1577

36. Dasovich M, Beckett MQ*, **Bailey S**, Ong SE, Greenberg MM and Leung AKL (2021) Identifying Poly(ADP-ribose)-binding proteins with photoaffinity-based proteomics. *J Am Chem Soc* 143(8): 3037-3042

35. Wang Y, Mallon J*, Wang H*, Singh D, Jo MH, Hua B, **Bailey S** and Ha T (2021) Real-time observations of Cas9 postcatalytic domain motions. *Proc. Natl. Acad. Sci. USA* 118(2):e2010650118

34. Foster K, Gruschow S, **Bailey S**, White MF and Terns MP (2020) Regulation of the RNA and DNA nuclease activities required for *Pyrococcus furiosus* Type III-B CRISPR-Cas immunity. Nucleic Acids Res. 48(8): 4418-4434

33. Ramachandran A*, Summerville L*, Learn BA*, DeBell L* and **Bailey S**. (2020) Processing and integration of functionally oriented prespacers in the E. coli CRISPR system depends on bacterial host exonucleases. *J. Biol. Chem.* 295(11): 3403-3414

32. Okafor IC, Singh D, Wang Y, Jung M, Wang H*, Mallon J*, **Bailey S**, Lee JK, Ha T. (2019) Single molecule analysis of effects of non-canonical guide RNAs and specificity-enhancing mutations on Cas9-induced DNA unwinding. *Nucleic Acids Res*. 47(22): 11880-11888

31. Johnson K*, Learn BA*, Estrella MA*, **Bailey S**. (2019) Target sequence requirements of a type III-B CRISPR-Cas immune system. *J. Biol. Chem*. 294(26): 10290-10299

30. Liu Y, Wang T, Ju Ji Y, Johnson K, Liu H, Johnson K*, **Bailey S**, Suk Y, Lu Y-N, Liu M, Wang J (2018) A c9orf72-CARM1 axis regulates lipid metabolism under glucose starvation-induced nutrient stress. *Genes & Dev.* 32(21-22): 1380-1387

29. Singh D, Wang Y, Mallon J*, Yang O, Fei J, Poddar A, Ceylan D, **Bailey S**, Ha T (2018) Mechanisms of improved specificity of engineered Cas9s revealed by single-molecule FRET analysis, *Nat. Struct. Mol. Biol*. 25: 347-354

28. Singh D, Mallon J*, Poddar A, Wang Y, Tippana R, Yang O, **Bailey S**, Ha T (2018) Real-time observation of DNA target interrogation and product release by the RNA-guided CRISPR endonuclease Cpf1 (Cas12a). *Proc. Natl. Acad. Sci. USA* 115(21):5444-5449.

27. Johnson K*, **Bailey S**. (2017) Microbiology: The case of the mysterious messenger. *Nature.* 548, 527-528.

26. Kumar P, Chauhan V, Silva JRA, d'Andrea F, Li, S, Ginell SL, Freundlich JS, Alves CN, **Bailey S**, Cohen KA, Lamichhane G. (2017) Mycobacterium abscessus L,D-transpeptidases are susceptible to inactivation by carbapenems and cephalosporins but not penicillins. *Antimicrob Agents Chemother*. *61(10): e00866-17*

25. Kuznedelov K, Mekler V, Lemak S, Tokmina-Lukaszewska M, Datsenko KA, Jain I, Savitskaya E, Mallon J*, Shmakov S, Bothner B, **Bailey S**, Yakunin AF, Severinov K, Semenova E. (2016) Altered stoichiometry *Escherichia coli* Cascade complexes with shortened CRISPR RNA spacers are capable of interference and primed adaptation. *Nucleic Acids Res*. 44: 10849-10861.

24. Estrella MA*, Kuo FT*, **Bailey S** (2016) RNA activated DNA cleavage by the Type III-B CRISPR-Cas effector complex. *Genes & Dev*. 30(4): 460-470.

23. Hayes RP, Xiao Y, Ding F, van Erp PBG, Rajashankar K, **Bailey S**, Wiedenheft B, Ke A (2016) Structure of CRISPR RNA-guided complex bound to foreign DNA reveals mechanisms for target recognition. *Nature* 530(7591): 499-503.

22. van Erp PBG, Jackson RN, Carter J, Golden SM, **Bailey S**, Wiedenheft B (2015) Mechanism of CRISPR-RNA guided recognition of DNA targets in *Escherichia coli. Nucleic Acids Res*. 43: 8381-8392

21. Hodgson A, Wier EM, Fu K, Sun X, Yu H, Zheng W, Sham HP, Johnson K*, **Bailey S**, Vallance BA, Wan F (2015) Metalloprotease NleC suppresses host NF-kB/inflammatory responses by cleaving p65 and interfering with the p65/RPS3 interaction. *PLoS Pathog.* 11(3):e1004705

20. Mulepati S*, Heroux A, **Bailey S** (2014) Crystal structure of a CRISPR RNA-guided surveillance complex bound to a ssDNA target. *Science* 345: 1479-1484.

19. Chen H*, Choi J*, **Bailey S** (2014) Independent Cut Site Selection by the Two Nuclease Domains of the Cas9 RNA-guided Endoribonuclease. *J. Biol. Chem.* 289: 13284-13294.

18. **Bailey S** (2013) The Cmr complex: an RNA-guided Endoribonuclease. *Biochem. Soc. Trans.* 41: 1459-1463.

17. Brandt SG*, **Bailey S** (2013) Dematin, a human erythrocyte cytoskeletal protein, is a substrate for a recombinant FIKK kinase from *Plasmodium falciparum*. *Mol. Biochem. Parasitol*. 191: 20-23.

16. Mulepati S*, **Bailey S** (2013) *In vitro* Reconstitution of the *Escherichia coli* RNA-guided Immune System Reveals Unidirectional, ATP-dependent degradation of DNA target. *J. Biol. Chem.* 288: 22184-22192.

15. Mulepati S*, Orr A*, **Bailey S.** (2012) Crystal Structure of the Largest Subunit of a Bacterial RNA-guided Immune Complex and its Role in DNA Target Binding. *J. Biol. Chem.* 287: 22445-22449.

14. Mulepati S*, **Bailey S**. (2011) Structural and biochemical analysis of the nuclease domain of the clustered regularly interspaced short palindromic repeat (CRISPR) associated protein 3 (cas3). *J. Biol. Chem.* 286: 31896-31903.

13. Yin FF, **Bailey S**, Innis CA, Ciubotaru M, Kamtekar S, Steitz TA, Schatz DG. (2009) Structure of the RAG1 nonamer binding domain with DNA reveals a dimmer that mediates DNA synapsis. *Nat. Struct. Mol. Biol* 16: 499-508

12. Durniak KJ, **Bailey S**. Steitz TA. (2008). The structure of a transcribing T7 RNA polymerase in transition from initiation to elongation. Science 322: 553-557

11. Wing RA, **Bailey S**, Steitz TA. (2008). Insights into the replisome from the structure of a ternary complex of the DNA polymerase III alpha-subunit. *J. Mol. Biol.* 382: 859-86

10. Evans RN, Blaha G, **Bailey S**, Steitz TA. (2008) The structure of LepA, the ribosomal back translocate. *Proc. Natl. Acad. Sci. USA* 105*:* 4673-4678.

9. **Bailey S**, Eliason WA, Steitz TA. (2007). Structure of Hexameric DnaB Helicase and its Complex with a Domain of DnaG Primase. *Science* 318: 459-463.

8. **Bailey S**, Eliason WA, Steitz TA. (2007). The Crystal Structure of the Thermus aquaticus DnaB Helicase Monomer. *Nucleic Acids Res*. 35: 4728-4736.

7. **Bailey S**, Wing RA, Steitz TA. (2006). The Structure of *T. aquaticus* DNA Polymerase III Is Distinct from Eukaryotic Replicative DNA Polymerases. *Cell* 126: 893-904.

6. **Bailey S**, Sedelnikova SE, Mesa P, Ayora S, Waltho JP, Aschroft AE, Baron AJ, Alonso JC, Rafferty JB. (2003) Structural analysis of Bacillus subtilis SPP1 phage helicase loader protein G39P. *J. Biol. Chem.* 278: 15304-15312.

5. **Bailey S**, Sedelnikova SE, Mesa P, Ayora S, Alonso JC, Rafferty JB. (2003). Crystallization of the Bacillus subtilis SPP1 bacteriophage helicase loader protein G39P. *Acta. Crystallogr.* D59: 1090-1092.
4. Abdelghany HM, **Bailey S**, Blackburn GM, Raffertry JB, McLennan AG. (2003). Analysis of the catalytic and binding residues of the diadenosine tetraphosphate pyrophosphohydrolase from *Caenorhabditis elegans. J. Biol. Chem.* 278: 4435-4439.

3. **Bailey S**, Sedelnikova SE, Blackburn GM, Abdelghany HM, Baker PJ, McLennan AG, Rafferty JB. (2002). The crystal structure of diadenosine tetraphosphate hydrolase from *Caenorhabditis elegans* in free and binary complex forms. *Structure*. 10: 589-600.

2. **Bailey S**, Sedelnikova SE, Blackburn GM, Abdelghany HM, McLennan AG. Rafferty JB. (2002). Crystallization of a complex of *Caenorhabditis elegans* diadenosine tetraphosphate hydrolase and a non-hydrolysable substrate analogue, AppCH2ppA. *Acta. Crystallogr.* D58: 526-528.

1. Abdelghany HM. Gasmi L, Cartwright JL, **Bailey S**, Rafferty JB, McLennan AG. (2001) Cloning, characterization and crystallization of a diadenosine 5'5"'-P^1,P^4-tetraphosphate pyrophosphohydrolase from *Caenorhabditis elegans. Biochem. Biophys. Acta*. 1550: 27-36.

Book Chapters:

2. Beckett MQ*, Ramachandran A*, **Bailey S**. (2021) Type V CRISPR-Cas systems. ASM *In press*

1. **Bailey S**. (2019) Preface: CRISPR-Cas Enzymes*. Methods Enzymol*. 616: xvii-xviii

Articles, Editorials and Other Publications Not Peer Reviewed:

4. Ramachandran A*, **Bailey S**. (2016) Memory Upgrade: insights into primed adaptation by CRISPR-Cas immune systems. *Mol Cell*. 64: 641-642.

3. Mallon J*, **Bailey S** (2016) A molecular arms race new insights into antiCRISPR mechanisms. *Nat. Struct. Mol. Biol.* 23: 765-766

2. Chen H*, **Bailey S** (2016) Cas9, poised for DNA cleavage. *Science* 351: 811-812

1. **Bailey S**. (2012) Hidden iron-sulfur clusters. *Nat. Chem. Biol.* 8: 24-25

TEACHING

Academic Advises doing laboratory research:

Graduate students (Ph.D.):

12. Zoë Hutchinson, pre-doctoral graduate student (PMB) 2022 – present
Recipient of NSF GRFP

11. Elvar Bjarkason, pre-doctoral graduate student (BMB) 2021 - present

10. Charlie Lenihan, pre-doctoral graduate student (BMB) 2020 - present

9. Morgan Beckett, pre-doctoral graduate student (PMB) 2018 - present

8. Haobo Wang, pre-doctoral graduate student (BMB) 2017 – 2022
Recipient of 2020 Brian Crawford Scholarship Award
Thesis title: Structural basis of noncognate target recognition by a type I CRISPR system

7. Katelyn Jackson, pre-doctoral graduate student (CBI) 2016 - 2022
Thesis title: The structural basis for off-target binding by a type I-E CRISPR system
Position after the Bailey lab: postdoc at St. Jude's in Richard Kriwacki's lab

6. Anita Ramachandran, Ph.D. (BMB) 2015 – 2020
Thesis title: Mechanisms of Acquiring Memory for CRISPR-Cas Adaptive Immunity
Position after the Bailey lab: Scientist at Intelia Therapeutics, Inc.

5. John Mallon, Ph.D. (CBI) 2013 – 2020
Thesis title: Self/non-self discrimination and interference activation in a I-B CRISPR-Cas system
Position after the Bailey lab: postdoc at Brandeis University in Alexandre Bisson's lab

4. Kaitlin Johnson, Ph.D. (BMB) 2013 – 2019
Thesis title: Activation of a transcription-dependent CRISPR-Cas immune system
Position after the Bailey lab: postdoc at the University of Boulder in Thomas Cech's lab

3. Michael Estrella, Ph.D. (BMB) 2011 – 2016
Thesis title: Nucleic Acid Degradation by the CRISPR Type III-B complex
Recipient of NIH NRSA F31
Position after the Bailey lab: postdoc at Princeton in Alexei Korennykh's lab

2. Hongfan Chen, Ph.D. (BMB) 2011 – 2016

Thesis title: Biochemical and Structural Characterization of Bacterial RNA-Guided DNA Targeting systems
Position after the Bailey lab: technical specialist DT Ward, PC
Current Position: Patent Agent at Troutman Sanders LLP

1. Sabin Mulepati, Ph.D. (PMB) 2009 – 2014
Thesis title: Mechanism of Foreign DNA Recognition and Degradation by the Type I CRISPR system in *Escherichia coli*
Recipient of 2014 John Scocca Award
Position after the Bailey lab: postdoc at Harvard in Sunney Xie's lab
Current Position: Principal Scientist at Intelia Therapeutics, Inc.

Postdoctoral trainees:

Gabriel Brandt 2008 – 2013
Current Position: Associate Professor of Chemistry, Franklin & Marshall College PA

Research Associates:

Brian Learn 2017 – present

Graduate students (Sc.M.):

12. Brynn Durecki, (BMB) 2022 - present

11. Elvar Bjarkason, (BMB) 2019 – 2020
Thesis title: Effects of Target Sequence Mutation on Type I-E CRISPR-mediated Immunity

10. Lesley Summerville, (BMB) 2017 – 2018
Thesis title: The effect of Structural Variations in Protospacers on Integration Site and Orientation in a Type I-E CRISPR-Cas System.

9. Brian Krahl, (BMB) 2017 – 2018
Thesis title: Characterization of Protospacer Adjacent Motifs in a Type I-B CRISPR system of *Thermotoga maritima*

8. Bobby Kwan, (BMB) 2016 – 2017
Thesis title: Towards Structural Studies of Transcriptionally-coupled CRISPR Systems

7. Jasvir Kaila, (BMB) 2015 – 2016
Thesis title: Mutational Analysis of the *Escherichia coli* CRISPR-Cas Immune System

6. Fang Ting Kuo, (BMB) 2013 – 2014
Thesis title: Functional Analysis of Subunits of the RNA-Guided CRISPR Immune System in *Thermotoga maritima*

5. Vanessa Levine, (BMB) 2012 – 2013

Thesis title: Characterizing the Gyrase and DNA polymerase from the Malaria Parasite *Plasmodium falciparum*

4. Jihoon Choi, (BMB) 2012 – 2013
Thesis title: Analysis of the Substrate Requirements of an RNA-Guided DNA Endonuclease that Functions in Bacterial Immunity

3. Katie Scarbinsky, (BMB) 2011 – 2012
Thesis title: Characterizing the Activity and Function of FIKK Kinases from the Malaria Parasite *Plasmodium falciparum*

2. Amberly Orr, (BMB) 2011 – 2012
Thesis title: The Largest Subunit of a Bacterial RNA-Guided Immune Complex and its Role in Targeting Foreign DNA.

1. Cheng Peng, (BMB) 2009 – 2010
Thesis title: Functional Analysis of the subunits of the CRISPR associated CMR Complex

Biophysics Research for Baltimore Teens, Lab Volunteers

8. Iris Zheng, 2021
7. Colton Ross, 2019
6. Katemanee Burapachaisri, 2018
5. Edoghogho Ighodaro, 2017
4. Uchenna Nwokeji, 2016
3. Richard Ramirez-Garcia, 2015
2. Erika Johnson, 2014
1. Calvin Fields, 2013

The Ingenuity Project, Baltimore Polytechnic Institute (High School), Lab Volunteers

3. Iris Zheng, 2021
2. Tate Bothner, 2019
1. Lily DeBell, 2017

Classroom Instruction:

Course Director:

2019 - present	Module in X-ray Crystallography/cryo-EM, PMB (5 half-day sessions) Enrollment: 15-20 students per year Co-director since 2022 with Edward Twomey
2019 - present	Gene Editing, Therapy and Manipulation (16 class session) Enrollment: 50-60 students per year
2017 - present	Introduction to Molecular Biology; online (16 class sessions) Enrollment: 25-35 students per year
2015 - present	Concepts of Molecular Biology, JHSPH (8 class sessions) Enrollment: 50-60 students per year

Co-director with Anthony Leung

2014 - 2018 Genes and Gene Therapy, JHSPH (6 class sessions)
Enrollment: 40-50 students per year
Co-director with Janice Evans

Other Teaching (Guest Lectures):

2022 - present	Scientific Foundations of Medicine, SOM (3 discussion sessions)
2020 - present	Quantitative Biology Lab, BCMB (3 lecture)
2020 - present	Analysis of Macromolecules, BCMB (1 lecture)
2019 - present	Advanced Topics in Protein Crystallography, PMB (2 lectures)
2018 - present	Proteins and Nucleic Acids II, PMB (1 lecture)
2017 - 2019	Macromolecular Structure and Analysis, BCMB (1 lecture)
2014 - 2018	Fundamentals of X-ray Crystallography, PMB (2 lectures)
2012 - 2014	Principles of Cell Biology, JHSPH (1 lecture)
2012	Introduction to Biomedical Research and Careers Homewood (1 lecture)
2011 - 2014	Genome Integrity, JHSPH (2 lectures)
2010 - 2018	Discussion leader, Core Discussion in Biochemistry, JHSPH (1 lecture)
2009	Special Topics in Biochemistry, JHSPH (6 class sessions)
2008 - present	Chemical Biology Interface I, CBI Homewood (2 lectures)

ACADEMIC SERVICE

University:

2017 - 2018	Johns Hopkins Presidents Award Selection committee
2017 - present	Reviewer for JHU Catalyst and Discovery Awards

Graduate Programs:

2021	PMB Responsible Conduct of Research (RCR) Discussion Leader
2020 - present	PMB Admissions Committee, JHU
2019 - present	BCMB Admission Committee, SOM
2018	PMB Responsible Conduct of Research (RCR) Discussion Leader
2013 - 2017	PMB Seminar Coordinator, SOM
2012 - 2015	PMB Thesis Advisory Committee, SOM (Chair in 2015)
2010 - 2011	PMB First year oral examination Committee, SOM
2009 - 2019	CBI Student Advisory Committee, JHU

School of Medicine:

2020	Search Committee for Director of Biophysics and Biophysical Chemistry
2019	Sub-committee member, Discovery Roadmap Initiative, SOM
2018 - 2020	Cryo-EM Faculty Search Committee, Biophysics, SOM

School of Public Heath:

2016 - 2017	ad hoc committee to examine joint BMB, MMI & EHE training
2015	Session member, CEPH accreditation site visit
2012 - 2014	Faculty Senate representing BMB, JHSPH

Department of Biochemistry and Molecular Biology:

2017 - present	Steering committee for NCI Training Grant, BMB JHSPH
2016 - 2018	Diversity and Inclusion Committee
2015 - present	BMB Curriculum Committee (Chair: 2017 to present)
2015	ad hoc committee to examine BMB curriculum
2012 - 2014	Faculty Search Committee BMB
2010 - 2015	Faculty Organizer for annual BMB retreat
2009 - present	BMB Graduate Admissions Committee (Chair: 2015 to 2020)

PRESENTATIONS

Scientific Meetings:

2022 Johns Hopkins University, Dept Biophysics and Biophysical Chemistry
2018 CRISPR Meeting, Vilnius University, Lithuania
2017 CRISPR Meeting, Montana, USA
2016 Zing Conference on Nucleic Acids, Florida, USA
2016 CRISPR Meeting, Israel
2015 CRISPR Meeting, Rockefeller University, USA
2015 45th Mid-Atlantic Macromolecular Crystallography Meeting
2015 Frontiers of CBI symposium, UMBC
2015 Johns Hopkins University, School of Medicine CRISPR symposium
2014 Zing Conference on Nucleic Acids, Mexico
2014 CRISPR meeting, Berlin Germany
2014 44th Mid-Atlantic Macromolecular Crystallography Meeting
2013 CRISPR meeting, St Andrews University, UK
2012 Zing Conference on Nucleic Acids, Xcaret, Mexico

Invited Seminars:

2019 Rockefeller University, New York, USA
2017 McGill University, Department of Biochemistry, Canada
2017 Villanova University
2015 Keynote address, Chemical Biology Interface Program Retreat, JHU
2015 Drexel University, Dept. Biochemistry and Molecular Biology
2015 Johns Hopkins Malaria Research Institute
2015 Brandeis University, Dept. Biochemistry
2014 Johns Hopkins School of Medicine, Dept. Molecular Biology and Genetics
2014 Yale University, Department of Molecular Biology and Biophysics
2013 Montana State University in Bozeman, Dept. Immunology and Infectious Disease
2008 SUNY Upstate Medical University, Dept. Biochemistry and Molecular Biology
2008 Harvard Medical School, Immune Disease Institute
2008 Johns Hopkins University, Dept. Biochemistry and Molecular Biology
2008 University of Maryland Biotechnology Institute
2008 University of Oregon, The Institute of Molecular Biology
2008 Cambridge University, Laboratory of Molecular Biology, UK

2008 University of Maryland, Dept. of Chemistry
2006 Wadsworth Center, New York