

Jon R. Lorsch, Ph.D.

CURRENT APPOINTMENT

Director, National Institute of General Medical Sciences

Office of the Director

National Institute of General Medical Sciences
National Institutes of Health
45 Center Drive MSC 6200
Bethesda, MD 20892-6200
Phone: (301) 594-2172
Fax: (301) 402-0156
E-mail: jon.lorsch@nih.gov

EDUCATION AND TRAINING

1990	B.A.	Swarthmore College (Chemistry with Honors)
1995	Ph.D.	Harvard University (Biochemistry)
1995-1999	Fellowship	Stanford University (Biochemistry)

PROFESSIONAL EXPERIENCE

1989-1990	Honors Thesis, Swarthmore College Advisors: Judith Voet, Ph.D. and Nancy Hamlett, Ph.D. Thesis: Enzymology of mercuric reductase from a novel bacterium, <i>C. iridescens</i>
1990-1995	Ph.D., Harvard University Department of Molecular and Cellular Biology Advisor: Jack W. Szostak, Ph.D. Thesis: <i>In vitro</i> selection of novel functional RNAs
1993	Graduate Teaching Fellow, Harvard University
1994	Head Graduate Teaching Fellow, Harvard University
1995-1999	Postdoctoral Fellow, Stanford University Department of Biochemistry Advisor: Daniel Herschlag, Ph.D.
1999-2005	Assistant Professor
2005-2009	Associate Professor
2009-2013	Professor Department of Biophysics and Biophysical Chemistry Johns Hopkins University School of Medicine
2013-2014	Adjunct Investigator, <i>Eunice Kennedy Shriver</i> National Institute of Child Health and Human Development
2013-present	Director, National Institute of General Medical Sciences
2014-present	Senior Investigator, <i>Eunice Kennedy Shriver</i> National Institute of Child Health and Human Development

RESEARCH ACTIVITIES

Peer-Reviewed Original Research Articles

1. Ruprecht RM, Lorsch JR, Trites DH. Analysis of suramin plasma levels by ionpair high-performance liquid chromatography under isocratic conditions. *J Chromatogr.* 1986 Jun 13;378(2):498-502.
2. Lorsch JR, Szostak JW. In vitro selection of RNA aptamers specific for cyanocobalamin. *Biochemistry.* 1994 Feb 1;33(4):973-82.
3. Lorsch JR, Szostak JW. In vitro evolution of new ribozymes with polynucleotide kinase activity. *Nature.* 1994 Sep 1;371(6492):31-6.
4. Lorsch JR, Bartel DP, Szostak JW. Reverse transcriptase reads through a 2'-5' linkage and a 2'-thiophosphate in a template. *Nucleic Acids Res.* 1995 Aug 11;23(15):2811-4.
5. Lorsch JR, Szostak JW. Kinetic and thermodynamic characterization of the reaction catalyzed by a polynucleotide kinase ribozyme. *Biochemistry.* 1995 Nov 21;34(46):15315-27.
6. Lorsch JR, Herschlag D. The DEAD Box Protein eIF4A. 1. A minimal kinetic and thermodynamic framework reveals coupled binding of RNA and nucleotide. *Biochemistry.* 1998 Feb 24;37(8):2180-93.
7. Lorsch JR, Herschlag D. The DEAD box protein eIF4A. 2. A cycle of nucleotide and RNA-dependent conformational changes. *Biochemistry.* 1998 Feb 24;37(8):2194-206.
8. Lorsch JR, Herschlag D. Kinetic dissection of fundamental processes of eukaryotic translation initiation in vitro. *EMBO J.* 1999 Dec 1;18(23):6705-17.
9. Algire MA, Maag D, Savio P, Acker MG, Tarun SZ Jr, Sachs AB, Asano K, Nielsen KH, Olsen DS, Phan L, Hinnebusch AG, Lorsch JR. Development and characterization of a reconstituted yeast translation initiation system. *RNA.* 2002 Mar;8(3):382-97.
10. Carriere M, Vijayabaskar V, Applefield D, Harvey I, Garneau P, Lorsch J, Lapidot A, Pelletier J. Inhibition of protein synthesis by aminoglycoside-arginine conjugates. *RNA.* 2002 Oct;8(10):1267-79.
11. Shin BS, Maag D, Roll-Mecak A, Arefin MS, Burley SK, Lorsch JR, Dever TE. Uncoupling of initiation factor eIF5B/IF2 GTPase and translational activities by mutations that lower ribosome affinity. *Cell.* 2002 Dec 27;111(7):1015-25.
12. Maag D, Lorsch JR. Communication between eukaryotic translation initiation factors 1 and 1A on the yeast small ribosomal subunit. *J Mol Biol.* 2003 Jul 25;330(5):917-24.
13. Kapp LD, Lorsch JR. GTP-dependent recognition of the methionine moiety on initiator tRNA by translation factor eIF2. *J Mol Biol.* 2004 Jan 23;335(4):923-36.

14. Maag D, Fekete CA, Gryczynski Z, Lorsch JR. A conformational change in the eukaryotic translation preinitiation complex and release of eIF1 signal recognition of the start codon. *Mol Cell*. 2005 Jan 21;17(2):265-75.
15. Fekete CA, Applefield DJ, Blakely SA, Shirokikh N, Pestova T, Lorsch JR, Hinnebusch, AG. The eIF1A C-terminal domain promotes initiation complex assembly, scanning and AUG selection in vivo. *EMBO J*. 2005 Oct 19;24(20):3588-601.
16. Algire MA, Maag D, Lorsch JR. P_i release from eIF2, not GTP hydrolysis, is the step controlled by start-site selection during eukaryotic translation initiation. *Mol Cell*. 2005 Oct 28;20(2):251-62.
17. Maag D, Algire MA, Lorsch JR. Communication between eukaryotic translation initiation factors 5 and 1A within the ribosomal pre-initiation complex plays a role in start site selection. *J Mol Biol*. 2006 Feb 24;356(3):724-37.
18. Acker MG, Shin BS, Dever TE, Lorsch JR. Interaction between eukaryotic initiation factors 1A and 5B is required for efficient ribosomal subunit joining. *J Biol Chem*. 2006 Mar 31;281(13):8469-75.
19. Kapp LD, Kolitz SE, Lorsch JR. Yeast initiator tRNA identity elements cooperate to influence multiple steps of translation initiation. *RNA*. 2006 May;12(5):751-64.
20. Robert F, Kapp LD, Khan SN, Acker MG, Kolitz SE, Kazemi S, Kaufman RJ, Merrick WC, Koromilas AE, Lorsch JR, Pelletier J. Initiation of protein synthesis by hepatitis C virus is refractory to reduced eIF2.GTP.Met-tRNA(i)(Met) ternary complex availability. *Mol Biol Cell*. 2006 Nov;17(11):4632-44.
21. Shin BS, Acker MG, Maag D, Kim JR, Lorsch JR, Dever TE. Intragenic suppressor mutations restore GTPase and translation functions of eukaryotic initiation factor 5B switch II mutant. *Mol Cell Biol*. 2007 Mar;27(5):1677-85.
22. Fringer JM, Acker MG, Fekete CA, Lorsch JR, Dever TE. Coupled release of eukaryotic translation initiation factors 5B and 1A from 80S ribosomes following subunit joining. *Mol Cell Biol*. 2007 Mar;27(6):2384-97.
23. Fekete CA*, Mitchell SF*, Cherkasova VA, Applefield DJ, Algire MA, Maag D, Saini, A, Lorsch JR[‡], Hinnebusch AG[‡]. N- and C-terminal residues of eIF1A have opposing effects on the fidelity of start codon selection. *EMBO J*. 2007 Mar 21;26(6):1602-14.
24. Passmore LA, Schmeing TM, Maag D, Applefield DJ, Acker MG, Algire MA, Lorsch JR[‡], Ramakrishnan V[‡]. The eukaryotic translation initiation factors eIF1 and eIF1A induce an open conformation of the 40S ribosome. *Mol Cell*. 2007 Apr 13;26(1):41-50.
25. Cheung, YN, Maag D, Mitchell SF, Fekete CA, Algire MA, Takacs JE, Shirokikh N, Pestova TV, Lorsch JR[‡], Hinnebusch AG[‡]. Dissociation of eIF1 from the 40S ribosomal subunit is a key step in start codon selection in vivo. *Genes Dev*. 2007 May 15;21(10):1217-30.

* Equal contribution

‡ Co-corresponding authors

26. Dong J, Nanda JS, Rahman H, Pruitt MR, Shin BS, Wong CM, Lorsch JR, Hinnebusch AG. Genetic identification of yeast 18S rRNA residues required for efficient recruitment of initiator tRNA(Met) and AUG selection. *Genes Dev.* 2008 Aug 15;22(16):2242-55.
27. Acker MG, Shin BS, Saini AK, Dever TE, Lorsch JR. Kinetic analysis of late steps of eukaryotic translation initiation. *J Mol Biol.* 2009 Jan 16;385(2):491-506.
28. Kolitz SE, Takacs JE, Lorsch JR. Kinetic and thermodynamic analysis of the role of start codon/anticodon base pairing during eukaryotic translation initiation. *RNA.* 2009 Jan;15(1):138-52.
29. Shin BS, Kim JR, Acker MG, Maher KN, Lorsch JR, Dever TE. rRNA suppressor of a eukaryotic translation initiation factor 5B/initiation factor 2 mutant reveals a binding site for translational GTPases on the small ribosomal subunit. *Mol Cell Biol.* 2009 Feb;29(3):808-21.
30. Saini AK, Nanda JS, Lorsch JR, Hinnebusch AG. Regulatory elements in eIF1A control the fidelity of start codon selection by modulating tRNA(i)(Met) binding to the ribosome. *Genes Dev.* 2010 Jan 1;24(1):97-110.
31. Kurata S, Nielsen KH, Mitchell SF, Lorsch JR, Kaji A, Kaji H. Ribosome recycling step in yeast cytoplasmic protein synthesis is catalyzed by eEF3 and ATP. *Proc Natl Acad Sci U S A.* 2010 Jun 15;107(24):10854-9.
32. Mitchell SF, Walker SE, Algire MA, Park EH, Hinnebusch AG, Lorsch JR. The 5'-7-methylguanosine cap on eukaryotic mRNAs serves both to stimulate canonical translation initiation and to block an alternative pathway. *Mol Cell.* 2010 Sep 24;39(6):950-62.
33. Park EH, Walker SE, Lee JM, Rothenberg S, Lorsch JR, Hinnebusch AG. Multiple elements in the eF4G1 N-terminus promote assembly of eIF4G1•PABP mRNPs in vivo. *EMBO J.* 2011 Jan 19;30(2):302-16.
34. Takacs JE, Neary TB, Ingolia NT, Saini AK, Martin-Marcos P, Pelletier J, Hinnebusch AG, Lorsch JR. Identification of compounds that decrease the fidelity of start codon recognition by the eukaryotic translational machinery. *RNA.* 2011 Mar;17(3):439-52.
35. Shin BS, Acker MG, Kim JR, Maher KN, Arefin SM, Lorsch JR, Dever TE. Structural integrity of {alpha}-helix H12 in translation initiation factor eIF5B is critical for 80S complex stability. *RNA.* 2011 Apr;17(4):687-96.
36. Shin BS, Kim JR, Walker SE, Dong J, Lorsch JR, Dever TE. Initiation factor eIF2y promotes eIF2-GTP-Met-tRNAi(Met) ternary complex binding to the 40S ribosome. *Nat Struct Mol Biol.* 2011 Oct 16;18(11):1227-34.
37. Rajagopal V, Park EH, Hinnebusch AG, Lorsch JR. Specific domains in yeast translation initiation factor eIF4G strongly bias RNA unwinding activity of the eIF4F complex toward duplexes with 5'-overhangs. *J Biol Chem.* 2012 Jun 8;287(24):20301-12.

38. Luna RE, Arthanari H, Hiraishi H, Nanda J, Martin-Marcos P, Markus MA, Akabayo B, Milbradt AG, Luna LE, Seo HC, Hyberts SG, Fahmy A, Reibarkh M, Miles D, Hagner PR, O'Day EM, Yi T, Marintchev A, Hinnebusch AG, Lorsch JR, Asano K, Wagner G. The C-terminal domain of eukaryotic initiation factor 5 promotes start codon recognition by its dynamic interplay with eIF1 and eIF2 β . *Cell Rep.* (2012) 1:689-702.
39. Allen RC, Tu YK, Nevarez MJ, Bobbs AS, Friesen JW, Lorsch JR, McCauley JA, Voet JG, Hamlett NV. The mercury resistance (*mer*) operon in a marine gliding flavobacterium, *Tenacibaculum discolor* 9A5. *FEMS Microbiol Ecol.* 2013 Jan;83(1):135-48.
40. Park EH, Walker SE, Zhou F, Lee JM, Rajagopal V, Lorsch JR, Hinnebusch AG. Yeast eukaryotic initiation factor 4B (eIF4B) enhances complex assembly between eIF4A and eIF4G in vivo. *J Biol Chem.* 2013 Jan 25;288(4):2340-54.
41. Walker SE^{*}, Zhou F^{*}, Mitchell SF, Larson VS, Valasek L, Hinnebusch AG[‡], Lorsch JR[‡]. Yeast eIF4B binds to the head of the 40S ribosomal subunit and promotes mRNA recruitment through its N-terminal and internal repeat domains. *RNA.* 2013 Feb;19(2):191-207.
42. Nanda JS, Saini AK, Muñoz AM, Hinnebusch AG, Lorsch JR. Coordinated movements of eukaryotic translation initiation factors eIF1, eIF1A, and eIF5 trigger phosphate release from eIF2 in response to start codon recognition by the ribosomal preinitiation complex. *J Biol Chem.* 2013 Feb 22;288(8):5316-29.
43. Martin-Marcos P, Nanda J, Luna RE, Wagner G, Lorsch JR,[‡] Hinnebusch AG.[‡] β -Hairpin loop of eukaryotic initiation factor 1 (eIF1) mediates 40 S ribosome binding to regulate initiator tRNA(Met) recruitment and accuracy of AUG selection in vivo. *J Biol Chem.* 2013 Sep 20;288(38):27546-62.
44. Fernández IS^{*}, Bai XC^{*}, Hussain T, Kelley AC, Lorsch JR[‡], Ramakrishnan V[‡], Scheres SH[‡]. Molecular architecture of a eukaryotic translational initiation complex. *Science.* 2013 Nov 15;342(6160):1240585.
45. Zhou F^{*}, Walker SE^{*}, Mitchell SF, Lorsch JR[‡], Hinnebusch AG[‡]. Identification and characterization of functionally critical, conserved motifs in the internal repeats and N-terminal domain of yeast translation initiation factor 4B (yeIF4B). *J Biol Chem.* 2014 Jan 17;289(3):1704-22.
46. Martin-Marcos P, Nanda JS, Luna RE, Zhang F, Saini AK, Cherkasova VA, Wagner G, Lorsch JR,[‡] Hinnebusch AG.[‡] Enhanced eIF1 binding to the 40S ribosome impedes conformational rearrangements of the preinitiation complex and elevates initiation accuracy. *RNA.* 2014 Feb;20(2):150-67.
47. Dong J^{*}, Munoz A^{*}, Kolitz SE, Saini AK, Chiu W, Rahman H, Lorsch JR,[‡] Hinnebusch AG.[‡] Conserved residues in yeast initiator tRNA calibrate initiation accuracy by regulating preinitiation complex stability at the start codon. *Genes Dev.* 2014 Mar 1;28(5):502-20.

*Equal contribution

‡ Co-corresponding authors

48. Dong J, Aitken CE, Thakur A, Shin BS, Lorsch JR, Hinnebusch AG. Rps3/uS3 promotes mRNA binding at the 40S ribosome entry channel and stabilizes preinitiation complexes at start codons. *Proc Natl Acad Sci U S A*. 2017 Mar 14;114(11):E2126-E2135.
49. Munoz AM, Yourik P, Rajagopal V, Nanda JS, Lorsch JR, Walker SE. Active yeast ribosome preparation using monolithic anion exchange chromatography. *RNA Biol*. 2017 Feb;14(2):188-196.
50. Aitken EE, Beznosková P, Vičková V, Chiu WL, Zhou F, Valášek LS, Hinnebusch AG, Lorsch JR.† Eukaryotic translation initiation factor 3 plays distinct roles at the mRNA entry and exit channels of the ribosomal preinitiation complex. *Elife*. 2016 Oct 26;5.
51. Collins FS, Anderson JM, Austin CP, Battey JF, Birnbaum LS, Briggs JP, Clayton JA, Cuthbert B, Eisinger RW, Fauci AS, Gallin JI, Gibbons GH, Glass RI, Gottesman MM, Gray PA, Green ED, Greider FB, Hodes R, Hudson KL, Humphreys B, Katz SI, Koob GF, Koroshetz WJ, Lauer MS, Lorsch JR, Lowy DR, McGowan J, Murray DM, Nakamura R, Norris A, Perez-Stable EJ, Pettigrew RI, Riley WT, Rodgers GP, Sieving PA, Somerman JJ, Spong CY, Tabak LA, Volkow ND, Wilder EL. Basic science: Bedrock of progress. *Science*. 2016 Mar 25;351(6280):1405.
52. Bourne PE, Lorsch JR, Green ED. Perspective: Sustaining the big-data ecosystem. *Nature*. 2015 Nov 5;527(7576):S16-7.
53. Llàcer JL, Hussain T, Marier L, Aitken CE, Thakur A, Lorsch JR, Hinnebusch AG, Ramakrishnan V. Conformational Differences between Open and Closed States of the Eukaryotic Translation Initiation Complex. *Mol Cell*. 2015 Aug 6;59(3):399-412.
54. Lorsch JR. Preface. *Laboratory Methods in Enzymology: Protein Part D. Methods Enzymol*. 2015;559:xi.
55. Mitchell SF, Lorsch JR. Protein Affinity Purification using Intein/Chitin Binding Protein Tags. *Methods Enzymol*. 2015;559:111-25.
56. Saini AK, Nanda JS, Martin-Marcos P, Dong J, Zhang F, Bhardwaj M, Lorsch JR, Hinnebusch AG. Eukaryotic translation initiation factor eIF5 promotes the accuracy of start codon recognition by regulating Pi release and conformational transitions of the preinitiation complex. *Nucleic Acids Res*. 2014 Sep;42(15):9623-40. Erratum in: *Nucleic Acids Res*. 2015 Jun 23;43(11):5673-4.
57. Hussain T, Llàcer JL, Fernández IS, Munoz A, Martin-Marcos P, Savva CG, Lorsch JR, Hinnebusch AG, Ramakrishnan V. Structural changes enable start codon recognition by the eukaryotic translation initiation complex. *Cell*. 2014 Oct 23;159(3):597-607.
58. Lorsch JR, Barrett K, Pollock D, Barman S. APS leadership meets with NIGMS. *Physiologist*. 2014 Jul;57(4):157, 191-2.
59. Nanda JS, Lorsch JR. Labeling of a protein with fluorophores using maleimide derivatization. *Methods Enzymol*. 2014;536:79-86.

† Co-corresponding authors

60. Martin-Marcos P, Zhou F, Karunasiri C, Zhang F, Dong J, Nanda J, Kulkarni SD, Sen ND, Tamame M, Zeschnigk M, Lorsch JR[‡], Hinnebusch AG[‡]. eIF1A residues implicated in cancer stabilize translation preinitiation complexes and favor suboptimal initiation sites in yeast. *Elife*. 2017 Dec 5;6.
61. Yourik P, Aitken CE, Zhou F, Gupta N, Hinnebusch AG[‡], Lorsch JR[‡]. Yeast eIF4A enhances recruitment of mRNAs regardless of their structural complexity. *Elife*. 2017 Nov 30;6.

Review Articles

1. Lorsch JR, Szostak JW. Chance and necessity in the selection of nucleic acid catalysts. *Acc Chem Res*. 1996 Feb;29(2):103-10.
2. Lorsch JR. RNA chaperones exist and DEAD box proteins get a life. *Cell*. 2002 Jun 28;109(7):797-800.
3. Green R, Lorsch JR. The path to perdition is paved with protons. *Cell*. 2002 Sep 20;110(6):665-8.
4. Kapp LD, Lorsch JR. The molecular mechanics of eukaryotic translation. *Annu Rev Biochem*. 2004;73:657-704.
5. Doudna, JA, Lorsch JR. Ribozyme catalysis: not different, just worse. *Nat Struct Mol Biol*. 2005 May;12(5):395-402.
6. Algire MA, Lorsch JR. Where to begin? The mechanism of translation initiation codon selection in eukaryotes. *Curr Opin Chem Biol*. 2006 Oct;10(5):480-6.
7. Acker MG, Kolitz SE, Mitchell SF, Nanda JS, Lorsch JR. Reconstitution of yeast translation initiation. *Methods Enzymol*. 2007;430:111-45.
8. Acker MG, Lorsch JR. Mechanism of ribosomal subunit joining during eukaryotic translation initiation. *Biochem Soc Trans*. 2008 Aug;36(Pt 4):653-7.
9. Mitchell SF, Lorsch JR. Should I stay or should I go? Eukaryotic translation initiation factors 1 and 1A control start codon recognition. *J Biol Chem*. 2008 Oct 10;283(41):27345-9.
10. Kolitz SE, Lorsch JR. Eukaryotic initiator tRNA: finely tuned and ready for action. *FEBS Lett*. 2010 Jan 21;584(2):396-404.
11. Lorsch JR, Dever TE. Molecular view of 43 S complex formation and start site selection in eukaryotic translation initiation. *J Biol Chem*. 2010 Jul 9;285(28):21203-7.
12. Aitken, CE, Lorsch JR. A mechanistic overview of translation initiation in eukaryotes. *Nat Struct Mol Biol*. 2012 Jun 5;19(6):568-76.
13. Hinnebusch AG, Lorsch JR. The mechanism of eukaryotic translation initiation: New insights and challenges. *Cold Spring Harb Perspect Biol*. 2012 Oct 1;4(10).

[‡] Co-corresponding authors

14. Walker SE, Lorsch JR. Sanger dideoxy sequencing of DNA. *Methods Enzymol.* 2013;529:171-84.
15. Kolitz S, Lorsch JR. Explanatory chapter: nucleic acid concentration determination. *Methods Enzymol.* 2013;530:331-6.
16. Walker SE, Lorsch JR. RNA purification—precipitation methods. *Methods Enzymol.* 2013;530:337-43.
17. Walker SE, Lorsch JR. Reverse transcriptase dideoxy sequencing of RNA. *Methods Enzymol.* 2013;530:347-59.
18. Rajagopal V, Lorsch JR. ATP and GTP hydrolysis assays (TLC). *Methods Enzymol.* 2013;533:325-34.
19. Lorsch JR. Practical steady-state enzyme kinetics. *Methods Enzymol.* 2014;536:3-15.
20. Nanda JS, Lorsch JR. Labeling of a protein with fluorophores using maleimide derivitization. *Methods Enzymol.* 2014;536:79-86
21. Nanda JS, Lorsch JR. Labeling a protein with fluorophores using NHS ester derivitization. *Methods Enzymol.* 2014;536:87-94.
22. Mitchell SF, Lorsch JR. Protein derivitization-expressed protein ligation. *Methods Enzymol.* 2014;536:95-108.
23. Mitchell SF, Lorsch JR. Standard in vitro assays for protein-nucleic acid interactions—gel shift assays for RNA and DNA binding. *Methods Enzymol.* 2014;541:179-96.
24. Kolitz S, Lorsch JR. Protein filter binding. *Methods Enzymol.* 2014;541:197-205.

Commentaries and Perspectives

1. Lorsch JR, Nichols DG. Organizing graduate life sciences education around nodes and connections. *Cell.* 2011 Aug 19;146(4):506-9.
2. Lorsch JR. Good outcomes. *ASBMB Today.* 2012 Aug.
3. Lorsch JR, Collins FS, Lippincott-Schwartz JL. Fixing problems with cell lines. *Science.* 2014 Dec 19;346(6216):1452-3.
4. Lorsch JR. Maximizing the return on taxpayers' investments in fundamental biomedical research. *Mol Biol Cell.* 2015 May 1;26(9):1578-82.
5. Bourne PE, Lorsch JR, Green ED. Perspective: Sustaining the big-data ecosystem. *Nature.* 2015 Nov 5;527(7576):S16-7.

Letter (Technical Comment)

1. Lorsch JR, Berg JM. Mechanism of ribosomal peptide bond formation. *Science*. 2001 Jan 12;291(5502):203.

Book Chapters

1. Lorsch JR, Szostak JW. In vitro selection of nucleic acid sequences that bind small molecules. In: Cortese R, editor. *Combinatorial Libraries: Synthesis, Screening and Application Potential*. Berlin: Walter de Gruyter & Co.; 1996. p. 69-86.
2. Pestova TV, Lorsch JR, Hellen CUT. The mechanism of translation initiation in eukaryotes. In: Mathews MB, Sonenberg N, Hershey JWB, editors. *Translational Control in Biology and Medicine*. Cold Spring Harbor: Cold Spring Harbor Laboratory Press; 2007. p. 87-128.
3. Mitchell SF, Walker SE, Rajagopal V, Aitken CE, Lorsch JR. Recruiting knotty partners: The roles of translation initiation factors in mRNA recruitment to the eukaryotic ribosome. In: Rodnina MV, Wintermeyer W, Green R, editors. *Ribosomes: Structure, Function and Dynamics*. Vienna: Springer; 2011. p. 155-169.

Books Edited

1. Lorsch JR, editor. *Translation Initiation: Extract Systems and Molecular Genetics*. Vol. 429, *Methods in Enzymology*. San Diego: Elsevier; 2007.
2. Lorsch JR, editor. *Translation Initiation: Reconstituted Systems and Biophysical Methods*. Vol. 430, *Methods in Enzymology*. San Diego: Elsevier; 2007.
3. Lorsch JR, editor. *Translation Initiation: Cell Biology, High-Throughput and Chemical-Based Approaches*. Vol. 431, *Methods in Enzymology*. San Diego: Elsevier; 2007.
4. Lorsch JR, editor. *Laboratory Methods in Enzymology: DNA*. Vol. 529, *Methods in Enzymology*. San Diego: Elsevier; 2013.
5. Lorsch JR, editor. *Laboratory Methods in Enzymology: RNA*. Vol. 530, *Methods in Enzymology*. San Diego: Elsevier; 2013.
6. Lorsch JR, editor. *Laboratory Methods in Enzymology: Cell, Lipid and Carbohydrate*. Vol. 533, *Methods in Enzymology*. San Diego: Elsevier; 2013.
7. Lorsch JR, editor. *Laboratory Methods in Enzymology: Protein Part A*. Vol. 536, *Methods in Enzymology*. Sand Diego: Elsevier; 2014.

Patents

1. Szostak JW, Lorsch, JR, Wilson C, inventors; The General Hospital Corporation, assignee. Self-modifying RNA molecules and methods of making them. United States patent 5,688,670. 1997 Nov 18.

2. Lorsch JR, Takacs JE, Neary TB, inventors; The Johns Hopkins University, assignee. Identification and use of compounds that affect the fidelity of eukaryotic translation initiation codon selection. United States patent 8,828,976. 2014 Sept 9.

Previous Extramural Sponsorship

- | | |
|-----------------------|---|
| 07/01/1998-06/30/2001 | <p>Kinetic and Thermodynamic Analysis of Eukaryotic Translation Initiation
Career Development Award #3762-99
Leukemia Society of America
\$183,000
PI, 50%</p> <p>The goal of this project was to develop a fully reconstituted translation system using yeast components and to use this system to begin to analyze yeast translation initiation.</p> |
| 09/01/2000-08/01/2013 | <p>Kinetic Dissection of Eukaryotic Translation Initiation
R01 GM62128
NIH/NIGMS
\$1,924,241
PI, 20%</p> <p>The major goal of this project was to dissect the molecular mechanics of the steps involved in 43S pre-initiation complex formation and start codon recognition in eukaryotic translation initiation using a reconstituted yeast system.</p> |
| 07/01/2003-06/30/2005 | <p>Elucidation of the Molecular Mechanisms Employed by a Central Eukaryotic Translation Initiation Factor, eIF1
Grant-in-Aid
American Heart Association
\$120,000
PI, 30%</p> <p>The goal of this project was to probe the molecular mechanisms used by the eukaryotic translation initiation factor eIF1 in ensuring the fidelity of initiation codon selection.</p> |
| 07/01/2003-12/31/2007 | <p>Mechanism of Action of a Central Translation Factor, eIF5B
RSG GMC-105934
American Cancer Society \$600,000
PI, 30%</p> <p>The goal of this project was to elucidate the molecular mechanisms employed by the translation initiation factor eIF5B, a GTPase that facilitates the joining of the ribosomal subunits at the end of translation initiation.</p> |

07/01/2005-06/30/2007	<p>The Molecular Mechanics of the Penultimate Steps in Eukaryotic Translation Initiation</p> <p>Grant-in-Aid American Heart Association \$120,000 PI, 20%</p> <p>The goal of this project was to elucidate the molecular mechanics of the steps following the first committed step in eukaryotic translation initiation, GTP hydrolysis by the factor eIF2, and preceding the final step, joining of the two ribosomal subunits. These penultimate steps may play an important role in proofreading the selection of the translational start site in the mRNA.</p>
06/01/2007-05/31/2009	<p>Small Molecule Effectors of Eukaryotic Translation Initiation Site Selection</p> <p>R21 DK078633 NIH/NIDDK \$275,000 PI, 20%</p> <p>The goal of this project was to find and begin to characterize small molecules that can modulate the fidelity of start codon recognition in eukaryotes.</p>
12/01/2009-11/30/2012	<p>Structural Studies of Yeast Translation Initiation</p> <p>RGP0028/2009-C Human Frontier Science Program \$750,000 PI, 10%; co-PIs: A. Hinnebusch and V. Ramakrishnan</p> <p>The goal of this project was to determine three-dimensional structures of yeast translation initiation complexes.</p>
09/10/2011-08/31/2013	<p>Modulators of the Fidelity of Start Codon Recognition in Eukaryotes</p> <p>1R03 MH095520-01 NIH \$25,000 (Yr 1 Direct Cost)</p> <p>The major goal of this project was to perform a high-throughput screen for additional compounds that modulate the fidelity of start codon recognition.</p>
06/2007-08/2007	<p>Supplement to Kinetic Dissection of Eukaryotic Translation Initiation</p> <p>3R01GM062128-07S1 NIH/NIGMS \$4,800 PI, 20%</p> <p>This award provided support under the Research Supplements to Promote Diversity in Health-Related Research Program for Jasmine Hope's summer research.</p>

06/2008-08/2008	<p>Supplement to Kinetic Dissection of Eukaryotic Translation Initiation</p> <p>3R01GM062128-08S1 NIH/NIGMS</p> <p>\$7,800</p> <p>PI, 20%</p> <p>This award provided support under the Research Supplements to Promote Diversity in Health-Related Research Program for Jasmine Hope's summer research.</p>
07/2009-03/2010	<p>Supplement to Kinetic Dissection of Eukaryotic Translation Initiation</p> <p>3R01GM062128-09S1</p> <p>NIH/NIGMS</p> <p>\$67,841</p> <p>This was an ARRA supplement to the parent grant to provide funds to purchase a new FPLC.</p>
07/2010-06/2012	<p>Supplement to Kinetic Dissection of Eukaryotic Translation Initiation</p> <p>3R01GM062128-10S1</p> <p>NIH/NIGMS</p> <p>\$178,886</p> <p>This award provided support under the Research Supplements to Promote Diversity in Health-Related Research Program for Colin Echeverria Aitken's research.</p>
07/2010-06/2012	<p>Supplement to Kinetic Dissection of Eukaryotic Translation Initiation</p> <p>3R01GM062128-10S2</p> <p>NIH/NIGMS</p> <p>\$101,702</p> <p>This award provided support under the Research Supplements to Promote Diversity in Health-Related Research Program for Antonio Muñoz's research.</p>

EDUCATIONAL ACTIVITIES

Teaching

2000	Molecules and Cells, Macromolecules block (Section Leader)
2001-2003	Molecules and Cells, Macromolecules block (Lecturer, Section Leader)
2004-2009	Molecules and Cells, Macromolecules block (Director, Lecturer, Section Leader)
2009-2013	Scientific Foundations of Medicine (Director, Lecturer, Section Leader) 2000-2005
	Topics in Macromolecular Structure and Function (Course Director, Lecturer)
2001-2002	Biochemistry and Cell Biology (Lecturer)
2001-2004	Bioorganic Chemistry (Lecturer)
2003-2007	Method and Logic (Section Leader)
2003-2013	Biochemical and Biophysical Principles (Lecturer)
2009-2013	Basic Science Scholarly Concentration (Course Director)

2011-2013 Medical Education Elective (Lecturer, Discussion Leader)
2012-2013 Infectious Diseases Translational Intersession (co-leader of the Antibiotics section, with Khalil Ghanem, M.D.)

Mentoring

Graduate Students

2000-2006 Drew Applefield (Ph.D.; BCMB student; currently business and technology development associate, North Carolina Biotechnology Center)
2000-2005 Lee Kapp (Ph.D.; BCMB student; currently lecturer, SUNY Plattsburgh)
2001-2006 Mikkel Algire (Ph.D.; BCMB student; currently oncology assay lab head, Abbvie)
2001-2006 David Maag (Ph.D.; BCMB student; NSF pre-doctoral fellow; 2005; currently associate scientific director, oncology discovery, Abbvie)
2002-2008 Michael Acker (Ph.D.; BCMB student; currently senior investigator, Novartis)
2004-2010 Sarah Kolitz (Ph.D., PMB student; currently vice president, translational medicine, immuneering)
2004-2010 Sarah Mitchell (Ph.D., PMB student; currently assistant professor, Loyola Marymount University)
2005-2011 Julie Takacs (Ph.D., BCMB student; currently instructor, Anne Arundel Community College)
2010-2015 Antonio Muñoz (Ph.D., PMB student; currently consultant, Accenture)
2012-2017 Paul Yourik (Ph.D., BCMB student; currently postdoctoral fellow, New England Biolabs)

Postdoctoral Fellows

2006-2012 Jagpreet Nanda (Ph.D., 2005, IMTECH, Jawaharlal Nehru University, New Delhi; currently Lorsch lab staff scientist)
2008-2015 Sarah Walker (Ph.D., 2008, Ohio State University; American Heart Association Fellow; currently assistant professor, University of Buffalo)
2009-2013 Vaishnavi Rajagopal (Ph.D., 2009, Rutgers University; currently senior scientist, Ra Pharmaceuticals)
2010-present Colin Aitken (Ph.D., 2010, Stanford University; Leukemia and Lymphoma Society Fellow; currently assistant professor, Vassar College)
2011-2012 Aleksander Todorovic (Ph.D., 2006, University of Florida)
2013-present Shardul Kulkarni

Research Associate/Senior Scientist

2012-present Jagpreet Nanda (Ph.D., 2005, IMTECH, Jawaharlal Nehru University, New Delhi)

Medical, Undergraduate, Postbaccalaureate, and High School Students

2000-2003 Clarence Lin (JHU undergraduate; attended NYU Medical School)
2006-2009 Jasmine Hope (Baltimore Polytechnic High School student; Baltimore Scholar, JHU; Teach for America; worked in lab senior year, 2006-2007; Summers 2007, 2008)
2006-2008 Alex Herrera (B.A., UMBC; postbaccalaureate PREP student)
2007-2008 Amy Dusto (JHU undergraduate)
2011-2012 Nirvan Sengupta (JHU undergraduate)
2012-2013 Candice Jennings (Carver Vocational Technical High School student; Biophysics Research for Baltimore Teens program, summers of 2012, 2013)

2012-2013 Nikhil Jiwrajka (medical student)

Thesis Committees and Graduate Board Oral Examinations

2000-2013 Served on 39 thesis committees and over 50 oral examination committees

Training Grant Participation

1999-2013 Member, Biochemistry, Cell and Molecular Biology (BCMB) Graduate Program

1999-2013 Member and Chair of Admissions Committee, Program in Molecular Biophysics (PMB)

Educational Program Building/Leadership

2002-2013 Chair, Admissions Committee, Graduate Program in Molecular Biophysics

2002-2013 Member, Steering Committee, Graduate Program in Molecular Biophysics

2005-2006 Member, Medical Curriculum Reform Committee

2005-2006 Member, "Scientific Foundations of Medicine" Subcommittee, Medical Curriculum Reform Committee

2006-2013 Member, Genes to Society (GtS) Integration Committee

2008-2009 Member, Committee on Graduate Education

2008-2013 Director, Scientific Foundations of Medicine course (GtS curriculum)

2008-2013 Director, Basic Sciences Scholarly Concentration course (GtS curriculum)

2010-2013 Member, Managing Board of the Johns Hopkins Institute for Excellence in Education

2011-2013 Chair, MA/PhD Committee (oversees and coordinates graduate education at the School of Medicine)

2011-2013 Member, Gateway Science Initiative Steering Committee (Provost's Office)

2011-2012 Chair, Gateway Science Initiative Symposium Planning Committee

2012-2013 Director, Biophysics Research for Baltimore Teens Program

2012-2013 Chair, Committee on the Future of Ph.D. Education (Provost's Office)

EDITORIAL ACTIVITIES

2006 Member, ad hoc advisory panel for *Nature Structural and Molecular Biology*

2007 Editor of three volumes of *Methods in Enzymology* (Vols. 429-431)

2009-2011 Editor, *Methods Navigator Protocols for Biomedical Research* (Elsevier)
(Subsequently turned into multiple volumes of *Methods in Enzymology*)

2013 Member, editorial advisory board, *ASBMB Today*

Reviewer for *Biochemistry*; *Cell*; *EMBO Journal*; *Journal of Biological Chemistry*; *Journal of Molecular Biology*; *Molecular Cell*; *Molecular and Cellular Biology*; *Nature Structural and Molecular Biology*; *Proceedings of the National Academy of Sciences*; *PLOS Biology*; *RNA*; *Science*; *Virology*

ORGANIZATIONAL ACTIVITIES

Institutional Administrative Appointments

Johns Hopkins

- 2000-2001 Co-chair, Ad hoc Committee to Reevaluate Oral Examination Procedures, Graduate Program in Biochemistry, Cellular and Molecular Biology
- 2000-2005 Course director, Topics in Macromolecular Structure and Function
- 2001-2005 Member, Admissions Committee, Graduate Program in Biochemistry, Cellular and Molecular Biology
- 2002-2013 Chair, Admissions Committee, Graduate Program in Molecular Biophysics
- 2002-2013 Member, Steering Committee, Graduate Program in Molecular Biophysics
- 2002-2004 Chair, Student Seminar Evaluation Committee, Program in Molecular Biophysics
- 2003, 2012 Member, Curriculum Committee, Program in Molecular Biophysics
- 2003-2006 Member, Medical School Council
- 2004-2013 Member, Professors' Awards Committee
- 2004-2013 Course Director, Macromolecules block of Molecules and Cells
- 2005-2006 Member, Medical Curriculum Reform Committee
- 2005-2006 Member, "Scientific Foundations of Medicine" Subcommittee, Medical Curriculum Reform Committee
- 2005-2006 Participant, Leadership Development Program, Johns Hopkins University School of Medicine
- 2006-2009 Chair, Year 1 Medical Curriculum Committee
- 2006-2013 Member, Educational Policy and Curriculum Committee (EPCC)
- 2006-2013 Member, EPCC Agenda/Executive Committee
- 2006-2013 Member, Student Assessment and Program Evaluation Committee (SAPE)
- 2006-2013 Member, Genes to Society Integration Committee
- 2006-2012 Member, Instructor and Assistant Professor Reappointment Committee
- 2008-2009 Member, Committee on Graduate Education
- 2009-2013 Chair, Foundations of Medicine Curriculum Committee
- 2011-2013 Chair, MA/PhD Committee
- 2011-2013 Member, Gateway Science Initiative Steering Committee (Provost's Office)
- 2011-2012 Chair, Gateway Science Initiative Symposium Planning Committee
- 2012-2013 Co-chair, Committee on the Future of PhD Education (Provost's Office)
- 2012-2013 Provost's Fellow on Graduate Education

NIH

- 2013-present NIH Steering Committee
- 2013-present Scientific Data Council (SDC) – Co-Chair, 2016-Present
- 2013-2016 BD2K Multi-Council Working Group
- 2014-present Extramural Activities Working Group (EAWG) – Co-Chair
- 2014-present Administrative Data Council (ADC)
- 2015-present Diversity Program Consortium – Co-Chair
- 2015-2016 Cell Line Authentication Working Group – Co-Chair
- 2016-present Executive Leadership Program Advisory Group
- 2016-present Developing Efficient and Sustainable Funding Policies Working Group of EAWG/EPMC – Chair

2016-present Extramural Program Management Committee (EPMC) Agenda Subcommittee
 2016 National Center for Biotechnology Information (NCBI) Resource Board
 2016-2017 Grand Support Index (GSI) Implementation Subcommittee
 2017 SDC Data Resource Ecosystem “Blue Sky” Working Group – Chair
 2017-present Advisory Committee to the Director (ACD) Next Generation Researchers Initiative Working Group
 2017-present EAWG Workgroup on Peer Review
 2017 Headquarters Building Planning Committee
 2017 21st Century Cures Implementation Working Group

NIH Search Committees

2014 Director, Division of Biomedical Research Workforce, Office of Extramural Research (OER), NIH (Chair)
 2014 Division Directors (2), Center for Scientific Review (CSR), NIH
 2015 Director, National Library of Medicine (NLM) (Co-Chair)
 2015 Director, National Institute of Neurological Disorders and Stroke (NINDS)

External Administrative Appointments

2012 Member, Mentoring Committee, ASBMB
 2013 Board of Directors, RNA Society

Professional Societies

1990-2008 Member, American Chemical Society
 1998-2013 Member, RNA Society
 2001-2005 Member, Faculty of 1000, RNA Structural Biology Section 2006-2013 Member, American Society for Biochemistry and Molecular Biology

Conference Organizer

2004 Co-organizer, Baltimore-Washington Protein Synthesis Meeting
 2006 Co-organizer, DIMACS/DARPA Workshop on State-Dependent Delays in Gene Regulatory Networks
 2011 Co-organizer, EMBL Conference on Protein Synthesis and Translational Control
 2012 Chair, Organizing Committee, Johns Hopkins University Gateway Sciences Initiative Symposium on Teaching Excellence in the Sciences

Session Chair

2006 RNA Society Meeting
 2007 FASEB Summer Research Conference on Helicases & NTP-Driven Nucleic Acid Motors: Structure, Function, Mechanisms & Roles in Human Disease
 2007 22nd tRNA Workshop
 2009 RNA Society Meeting
 2009 EMBO Protein Synthesis and Translational Control Meeting, Heidelberg, Germany
 2010 Ribosome Meeting
 2010 Cold Spring Harbor Translational Control Meeting
 2012 ASBMB Meeting: RNA Dynamics

Review Groups

2001-2002	Ad Hoc Reviewer for NSF grant applications
2005	Ad hoc member, NIH special program project study section
2006-2008	Ad hoc member, NIH Molecular Genetics A Study Section (three times)
2007	Member, American Heart Association Mid-Atlantic Division Peer Review Committee 6A (Basic Cell and Molecular Biology)
2008	Member, NIH Special Emphasis Panel on Enzyme and Gene Evolution
2008	Co-chair, American Heart Association Region II Basic Cell and Molecular Biology Study Group
2008-2012	Member, NIH Molecular Genetics A Study Section
2010	Acting Chair, NIH Molecular Genetics A Study Section (February meeting)

RECOGNITION

Honors and Awards

1989	Adamson Prize in Chemistry (Swarthmore College)
1990	American Chemical Society Award for Academic Achievement
1990	Phi Beta Kappa
1995-1998	Damon Runyon-Walter Winchell Postdoctoral Fellowship
1998-2001	Leukemia Society of America Special Fellowship 2001-2005
	Member, Faculty of 1000, RNA Structural Biology Section
2002	Graduate Student Association Teacher of the Year (Johns Hopkins School of Medicine)
2003-2007	American Cancer Society Research Scholar
2005	Dean's Marshall (Commencement)
2006	Barry Wood Teaching Award (first year medical students)
2007	Professors Award for Excellence in Preclinical Teaching
2008	Graduate Student Association Teacher of the Year
2008	Students' Marshall (Commencement)
2009	"Last Lecture" (Selected by Nathans College Students)
2012	Barry Wood Teaching Award
2012	Graduate Student Association Teacher of the Year
2012	Dean's Lecture (Johns Hopkins School of Medicine)
2013	Convocation Speaker (Johns Hopkins School of Medicine) (http://www.youtube.com/watch?v=ITHDKfCWvOg)

INVITED TALKS (since 2000)

2/9/00	Institute for Biophysical Research, Johns Hopkins University
2/21/01	Johns Hopkins University School of Medicine, Department of Pharmacology
7/20/01	Message Pharmaceuticals
7/24/01	LGRD, NICHD, National Institutes of Health
10/14-16/01	West Coast Translation and mRNA Stability Meeting, Washington: selected speaker (from submitted abstracts)
2/28/02	Trinity College, Department of Biology
3/12/02	Pennsylvania State University, Department of Chemistry

7/10/02 Bryn Mawr College, Department of Chemistry
10/24/02 Swarthmore College, Department of Chemistry
6/28-7/3/03 FASEB Summer Research Conference "Helicases: Structure, Function, and Roles in Human Disease," Vermont
10/17/03 Institute for Biophysical Research, Johns Hopkins University, Annual Retreat: keynote speaker (selected by Program in Molecular and Computational Biophysics graduate students)
10/31/03 LGRD, NICHD, National Institutes of Health
11/18/03 Johns Hopkins University School of Medicine, Department of Biological Chemistry
11/4-11/6/04 National Academy of Sciences, Beckman Frontiers of Science Symposium, California
11/19/04 Meyerhoff Scholars Program, University of Maryland, Baltimore County:
12/2-12/4/04 Workshop on "Quantitative mathematical modeling of gene regulatory networks," Mathematical Biosciences Institute, Ohio State University
4/21/05 Louisiana State University Health Sciences Center, Department of Biochemistry and Molecular Biology
10/26/05 Washington University in St. Louis, Department of Biochemistry and Molecular Biophysics
12/8/05 SUNY Downstate Medical Center, Department of Molecular Biology and Immunology
2/13/06 University of Delaware, Department of Chemistry and Biochemistry
3/2/06 Rutgers University, DIMACS/DARPA Workshop on State-Dependent Delays in Gene Regulatory Networks: co-organizer and speaker
5/1-5/5/06 American Society for Biochemistry and Molecular Biology 100th Anniversary Meeting, Symposium on Protein Synthesis, Post-translational Modification and Degradation, San Francisco, CA
6/10-6/12/06 FASEB Summer Research Conference on Nucleic Acid Enzymes, Saxtons River, VT
6/20-6/25/06 RNA Society Meeting, Seattle, WA: session chair
10/25/06 University of Rochester Medical Center, Department of Biochemistry and Biophysics
11/10/06 Columbia University, Department of Biochemistry and Molecular Biophysics;
12/12/06 Uniformed Services University of the Health Sciences, Department of Biochemistry and Molecular Biology
3/14/07 Institute for Biophysical Research, Johns Hopkins University
4/12/07 Laboratory of Molecular Biology, Medical Research Council, Cambridge, UK
6/3-6/7/07 Ribosome Meeting, Cape Cod, MA
6/24-6/28/07 FASEB Summer Research Conference on Helicases & NTP-Driven Nucleic Acid Motors: Structure, Function, Mechanisms & Roles in Human Disease, Indian Wells, CA: invited speaker and session chair
7/21-7/25/07 Protein Society Meeting, Boston, MA
10/18/07 McGill University Cancer Centre
11/1-11/6/07 22nd tRNA Workshop, Uppsala, Sweden (Sponsored by the Royal Swedish Academy of Sciences): invited speaker and session chair
12/11/07 University of Maryland, College Park, Department of Chemistry and Biochemistry
1/15/08 University of California, San Francisco, Department of Biochemistry and Biophysics
1/16/08 Stanford University School of Medicine, Department of Biochemistry

1/28-2/2/08 Keystone Symposium on Translational Regulatory Mechanisms, Coeur d'Alene, ID

2/25/08 University of Maryland Medical Center, Department of Biochemistry and Molecular Biology

3/26-3/28/08 The UK Biochemical Society's Meeting on "Gene Expression and Analysis," Manchester, UK

4/11/08 University of Michigan, Department of Chemistry

4/28/08 Yale University, Department of Molecular Biophysics and Biochemistry

5/28/08 Albert Einstein College of Medicine of Yeshiva University, Department of Developmental and Molecular Biology

6/8-6/13/08 FASEB Summer Research Conference on Nucleic Acid Enzymes, Saxtons River, VT

10/22/08 Undergraduate Biochemistry Majors Association, Case Western Reserve University

10/23/08 Department of Biochemistry, Case Western Reserve University School of Medicine

1/26-1/27/09 Roy Parker Lab Retreat, University of Arizona: invited speaker and advisor

4/29/09 Department of Biochemistry and Molecular Biology, University of Chicago

5/21-26/09 RNA Society Meeting, Madison, WI: session chair

6/26/09 Genes to Society Curriculum Retreat, Faculty Development Session on Lecturing

9/9-13/09 EMBO Protein Synthesis and Translational Control Meeting, Heidelberg, Germany: session chair and invited speaker

4/20/10 Department of Microbiology, Ohio State University

5/3-7/10 Ribosome Meeting, Orvieto, Italy: invited speaker and session chair

6/23/10 RNA Society Meeting

8/30/10 PTC Therapeutics: invited speaker and consultant

10/30/10 American College of Veterinary Pathologists Annual Meeting—Pre-meeting workshop on Principles of Educational Theory in Practice

11/18/10 Department of Chemistry, Swarthmore College

3/2/11 National Academy of Sciences Workshop: Towards a New Taxonomy of Disease: panelist

4/21/11 Department of Chemistry and Biochemistry, University of Texas at Austin

6/17/11 Workshop on Leading Small Group Discussions, Genes to Society Curriculum Retreat, Johns Hopkins University School of Medicine: co-leader

9/8/11 EMBL Proteins Synthesis and Translational Control Meeting, Heidelberg, Germany: organizer

11/3/11 University of Illinois, Urbana-Champaign, Department of Biochemistry

12/7/11 Washington University School of Medicine, Department of Biochemistry and Molecular Biophysics

1/20/12 Gateway Sciences Initiative Symposium on Teaching Excellence: organizer

2/20/12 Dean's Lecture, "The Widening Gyre: Biomedical Education in the Age of Information Overload." Johns Hopkins University School of Medicine: invited speaker (four senior faculty selected by the Dean per year)

3/14/12 University of Massachusetts School of Medicine

3/23/12 Education Retreat, Johns Hopkins University School of Medicine: workshop leader (teaching and mentoring in a laboratory setting)

4/22/12 ASBMB Meeting, San Diego, CA: invited speaker and session chair

5/2/12 Department of Cell and Molecular Biology, Uppsala University, Sweden: invited speaker and thesis examiner

2/11/13 Department of Biology, University of Richmond

4/11/13 Division of Chemistry and Chemical Engineering, Biochemistry subgroup, California Institute of Technology

5/6/13 Department of Biochemistry and Molecular Genetics, University of Colorado School of Medicine

5/24/13 Johns Hopkins University School of Medicine Convocation: *Keynote speaker*

7/9-12/13 Ribosome Meeting, Sonoma, CA

9/16-17/13 National Academies' Committee on Key Challenge Areas for Convergence and Health, Washington, DC

9/30/13 National Academies' Board on Mathematical Sciences and their Applications Board Meeting, Washington, DC

11/15-16/13 Southeast Regional IDeA Meeting, Little Rock, AK: plenary speaker

12/14-16/13 ASCB Annual Meeting, New Orleans, LA

3/8/2014 Mid-Atlantic American Medical Association, Medical Student Section Regional Meeting, Washington, DC: keynote speaker

7/29-8/3/14 Genetics Society of America 2014 Yeast Genetics Meeting, Seattle, WA

9/2-6/14 Cold Spring Harbor Translational Control Meeting, Cold Spring Harbor, NY: keynote speaker

9/16/14 FASEB Roundtable, Bethesda, MD: panelist

10/21/14 16th Annual NIH SBIR/STTR Conference: "Land of Achievement: Extending the Reach of Science with the SBIR/STTR Programs," Albuquerque, NM: keynote speaker

12/8/14 ASCB Annual Meeting, Philadelphia, PA: panelist leader

2/10/15 Biophysical Society Annual Meeting, Baltimore, MD

2/24/15 The American Academy of Arts and Sciences and Duke University, Durham, NC: panelist

3/5/15 ASCPT Annual Meeting (attended via videoconference)

3/17/15 Grand Rounds Lecture Series at the Johns Hopkins Institute of Excellence in Education, Baltimore, MD

3/27/15 2015 GRAND Spring Conference at the American Association of Medical Colleges Learning Center, Washington, DC

4/14/15 National Diversity Equity Workshop, Open Chemistry Collaborative in Diversity Equity, Arlington, VA

4/19-21/15 Molecular Biophysics and Biochemistry Departmental Seminar Series, Yale University, New Haven, CT

4/30/15 National Organization of Research Development Professionals 7th Annual Research Development Conference, Bethesda, MD

5/6-7/15 Joint Seminars in Molecular Biology seminar series; University of California, San Francisco and University of California, Davis

5/31/15 FASEB Science Policy Symposium on Reproducibility of Biological Research, Arlington, VA

9/9/15 2015 Drug Information Association/FDA Oligonucleotide-Based Therapeutic Conference, Washington, DC

9/25/15 Northeast Regional IDeA Meeting, Bar Harbor, ME

10/23/15 Harvard Medical School Program in Graduate Education Symposium, Cambridge, MA

10/29/15 2015 SACNAS National Conference, Washington, DC: keynote speaker

11/12/15 ABRCMS 2015, Seattle, WA

11/13/15 Oregon Health and Science University Research Week, Portland, OR
 11/16/15 Genetics Society of America Board Meeting, Bethesda, MD
 1/15/16 Association of Medical and Graduate Departments of Biochemistry Meeting,
 Skype meeting: invited participant
 2/4-5/16 ASBMB, Sustaining the Biomedical Research Enterprise, Washington, DC
 2/16-17/16 Howard Hughes Medical Institute, Accelerating Science and Publication in
 Biology, Washington, DC
 2/29/16 EPSCoR/IDeA Annual Conference, Washington, DC: keynote address
 3/2/16 FASEB Public Service Award Ceremony, Washington, DC
 3/7/16 University of Maryland-Baltimore MARC Scholars Seminar
 3/16/16 Research!America's Advocacy Award Ceremony, Washington, DC
 5/4/16 USUHS 2016 Research Days (Wu Award Ceremony, Washington, DC)
 5/9/16 NIH SciEd Annual Conference, Washington, DC: keynote address
 5/16/16 American Society for Cell Biology Council, Training Grant Support, Bethesda, MD
 5/23-24/16 MIDAS PI Network Meeting, Reston, VA
 5/25/16 Tri-Institutional Collaboration Network (TCN), New York: plenary speaker
 5/26/16 Hunter College, Developing a More Productive, Efficient and Sustainable
 Biomedical Research Enterprise, New York
 6/20-21/16 2016 Select USA Summit, US Department of Commerce, Washington, DC
 6/27/16 National IDeA Symposium of Biomedical Research Excellence, Washington, DC
 7/8-11/16 Gordon Research Conference—Post-Transcriptional Control, Burlington, VT:
 keynote speaker
 9/9/2016 US-German Science Leadership Breakfast, Washington, DC: NIH representative
 9/29/16 Kenyon College, Developing a More Productive, Efficient and Sustainable
 Biomedical Research Enterprise, Ohio
 10/13/16 Kansas University COBRE Center Visit
 10/26/16 University of North Carolina, Chapel Hill, speak to SACNAS students
 10/27/16 Duke University Seminar, Durham, NC
 2/1/17 ISPCTN Steering Committee Meeting, Bethesda, MD
 3/24-25/17 AAMC Council of Deans, Ongoing Developments in Mechanisms for Funding
 Research at the NIH, New York City
 5/15/17 American Society for Cell Biology Council, MIRA, Bethesda, MD
 5/21/17 University of Virginia-Charlottesville, VA: commencement address
 5/31/17 NIH SCiEd (SEPA) Conference, "NIGMS Education and Training Programs":
 Washington, DC
 6/7-9/17 IDeA Central Regional Meeting, Sioux Falls, SD
 7/20/17 Association of American Medical Colleges, Great Group MD-Ph.D. Section
 Meeting, Rockville, MD
 8/20/17 American Chemical Society, Advancing Graduate Education in the Sciences,
 Washington, DC: plenary speaker
 9/25/17 2017 Annual INBRE PI/PC Meeting, Bethesda, MD
 10/2/17 Association of Independent Research Institutes, NIH's current and future research
 initiatives and priorities, Washington, DC
 11/13/17 Vermont Research Day, Burlington, VT