

Michelle M. Meyer

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Education

California Institute of Technology, Pasadena, CA PhD in Biochemistry and Molecular Biophysics	2006
Rice University, Houston, TX BS Chemistry, BA Biochemistry, <i>cum laude</i>	2001

Academic/Research Positions

Boston College, Chestnut Hill, MA Professor, Department of Biology	2021-current
Associate Professor, Department of Biology	2016-2021
Assistant Professor, Department of Biology	2010-2016
Yale University, New Haven, CT NRSA Postdoctoral Fellow with Professor Ronald R. Breaker	2006-2010
California Institute of Technology, Pasadena, CA HHMI Predoctoral Fellow with Professor Frances H. Arnold	2001-2006
Rice University, Houston, TX Undergraduate Research Assistant with Professor Seiichi P. T. Matsuda	1998-2001

Awards and Honors

Alfred P. Sloan Foundation Research Fellowship	2012-2014
NIH National Research Service Award Postdoctoral Fellowship	2007-2010
Caltech Graduate Dean's Award for Outstanding Community Service	2006
Kavli Nanoscience Institute Graduate Travel Stipend	2005
Howard Hughes Medical Foundation Predoctoral Fellowship	2001-2006
National Science Foundation Doctoral Fellowship (declined)	2001
Hertz Foundation Graduate Research Grant	2001
American Society of Pharmacognosy Undergraduate Research Grant	1999

Professional Memberships

American Chemical Society	2001-current
RNA Society	2008-current
International Society of Computational Biology	2010-current
American Society for Microbiology	2010-current
American Association for the Advancement of Science	2010-current
Society for Molecular Biology and Evolution	2012-current

Peer Reviewed Publications

At Boston College

- Ram-Mohan N and Meyer MM: Comparative metatranscriptomics of periodontitis supports a common polymicrobial shift in metabolic function and identifies novel putative disease-associated ncRNAs. 2020 *Front. Microbiol.* 11:482.
- Crum, M, Ram-Mohan N, Meyer MM: Regulatory context drives conservation of glycine riboswitch aptamers. *PLoS Comput. Biol.* 2019: 15(12):e1007564.
- Warrier I, Ram Mohan N, Zhu Z, Hazery A, Echlin H, Rosch J, Meyer MM, van Opijnen T: The Transcriptional landscape of *Streptococcus pneumoniae* TIGR4 reveals a complex operon architecture and abundant riboregulation critical for growth and virulence. *PLoS Pathogens* 2018: 14(12):e1007461.
- Babina AM, Parke DJ, Li GW, Meyer MM: Fitness advantages conferred by the L20-interacting RNA cis-regulator of ribosomal protein synthesis in *Bacillus subtilis*. *RNA* 2018 **24**:11330-1143.
- Babina AM, Lea NL**, Meyer MM: *In vivo* Behavior of the Tandem Glycine Riboswitch in *Bacillus subtilis*. *mBio* 2017 **8**(5):e01602-17.
- Pei S, Slinger BL, Meyer MM Recognizing RNA structural motifs in HTS-SELEX data. *BMC Bioinformatics* 2017 **18**:298.
- Slinger BL and Meyer MM. Regulators RNAs are readily derived from *in vitro* selected aptamers to ribosomal protein S15. *Nucleic Acids Research* 2016 **44**: 9331-9341.
- Slinger BL, Newman H**, Lee Y**, Pei S, Meyer MM. Co-evolution of bacterial ribosomal protein S15 with diverse mRNA regulatory structures *PLOS Genetics* 2015.**11**: e1005720. .
- Babina AM, Soo MW**, Fu Y, Meyer MM. An S6:S18 complex regulates translation of *rpsF* RNA 2015 **21** (12): 2039-2046.
- Pei S, Anthony J, Meyer MM: The structural ensemble neutrality as a feature for structured RNA classification. *BMC Genomics* 2015, **16**:77.
- Lorenz, DR, Meyer LF, Grady PJ, Meyer MM, Cam HP: Heterochromatin assembly and transcriptome repression by Set1 in coordination with a class II histone deacetylase. *Elife* 2014, 10.7554/eLife.04506.
- Dotu I, Garcia-Martin JA, Dixon BL, Mechery V, Meyer MM, Clote P: Complete RNA inverse folding: computational design of functional hammerhead ribozymes. *Nucleic Acids Research* 2014, **42**:11752-11762.
- Slinger BL, Deiorio-Hagger K, Anthony J, Gilligan M**, Meyer MM: Discovery and validation of novel and distinct RNA regulators for ribosomal protein S15. *BMC Genomics* 2014, **15**:657.
- Fu Y, Deiorio-Hagger K, Soo MW**, Meyer MM: A broadly distributed motif in the 5'-UTR of *rpsF* interacts with an S6:S18 complex. *RNA* 2014 **20**:168-176.
- Deiorio-Hagggar K, Anthony J, Meyer MM: RNA Structures Regulating Ribosomal Protein Biosynthesis in Bacilli. *RNA Biology* 2013 **10**:1180-1184.
- Fu Y, Deiorio-Hagggar K, Anthony J, Meyer MM: Most RNAs regulating ribosomal protein biosynthesis in *E. coli* are narrowly distributed to Gammaproteobacteria. *Nucleic Acids Research* 2013 **41**:3491-3503.
- Miller C, Anthony J, Meyer MM, Marth G: Scribl: An HTML5 Canvas-based graphic library for visualizing genomic data over the web. *Bioinformatics* 2013, **29**:381-383
- Zarringhalam K, Meyer MM, Dotu I, Chuang J, Clote P: Integrating chemical footprinting data into RNA secondary structure prediction. *PLOS ONE* 2012, **7**(10): e45160.

** undergraduate student author

Graduate, and Postdoctoral Research:

- Meyer MM, Hammond MC, Salinas Y, Roth A, Sudarsan N, Breaker RR: Aspects of ligand identification of challenging riboswitch candidates. *RNA Biology* 2011, **8**:5-10.
- Weinberg Z, Perreault P, Meyer MM, Breaker RR: Exceptional Structured Non-coding RNAs Revealed by Bacterial Metagenome Analysis. *Nature* 2009, **462**:656-659.
- Poiata E, Meyer MM, Ames TD, Breaker RR: A variant riboswitch aptamer class of *S*-adenosylmethionine common in marine bacteria. *RNA* 2009, **15**:2046-2056.
- Meyer MM, Ames TD, Smith DP, Weinberg Z, Schwalbach MS, Giovannoni SJ, Breaker RR: Identification of candidate structured RNAs in the marine organism ‘*Candidatus Pelagibacter ubique*’. *BMC Genomics* 2009, **10**:268.
- Tripp HJ, Schwalbach MS, Meyer MM, Kitner JB, Breaker RR, Giovannoni SJ: ‘*Candidatus Pelagibacter ubique*’ is a functional glycine-serine auxotroph with a glycine riboswitch preceding malate synthase. *Environmental Microbiology* 2009, **11**:230-238.
- Meyer MM, Roth A, Chervin S, Garcia GA, Breaker RR: Confirmation of a second natural preQ₁-binding aptamer. *RNA* 2008 **14**:685-695.
- Meyer MM, Hochrein L, Arnold FH: Structure-Guided Recombination of Distantly Related beta-lactamases. *Prot. Eng. Des. Sel.* 2006, **19**:563-570.
- Drummond DA, Silberg JJ, Meyer MM, Wilke CO, Arnold FH: On the conservative nature of intragenic recombination. *Proc. Natl. Acad. Sci.* 2005, **102**:5380-5385.
- Meyer MM, Silberg JJ, Voigt CA, Endelman JB, Mayo SL, Wang ZG, Arnold FH: Library analysis of SCHEMA-guided protein recombination. *Protein Sci.* 2003, **12**:1686-1693.

Patents

- Riboswitches and methods and compositions for use of and with riboswitches. Inventors: RR Breaker, Z Weinberg, N Sudarsan, X Wang, MM Meyer, A Roth, EE Regulski. US 2010/0286082, EP 2164996 (2010/3/24)

Reviews/Book Chapters

- Meyer MM: Revisiting the Relationships Between Genomic G + C Content, RNA Secondary Structures, and Optimal Growth Temperature *J. Mol. Evol.* 2021 89(3): 165-171 -*invited review*
- Gray EC, Beringer DM, and Meyer MM: Siblings or Doppelgänger? Deciphering the evolution of structured cis-regulatory RNAs beyond homology *Biochem. Soc. Trans.* 2020 48:1941-1951 -*invited review*
- Meyer MM: Debating tRNA origins *J. Mol. Evol.* 2020 88:227. - *editorial*
- Liberles DA, Chang B, Geiler-Samerotte K, Goldman A, Hey J, Kacar B, Meyer M, Murphy W, Posada D, Storfer A: Emerging Frontiers in the Study of Molecular Evolution *J. Mol. Evol.* 2020 88:211-226. - *editorial*
- Meyer MM: “Ribosomal RNA Mimicry in RNA Regulation of Gene Expression” In *Regulating with RNA in Bacteria and Archaea*. ASMpress. 2018. -*invited book chapter (also cited as Microbiology Spectrum)*
- Meyer MM: The role of mRNA structure in bacterial translational regulation. *WIREs RNA* 2016 doi: 10.1002/wrna.1370. -*invited review*
- Saab-Rincon G, Li Y, Meyer MM, Carbone M, Landwehr M, Arnold FA: “Protein Engineering by Structure-Guided SCHEMA Recombination” In *Protein Engineering Handbook* 2009 Eds. Lutz S & Bornscheuer UT, pp. 481-492.
- Meyer, MM Hiraga K, Arnold FH: “Site-directed Recombination” In *Current Protocols in Protein Science* 2006 Eds. Coligan JE, Dunn BM, Speicher DW, Wingfield PT, pp. 26.2.1-26.2.17.
- Bloom JD, Meyer MM, Meinhold P, Otey CR, MacMillan D, Arnold FH: Evolving strategies for enzyme engineering. *Current Opinion. Struc. Biol.* 2005, **15**:447-452.

Professional Service

Professional Service:

Scientific Advisory Board:

European Bioinformatics Institute (EBI): Rfam and RNACentral Databases (2016-current)
Helmholtz Institute for RNA-based Infection Research (HIRI): Wurzburg Germany (2020-current)

Editorial Positions:

Senior Editor: Journal of Molecular Evolution (2019-current)
Associate Editor: Genome Biology and Evolution (2015-2021)

Journal Reviewing:

Bioinformatics, PLoS ONE, PLoS Genetics, PLoS Computational Biology, ACS Synthetic Biology, RNA Biology, RNA, BMC Evolutionary Biology, BMC Bioinformatics, The Protein Journal, Nucleic Acids Research, Methods, Cell, Science Reports

Grant Reviewing:

NIH MSFB study section member (7/2020-6/2024).
NSF MCB review panel (2015, 2016, 2020)
NSF Graduate Research Fellowship Reviewer (2019-2020)
PhRMA Foundation Informatics Award Committee (2017-2019)
NIH *ad hoc* MSFB study section (2019)
NASA Exobiology review panel (2018)
NSF *ad hoc* reviewer: BIO:CAREER (2014, 2016), BIO:MCB (2019)
NIH-NIAID stage 1 reviewer for CETR (Centers for Excellence in Translational Research, U19) (2013)
German-Israeli Foundation for Scientific Research and Development, (2012)

Meeting Organization:

Symposium *Beyond Proteins – The ever-evolving functions of ncRNAs* for SMBE Meeting June 2020, Quebec City (cancelled).
RNA Society 2021 – Grand Challenges in RNA Computational Biology – organizer.

Teaching (2015-2021)

BIOL5440	Synthetic Biology (2 credit hr, 12 student undergraduate class)*	Spring 2021
BIOL4350	Biological Chemistry (3 credit hr, 70+ student course, online delivery)*	Spring 2021
BIOL1705	Scientific Exploration of Our Origins (3 credit hr, 19 student core class)	Spring 2020
BIOL4350	Biological Chemistry (3 credit hr, 70+ student course)	Spring 2020
BIOL1705	Scientific Exploration of Our Origins (3 credit hr, 18 student core class)	Fall 2018
BIOL0836	Current Methods in Microbiology (3 credit hr, 2 student graduate class)	Fall 2018
BIOL5520	Synthetic Biology (2 credit hr, 12 student undergraduate class)	Spring 2018
BIOL4350	Biological Chemistry (3 credit hr, 88 student undergraduate class)	Spring 2018
BIOL0836	Current Methods in Microbiology (3 credit hr, 5 student graduate class)	Spring 2017
BIOL5520	Synthetic Biology (2 credit hr, 12 student undergraduate class)	Fall 2016
BIOL5520	Synthetic Biology (2 credit hr, 11 student undergraduate class)	Spring 2016
BIOL4170	Microbial Genetics (3 credit hr, 45 student undergraduate class)	Spring 2016
BIOL6180	Scientific Proposal Writing (3 credit hr, 10 student graduate class)	Spring 2015
Bi417	Microbial Genetics (3 credit hour undergraduate class, 12 students)	Spring 2015