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Education

- 1996 Ph.D., Chemical Engineering, University of Texas at Austin
Advisor: George Georgiou
1990 B.S., Chemical Engineering, University of Wisconsin-Madison

Positions and Employment

- 2011- Professor of Chemical and Biomolecular Engineering, Johns Hopkins University
2007- Faculty Member, Chemistry-Biology Interface Program, Johns Hopkins University.
2000- Faculty Member, Program in Molecular Biophysics, Johns Hopkins University.
2011-2013 Vice Chair, Chemical and Biomolecular Engineering, Johns Hopkins University
2008-2011 Director of the Graduate Program, Chemical and Biomolecular Engineering, Johns Hopkins University.
2007-2011 Associate Professor of Chemical and Biomolecular Engineering, Johns Hopkins University.
2005-2008 Director of the Undergraduate Program, Chemical and Biomolecular Engineering, Johns Hopkins University.
2000-2007 Assistant Professor of Chemical and Biomolecular Engineering, Johns Hopkins University.
1996-2000 Postdoctoral Fellow, Chemistry Department, Pennsylvania State University.
Advisor: Stephen J. Benkovic

Honors and Awards

- 2021- Fellow of the American Association for the Advancement of Science (AAAS)
2014- Fellow of the American Institute for Medical and Biological Engineering (AIMBE)
2003-2008 NSF CAREER Award
1996-1999 NIH Postdoctoral Fellowship

Publications

94. R. Weeks and M. Ostermeier (2023) "Fitness and functional landscapes of the *E. coli* RNase III gene *mc*" *Mol. Bio. Evol.* DOI: 10.1093/molbev/msad047.
93. J. D. Mehlhoff and M. Ostermeier (2023) "Genes vary greatly in their propensity for collateral fitness effects of mutations" *Mol. Bio. Evol.* **40**, msad038.
92. P. Hauk, R. Weeks, and M. Ostermeier (2023) "A CRISPR/dCas9 system for assaying and selecting for RNase III activity in vivo in *E. coli*" *CRISPR J.* **6**, 43-51.
91. S. Spisak, B. O'Brien, and M. Ostermeier (2022) "A bacterial dual positive and negative selection system for dCas9 activity" *PLoS One* **17(6)**, e0269270.
90. J. D. Mehlhoff, F. W. Stearns, D. Rohm, B. Wang, E.-Y. Tsou, N. Dutta, M.-H. Hsiao, C. E. Gonzalez, A. F. Rubin, and M. Ostermeier (2020) "Collateral fitness effects of mutations" *Proc. Nat. Acad. Sci. USA* **117**, 11597-11607.
89. S. Spisak and M. Ostermeier (2020) "Engineered protein switches for exogenous control of gene expression" *Biochem. Soc. Trans.* **48**, 2205-2212.
88. J. D. Mehlhoff and M. Ostermeier "Biological fitness landscapes by deep mutational scanning" (2020) *Methods Enzymol.* **643**, 203-224.

87. T. Sagara, M. Debeljak, C. Hu, C. M. Wright, N. Anders, H. Liang, A. Maitra, M. Rudek, M. Ostermeier, J. R. Eshleman, and Y. Matsushita (2020) "Successful gene therapy requires targeting the vast majority of cancer cells" *Cancer Biology & Therapy*, **21**, 946-953.
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85. J. P. Fuenzalida, T. Xiong, B. M. Moerschbacher, M. Ostermeier, and F. M. Goycoolea (2019) "Protein-surfactant-polysaccharide nanoparticles increase the catalytic activity of an engineered β -lactamase maltose-activated switch enzyme" *bioRxiv*, doi:10.1101/746560.
84. T. D. Warren, K. Patel, J. R. Eshleman, and M. Ostermeier (2019) "Protein-programmed accumulation of yeast cytosine deaminase in cancer cells in response to mock-hypoxia" *ACS Synth. Biol.* **17**, 948-954.
83. C. E. Gonzalez, P. Roberts, and M. Ostermeier (2019) "Fitness effects of single amino acid insertions and deletions in TEM-1 β -lactamase" *J. Mol. Biol.* **431**, 2320-2330.
82. C. E. Gonzalez and M. Ostermeier (2019) "Pervasive pairwise intragenic epistasis among sequential mutations in TEM-1 β -lactamase" *J. Mol. Biol.* **431**, 1981-1992.
81. L. Ribeiro, C. Chelius, K. Boppidi, N. Naik, S. Hossain, J. Ramsey, J. Kumar, L. Riberio, M. Ostermeier, B. Tran, Y. Goo, L. deAssis, M. Ulas, Ö. Bayram, G. Goldman, S. Lincoln, R. Srivastava, S. Harris, and M. Marten (2019). "Comprehensive analysis of *A. nidulans* PKA phosphorylome identifies a novel mode of CreA regulation" *mBio* **10**:e02825-18.
80. T. Xiong, D. Rohm, R. E. Workman, L. Roundtree, C. D. Novina, W. Timp, and M. Ostermeier (2018) "Protein engineering strategies for improving the selective methylation of target CpG sites by a dCas9-directed cytosine methyltransferase in bacteria" *PLoS One*, **13(12)**: e0209408.
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77. L. F. Ribeiro, T. D. Warren, and M. Ostermeier (2017) "Construction of protein switches by domain insertion and directed evolution" *Methods Mol. Biol.*, **1596**, 43-55.
76. N. Y. Shelat, S. Parhi, and M. Ostermeier (2017) "Development of a cancer-marker activated enzymatic switch from the herpes simplex virus thymidine kinase" *Protein Eng. Des. Sel.* **30**, 95-103.
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74. N. Y. Shelat, S. Parhi, and M. Ostermeier (2016) "A positive selection for nucleoside kinases in *E. coli*" *PLoS One*, **11(9)**:e0162921.
73. J. H. Choi, T. Xiong, and M. Ostermeier (2016) "The interplay between effector binding and allostery in an engineered protein switch" *Protein Sci.* **25**, 1605–1616.
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71. B. Steinberg and M. Ostermeier (2016) "Shifting fitness and epistatic landscapes reflect tradeoffs along an evolutionary pathway" *J. Mol. Biol.* **428**, 2730–2743.
70. B. Steinberg and M. Ostermeier (2016) "Environmental changes bridge evolutionary valleys" *Sci. Adv.*, **2(1)**:e1500921.
69. N. Nicholes, A. Date, P. Beaujean, P. Hauk, M. Kanwar, and M. Ostermeier (2016) "Modular protein switches derived from antibody mimetic proteins" *Protein Eng. Des. Sel.*, **29**, 77-85.

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67. J. H. Choi, M. Zayats, P. C. Searson, and M. Ostermeier (2016) "Electrochemical activation of engineered protein switches" *Biotechnol. Bioeng.*, **113**, 453-456.
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23. Choe, W., S. Chandrasegaran, and M. Ostermeier, (2005) Protein fragment complementation in M.HhaI DNA methyltransferase. *Biochem. Biophys. Res. Commun.* **334**, 1233-1240.
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3. Ostermeier, M., De Sutter, K. and Georgiou, G. (1996) Eukaryotic protein disulfide isomerase complements *Escherichia coli dsbA* mutants and increases the yield of a heterologously secreted protein with disulfide bonds. *J. Biol. Chem.* **271**, 10616-10622.
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Patents

7. M. Ostermeier and E. Firnberg "Methods for efficient, expansive user-defined DNA mutagenesis", U.S. patent 9,347,057, 9,458,453, and 9,777,266.
6. M. Ostermeier and C. M. Wright "Prodrug activation in cancer cells using molecular switches" U.S. patent 8,771,679 and 9,469,841.
5. J. R. Kim; B. Pierre, M. Ostermeier, and C.-S. Kim "Protein stabilization by domain insertion into a thermophilic protein" U.S. patent 8,592,192.
4. M. Ostermeier, "Molecular switches and methods for making and using the same." U.S. patents 8,492,122 and 9,273,319.
3. M. Ostermeier and G. Guntas, "Methods for making and using molecular switches involving circular permutation" U.S. patents 8,338,138; 8,679,753 and 9,290,544.
2. S. J. Benkovic, M. Ostermeier, A. E. Nixon, and S. Lutz, "Incrementally truncated nucleic acids and methods of making same" U.S. patents 7,332,308 and 7,820,413.
1. G. Georgiou and M. Ostermeier, "Methods for producing soluble, biologically-active disulfide-bond containing eukaryotic proteins in bacterial cells" U.S. patent 6,027,888.