

Jay D Keasling

Positions	<i>Hubbard Howe, Jr. Distinguished Professor of Biochemical Engineering,</i> Department of Chemical and Biomolecular Engineering, Department of Bioengineering, University of California, Berkeley <i>Associate Laboratory Director and Senior Faculty Scientist,</i> Lawrence Berkeley National Laboratory <i>Chief Executive Officer and Vice President for Fuels Synthesis,</i> Joint BioEnergy Institute <i>Director,</i> Synthetic Biology Engineering Research Center
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Education	<i>Postdoctorate,</i> Biochemistry, 1991-1992, Stanford University <i>Ph.D.,</i> Chemical Engineering, 1991, University of Michigan <i>M.S.,</i> Chemical Engineering, 1988, University of Michigan <i>B.S.,</i> Chemistry and Biology, 1986, University of Nebraska, Lincoln
Professional Experience	<i>Chief Executive Officer</i> (2007 – present), Joint BioEnergy Institute, Emeryville, CA. <i>Associate Laboratory Director</i> (2010 – present), <i>Acting Deputy Laboratory Director</i> (2009 – 2010), Lawrence Berkeley National Laboratory, Berkeley, CA. <i>Director</i> (2005 – 2009), <i>Senior Faculty Scientist</i> (2006 – present), <i>Faculty Scientist</i> (1992 – 2006), <i>Department Head</i> (2003 – 2005), Physical Biosciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA. <i>Professor</i> (2001 – present), <i>Vice</i> <i>Chair</i> (1999 – 2000), <i>Associate Professor</i> (1998 – 2001), <i>Assistant Professor</i> (1992 – 1998), Department of Chemical Engineering, University of California, Berkeley, CA. <i>Professor</i> (2004 – present), Department of Bioengineering, University of California, Berkeley, CA. <i>Director</i> (2006 – present), Synthetic Biology Engineering Research Center, University of California, Berkeley. <i>Director,</i> University of California Systemwide BioSTAR Project (2001 – 2003). <i>Executive</i> <i>Committee Chair,</i> University of California Discovery Grant Program (2003 – 2008). <i>Associate Editor, Biotechnology & Bioengineering</i> (2003 – 2005). <i>Postdoctoral</i> <i>Research Associate,</i> Department of Biochemistry, Stanford University School (1991 – 1992). <i>Research Assistant,</i> Department of Chemical Engineering, University of Michigan (1986 – 1991).
Honors & Awards	<i>Food, Pharmaceutical and Bioengineering Division Award,</i> Food, Pharmaceutical and Bioengineering Division, American Institute of Chemical Engineers, 2013. <i>George Washington Carver Award for Innovation in Industrial Biotechnology,</i> Biotechnology Industry Organization, 2013. <i>Promega Biotechnology Research</i> <i>Award,</i> American Society for Microbiology, 2013. <i>Marvin Johnson Award in</i> <i>Microbial and Biochemical Technology,</i> Division of Biochemical Technology, American Chemical Society, 2013. <i>Heinz Award for Technology, the Economy</i> <i>and Employment,</i> Heinz Family Foundation, 2012. <i>International Metabolic</i> <i>Engineering Award,</i> Metabolic Engineering Society, 2012. <i>Heuermann Lecture,</i> Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, 2012. <i>Katz Lectureship,</i> Department of Chemical Engineering, University of Michigan, 2012. <i>2012 Henry McGee Lecturer,</i> Virginia Commonwealth University, School of Engineering, 2012. <i>Tetelman Fellowship Lectureship,</i> Jonathan Edwards College, Yale University, 2012. <i>2011 Kewaunee Lectureship,</i> Pratt School of Engineering, Duke University, 2011. <i>2010 Presidential Green Chemistry</i> <i>Challenge Award,</i> United States Environmental Protection Agency, 2010. <i>Division</i> <i>O (Fermentation and Biotechnology) Lectureship,</i> American Society for Microbiology, 2010. <i>Treat B Johnson Lecture,</i> Department of Chemistry, Yale University, 2010. <i>Eyring Lectures in Chemistry and Biochemistry,</i> Arizona State University, 2010. <i>National Academy of Engineering,</i> 2010. <i>GLBT Engineer of the</i> <i>Year,</i> National Organization of Gay and Lesbian Scientists and Technical Professionals, 2010. <i>Cox Distinguished Lectureship,</i> Washington University, 2009. <i>Ashland Lectureship,</i> University of Kentucky, 2009. <i>Danckwerts Lectureship,</i> World Congress on Chemical Engineering, 2009. <i>Inaugural Biotech Humanitarian</i> <i>Award,</i> Biotechnology Industry Organization (BIO), 2009. <i>2009 University</i> <i>Lectures in Chemistry,</i> Department of Chemistry, Boston College, 2009. <i>The</i>

Sixteenth F. A. Bourke Distinguished Lecture in Biotechnology, Center for Advanced Biotechnology and Department of Biomedical Engineering, Boston University, 2009. *Chancellor's Award for Public Service for Research in the Public Interest*, University of California, Berkeley, 2009. *2008 Britton Chance Distinguished Lecturer*, Department of Chemical and Biomolecular Engineering and Institute Medicine and Engineering, University of Pennsylvania, 2008. *Patten Distinguished Seminar*, Department of Chemical Engineering, University of Colorado, 2008. *Sierra Section Recognition for Leadership in the Chemical Engineering Profession*, American Institute of Chemical Engineers – Northern California Section, 2008. *Visionary Award*, Bay Bio, 2007. *Truman Lecturer*, Sandia National Laboratories, 2007. *Professional Progress Award*, American Institute for Chemical Engineers, 2007. *Elected Fellow of the American Academy for Microbiology*, 2007. *Research Project of the Year*, Northern California Section of the American Institute for Chemical Engineers, 2007. *Eastman Lectureship*, Department of Chemical Engineering, Georgia Tech University, 2007. *Scientist of the Year*, Discover Magazine, 2006. *Technology Pioneer*, World Economic Forum, 2005. *Seventh Annual Frontiers of Biotechnology Lecture*, Department of Chemical Engineering, Massachusetts Institute of Technology, 2005. *Blue-Green Lecturer*, Department of Chemical Engineering, University of Michigan & Department of Chemical Engineering and Materials Sciences, Michigan State University, 2005. *Inaugural Schwartz Lecturer*, Department of Chemical Engineering, Johns Hopkins University, 2003. *Allan P. Colburn Memorial Lecturer*, Department of Chemical Engineering, University of Delaware, 2002. *Elected Fellow of the American Institute of Medical and Biological Engineering*, 2000. *AIChE Award for Chemical Engineering Excellence in Academic Teaching*, Northern California Section of the American Institute for Chemical Engineers, 1999. *Chevron Young Faculty Fellowship*, Chevron, 1995. *CAREER Award*, National Science Foundation, 1995. *Zeneca Young Faculty Fellowship*, Zeneca Ltd., 1992-1997. *NIH Postdoctoral Fellowship*, Stanford University, 1991-1992. *Regents Scholarship*, The University of Nebraska, 1982-1986. *Graduation with High Distinction*, The University of Nebraska, 1986.

Memberships National Academy of Engineering, Phi Beta Kappa, American Chemical Society, American Institute of Chemical Engineers, American Society for Microbiology, American Institute of Medical and Biological Engineering

Founder Amyris, LS9, Lygos, Codon Devices

Refereed Journal Publications

1. J. D. Keasling and B. O. Palsson. 1989. "On the kinetics of plasmid replication." *J. Theor. Biol.* **136**:487-492.
2. J. D. Keasling and B. O. Palsson. 1989. "ColE1 plasmid replication: a simple kinetic description from a structured model." *J. Theor. Biol.* **141**:447-461.
3. B. O. Palsson, J. D. Keasling, and S. G. Emerson. 1990. "The regulatory mechanisms of human immunodeficiency virus replication predict multiple expression rates." *Proc. Natl. Acad. Sci. USA.* **87**:772-776.
4. J. D. Keasling, B. O. Palsson, and S. Cooper. 1991. "Cell-cycle-specific F'/lac plasmid replication: regulation by cell size control of initiation." *J. Bacteriol.* **173**:2673-2680.
5. J. D. Keasling, B. O. Palsson, and S. Cooper. 1992. "Replication of the R6K plasmid during the *Escherichia coli* cell cycle." *J. Bacteriol.* **174**:1060-1062.
6. J. D. Keasling, B. O. Palsson, and S. Cooper. 1992. "Replication of prophage P1 is cell-cycle specific." *J. Bacteriol.* **174**:4457-4462.
7. J. D. Keasling, B. O. Palsson, and S. Cooper. 1992. "Replication of mini-F plasmids during the bacterial division cycle." *Res. Microbiol.* **143**:541-548.
8. J. D. Keasling, L. Bertsch, and A. Kornberg. 1993. "Guanosine pentaphosphate phosphohydrolase of *Escherichia coli* is a long-chain polyphosphatase." *Proc. Natl. Acad. Sci. USA* **90**:7029-7033.
9. J. D. Keasling and S. Cooper. 1994. "Analysis of plasmid replication during the bacterial division cycle." *Methods in Molecular Genetics* **3**:380-388.
10. T. R. Hupp, J. D. Keasling, S. Cooper, and J. M. Kaguni. 1994. "Synthesis of DnaK protein during the division cycle of *Escherichia coli*." *Res. Microbiol.* **145**:99-109.
11. J. D. Keasling, H. Kuo, and G. Vahanian. 1995. "A Monte Carlo simulation of the *Escherichia coli* cell cycle." *J. Theor. Biol.* **176**:411-430.
12. J. D. Keasling and G. A. Hupf. 1996. "Genetic manipulation of polyphosphate metabolism affects cadmium tolerance in *Escherichia coli*." *Appl. Environ. Microbiol.* **62**:743-746.

13. S. T. Sharfstein, S. J. Van Dien, and J. D. Keasling. 1996. "Modulation of the phosphate-starvation response in *Escherichia coli* by genetic manipulation of the polyphosphate pathways." *Biotechnol. Bioeng.* **51**:434-438.
14. N. Shapiro and J. D. Keasling. 1996. "The *recA* gene and cadmium toxicity in *Escherichia coli* K-12." *Microbios* **86**:23-26.
15. H. Kuo and J. D. Keasling. 1996. "A Monte Carlo simulation of plasmid replication during the bacterial division cycle." *Biotechnol. Bioeng.* **52**:633-647.
16. S. Keyhani, J. L. Lopez, D. S. Clark, and J. D. Keasling. 1996. "Intracellular polyphosphate content and cadmium tolerance in *Anacystis nidulans* R2." *Microbios* **88**:105-114.
17. P. Wong, S. Gladney, and J. D. Keasling. 1996. "A mathematical model of the *lac* operon: inducer exclusion, catabolite repression, and diauxic growth on glucose and lactose." *Biotechnol. Prog.* **13**:132-143.
18. S. J. Van Dien, S. Keyhani, C. Yang, and J. D. Keasling. 1997. "Manipulation of independent synthesis and degradation of polyphosphate in *Escherichia coli* for investigation of phosphate secretion from the cell." *Appl. Environ. Microbiol.* **63**:1689-1695.
19. J. Elmen, W. Pan, S. Y. Leung, A. Magyarosy, and J. D. Keasling. 1997. "Kinetics of toluene degradation by a nitrate-reducing bacterium isolated from a groundwater aquifer." *Biotechnol. Bioeng.* **55**:82-90.
20. T. A. Carrier and J. D. Keasling. 1997. "Engineering mRNA stability in *E. coli* by the addition of synthetic hairpins using a 5' cassette system." *Biotechnol. Bioeng.* **55**:577-580.
21. C. L. Wang, P. C. Michels, S. Dawson, S. Kitisakkul, J. A. Baross, J. D. Keasling, and D. S. Clark. 1997. "Cadmium removal by a new strain of *Pseudomonas aeruginosa* in aerobic culture." *Appl. Environ. Microbiol.* **63**:4075-4078.
22. J. Pramanik and J. D. Keasling. 1997. "A stoichiometric model of *Escherichia coli* metabolism: incorporation of growth-rate dependent biomass composition and mechanistic energy requirements." *Biotechnol. Bioeng.* **56**:398-421.
23. T. A. Carrier and J. D. Keasling. 1997. "Controlling messenger RNA stability in bacteria: strategies for engineering gene expression." *Biotechnol. Prog.* **13**:699-708.
24. T. A. Carrier and J. D. Keasling. 1997. "Mechanistic modelling of mRNA decay." *J. Theor. Biol.* **189**:195-209.
25. J. D. Keasling, S. J. Van Dien, and J. Pramanik. 1998. "Engineering polyphosphate metabolism in *Escherichia coli*: implications for bioremediation of inorganic contaminants." *Biotechnol. Bioeng.* **58**:231-239.
26. S. J. Van Dien and J. D. Keasling. 1998. "A dynamic model of the *Escherichia coli* phosphate-starvation response." *J. Theor. Biol.* **190**:37-49.
27. J. D. Keasling and S.-W. Bang. 1998. "Recombinant DNA techniques for bioremediation and environmentally-friendly synthesis." *Current Biology* **9**:135-140.
28. S. Cooper and J. D. Keasling. 1998. "Cycle-specific replication of chromosomal and F-plasmid origins." *FEMS Microbiol. Lett.* **163**:217-222.
29. K. L. Jones and J. D. Keasling. 1998. "Construction and characterization of F plasmid-based expression vectors." *Biotechnol. Bioeng.* **59**:659-665.
30. T. A. Carrier, K. L. Jones, and J. D. Keasling. 1998. "mRNA stability and plasmid copy number effects on gene expression from an inducible promoter system." *Biotechnol. Bioeng.* **59**:666-672.
31. S. J. Van Dien and J. D. Keasling. 1998. "Optimization of polyphosphate degradation and phosphate secretion using hybrid metabolic pathways and engineered host strains." *Biotechnol. Bioeng.* **59**:754-761.
32. J. Pramanik, P. L. Trelstad, and J. D. Keasling. 1998. "A flux-based stoichiometric model of enhanced biological phosphorus removal metabolism." *Wat. Sci. Tech.* **37**:609-613.
33. J. Pramanik and J. D. Keasling. 1998. "Effect of carbon source and growth rate on biomass composition and metabolic flux predictions of a stoichiometric model." *Biotechnol. Bioeng.* **60**:230-238.
34. S. J. Van Dien and J. D. Keasling. 1998. "Control of polyphosphate metabolism in genetically-engineered *Escherichia coli*." *Enzyme Microb. Technol.* **24**:21-25.
35. J. Pramanik, P. L. Trelstad, A. J. Schuler, D. Jenkins, and J. D. Keasling. 1998. "Development and validation of a flux-based stoichiometric model for enhanced biological phosphorus removal metabolism." *Water Research* **33**:462-476.
36. R. Brent Nielsen and J. D. Keasling. 1999. "Reductive dechlorination of chlorinated ethene DNAPLs by a culture enriched from contaminated groundwater." *Biotechnol. Bioeng.* **62**:160-165.
37. T. A. Carrier and J. D. Keasling. 1999. "A library of synthetic 5' secondary structures to manipulate mRNA stability in *Escherichia coli*." *Biotechnol. Prog.* **15**:58-64.

38. E. Gilbert, A. Khlebnikov, W. Meyer-Ilse, and J. D. Keasling. 1999. "Use of soft X-ray microscopy for analysis of early-stage biofilm formation." *Wat. Sci. Tech.* **39**(7):269-272.
39. S. J. Van Dien and J. D. Keasling. 1999. "Effect of polyphosphate metabolism on the *Escherichia coli* phosphate-starvation response." *Biotechnol. Prog.* **15**(4):587-593.
40. S. E. Cowan, J. Black, J. D. Keasling, and R. M. White. 1999. "Ultrasonic flexural-plate-wave sensor for detecting the concentration of settling *E. coli* W3110 cells." *Analytical Chemistry*. **71**(16):3622-3625.
41. P. L. Trelstad, P. Purdhani, W. Geibdorfer, W. Hillen, and J. D. Keasling. 1999. "Polyphosphate kinase of *Acinetobacter* sp. Strain ADP1: purification and characterization of the enzyme and its role during changes in extracellular phosphate." *Appl. Environ. Microbiol.* **65**(9):3780-3786.
42. J. D. Keasling. 1999. "Gene-expression tools for the metabolic engineering of bacteria." *Trends in Biotechnology* **17**:452-460.
43. T. A. Carrier and J. D. Keasling. 1999. "Investigating autocatalytic gene expression systems through mechanistic modeling." *J. Theor. Biol.* **201**:25-36.
44. S. E. Cowan, E. Gilbert, A. Khlebnikov, and J. D. Keasling. 2000. "Dual labeling with green fluorescent proteins for confocal microscopy." *Appl. Environ. Microbiol.* **66**:413-418.
45. D. S. Reichmuth, J. L. Hittle, H. W. Blanch, and J. D. Keasling. 2000. "Biodesulfurization of dibenzothiophene in *Escherichia coli* is enhanced by expression of a *Vibrio harveyi* oxidoreductase gene." *Biotechnol. Bioeng.* **67**:72-79.
46. J. D. Keasling, S. J. Van Dien, P. Trelstad, N. Renninger, and K. McMahon. 2000. "Application of polyphosphate metabolism to environmental and biotechnological problems." *Biochemistry (Moscow)*. **65**:324-331.
47. D. G. Bolesch and J. D. Keasling. 2000. "The effect of monovalent ions on polyphosphate binding to *Escherichia coli* exopolyphosphatase." *Biochem. Biophys. Res. Comm.* **274**:236-241.
48. S.-W. Bang, D. S. Clark, and J. D. Keasling. 2000. "Engineering hydrogen sulfide production and cadmium removal by expression of the thiosulfate reductase gene (*phsABC*) from *Salmonella enterica* serovar Typhimurium in *Escherichia coli*." *Appl. Environ. Microbiol.* **66**:3939-3944.
49. C. L. Wang, P. D. Maratukulam, A. M. Lum, D. S. Clark, and J. D. Keasling. 2000. "Metabolic engineering of an aerobic sulfate reduction pathway and its application to precipitation of cadmium on the cell surface." *Appl. Environ. Microbiol.* **66**:4497-4502.
50. S. E. Cowan, E. Gilbert, D. Liepmann, and J. D. Keasling. 2000. "Commensal interactions in a dual-species biofilm exposed to mixed organic compounds." *Appl. Environ. Microbiol.* **66**:4481-4485.
51. S.-W. Bang, D. S. Clark, and J. D. Keasling. 2000. "Cadmium, lead, and zinc removal by expression of the thiosulfate reductase gene from *Salmonella typhimurium* in *Escherichia coli*." *Biotechnol. Lett.* **22**:1331-1335.
52. D. G. Bolesch and J. D. Keasling. 2000. "Polyphosphate binding and chain length recognition of *Escherichia coli* exopolyphosphatase." *J. Biol. Chem.* **275**:33814-33819.
53. A. Khlebnikov, O. Risa, T. Skaug, T. A. Carrier, and J. D. Keasling. 2000. "Regulatable arabinose-inducible gene expression system with consistent control in all cells of a culture." *J. Bacteriol.* **182**:7029-7034.
54. C. D. Smolke, T. A. Carrier, and J. D. Keasling. 2000. "Coordinated, differential expression of two genes through directed mRNA cleavage and stabilization by secondary structures." *Appl. Environ. Microbiol.* **66**:5399-5405.
55. K. L. Jones, S.-W. Kim, and J. D. Keasling. 2000. "Low-copy plasmids can perform as well as or better than high-copy plasmids for metabolic engineering of bacteria." *Met. Eng.* **2**:328-338.
56. S.-W. Kim and J. D. Keasling. 2001. "Metabolic engineering of the nonmevalonate isopentenyl diphosphate synthesis pathway in *Escherichia coli* enhances lycopene production." *Biotechnol. Bioeng.* **72**:408-415.
57. C. L. Wang, A. M. Lum, S. C. Ozuna, D. S. Clark, and J. D. Keasling. 2001. "Aerobic sulfide production and cadmium precipitation by *Escherichia coli* expressing the *Treponema denticola* cysteine desulfhydrase gene." *Appl. Microbiol. Biotechnol.* **56**:425-430.
58. S. E. Cowan, D. Leipmann, and J. D. Keasling. 2001. "Development of engineering biofilms on poly-L-lysine patterned surfaces." *Biotechnol. Lett.* **23**:1235-1241.
59. I. Aldor and J. D. Keasling. 2001. "Metabolic engineering of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) composition in recombinant *Salmonella enterica* serovar Typhimurium." *Biotechnol. Bioeng.* **76**:108-114.
60. C. L. Wang, D. S. Clark, and J. D. Keasling. 2001. "Analysis of an engineered sulfate reduction pathway and cadmium precipitation on the cell surface." *Biotechnol. Bioeng.* **75**:285-291.

61. C. D. Smolke, V. J. J. Martin, and J. D. Keasling. 2001. "Controlling the metabolic flux through the carotenoid pathway using directed mRNA processing and stabilization." *Met. Eng.* **3**:313-321.
62. V. J. J. Martin, Y. Yoshikuni, and J. D. Keasling. 2001. "The in vivo synthesis of plant sesquiterpenes in *Escherichia coli*." *Biotechnol. Bioeng.* **75**:497-503.
63. C. D. Smolke, A. Khlebnikov, and J. D. Keasling. 2001. "Effects of transcription induction homogeneity and transcript stability on expression of two genes in a constructed operon." *Appl. Microbiol. Biotechnol.* **57**:689-696.
64. A. Khlebnikov, K. A. Datsenko, T. Skaug, B. L. Wanner, and J. D. Keasling. 2001. "Homogeneous expression of the P_{BAD} promoter in *Escherichia coli* by constitutive expression of the low-affinity high-capacity AraE transporter." *Microbiology* **147**:3241-3247.
65. E. S. Gilbert, A. Khlebnikov, S. E. Cowan, and J. D. Keasling. 2001. "Analysis of biofilm structure and gene expression using fluorescence dual labeling." *Biotechnol. Prog.* **17**:1180-1182.
66. C. D. Smolke and J. D. Keasling. 2002. "Effect of copy number and mRNA processing and stabilization on transcript and protein levels from an engineered dual-gene operon." *Biotechnol. Bioeng.* **78**:412-424.
67. N. Renninger, K. D. McMahon, R. Knopp, H. Nitsche, D. S. Clark, and J. D. Keasling. 2002. "Uranyl precipitation by biomass from an enhanced biological phosphorus removal reactor." *Biodegradation* **12**:401-410.
68. C. L. Wang, S. C. Ozuna, D. S. Clark, and J. D. Keasling. 2002. "A deep-sea hydrothermal vent isolate, *Pseudomonas aeruginosa* CW961, requires thiosulfate for Cd²⁺ tolerance and precipitation." *Biotechnol. Lett.* **24**:637-641.
69. A. W. Walker and J. D. Keasling. 2002. "Metabolic engineering of *Pseudomonas putida* for the utilization of parathion as a carbon and energy source." *Biotechnol. Bioeng.* **78**:715-721.
70. V. J. J. Martin, C. D. Smolke, and J. D. Keasling. 2002. "Redesigning cells for production of complex organic molecules." *ASM News* **68**:336-343.
71. A. Magyarosy, R. D. Laidlaw, R. Kilaas, C. Echer, D. S. Clark, and J. D. Keasling. 2002. "Nickel accumulation and nickel oxalate precipitation by *Aspergillus niger*." *Appl. Microbiol. Biotechnol.* **59**:381-388.
72. A. Magyarosy, J. Z. Ho, H. Rapoport, S. Dawson, J. Hancock, and J. D. Keasling. 2002. "Chloroxanthomycin, a fluorescent, chlorinated, pentacyclic pyrene from a *Bacillus* sp." *Appl. Environ. Microbiol.* **68**:4095-4101.
73. I. S. Aldor, S.-W. Kim, K. L. Jones, and J. D. Keasling. 2002. "Metabolic engineering of a novel propionate-independent pathway for the production of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) in recombinant *Salmonella enterica* serovar Typhimurium." *Appl. Environ. Microbiol.* **68**:3848-3854.
74. A. Khlebnikov, T. Skaug, and J. D. Keasling. 2002. "Modulation of gene expression from the arabinose-inducible *araBAD* promoter." *J. Ind. Microbiol. Biotechnol.* **29**:34-37.
75. N. L. Goeden-Wood, V. P. Conticello, S. J. Muller, and J. D. Keasling. 2002. "Improved assembly of multimeric genes for the biosynthetic production of protein polymers." *Biomacromolecules* **3**:874-879.
76. A. Khlebnikov and J. D. Keasling. 2002. "Effect of *lacY* expression on homogeneity of induction from the P_{tac} and P_{trc} promoters by natural and synthetic inducers." *Biotechnol. Prog.* **18**:672-674.
77. K. D. McMahon, D. Jenkins, and J. D. Keasling. 2002. "Polyphosphate kinase genes from activated sludge carrying out enhanced biological phosphorus removal." *Water Sci. Technol.* **46**:155-162.
78. K. D. McMahon, M. A. Dojka, N. R. Pace, D. Jenkins, and J. D. Keasling. 2002. "Polyphosphate kinase from activated sludge performing enhanced biological phosphorus removal." *Appl. Environ. Microbiol.* **68**:4971-4978.
79. C. D. Smolke and J. D. Keasling. 2002. "Effect of gene location, mRNA secondary structures, and RNase sites on expression of two genes in an engineered operon." *Biotechnol. Bioeng.* **80**:762-776.
80. G.-Y. Wang and J. D. Keasling. 2002. "Amplification of HMG-CoA reductase production enhances carotenoid accumulation in *Neurospora crassa*." *Met. Eng.* **4**:193-201.
81. S. K. Tehara and J. D. Keasling. 2003. "Gene cloning, purification, and characterization of a phosphodiesterase from *Delftia acidovorans*." *Appl. Environ. Microbiol.* **69**:504-508.
82. E. S. Gilbert, A. W. Walker and J. D. Keasling. 2003. "A constructed microbial consortium for biodegradation of the organophosphorus insecticide parathion." *Appl. Microbiol. Biotechnol.* **61**:77-81.
83. N. L. Goeden-Wood, J. D. Keasling, and S. J. Muller. 2003. "Self-assembly of a designed protein polymer into β -sheet fibrils and responsive gels." *Macromolecules* **36**:2932-2938.

84. R. Knopp, P. J. Panak, L. A. Wray, N. S. Renninger, J. D. Keasling, and H. Nitsche. 2003. "Laser spectroscopic studies of U(VI) with bacterial phosphate species." *Chem. Eur. J.* **9**:2812-2818.
85. V. J. J. Martin, D. J. Pitera, S. T. Withers, J. D. Newman, and J. D. Keasling. 2003. "Engineering the mevalonate pathway in *Escherichia coli* for production of terpenoids." *Nat. Biotechnol.* **21**:796-802.
86. I. Chang, E. Gilbert, N. Eliashberg, and J. D. Keasling. 2003. "A three-dimensional, stochastic simulation of biofilm growth and transport-related factors that affect structure." *Microbiology* **149**:2859-2871.
87. D. J. Scott, B. M.T. da Costa, S. C. Espy, J. D. Keasling, and Katrina Cornish. 2003. "Activation and inhibition of rubber transferases by metal cofactors and pyrophosphate substrates." *Phytochemistry* **64**:123-134.
88. M.M. Maharbiz, W.J. Holtz, S. Sharifzadeh, J. D. Keasling, R. T. Howe. 2003. "A microfabricated electrochemical oxygen generator for high-density cell culture arrays." *IEEE J. Microelectromech. Syst.* **12**:590-599.
89. I. S. Aldor and J. D. Keasling. 2003. "Process design for microbial plastic factories: metabolic engineering of polyhydroxyalkanoates." *Curr. Opin. Biotechnol.* **14**:475-483.
90. C. Khosla and J. D. Keasling. 2003. "Metabolic engineering for drug discovery and development." *Nature Rev. Drug Disc.* **2**:1019-1025.
91. M. M. Maharbiz, W. J. Holtz, R. T. Howe, and J. D. Keasling. 2004. "Microbioreactor arrays with parametric control for high-throughput experimentation." *Biotechnol. Bioeng.* **86**:485-90.
92. E. S. Gilbert and J. D. Keasling. 2004. "Bench Scale Flow Cell for Nondestructive Imaging of Biofilms." *Meth. Microbiol.* **16**:109-118.
93. K. K. Reiling, Y. Yoshikuni, V. J. J. Martin, J. Newman, J. Bohlmann, and J. D. Keasling. 2004. "Mono and diterpene production in *Escherichia coli*." *Biotechnol. Bioeng.* **87**:200-212.
94. D. S. Reichmuth, H. W. Blanch, and J. D. Keasling. 2004. "Dibenzothiophene desulfurization pathway improvement using diagnostic GFP fusions." *Biotechnol. Bioeng.* **88**:94-99.
95. N. Renninger, R. Knopp, H. Nitsche, D.S. Clark, J. D. Keasling. 2004. "Uranyl precipitation by *Pseudomonas aeruginosa* via controlled polyphosphate metabolism." *Appl. Environ. Microbiol.* **70**:7404-7412.
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 281. H. H. Chou and J. D. Keasling. 2013. "Programming adaptive control to evolve increased metabolite production." *Nat. Commun.* **4**:2595. DOI: 10.1038/ncomms3595.
 282. A. Zhou, E. Baidoo, Z. He, A. Mukhopadhyay, J. K. Baumohl, P. Benke, M. P. Joachimiak, M. Xie, R. Song, A. P. Arkin, T. C. Hazen, J. D. Keasling, J. D. Wall, D. A. Stahl and J. Zhou. 2013. "Characterization of NaCl tolerance in *Desulfovibrio vulgaris* Hildenborough through experimental evolution." *ISME J.* **7**(9):1790-1802.
 283. S. Gille, V. Sharma, E. E. Baidoo, J. D. Keasling, H. V. Scheller, and M. Pauly. 2013. "Arabinosylation of a Yarrowia precipitable cell wall polymer impacts plant growth as exemplified by the Arabidopsis glycosyltransferase mutant ray1." *Mol. Plant* **6**(4):1369-1372.
 284. R. H. Dahl, F. Zhang, J. Alonso-Gutierrez, E. Baidoo, T. S. Batth, A. M. Redding-Johanson, C. J. Petzold, A. Mukhopadhyay, T. Soon Lee, P. D. Adams, and J. D. Keasling. 2013. "Engineering dynamic pathway regulation using stress-response promoters." *Nat. Biotechnol.* **31**(11):1039-1046. doi: 10.1038/nbt.2689.

In Press Refereed Journal Publications

- IP1. H. L. Szmidt-Middleton, M. Ouellet, P. D. Adams, J. D. Keasling, and A. Mukhopadhyay. 2013. "Utilizing a highly responsive gene, *yhjX*, in *E. coli* based production of 1,4-butanediol." *Chem. Eng. Sci.* In press.
- IP2. W. Rungtaphan and J. D. Keasling. 2013. "Metabolic engineering of *Saccharomyces cerevisiae* for production of fatty acid-derived biofuels and chemicals. *Met. Eng.* In press.
- IP3. S. Yuzawa, C. H. Eng, L. Katz, and J. D. Keasling. 2013. "Enzyme analysis of the polyketide synthase leads to the discovery of a novel analog of the antibiotic α -lipomycin." *J. Antibiotics* In press.
- IP4. P. Javidpour, J. Pereira, E. B. Goh, R. McAndrew, S. Ma, G. Friedland, J. D. Keasling, S. Chhabra, P. Adams, and H. Beller. 2013. "Biochemical and structural studies of NADH-dependent FabG used to increase the bacterial production of fatty acids under anaerobic conditions." *Appl. Env. Microbiol.* In press.
- IP5. S. D. Colloms, C. A. Merrick, F. J. Olorunniji, W. M. Stark, M. C. Smith, A. Osbourn, J. D. Keasling, and S. J. Rosser. "Rapid metabolic pathway assembly and modification using serine integrase site-specific recombination." *Nucl. Acids Res.* In press.
- IP6. J. Ito, T. Herter, E.E.K. Baidoo, J. Lao, M. E. Vega-Sanchez, A. M. Smith-Moritz, Adams PD, Keasling JD, Usadel B, Petzold CJ, J. L. Heazlewood. 2013. "Analysis of plant nucleotide sugars by hydrophilic interaction liquid chromatography and tandem mass spectrometry." *Anal. Biochem.* In press.

Refereed Conference Proceedings

- CP1. S. T. Sharfstein and J. D. Keasling. 1994. "Polyphosphate metabolism in *Escherichia coli*." *Ann. N. Y. Acad. Sci.* **745**:77-92.
- CP2. J. D. Keasling. 1997. "Regulation of intracellular toxic metals and other cations by hydrolysis of polyphosphate." *Ann. N. Y. Acad. Sci.* **829**:242-249.
- CP3. D. G. Bolesch, R. B. Nielsen, and J. D. Keasling. 1997. "Complete reductive dechlorination of trichloroethene by a groundwater microbial consortium." *Ann. N. Y. Acad. Sci.* **829**:97-102.
- CP4. D. Szykowny and J. D. Keasling. 1997. "Kinetics of BTEX degradation by a nitrate-reducing mixed culture." *Ann. N. Y. Acad. Sci.* **829**:135-141.

- CP5. R. B. Nielsen and J. D. Keasling. 1998. "Anaerobic degradation of PCE and TCE DNAPLs by groundwater microorganisms." In *Bioremediation and Phytoremediation: Chlorinated and Recalcitrant Compounds*, G. B. Wickramanayake and R. E. Hinchey, eds. Battelle Press, Columbus, OH. pp. 97-102.
- CP6. J. D. Keasling, J. Benemann, J. Pramanik, T. A. Carrier, K. L. Jones, and S. J. Van Dien. 1998. "A toolkit for metabolic engineering of bacteria: application to hydrogen production." In *Biohydrogen*, O. Zaborsky, ed. pages 87-97. Plenum Publishing, New York, NY.
- CP7. S. W. Bang, D. S. Clark, and J. D. Keasling. 1999. "Heavy metal decontamination by engineered genetic cassettes." Proceedings of the World Congress of Korean Scientists and Engineers. Pgs. 449-455. The Korean Federation of Science and Technology Societies. Seoul, Korea.
- CP8. M. M. Maharbiz, R. T. Howe, J. D. Keasling. 2000. "Silicon microbial bioreactor arrays." Proceedings of the IEEE-EMBS Special Topic Conference on MicroTechnologies in Medicine and Biology, Paris, France, October 12-14, 2000. pp. 165-170.
- CP9. M.M. Maharbiz, W.J. Holtz, S. Sharifzadeh, J.D. Keasling and R.T. Howe. 2002. "A microfabricated electrochemical oxygen generator for high-density cell culture arrays." Solid-State Sensor, Actuator and Microsystems Workshop, Hilton Head Island, SC, June 2-6 2002. pp. 259-264.
- CP10. J.D. Keasling, 2005. "The promise of synthetic biology." *The Bridge* **35**(4):18-21. Presented at the National Academy of Engineering, U.S. Frontiers of Engineering meeting, GE Global Research Center, Niskayuna, NY, September 22-24.
- CP11. C. A. Voigt and J. D. Keasling. 2005. "Programming cellular function." *Nat. Chem. Biol.* **1**:304-307. Life Engineering Symposium, San Francisco, CA. August 19-20, 2005.

Refereed Book Chapters

- BC1. J. D. Keasling, T. A. Carrier, K. L. Jones, J. Pramanik, and S. J. Van Dien. 1999. "New tools for metabolic engineering of *Escherichia coli*." In *Metabolic Engineering*, S.-Y. Lee and E. T. Papoutsakis, eds. Marcel Dekker, New York, NY.
- BC2. C. D. Smolke, V. J.J. Martin, and J. D. Keasling. 2004. "Tools for Metabolic Engineering in *Escherichia coli*." In *Protein Expression Technologies: Current Status and Future Trends*, F. Baneyx, ed. Horizon Bioscience, Norfolk, UK. Pages 149-197.
- BC3. G. Y. Wang, R. D. Laidlaw, J. H. Marshall, and J. D. Keasling. 2004. "Metabolic engineering of fungal secondary metabolite pathways." In *Handbook of Industrial Mycology*, Z. An, ed. Marcel Dekker, New York, NY. Pages 635-666.
- BC4. S. K. Lee and J. D. Keasling. 2009. "Practical Pathway Engineering – Demonstration in Integrating Tools." In *The Metabolic Pathway Engineering Handbook*, C. D. Smolke, ed. CRC Press, Taylor & Francis Group, Boca Raton, FL. Section II, Chapter 12, pages 1-14.
- BC5. J. D. Keasling. 2009. "Application of emerging technologies to metabolic engineering." In *The Metabolic Pathway Engineering Handbook*, C. D. Smolke, ed. CRC Press, Taylor & Francis Group, Boca Raton, FL. Section III, pages 1-3.
- BC6. M. de la Pena Mattozzi, Y. Kang, J. D. Keasling. 2010. "Feast: Choking on Acetyl-CoA, the Glyoxylate Shunt, and Acetyl-CoA-Driven Metabolism." In *Handbook of Hydrocarbon and Lipid Microbiology*, K. N. Timmis, T. McGenity, J. R. van der Meer, and V. de Lorenzo, eds. Springer DE. Pages 1649-1660.
- BC7. J. D. Keasling. 2010. "Microbial production of isoprenoids." In *Handbook of Hydrocarbon and Lipid Microbiology*, K. N. Timmis, T. McGenity, J. R. van der Meer, and V. de Lorenzo, eds. Springer DE. Pages 2951-2966.
- BC8. S.R. Chhabra and J.D. Keasling. 2011. "The Biological Basis | Metabolic Design and Control for Production in Prokaryotes." In *Comprehensive Biotechnology, Second Edition*, Murray Moo-Young, ed. Elsevier. Volume 1, pages 243–255.
- BC9. J. A. Dietrich, J. L. Fortman, D. Juminaga, and J. D. Keasling. 2011. "Microbial production of plant-derived pharmaceutical natural products through metabolic engineering: artemisinin and beyond." In *Biocatalysis for Green Chemistry and Chemical Process Development*, J. Tao and R. Kazlauskas, ed. John Wiley. Chapter 7, pages 173-196.
- BC10. A. Mukhopadhyay, N. J. Hillson, and J. D. Keasling. 2011. "Control of stress tolerance in bacterial host organisms for bioproduction of fuels." In *Microbial Stress Tolerance for Biofuels*, Z. L. Liu, ed. Springer-Verlag. Pages 209-238.
- BC11. E. E. K. Baidoo, P. I Benke, and J. D. Keasling. 2012. "Mass spectrometry-based microbial metabolomics." In *Microbial Systems Biology: Methods and Protocols, Methods in Molecular Biology*, A. Navid, ed. Springer-Verlag. Vol. 881, Pages 215-278.

- BC12. T. S. Baath, J. D. Keasling, and C. J. Petzold. 2012. "Targeted proteomics for metabolic pathway optimization." In *Fungal Secondary Metabolism: Methods and Protocols, Methods in Molecular Biology*, N. P. Keller and G. Turner, eds. Springer-Verlag. Vol. 944, pages 237-249.
- BC13. G. Bokinsky, D. Groff, and J. D. Keasling. 2012. "Synthetic biology of microbial biofuel production: From enzymes to pathways to organisms." In *Synthetic Biology: Tools and Applications*, H. Zhao, ed. Elsevier. Pages 207-223

Patents

1. J. D. Keasling, D. G. Bolesch, T. Delfino. 2000. "Reductive dehalogenation of organic halides in contaminated groundwater." US Patent No. 6,150,157.
2. J. D. Keasling, V. Martin, D. Pitera, S.-W. Kim, S. T. Withers III, Y. Yoshikuni, J. D. Newman, A. V. Khlebnikov. 2007. "Biosynthesis of isopentenyl pyrophosphate." US Patent No. 7,172,886.
3. J. D. Keasling, J. D. Newman, D. J. Pitera. 2007. "Method for enhancing production of isoprenoid compounds." US Patent No. 7,183,089.
4. J. D. Keasling, V. Martin, D. Pitera, S. T. Withers III, J. Newman. 2007. "Biosynthesis of amorphadiene." US Patent No. 7,192,751.
5. J. D. Keasling, V. J. J. Martin, D. J. Pitera, S.-W. Kim, S. T. Withers, Y. Yoshikuni, J. D. Newman, A. V. Khlebnikov. 2009. "Methods for synthesizing isopentenyl pyrophosphate." US Patent No. 7,622,282.
6. J. D. Keasling, V. J. J. Martin, D. J. Pitera, S.-W. Kim, S. T. Withers, Y. Yoshikuni, J. D. Newman, A. V. Khlebnikov. 2009. "Methods for synthesizing mevalonate." US Patent No. 7,622,283.
7. J. D. Keasling, V. J. J. Martin, D. J. Pitera, S.-W. Kim, S. T. Withers, Y. Yoshikuni, J. D. Newman, A. V. Khlebnikov. 2010. "Isolated mevalonate pathway enzyme nucleic acids." US Patent No. 7,667,017.
8. J. D. Keasling, J. D. Newman, D. J. Pitera. 2010. "Method for enhancing production of isoprenoid compounds." US Patent No. 7,670,825.
9. J. D. Keasling, V. J. J. Martin, D. J. Pitera, S.-W. Kim, S. T. Withers, Y. Yoshikuni, J. D. Newman, A. V. Khlebnikov. 2010. "Host cells for production of isoprenoid compounds." US Patent No. 7,736,882.
10. J. D. Newman, N. Renninger, V. J. J. Martin, J. D. Keasling, K. K. Reiling. 2010. "Method for identifying terpene synthase." US Patent No. 7,745,108.
11. J. D. Keasling, Y. Yoshikuni. 2011. "Methods of generating protein variants with altered function." US Patent No. 7,888,095.
12. J. D. Keasling, V. J. J. Martin, D. J. Pitera, S.-W. Kim, S. T. Withers, Y. Yoshikuni, J. Newman, A. V. Khlebnikov. 2011. "Host cells for production of isoprenoid compounds." US Patent No. 7,915,026.
13. J. D. Keasling, J. Newman, D. J. Pitera, S. T. Withers, K. K. Reiling, V. J. J. Martin. 2011. "Methods for identifying a biosynthetic pathway gene product." US Patent No. 7,927,794.
14. H. Chou, J. D. Keasling. 2011. "Host cells and methods for producing 3-methyl-2-buten-1-ol, 3-methyl-3-buten-1-ol, and 3-methyl-butan-1-ol." US Patent No. 7,985,567.
15. M. C.-Y. Chang, R. A. Krupa, D.-K. Ro, Y. Yoshikuni, J. D. Keasling. 2012. "Nucleic acids encoding modified cytochrome P450 enzymes and methods of use thereof." US Patent No. 8,097,438.
16. J. A. Dietrich, Y. Yoshikuni, J. D. Keasling, M. C. Y. Chang. 2012. "Artemisinic epoxide and methods for producing the same." US Patent No. 8,101,399.
17. D. J. Pitera, J. D. Newman, J. L. Kizer, J. D. Keasling, B. F. Pfleger. 2012. "Methods for increasing isoprenoid and isoprenoid precursor production by modulating fatty acid levels." US Patent No. 8,114,645.
18. J. D. Keasling, Y. Yoshikuni, J. A. Dietrich, F. F. Nowroozi, P. C. Babbitt. 2012. "Methods of generating protein variants." US Patent No. 8,158,383.
19. D.-K. Ro, K. Newman, E. M. Paradise, J. D. Keasling, M. Ouellet, R. Eachus, K. Ho, T. Ham. 2012. "Polynucleotides encoding isoprenoid modifying enzymes and methods of use thereof." US Patent No. 8,163,980.
20. J. D. Keasling, S. K. Lee. 2012. "Inducible expression vectors and methods of use thereof." US Patent No. 8,178,338.
21. J. D. Keasling, F. Nowroozi, D. J. Pitera, J. Anthony, J. D. Newman, L. Anthony. 2012. "Production of isoprenoids and isoprenoid precursors." US Patent No. 8,257,957.
22. J. D. Keasling, V. J. J. Martin, D. J. Pitera, S.-W. Kim, S. T. Withers, Y. Yoshikuni, J. Newman, A. V. Khlebnikov. 2012. "Host cells for production of isoprenoid compounds." US Patent No. 8,288,147.

23. L. Katz, J. L. Fortman, J. D. Keasling. 2013. "Producing biofuels using polyketide synthases." US Patent No 8,420,833.
24. F. F. Chen, J. D. Keasling, Y. J. Tang. 2013. "Bioremediation of nanomaterials." US Patent No 8,440,423.
25. S. B. del Cardayre, S. Brubaker, J. D. Keasling. 2013. "Modified microorganisms and uses therefor." US Patent No 8,535,916.
26. J. A. Dietrich, J. D. Keasling. 2013. "Transcription factor-based biosensor." US Patent No 8,552,169.
27. L. Katz, J. L. Fortman, J. D. Keasling. 2013. "Producing Dicarboxylic acids using polyketide synthases." US Patent 8,569,023.

Invited Presentations

1. University of California at Davis, Department of Chemical Engineering, Davis, CA, May 1993
2. Genentech, South San Francisco, CA. January 1994.
3. Zeneca Bio-products, Billingham, England. November 1994.
4. University of California at Santa Barbara, Department of Chemical Engineering, Santa Barbara, CA. October 1994.
5. Chiron, Emeryville, CA. May 1996.
6. Stanford University, Department of Chemical Engineering, Stanford, CA. May 1997.
7. Society for Industrial Microbiology, National Meeting, Reno, NV. August 1997.
8. 7th Biochemical Engineering Conference, Seoul, Korea. September 1997.
9. California Water Environment Association, 1998 Annual CWAE Conference. April 1998.
10. Merck and Co., July 1998.
11. Institute for Biological Engineering, Annual Meeting, Orlando, FL. July 1998.
12. California Institute of Technology, Department of Environmental Engineering Science, Pasadena, CA. September 30, 1998.
13. University of Wisconsin, Department of Chemical Engineering, Madison, WI. October 1998.
14. University of Michigan, Department of Chemical Engineering, Ann Arbor, MI. October 1998.
15. University of Michigan, Department of Microbiology and Immunology, Ann Arbor, MI. October 1998.
16. University of Toledo, Department of Bioengineering, Toledo, OH. January 1999.
17. Chiron, Emeryville, CA. June 1999.
18. Merck and Co., Bioprocess Research and Development. June 1999.
19. Enzyme Engineering XV, Kona, HI. October 1999.
20. Massachusetts Institute of Technology, Department of Chemical Engineering. November 1999.
21. University of California at Irvine, Department of Chemical and Environmental Engineering. February 2000.
22. International Symposium on Modern Problems of Microbial Biochemistry and Biotechnology. Pushchino, Russia. June 2000.
23. International Society for Environmental Biotechnology Meeting. Kyoto, Japan. July 2000.
24. Biotechnology 2000, Berlin, Germany. August 2000.
25. Princeton University, Department of Chemical Engineering, September 2000.
26. Metabolic Engineering and Directed Evolution, British Biotechnology Research Council. London, England. November 2000.
27. University of Minnesota, Department of Chemical Engineering. December 2000.
28. PacifiChem, Honolulu, HI. December 2000.
29. World Congress on Enzyme Technologies. San Diego, CA. February 26, 2001.
30. American Society for Microbiology Annual Meeting, Orlando, FL. May 19, 2001.
31. Genomatica, San Diego, CA. October 26, 2001.
32. University College London, Department of Bioprocess Engineering. London, UK. October 22, 2001.

33. University of Wisconsin, Department of Chemical Engineering, Madison, WI. October 30, 2001.
34. Actinides 2001. Hayama, Japan. November 5, 2001.
35. Princeton University, Department of Chemical Engineering, Princeton, NJ. December 7, 2001.
36. Stanford University, Department of Civil and Environmental Engineering. Stanford, CA. February 8, 2002.
37. University of Maryland, Department of Chemical Engineering, College Park, Maryland. February 25, 2002.
38. Microbia, Cambridge, MA. February 27, 2002.
39. Diversa, San Diego, CA. March 13, 2002.
40. Kosan Biosciences, Hayward, CA. March 29, 2002.
41. University of Washington, Department of Chemical Engineering, Seattle, WA. April 22, 2002.
42. National Research Center, Biotechnology Research Institute, Montreal, Canada. June 3, 2002.
43. Sandia National Laboratory, August 27, 2002.
44. Tenth International Small Genomes Conference, Lake Arrowhead, CA. September 9, 2002.
45. City College of New York, Department of Chemical Engineering, New York, NY. September 30, 2002.
46. Polytechnic University, Department of Chemical Engineering, Brooklyn, NY. October 2, 2002.
47. University of Delaware, Department of Chemical Engineering (Allan P. Colburn Memorial Lecture), Newark, DE. November 2, 2002.
48. American Institute of Chemical Engineers National Meeting, Indianapolis, IN. November 5, 2002.
49. Firmenich, Geneva, Switzerland, November 7, 2002.
50. University of Michigan, Cellular Biotechnology Program, January 13, 2003.
51. Metabolic Engineering Working Group, National Science Foundation, Arlington, VA. January 31, 2003.
52. Synthetic Biology, SRI International, Menlo Park, CA. March 3-4, 2003.
53. University of California, San Diego, Department of Chemistry, La Jolla, CA. April 4, 2003.
54. Annual Meeting of the Society for Biochemistry and Molecular Biology (ASBMB), San Diego, CA. April 15, 2003.
55. Terpnet Meeting, University of Kentucky, Lexington, KY. May 15, 2003.
56. Johns Hopkins University, Department of Chemistry, Baltimore, MD. May 19, 2003.
57. Society of Industrial Microbiology Annual Meeting, Minneapolis, MN. August 10, 2003.
58. University of California, Berkeley, Department of Chemistry, Berkeley, CA. September 2, 2003.
59. University of Nebraska, Lincoln, Department of Chemistry, Lincoln, NE. September 12, 2003.
60. University of Illinois, Department of Chemical Engineering, Urbana-Champaign, IL. September 29, 2003.
61. Rice University, Department of Chemical Engineering, Houston, TX. October 9, 2003.
62. University of Colorado, Department of Chemical Engineering, Boulder, CO. October 14, 2003.
63. AIChE National Meeting, San Francisco, CA. November 17, 2003.
64. Thirteenth ISBA Meeting, Melbourne, Australia. December 1-5, 2003.
65. Eidgenossische Technische Hochschule, Department of Chemistry, Zurich, Switzerland. March 22, 2004.
66. PSI Protein Production and Crystallization Workshop, National Institute of General Medical Sciences, Natcher Conference Center, Bethesda, Maryland. March 29, 2004.
67. Illinois Institute of Technology, Department of Chemical Engineering, Chicago, IL. April 28, 2004.
68. Biotech Summit, Berkeley, CA. May 10, 2004.

69. Biological Input-Output Systems, DARPA, Boston MA. June 14, 2004.
70. Biotech 2004, Oviedo, Spain. July 19, 2004.
71. Society for Industrial Microbiology, Anaheim, CA. July 25, 2004.
72. American Chemical Society, Philadelphia, PA. August 22, 2004.
73. Cornell University, Department of Chemical Engineering, Ithaca, NY. September 13, 2004.
74. Purdue University, Department of Chemical Engineering, West Lafayette, IN. September 14, 2004.
75. Metabolic Engineering V, Lake Tahoe, CA. September 19, 2004.
76. Small Genomes Meeting, Lake Arrowhead, CA. September 26, 2004.
77. Council for the Advancement of Science Writing, Fayetteville, AK. November 8, 2004.
78. BioAgenda, Palm Springs, CA. December 7, 2004.
79. The Crossroads of Biotechnology 2005, Montreal, Canada. February 8, 2005.
80. USDA-ARS Commercial Strategic Rubber from Crop Plants and Bioreactors Third Annual Meeting, Albany, CA. February 17-18, 2005.
81. SynBio 2005 International Conference, Seoul, Korea. February 23, 2005.
82. 229th ACS National Meeting, San Diego, CA. March 12, 2005.
83. American Society for Microbiology 105th General Meeting, Atlanta, GA. June 9, 2005.
84. Gordon Research Conference "Plant Metabolic Engineering", Tilton, NH. July 13-15, 2005.
85. International Union of Microbiological Societies (IUMS), San Francisco, CA. July 27, 2005.
86. Manipulation of Biological Systems Conference, McLean, VA. July 28, 2005.
87. 2005 SIMS Annual Meeting, Chicago, IL. August 22-23, 2005.
88. 13th Annual International Conference on Microbial Genomes, Madison, WI. September 13-15, 2005.
89. National Academy of Engineering 11th Annual US Frontiers of Engineering Symposium, Niskayuna, NY. September 22-24, 2005.
90. University of California, Santa Barbara, Department of Chemical Engineering, Santa Barbara, CA. October 6, 2005.
91. ICSB 2005, Boston, MA. October 20-22, 2005.
92. IBM Academy of Technology Annual Meeting, Burlingame, CA. November 2, 2005.
93. University of Michigan, Department of Chemical Engineering, East Lansing, MI. November 8-12, 2005.
94. PacifiChem 2005, Honolulu, HI. December 16-18, 2005.
95. 2006 Institute of Biological Engineering Conference, Tucson, AZ. March 9-12, 2006.
96. University of Virginia, 2006 Symposium, Charlottesville, VA. April 10-11, 2006.
97. University of San Diego, San Diego, CA. April 13-14, 2006.
98. Stanford University, Stanford, CA. May 9, 2006.
99. DuPont Central Research and Development, Wilmington, DE. June 1-3, 2006.
100. CNN Future Summit "Of Man and Machine", Singapore. June 11-15, 2006.
101. IUCRP Fellows Seminar, UC San Diego, San Diego, CA. July 11, 2006.
102. SIMS 2006 Annual Meeting, Baltimore, MD. July 30-31, 2006.
103. California Commonwealth Club's INFORUM, San Francisco, CA. August 7, 2006.
104. Seminar, University of Minnesota, Dept. of Chemical Engineering and Material Sciences, Minneapolis, MN. Sept. 11-12, 2006.
105. Seminar, University of California, Irvine, Synthetic Biology Department, Irvine, CA. Sept. 14-15, 2006.
106. 14th Annual International Meeting on Microbial Genomics, Lake Arrowhead, CA, September 24-28, 2006.
107. IBOS Conference, Nunspeet, The Netherlands. September 27 – 30, 2006.
108. Metabolic Engineering VI: From recDNA towards Engineering Biological Systems, Noordwijkerhout, The Netherlands. October 1-5, 2006.
109. UC Berkeley Homecoming Seminar, Berkeley, CA. October 6, 2006.
110. Contra Costa College, San Pablo, CA. October 13, 2006.

111. Invited Presentation, 3rd International *E. coli* Alliance Conference, Jeju, South Korea. November 1-3, 2006.
112. Seminar, IBM Almaden Research Center, San Jose, CA. November 7, 2006.
113. Invited Presentation, William L. Brown Symposium, Missouri Botanical Garden, St. Louis, MO. November 10-11, 2006.
114. Seminar, University of California, San Francisco, Department of Biophysics and Chemistry, San Francisco, CA. November 16, 2006.
115. Invited Presentation, Keystone Symposium, Drugs Against Protozoan Parasites, Lake Tahoe, CA. January 28, 2007.
116. Keynote Address, Biotechnology and Biological Sciences Research Council, BBSRC Workshop in Synthetic Biology, Alexandra House, Wroughton, Swindon, UK. February 8, 2007.
117. Seminar, Stanford University, Department of Microbiology, Stanford, CA. February 16, 2007.
118. Keynote Address, The World Congress on Industrial Biotechnology & Bioprocessing, Biotechnology Industry Organization, Orlando, FL. March 23, 2007.
119. Keynote Address, Joint Genome Institute User's Meeting, Walnut Creek, CA. March 28, 2007.
120. Seminar, University of Missouri, Columbia, Department of Biochemistry, Columbia, MO. April 13, 2007.
121. Panelist, Burrill General Partners Meeting, San Francisco, CA. April 17, 2007.
122. Keynote Address, Recomb 2007, Oakland, CA. April 23, 2007.
123. Seminar, Harvard Malaria Symposium, Harvard University, Cambridge, MA. April 24, 2007.
124. Seminar, Georgia Tech University, Center for the Study of Systems Biology, Atlanta, GA. May 2, 2007.
125. Seminar, Georgia Tech University, Department of Chemical Engineering, Atlanta, GA, May 3, 2007.
126. Seminar, Northern California AIChE, Berkeley, CA. May 15, 2007.
127. Seminar, University of British Columbia, Michael Smith Laboratories, Vancouver, British Columbia, Canada. May 17, 2007.
128. Seminar, Congressional Biomedical Research Caucus, Washington, D.C., May 23, 2007.
129. Seminar, PARC Forum, Palo Alto Research Center, Palo Alto, CA. May 24, 2007.
130. Seminar, Harvard University, Department of Chemistry, Cambridge, MA, May 31, 2007.
131. Seminar, Kavli Futures Symposium, Ilulissat, Greenland. June 13, 2007.
132. Seminar, University of Manchester, Manchester Institute of Biotechnology, Manchester, UK. July 12, 2007.
133. Presentation, Biochemical Engineering XV, Quebec City, Canada. July 12, 2007.
134. Presentation, Natural Products Gordon Research Conference, Tilton, NH. July 25, 2007.
135. Presentation, Society for Industrial Microbiology Meeting, Denver, CO. July 29, 2007.
136. Presentation, Energy Modeling Forum, Workshop on Climate Impacts and Integrated Assessment, Snowmass, CO. August 1, 2007.
137. Keynote Address, 10th Functional Genomics Meeting on Synthetic Biology, Goteborg, Sweden. August 28, 2007.
138. Presentation, KI International Symposium Future Design, Korean Advanced Institute for Science and Technology, Daejeon, Korea. September 6, 2007.
139. Keynote Address, Enzyme Engineering XIX, Harrison Hot Springs, British Columbia, Canada. September 23, 2007.
140. Presentation, Metabolic Engineering Meeting, Mathematical Biosciences Institute, Ohio State University, Columbus, OH. September 24, 2007.
141. Keynote Address, Frontiers in Transgenesis, Danforth Center, St. Louis, OH. September 28, 2007.
142. Seminar, Rice University, Department of Bioengineering, Houston, TX. October 10, 2007.
143. Presentation, Malaria Forum, Bill & Melinda Gates Foundation, Seattle, WA. October 17, 2007.
144. Presentation, Pop!Tech, Camden, ME. October 20, 2007.

145. Presentation, Energy Roundtable, Stanford University, Hoover Institute, Stanford, CA. November 20, 2007.
146. Presentation, Biological and Environmental Research Advisory Committee (BERAC), Washington, DC. November 29, 2007.
147. Harry S. Truman Award Lecture, Sandia National Laboratories, Albuquerque, NM. December 5, 2007.
148. Presentation, International Conference on Cellular & Molecular Bioengineering, Nanyang Technological University, Singapore. December 10, 2007.
149. Presentation, Symposium on Future Directions in Research at the Intersection of the Physical and Life Sciences (RIPLS), National Academy of Science, Washington, D.C., December 19, 2007.
150. Keynote Address, Technology Innovation Conference, Novozymes, Copenhagen, Denmark. January 13, 2008.
151. Presentation, US-EC Workshop on Bioenergy, San Francisco, CA. February 22, 2008.
152. Keynote Address, 6th TLL Life Sciences Symposium, Temasec Life Sciences Laboratories, Singapore National University, Singapore. January 25, 2008.
153. Presentation, Orinda Intermediate School, Orinda, CA. January 30, 2008.
154. Keynote Address, 12th Netherlands Biotechnology Conference, Ede, The Netherlands. March 14, 2008.
155. Presentation, Symposium on Synthetic Biology, University of Arizona, Tucson, AZ. March 19, 2008.
156. Seminar, Duke University, Department of Biochemistry, Durham, NC. March 21, 2008.
157. Seminar, Reliance Life Sciences, Mumbai, India. March 28, 2008.
158. Seminar, Council of Scientific and Industrial Research, New Dehli, India. March 30, 2008.
159. Seminar, University of Nevada, Department of Chemical Engineering, Reno, NV. April 7, 2008.
160. Seminar, University of California, Berkeley, Department of Mechanical Engineering, Berkeley, CA, March 10, 2008.
161. Presentation, Targeting and Tinkering with Interaction Networks, Barcelona, Spain. April 15, 2008.
162. Presentation, Institute for Systems Biology, Seattle, WA. April 21, 2008.
163. Seminar, University of Washington, Department of Bioengineering, Seattle, WA. April 22, 2008.
164. Seminar, Sangamo Biosciences, Richmond, CA. April 25, 2008.
165. Presentation, Fifth Annual World Congress on Industrial Biotechnology & Bioprocessing, Chicago, IL. April 28, 2008.
166. Seminar, California Institute of Technology, Department of Bioengineering, Pasadena, CA. May 5, 2008.
167. Seminar, Scripps Research Institute, Department of Chemistry, La Jolla, CA. May 7, 2008.
168. Presentation, Khosla Ventures CEO Summit, Carmel, CA. May 8, 2008.
169. Seminar, Novozymes, Davis, CA. May 12, 2008.
170. Seminar, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, Harvard University Medical School, Department of Microbiology, Cambridge, MA. May 27, 2008.
171. Presentation, *Engineering Microorganisms for the Production of Drugs and Fuels*, Royal Society, London, UK. June 2, 2008.
172. Presentation, Burrill & Company, San Francisco, CA. June 10, 2008.
173. Presentation, *Engineering Microbial Metabolism for Production of Advanced Biofuels*, 4th European Plant Science Organization Conference, Cote d'Azur, France. June 26, 2008.
174. Presentation, *Metabolic Pathway Engineering for Drugs and Fuels*, Gordon Research Conference on Enzymes, Coenzymes, and Metabolic Pathways, Biddeford, ME. July 14, 2008.
175. Presentation, *Microbial Synthesis of Advanced Biofuels*, Protein Society Symposium, San Diego, CA. July 21, 2008.

176. Presentation, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, Cadence, Berkeley, CA. August 18, 2008.
177. Presentation, *BioEnergy Research in the USA*, Solar & BioEnergy Symposium, University of Glasgow, Scotland. August 31, 2008.
178. Seminar, *Synthetic Biology: From Bugs to Drugs and Fuels*, University of Michigan, Detroit, MI. Sept. 3, 2008.
179. Presentation, *Synthetic Biology for Advanced Biofuels*, Society for General Microbiology, Trinity College, Dublin, Ireland. September 9, 2008.
180. Presentation, *Synthetic Biology for Synthetic Chemistry*, Patten Distinguished Seminar, University of Colorado, Boulder, CO. Sept. 11, 2008.
181. Presentation, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, 13th Annual Human Genome Meeting: Genomics and the Future of Medicine, Hyderabad, India. September 27, 2008.
182. Presentation, *Fuel and Drug Production SB4.0: The Fourth International Conference on Synthetic Biology*, Kowloon, Hong Kong, China. October 11, 2008.
183. Presentation, *Life 2.0: From Bugs to Drugs and Fuels*, Fisher Center for Real Estate & Urban Economics, Pebble Beach, CA. October 15, 2008.
184. Presentation, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, Frontier in Multi-Scale Systems Biology, Atlanta, GA. October 18, 2008.
185. Presentation, *Synthetic Biology for Synthetic Chemistry*, 2008 Britton Chance Distinguished Lecture, University of Pennsylvania, Philadelphia, PA. October 22, 2008.
186. Presentation, VWR Stock Room Presentation, Emeryville, CA. October 24, 2008.
187. Seminar, *Synthetic Biology for Synthetic Chemistry*, University of Wisconsin, Madison, WI. November 17, 2008.
188. Professional Progress Award Lecture, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, AIChE Centennial Meeting. Philadelphia, PA. November 18, 2008.
189. Seminar, *Synthetic Biology for Synthetic Chemistry*, National University of Singapore, Singapore. Jan. 7, 2009.
190. Presentation, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, SBE's 2nd International Conference on Biomolecular Engineering, Santa Barbara, CA. January 19, 2009.
191. Presentation, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, AAAS Annual Meeting, Chicago, IL. February 13, 2009.
192. Seminar, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs* Vanderbilt Institute of Chemical Biology, Nashville, TN. February 18, 2009.
193. Merck Lecture, *Synthetic Biology for Synthetic Chemistry*, University of Virginia, Charlottesville, VA. February 19, 2008.
194. Presentation, *SynBio: From Bugs to Drugs to Fuels*, Hertz Foundation, Santa Clara, CA. March 20, 2009.
195. Seminar, *Synthetic Biology in Pursuit of Low-Cost, Effective Anti-Malarial Drugs* University of Austin, Austin, TX. March 24, 2009.
196. Presentation, *Engineering Microbial Metabolism for Production of Advanced Biofuels*, Keystone Symposia, Snowbird, UT. April 5, 2009.
197. New England Biolabs, *Engineering Microbial Metabolism for Synthesis of a Low-Cost, Effective, Anti-Malarial Drug*, Ipswich, MA. April 14, 2009.
198. Lecture, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, Boston University, Boston, MA. April 14, 2009.
199. Seminar, *Engineering Microbial Metabolism for Production of Anti-Malarial Drugs*, Boston College, Chestnut Hill, MA. April 15, 2009.
200. Seminar, *From Bugs to Biofuels*, Boston College, Boston, Chestnut Hill, MA. April 16, 2008.
201. Seminar, *Synthetic Biology: A New Discipline in Biological Engineering*, Boston College, Chestnut Hill, Boston, MA. April 17, 2009.
202. Seminar, *Engineering Microorganisms for Production of Advanced Biofuels*, Bollum Symposium, University of Minnesota, Minneapolis, MN. May 6, 2009.
203. Keynote Address, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, EPSRC Centre for Synthetic Biology and Innovation, Imperial College, London, UK. May 12, 2009.
204. Seminar, *Engineering Microorganisms for Production of Drugs and Fuels*, University of California, Irvine, CA, May 21, 2009.

205. Keynote Address, 8th International Workshop on Advanced Genomics Expansion of Genome Science, *Synthetic Biology in Pursuit of Low-Cost Effective, Anti-Malarial Drugs*, Tokyo, Japan. June 16, 2009.
206. Presentation, *Synthetic Biology for Synthetic Chemistry*, Firmenich SA, Geneva, Switzerland. July 7, 2009
207. Presentation, *Synthetic Biology for Synthetic Chemistry*, Givaudan SA, Dubendorf, Switzerland, July 8, 2009
208. Presentation, *Synthetic Biology for Synthetic Chemistry*, BioTrans 2009, Berne, Switzerland. July 9, 2009
209. Presentation, *Advances in Metabolic Engineering*, Scientific Advisory Board Meeting, Genomatica, San Diego, CA. July 13, 2009
210. Presentation, *Synthetic Biology for Synthetic Fuels*, Synthetic Genes to Synthetic Life, 33rd Steenbock Symposium, University of Wisconsin, Madison, WI. August 1, 2009
211. Presentation, *Synthetic Biology for Synthetic Drugs and Fuels*, Swedish-American Life Summit, Stockholm, Sweden. August 21, 2009
212. Presentation, *Synthetic Biology for Synthetic Chemistry: From Bugs to Drugs and Fuels*, Danckwerts Lecture, World Congress on Chemical Engineering, Montreal, Canada. August 26, 2009
213. Presentation, *Metabolic Engineering of Microorganisms*, Second Tiselius Symposium on Horizons in Biochemistry, Uppsala, Sweden. September 5, 2009
214. Presentation, *Engineering Microbial Metabolism for Production of Advanced Biofuels*, Society for General Microbiology, Edinburgh, Scotland. September 7, 2009
215. Seminar, *Engineering Microbial Metabolism for Production of Artemisinin*, University of Edinburgh, Edinburgh, Scotland. September 8, 2009
216. Presentation, *Engineering Micro-Organisms for Production of Drugs and Fuels*, Society for General Microbiology, Edinburgh, Scotland. September 8, 2009
217. Seminar, *Engineering Microbial Metabolism for Drugs and Fuels*, Forefront of Genomics, UC Davis, Davis, CA. September 18, 2009
218. Presentation, *Bio-Bricks to Bio-Businesses: Building Synthetic Biology Companies*, City Campus, University of Nebraska, Lincoln, NE. September 25, 2009
219. Presentation, *Bio-Bricks to Bio-Businesses: Building Synthetic Biology Companies*, East Campus, University of Nebraska, Lincoln, NE. September 25, 2009
220. Presentation, *Engineering Microbial Metabolism for Production of Advanced Biofuels*, Symposium on Synthetic Biology, CSIR Science Centre, Delhi, India. October 19, 2009.
221. Presentation, *Synthetic Biology for Synthetic Chemistry*, International Center for Genetic Engineering & Biotechnology, Delhi, India. October 20, 2009
222. Presentation, *Synthetic Biology for Synthetic Chemistry*, 2009 3rd International Symposium on Bio-Inspired Engineering, Taipei, Taiwan. October 22, 2009
223. Seminar, *Synthetic Biology for Synthetic Chemistry: From Bugs to Drugs and Fuels*, Cox Lecture, Washington University, St. Louis, MO. October 30, 2009
224. Seminar, *Engineering Microbial Metabolism for Low-Cost, Effective, Anti-Malarial Drugs*, University of Kentucky, Lexington, KY. November 6, 2009
225. Seminar, *Synthetic Biology for Synthetic Fuels*, University of Kentucky, Lexington, KY. November 6, 2009
226. Presentation, *Engineering Microbial Metabolism for Production of Advanced Biofuels*, 2009 AIChE Annual Meeting, Nashville, TN. Nov. 10, 2009
227. Presentation, *Engineering Biology for Drugs and Fuels*, American Philosophical Society, Philadelphia, PA. November 13, 2009
228. Presentation, *The Joint BioEnergy Institute*, USDA/DOE Biomass Advisory Group, Washington, DC. December 1, 2009
229. Presentation, *Overview of Synthetic Biology*, National Science Advisory Board for Biosecurity Meeting, Bethesda, MD. December 3, 2009
230. Presentation, *Synthetic Biology in Pursuit of Low-Cost, Effective, Anti-Malarial Drugs*, Stanford University, Stanford, CA. January 26, 2010
231. Presentation, *Synthetic Biology for Synthetic Chemistry*, Chemical Sciences Roundtable, Washington, DC. February 3, 2010
232. Presentation, *Engineering Microbial Metabolism for Production of Low-Cost, Effective, Anti-Malarial Drugs*, John Hopkins University, Baltimore, MD. March 18, 2010

233. Presentation, *Engineering Microbial Metabolism for Production of the Anti-Malarial Drug Artemisinin*, 239th ACS Meeting, San Francisco, CA. March 23, 2010
234. Presentation, *Life 2.0: Synthetic Biology*, Arizona State University, Tempe, AZ. March 25, 2010
235. Presentation, *Synthetic Biology for Synthetic Chemistry*, Arizona State University, Tempe, AZ. March 26, 2010
236. Presentation, *Synthetic Biology for Synthetic Chemistry: From Bugs to Drugs and Fuels*, University of Toronto, Toronto, Ontario, Canada. April 7, 2010
237. Presentation, *Synthetic Biology for Synthetic Chemistry: From Bugs to Drugs and Fuels*, Ohio State University, Columbus, OH. April 13, 2010
238. Presentation, *Synthetic Biology for Synthetic Chemistry*, Yale University, New Haven, CT. April 14, 2010
239. Presentation, *Engineering Microbial Metabolism for Production of the Anti-Malarial Drug Artemisinin*, Institute for Systems Biology Symposium, Seattle, WA. April 19, 2010
240. Seminar, *Synthetic Biology for Synthetic Chemistry: From Bugs to Drugs and Fuels*, Nanyang Technological University, Singapore. April 30, 2010
241. Seminar, *Synthetic Biology for Synthetic Chemistry*, Carnegie Mellon, Pittsburgh, Pennsylvania. May 6, 2010
242. Seminar, *Synthetic Biology for Advanced Biofuels*, University of Alberta, Edmonton, Alberta, Canada. May 21, 2010
243. Seminar, *Synthetic Biology for Advanced Biofuels*, Stanford, Palo Alto, California. May 24, 2010
244. Presentation, *Synthetic Biology for Synthetic Chemistry*, ASM Meeting, San Diego, California. May 25, 2010
245. Seminar, *Synthetic Biology for Synthetic Chemistry*, Closs Lecture, University of Chicago, Chicago, Illinois. May 28, 2010
246. Presentation, *Engineering Microorganisms with Plant-Derived Genes to Produce Drugs and Fuels*, IAPB 2010 Congress, St. Louis, Missouri. June 9, 2010
247. Presentation, *Synthetic Biology for Synthetic Fuels*, Metabolic Engineering Conference VIII, Jeju Island, Korea. June 14, 2010
248. Presentation, *Biofuels*, World Council on Industrial Biotechnology, Jeju Island, Korea. June 18, 2010
249. Presentation, *Synthetic Biology for Synthetic Chemistry*, BOSS XII, Namur, Belgium. July 15, 2010
250. Presentation, *Synthetic Biology for Synthetic Fuels*, Conference on Cellular & Molecular Bioengineering, Singapore. August 4, 2010
251. Presentation, *Synthetic Biology for Synthetic Chemistry*, Institute of Bioengineering and Nanotechnology, Singapore, August 5, 2010.
252. Presentation, *Engineering Microbial Metabolism for Production of Advanced Biofuels*, Gothenburg Life Science Conference, Gothenburg, Sweden. August 20, 2010
253. Presentation, *Engineering Microbial Metabolism for Production of the Anti-Malarial Drug Artemisinin*, American Chemical Society Meeting, Boston, MA. August 23, 2010
254. Presentation, *Medicinal Drug Production in Microbes*, Synthetic Biology International Workshop, University of Copenhagen, Denmark. August 25, 2010
255. Seminar, *Synthetic Biology for Synthetic Chemistry*, Chinese University of Hong Kong, Hong Kong. October 16, 2010
256. Presentation, *Synthetic Biology for Synthetic Chemistry*, International Symposium on Synthetic Biology, Singapore. October 19, 2010
257. Presentation, *Synthetic Biology: From Bugs to Drugs & Fuels*, ION Beams in Biology and Medicine Workshop, Claremont Hotel, Oakland, California. October 28, 2010
258. Presentation, *Joint BioEnergy Institute: Start-up for Advanced Biofuels*, Ministry of Trade and Industry, Singapore. November 10, 2010
259. Seminar, *Synthetic Biology for Synthetic Fuels*, A*STAR Scientific Conference, Singapore. November 10, 2010
260. Presentation, *Synthetic Biology for Advanced Agri-Products*, Farm Credit Counsel, San Francisco, California. January 24, 2011
261. Panel Discussion, *The Future of Fuel: Local Solution to Global Energy Challenges*, Science at the Leshner, Walnut Creek, California. January 18, 2011

262. Presentation, *Next Generation Biofuels through Synthetic Biology*, Keystone/A*Star Symposium on Biofuels, Singapore. March 2, 2011
263. Presentation, *Synthetic Biology for Synthetic Chemistry*, Burrill, Palo Alto, California. March 10, 2011
264. Presentation, *Engineering Microbial Metabolism for Production of Anti-Malarial Drugs*, IOMs Forum on Microbial Threats Public Workshop, Washington, DC. March 15, 2011
265. Distinguished Speaker Seminar, *Synthetic Biology for Synthetic Chemistry*, John Hopkins University/NIH, Bethesda, Maryland. March 16, 2011
266. Keynote, *Sustainable Production of Advanced Biofuels*, ACS/BIOT, Anaheim, California. March 29, 2011
267. Presentation, *Synthetic Biology for Synthetic Fuels*, ExxonMobil, Galveston, Texas. April 6, 2011
268. Director's Special Colloquium Lecture, *Synthetic Biology for Synthetic Fuels*, Argonne National Laboratory, Argonne, Illinois. April 14, 2011
269. Keynote, *Synthetic Biology for Synthetic Chemistry*, Duke University, Durham, North Carolina. April 16, 2011
270. Keynote, *Synthetic Biology for Synthetic Chemistry*, Synthetic Biology for Learning and Doing Conference, Paris, France. May 4, 2011
271. Presentation, *Synthetic Biology for Synthetic Chemistry*, Firmenich Biotech Symposium, Le Grand-Saconnex, Switzerland. May 5, 2011
272. Keynote, *Synthetic Biology for Synthetic Chemistry*, Biology by Design Symposium, Northwestern University, Evanston, Illinois. May 11, 2011
273. Seminar, *Synthetic Biology for Synthetic Chemistry*, University of California, San Francisco, California. May 24, 2011
274. Presentation, *Introduction to Synthetic Biology*, VTT, Espoo, Finland. June 9, 2011
275. Presentation, *Synthetic Biology Applications in Fuels and Chemicals Production*, VTT, Espoo, Finland. June 10, 2011
276. Presentation, *Synthetic Biology for Synthetic Chemistry*, Mexico Bio 2011, Guanajuato, Mexico. June 20, 2011
277. Presentation, *Synthetic Biology of Synthetic Fuels*, XIV Congreso Nacional de Biotecnologías y Bioingeniería, Queretaro, Mexico. June 21, 2011
278. Presentation, *Engineering Microorganisms for Production of Advanced Biofuels*, Biochemical and Molecular Engineering XVII, Seattle, Washington. June 27, 2011
279. Presentation, *Synthetic Biology for Synthetic Fuels*, Aspen Ideas Festival, Aspen, Colorado. June 28, 2011
280. Presentation, *Synthetic Biology for Synthetic Chemistry*, NASA Ames Research Center, Moffett Field, California. July 12, 2011
281. Keynote, *Sustainable, Biological Production of Hydrocarbons*, Synthetic Biology Biobased Future, Berkeley, CA. August 31, 2011
282. Presentation, *Synthetic Biology for Synthetic Fuels*, Poptech!, New York, NY. September 8, 2011
283. Keynote, *Sustainable, Microbial Production of Chemical and Fuels*, Dow Innovation Student Challenge Awards, Berkeley, CA. October 5, 2011
284. Presentation, *Synthetic Biology: From Bugs to Drugs and Fuels*, Siebel Scholars Conference, Chantilly, VA. October 15, 2011
285. Seminar, *Sustainable, Biological Production of Hydrocarbons*, University of Washington, Seattle, WA. October 19, 2011
286. Keynote, *Synthetic Biology for Synthetic Chemistry: Biological Production of Hydrocarbons*, SystemsX Conference, Basel, Switzerland. October 25, 2011
287. Keynote, *Synthetic Biology for Synthetic Chemistry*, Cold Spring Harbor – Asia Symposium, Suzhou, China. November 7, 2011
288. Seminar, *Synthetic Biology for Synthetic Chemistry*, Stanford University, Palo Alto, CA. February 3, 2012
289. Seminar, *Synthetic Biology for Synthetic Chemistry*, Gladstone Institute of Virology and Immunology, San Francisco, CA. March 22, 2012
290. Seminar, *Engineering Microbial Hydrocarbon Metabolism for Production of Advanced Fuels*, Genetics Department, Yale University, New Haven, CT. April 3, 2012
291. Tetelman Award Lecture, *Life 2.0: Engineering Biology to Change the World*, Yale University, New Haven, CT. April 4, 2012

292. Seminar, *Synthetic Biology for Synthetic Chemistry*, Virginia Commonwealth University, Richmond, VA. April 17, 2012
293. Keynote, *Microbial Production of Artemisinin*, Bay Area World Malaria Day Symposium, San Francisco, CA. April 25, 2012
294. Seminar, *Engineering Hydrocarbon Biochemistry in Microbes*, University of Calgary, Calgary, Alberta, Canada. May 1, 2012
295. Katz Ward Lecture 1, *Life 2.0: Engineering Biology for Sustainable Development*, Katz Lecture, University of Michigan, Ann Arbor, MI. May 3, 2012
296. Katz Award Lecture 2, *Engineering Microbial Hydrocarbon Metabolism for Production of Advanced Fuels*, Katz Lecture, University of Michigan, Ann Arbor, MI. May 4, 2012
297. Heuermann Award Lecture, *The Bold Future of Alternative Energy*, University of Nebraska, Lincoln, NE. May 8, 2012
298. Seminar, *Synthetic Biology for Synthetic Fuels*, Concordia University, Montreal, Quebec, Canada. May 21, 2012
299. Lecture, *Synthetic Biology towards Biofuels*, Molecular Frontiers Symposium, Stockholm, Sweden. May 30, 2012
300. Award Lecture, *Advanced Feedstocks to Advanced Fuels: An Integrated Approach*, Metabolic Engineering IX, Biarritz, France. June 6, 2012
301. Lecture, *Advanced Fuels from Advanced Feedstocks*, enGENEious Conference, University of Oxford, Oxford, UK. June 26, 2012
302. Lecture, *Synthetic Biology: From Bugs to Drugs and Fuels*, KingsLinks Colloquium, University of Edinburgh, Edinburgh, UK. June 27, 2012
303. Keynote, *Opportunities and Challenges for Synthetic Biology in Biocatalysis*, GRC Biocatalysis Conference, Smithfield, RI. July 8, 2012
304. Lecture, *Synthetic Biology for Synthetic Fuels*, CAS Conference on Synthetic Biology, Martinsried, Germany. July 25, 2012
305. Lecture, *Synthetic Biology for Synthetic Chemistry*, Ajinomoto-Genetika Research Institute, Moscow, Russia. July 27, 2012
306. Keynote, *Synthetic Biology for Synthetic Fuels*, Society for Industrial Microbiology Annual Meeting, Washington, DC. August 12, 2012
307. Keynote, *Synthetic Biology for Synthetic Fuels*, Pacific Northwest National Laboratory, Richland, WA. August 14, 2012
308. Keynote, *Metabolic Engineering of Hydrocarbon Production*, University of Western Ontario, London, Ontario, Canada. August 24, 2012
309. Seminar, *Synthetic Biology for Synthetic Chemistry*, National University of Singapore, Singapore. September 11, 2012
310. Seminar, *Advanced Fuels from Advanced Plants*, University of Washington, Seattle, Washington. September 18, 2012
311. Seminar, *Advanced Fuels from Advanced Plants*, Cornell University, Ithaca, NY. September 20, 2012
312. Guest lecturer in several classes, Masters Week, University of Nebraska, Lincoln, Nebraska. November 9, 2012
313. Seminar, *Biofuels for the Future*, Chalmers University of Technology, Gothenburg, Sweden. November 17, 2012
314. Lecture, *Synthetic Biology for Synthetic Chemistry*, American Society for Cell Biology Annual Meeting, San Francisco, CA. December 18, 2012
315. Lecture, *Managing an Energy Hub*, Joint Center for Energy Storage Research, Oakland, CA. December 18, 2012
316. Panel, *The Role of the Research Labs in our Regional Economy*, CCUSA 2013, Concord, CA. January 24, 2013

317. Seminar, *Metabolic Engineering of Hydrocarbon Production*, Georgia Institute of Technology, Atlanta, GA. March 5, 2013
318. Panel, *Programming Life, The Revolutionary Potential of Synthetic Biology*, SynBERC & Discover Event, UC Berkeley, Berkeley, CA. March 25, 2013
319. Award Talk, *Metabolic Engineering of Microbial Metabolism for Hydrocarbon Production*, ACS National Meeting and Exposition. New Orleans, LA. April 9, 2013
320. Panel, *How will Synthetic Biology and Conservation Shape the Future of Nature?* Wildlife Conservation Meeting, Clare College, Cambridge, England. April 10, 2013
321. Seminar, *Synthetic Biology for Synthetic Chemistry*, Nanyang Technological University, Singapore. April 18, 2013
322. Seminar, *Life 2.0: Engineering Biology for Sustainable Development*, University of St. Thomas, St. Paul, MN. May 1, 2013
323. Seminar, *Advanced Fuels from Advanced Plants*, University of St. Thomas, St. Paul, MN. May 3, 2013
324. Lecture, *Engineering Microbial Metabolism for Production of Advanced Hydrocarbons*, Cell Factories and Biosustainability Conference, Hillerod, Denmark. May 6, 2013.
325. Promega Biotechnology Research Award Lecture, *Advanced Plants to Advanced Fuels*, 2013 ASM General Meeting, Denver, CO. May 19, 2013
326. Lecture, *Synthetic Biology for Synthetic Chemistry*, Biochemical and Biomolecular Engineering XVIII Conference, Beijing, China. June 16, 2013
327. *George Washington Carver Award acceptance speech*, 10th Annual BIO World Congress on Industrial Biotechnology, Montreal, Quebec, Canada. June 18, 2013
328. Lecture, *Synthetic Biology for Synthetic Chemistry*, SB6.0, London, England. July 11, 2013

Workshops, Panels, and Short Courses

1. Massachusetts Institute of Technology, Department of Chemical Engineering. August 10-14, 1998. "Metabolic Engineering Short Course."
2. AIChE workshop on Bioinformatics. Houston, TX. March 13-14, 1999.
3. Massachusetts Institute of Technology, Department of Chemical Engineering. August 10-14, 1999. "Metabolic Engineering Short Course."
4. DARPA workshop on Metabolic Engineering. Washington, D.C. March 24 – 26, 2000.
5. Lawrence Berkeley National Laboratory Workshop "Solar to Fuel – Future Challenges and Solutions", Berkeley, CA. March 28-29, 2005.
6. 2005 Genomes to Life Program Workshop, Washington, DC. February 6-14, 2005.
7. Intercollegiate Genetically Engineered Machine Competition (iGEM) 2005 Teacher's Workshop, Boston, MA. May 14-15, 2005.
8. European Science Foundation Exploration Workshop, "Synthetic Biology: Constructing and Deconstructing Life" Arila, Spain. Oct. 13-16, 2005.

Presentations at National or International Meetings

1. J. D. Keasling, A. Joshi, and B. O. Palsson. 1987. "Towards rational design and exploitation of recombinant prokaryotic cells." *194th ACS National Meeting*, New Orleans, LA.
2. J. D. Keasling and B. O. Palsson. 1988. "Dynamics and control of vector replication." *196th ACS National Meeting*, Los Angeles, CA.
3. J. D. Keasling and B. O. Palsson. 1989. "Design in bacterial plasmids." *National AIChE Meeting*, San Francisco, CA.
4. J. D. Keasling, B. O. Palsson, and S. Cooper. 1990. "Cell-cycle-specific F'/lac plasmid replication: regulation by cell size control of initiation." *European Molecular Biology Organization Meeting on the Bacterial Cell Cycle*, Collonges-La Rouge, France.
5. J. D. Keasling, S. Cooper, and B. O. Palsson. 1990. "Dynamics and control of plasmid replication." *AIChE National Meeting*, Chicago, IL.

6. S. Cooper and J. D. Keasling. 1991. "F plasmid replication: cell-cycle specificity, regulation by cell size control of initiation, and the relationship of different origins of replication to plasmid synthesis." *Human Frontier Science Program Workshop on Regulatory Mechanisms of DNA Replication*, Les Arcs, France.
7. J. D. Keasling and S. Cooper. 1991. "Cell-cycle-specificity, regulation by cell-size control of initiation, and the relationship of different origins of replication to plasmid synthesis." *American Society for Microbiology*, Dallas, TX.
8. S. Cooper and J. D. Keasling. 1991. "Synthesis and regulation of cytoplasm, DNA, cell surface, and plasmid during the bacterial division cycle." *Cold Spring Harbor Symposium on Quantitative Biology*, Cold Spring Harbor, NY.
9. S. Cooper and J. D. Keasling. 1991. "Cell-cycle-specific F plasmid replication during the *Escherichia coli* division cycle: regulation of replication by cell size control of initiation." *Gordon Conference on Extrachromosomal Elements*.
10. J. D. Keasling, S. Cooper, and B. O. Palsson. 1991. "Dynamics and Control of Bacterial Plasmid Replication." *AIChE National Meeting*, Los Angeles, CA.
11. J. D. Keasling, B. O. Palsson, and S. Cooper. 1992. "Plasmid Replication during the Cell Cycle." *Keystone Symposium on Molecular Mechanisms in DNA Replication and Recombination*, Taos, NM.
12. J. D. Keasling, L. Bertsch, A. Kornberg. 1993. "Guanosine pentaphosphate phosphohydrolase of *Escherichia coli* is a long-chain polyphosphatase." *205th ACS National Meeting*, Denver, CO.
13. J. D. Keasling, S. T. Sharfstein, B. Deaton, G. Hupf. 1993. "Engineering and phosphate and energy metabolism in micro-organisms." *Biochemical Engineering VIII*, Princeton, NJ.
14. D. G. Bolesch and J. D. Keasling. 1993. "Anaerobic bioremediation of TCE contamination in groundwater." *Zeneca Process Technology Conference*, Leeds, UK.
15. S. T. Sharfstein, B. Deaton, J. D. Keasling. 1993 (1994). "Engineering and phosphate and energy metabolism in micro-organisms." *207th American Chemical Society National Meeting*, San Diego, CA.
16. J. D. Keasling, H. Kuo, and G. Vahanian. 1994. "A probabilistic representation of the *Escherichia coli* cell cycle." *AIChE National Meeting*, San Francisco, CA.
17. S. T. Sharfstein, S. J. Van Dien and J. D. Keasling. 1994. "Engineering and phosphate and energy metabolism in micro-organisms." *AIChE National Meeting*, San Francisco, CA.
18. G. A. Hupf, N. Shapiro and J. D. Keasling. 1994. "Manipulation of phosphate and energy metabolism to improve heavy metal resistance and uptake." *AIChE National Meeting*, San Francisco, CA.
19. J. Pramanik and J. D. Keasling. 1994. "Mathematical analysis of fluxes through the metabolic pathways of *Escherichia coli*." *AIChE National Meeting*, San Francisco, CA.
20. R. Pape, P. Jorjani, and J. D. Keasling. 1994. "Design and construction of low-copy plasmids for metabolic engineering of *Escherichia coli*." *AIChE National Meeting*, San Francisco, CA.
21. D. Bolesch and J. D. Keasling. 1994. "Anaerobic bioremediation of chlorinated alkanes." *AIChE National Meeting*, San Francisco, CA.
22. D. Bolesch and J. D. Keasling. 1995. "Anaerobic bioremediation of chlorinated hydrocarbons." *In Situ and On-Site Bioreclamation*, San Diego, CA.
23. G. Hupf and J. D. Keasling. 1995. "Manipulation of phosphate and energy metabolism to improve heavy metal resistance and uptake." *In Situ and On-Site Bioreclamation*, San Diego, CA.
24. J. D. Keasling, S. Van Dien, S. Keyhani, S. Sharfstein. 1995. "Engineering polyphosphate metabolism in bacteria." *Biochemical Engineering VIII*, Davos, Switzerland.
25. P. C. Michels, J. A. Baross, J. D. Keasling, and D. S. Clark. 1995. "Bioremediation potential of newly isolated, metal-tolerant archaea." *Biochemical Engineering VIII*, Davos, Switzerland.
26. J. D. Keasling, S. Van Dien, S. Keyhani, D. Bolesch, and S. Sharfstein. 1995. "Redirection of phosphate and energy metabolism through polyphosphate pathways." *AIChE National Meeting*, Miami Beach, FL.
27. J. D. Keasling, D. Szykowny, and J. Elmen. 1995. "Degradation of aromatic hydrocarbons under denitrifying conditions." *AIChE National Meeting*, Miami Beach, FL.
28. R. Brent Nielsen and J. D. Keasling. 1996. "Anaerobic bioremediation of chlorinated hydrocarbons." Engineering Foundation meeting *Bioremediation of Surface and Subsurface Contamination* in Palm Coast, FL.

29. Joacim Elmen, Dave Szykowny, and J. D. Keasling. 1996. "Degradation of aromatic hydrocarbons under denitrifying conditions." Engineering Foundation meeting *Bioremediation of Surface and Subsurface Contamination* in Palm Coast, FL.
30. J. D. Keasling. 1996. "Metabolic engineering of polyphosphate metabolism in bacteria for phosphate and heavy metal bioremediation." Engineering Foundation meeting *Bioremediation of Surface and Subsurface Contamination* in Palm Coast, FL.
31. Jaya Pramanik and J. D. Keasling. 1996. "A flux-based model of metabolism: effect of biomass requirements and redirected pathways on central metabolism." *211th American Chemical Society National Meeting* in New Orleans, LA.
32. J. D. Keasling. 1996. "Metabolic engineering for bioremediation of inorganic pollutants" *Metabolic Engineering*, Danvers, MA.
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224. Josh Gilmore, J.D. Keasling. "Site-specific, Orthogonal Phage Recombinases: New Functions for Old Tools" (poster) SB4.0 Hong Kong October 10, 2008.
 225. F. Nowroozi, E. Baidoo, D. Garcia, and J. D. Keasling. "Production of Isoprenoids in Bacterial Host" DOE Genomics:GTL. Systems Biology for Energy and Environment. Joint Meeting Genomics:GTL Awardee Workshop VII, Bethesda, MD, February 8-11, 2009.
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 232. M.J. Dunlop, M. Hadi, P. Adams, J. Keasling, A. Mukhopadhyay. "Role of Efflux Pumps in *E. coli* Solvent Tolerance" SIM Conference, San Francisco, CA, May 3-6, 2009 (Poster).
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 240. C. J. Joshua, P. I. Benke and J. D. Keasling. "Simultaneous Utilization of Glucose and Xylose by *Sulfolobus acidocaldarius* as Exclusive Sources of Carbon and Energy", Gordon Research conference, Waterville, NH, July 26-31, 2009.

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245. J.M. Gilmore, A. Lee, R. Lam, B. Wong, J.D. Keasling. "Determining the Orthogonality of Site Selective Recombinases" (poster) National Academies Keck Futures Initiative. UC Irvine, Nov 19-22, 2009.
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247. T. S. Lee, R. Krupa, A. Hajimorad, N. Prasad, S. K. Lee, J.D. Keasling. "Biobrick vectors and datasheets; a synthetic biology platform for metabolic engineering" (poster) DOE Genomics:GtL Workshop, Crystal City, Virginia, February, 2010.
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259. Rutherford BJ, Rosengarten RD, Dahl RH, Benke PI, Hillson NJ, Mukhopadhyay A, and Keasling JD. "Combinatorial Expression of n-Butanol Responsive Genes to Explore Resistant Phenotypes in *Escherichia coli*." , Jun 5-9, 2011 (American Society of Mass Spectrometry, Systems biology poster session, Denver CO)
260. Chijioke J. Joshua, Robert Dahl, Peter I. Benke and Jay D. Keasling. "Absence of glucose-induced diauxie in *Sulfolobus acidocaldarius*." Poster presentation at Gordon Research Conference (GRC), "Archaea: Ecology, metabolism and molecular biology." Waterville, NH, July 31 – August 5, 2011

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262. Lane Weaver, Jay Keasling, Nathan Hillson, International Conference on Systems Biology. "Towards Heterologous formation of microcompartments in *E. coli*" August 2011
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