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Education

- 2003 Post doctoral research, Microbiology/ Systems Biology, UC Berkeley and LBNL
- 2002 *Ph.D.*, Organic Chemistry, University of Chicago, Chicago, IL
- 1997 *M.S.*, Organic Chemistry, University of Chicago, Chicago, IL
- 1996 *M.Sc.*, Chemistry, Indian Institute of Technology, Mumbai, India

Professional positions

- 2021+ Science Deputy, Biological Systems and Engineering Division, Biosciences Area, LBNL, Berkeley, CA
- 2016+ Senior Scientist, Biological Systems and Engineering, Biosciences Area, LBNL, Berkeley, CA
- 2018+ Adjunct Professor, Comparative Biochemistry Program, University of California, Berkeley, CA
- 2016-17 Visiting Professor, Department of Chemical Engineering, Indian Institute of Technology, Mumbai, India.
- 2015-2016 Interim Division Director, Biological Systems and Engineering, Biosciences Area, LBNL
- 2015 Biosciences Area Divisional Reorganizational Lead, Biological Engineering Division, BioSciences Area, LBNL
- 2014+ Adjunct Professor, School of Life Sciences of the College of Liberal Arts and Sciences, Arizona State University, Tempe, AZ
- 2007-2016 Staff Scientist, LBNL, Berkeley, CA
- 2004-2007 Career Scientist, LBNL, Berkeley, CA
- 2000-2002 GSRA, Dept of Chemistry, Emory University, Atlanta, GA
- 1996-2000 GSRA, Dept of Chemistry, University of Chicago, Chicago, IL

Research Leadership

- 2017+ Vice President, Biofuels and Bioproducts Division, JBEI, Emeryville, CA
- 2021+ Project co-PI in the DOE SFA, Microbial Community Analysis & Functional Evaluation in Soils (m-CAFEs), LBNL
- 2009+ Project co-PI in the DOE Scientific Focus Area: Ecosystems and genomes integrated with genes and molecular assemblies (ENIGMA)
- 2020+ Project co-PI in the DOE Scientific Focus Area: m-CAFEs, LBNL
- 2019-2021 Co-PI, Roots 2.0 Laboratory Directed Research and Development (LDRD) project, LBNL
- 2017-2019 Co-PI, Advanced Bioinspired Chemicals and Materials Initiative LDRD project, LBNL

- 2016-2018 Science Strategy Mentor for Energy and Biomanufacturing for the LBNL BioSciences Area 10-year strategic plan.
- 2016-2018 Co-PI, Ecotoxicity for biomufacturing process, LDRD project, LBNL
- 2015-2017 Vice President, Fuels Synthesis Division, JBEI, Emeryville, CA
- 2015-2017 Deputy Vice President, Fuels Synthesis Division, JBEI, Emeryville, CA
- 2015-2016 PI, NASA STTR Phase II project: Automated strain engineering in cyanobacteria
- 2012+ Director, Host Engineering, Joint BioEnergy Institute, Emeryville, CA
- 2014-2015 PI, Study of novel *Acinetobacter venetianus* genes for alkane degradation, LBNL
- 2013-2014 Co-PI, microCLEAN DARPA seedling G-agent Bioremediation project, LBNL
- 2011-2014 Co-PI, Cyanobacterial Biological Soil Crusts, strategic LDRD project, LBNL
- 2007-2012 Director, Fuels Transport & toxicity, JBEI, Emeryville, CA
- 2007-2012 Director, Omics Technologies, Joint BioEnergy Institute (JBEI), Emeryville, CA
- 2007-2009 Project co-PI in the DOE Project: Environmental stress pathway project, LBNL
- 2004-2007 Technical lead for Proteomics studies for the DOE project: Virtual Institute of Microbial Stress and Survival, LBNL

General Background and Research Interests

My work is focused on understanding host response, membrane transport, signaling, stress and tolerance phenotypes in microbial systems. I study engineered and environmental microbes. I use microbiological, biochemical and systems biology tools to examine environmentally important organisms such as sulfate and metal reducing bacteria, cyanobacteria. I have specific interest in signaling mechanisms in non-model organisms like *Pseudomonas stutzeri*, *Desulfovibrio vulgaris* and *Microcoleus vaginatus*, *Agrobacterium tumefaciens* and for which I have conducted detailed studies. I develop tools, and use host genome and protein engineering strategies, to improve bioproduction and bioremediation applications, using bacterial and fungal systems such as *Escherichia coli*, *Pseudomonas putida*, *Corynebacterium glutamicum*, *Nosctoc punctiforme*, *Saccharomyces cerevisiae* and *Rhodospiridium toruloides*.

Publications (n = 142; google citations >10k; google h-index = 54)

Peer Reviewed

1. Banerjee D, Yunus IS, Wang X, Kim J, Srinivasan A, Menchavez R, Chen Y, Gin JW, Petzold CJ, Garcia Martin H, Magnuson JK, Adams PD, Simmons BA, **Mukhopadhyay A**, Kim JH, Lee TS*, Genome-scale and pathway engineering for the sustainable aviation fuel precursor isoprenol production in *Pseudomonas putida*, *Metabolic Engineering*, **2024**, doi.org/10.1016/j.ymben.2024.02.004.
2. Baral NR, Banerjee D, **Mukhopadhyay A**, Simmons BA, Singer SW, Scown CD * Economic and Environmental Trade-Offs of Simultaneous Sugar and Lignin Utilization for Biobased Fuels and Chemicals, *ACS Sustainable Chem. Eng.* **2024** doi: 10.1021/acssuschemeng.3c05541
3. Garber ME, Frank V, Kazakov AE, Incha MR, Nava AA, Zhang H, Valencia LE, Keasling JD, Rajeev L, Mukhopadhyay A. 2023. REC protein family expansion by the emergence of a new signaling pathway. **2023** *mBio* doi.org/10.1128/mbio.02622-23
4. Kulakowski, S, Banerjee, D, Scown, CD, **Mukhopadhyay, A*** Improving microbial bioproduction under low-oxygen conditions *COBIOT* **2023** doi.org/10.1016/j.copbio.2023.103016

5. Camargo AP*, Call L, Roux S, Nayfach S, Huntemann M, Palaniappan K, Ratner A, Chu K, Mukherjee S, Reddy T B K, Chen I-M A, Ivanova NN, Eloë-Fadrosch EA, Woyke T, Baltrus, Castañeda-Barba DAS, de la Cruz F, Funnell BE, Hall JPJ, **Mukhopadhyay A**, Rocha EPC, Stalder T, Top E, Kyrpides NC, IMG/PR: a database of plasmids from genomes and metagenomes with rich annotations and metadata, *Nucleic Acids Research*, **2024**, doi.org/10.1093/nar/gkad964
6. Eng T, Banerjee D, Menasalvas J, Chen Y, Gin J, Choudhary H, Baidoo E, Chen J-H, Ekman A, Kakumanu R, Liu Diercks Y, Codik A, Larabell C, Gladden J, Simmons BA, Keasling JD, Petzold CJ, **Mukhopadhyay A***, Maximizing microbial bioproduction from sustainable carbon sources using iterative systems engineering, *Cell Reports*, **2023**, doi.org/10.1016/j.celrep.2023.113087.
7. Garcia VE, Pidatala V, Barcelos CA, Liu D, Otoupal P, Wendt, O, Choudhary H, Sun N, Eudes A, Sundstrom ER, Scheller HV, Putnam DH, **Mukhopadhyay A**, Gladden JM, Simmons BA, Rodriguez A* Enhanced microbial production of protocatechuate from engineered sorghum using an integrated feedstock-to-product conversion technology *Green Chemistry* **2023** doi 10.1039/D3GC01481A
8. Huang J, Quest A, Cruz-Morales P, Deng K, Pereira JH, Van Cura D, Kakumanu R, Baidoo EEK, Dan Q, Chen Y, Petzold CJ, Northen TR, Adams PD, Clark DS*, Balskus EP, Hartwig JF*, **Mukhopadhyay A***, Keasling JD* Complete integration of carbene-transfer chemistry into biosynthesis *Nature* **2023** doi.org/10.1038/s41586-023-06027-2
9. Gauttam R, Eng T, Zhao Z, Rana Q, Simmons BA, Yoshikuni Y, **Mukhopadhyay A**, Singer SW Development of genetic tools for heterologous protein expression in a pentose-utilizing environmental isolate of *Pseudomonas putida* *Microbial Biotechnology* **2023** doi.org/10.1111/1751-7915.14205
10. Zha J*, Zhao Z, Xiao Z, Eng T, **Mukhopadhyay A**, Koffas MAG*, Tang Y* Biosystems Design of *Corynebacterium glutamicum* for Bio-Production, *COBIOT* **2023**
11. Banerjee D, **Mukhopadhyay A*** Perspectives in Growth Production Trade-off in Microbial Bioproduction *RSC Sustainability*, **2023**
12. Zhao R, Sengupta A, Tan AX, Whelan R, Pinkerton T, Menasalvas J, Eng T, **Mukhopadhyay A**, Jun Y-S, Pakrasi HB, Tang Y Photobiological production of high-value pigments via compartmentalized co-cultures using Ca-alginate hydrogels *npg Sci Rep* **2022**
13. Wang X, Baidoo EEK, Kakumanu R, Xie S, **Mukhopadhyay A**, Lee TS* Engineering isoprenoids production in metabolically versatile microbial host *Pseudomonas putida*, *Biotechnology for Biofuels and Bioproducts* **2022**
14. Park M-R, Gauttam R, Fong B, Chen Y, Lim H-Y, Feist, A, **Mukhopadhyay A**, Petzold CJ, Simmons BD, Singer SW Revealing Oxidative Pentose Metabolism in New *Pseudomonas putida* Isolates *Environmental Microbiology* **2022**
15. Otoupal PB, Geiselman GM, Oka A, Barcelos CA, Choudhary H, Dinh D, Zhong W, Hwang H, Keasling JD, **Mukhopadhyay A**, Sundstrom E, Haushalter RW, Sun N, Simmons BA Gladden* Advanced one-pot deconstruction and valorization of lignocellulosic biomass into triacetic acid lactone using *Rhodospiridium toruloides* *Microbial Cell Factories* **2022**
16. Lin H-H, Mendez-Perez D, Park J, Wang X, Cheng Y, Huo J, **Mukhopadhyay A**, Lee TS, Shanks BH* Precursor Prioritization for p-Cymene Production through Synergistic Integration of Biology and Chemistry, *Biotechnology for Biofuels and Bioproducts* **2022**
17. Czajka JJ, Banerjee D, Eng TT, Menasalvas J, Yan C, Munoz NM, Poirier BC, Kim Y-M, Baker SE, Tang YJ, **Mukhopadhyay A*** Tuning a high performing multiplexed-CRISPRi *Pseudomonas putida* strain to further enhance indigoidine production *MEC* **2022**

18. Schmidt M, Pearson AN, Incha MR, Thompson MG, Baidoo EEK, Kakumanu R, **Mukhopadhyay A**, Shih PM, Deutschbauer AM, Blank LM, Keasling JD Nitrogen metabolism in *Pseudomonas putida*: functional analysis using random barcode transposon sequencing *Applied and Environmental Microbiology* **2022**
19. Garber ME, Fregoso R, Lake J, Kakouridis A, **Mukhopadhyay A*** Pseudomonas response regulators produced in an E. coli heterologous expression host exhibit host-derived post-translational phosphorylation *Scientific reports* **2022**
20. Iwai K*, Wehrs M, Garber ME, Sustarich J, Washburn L, Costello Z, Kim PW, Ando D, Gaillard WR, Hillson NJ, Adams PD, **Mukhopadhyay A**, Garcia Martin H, Singh AK* Scalable and automated CRISPR-based strain engineering using droplet microfluidics. *Microsyst Nanoeng* **2022**
21. Liu Z, Huang J, Gu Y, Clark DS, **Mukhopadhyay A**, Keasling JD, Hartwig JF* Assembly and Evolution of Artificial Metalloenzymes within *E. coli* Nissle 1917 for Enantioselective and Site-Selective Functionalization of C—H and C=C Bonds *JACS* **2022**
22. Huang, J, Liu, Z, Bloomer B, Clark*, DS, **Mukhopadhyay, A***, Keasling*, JD, Hartwig*, JF. Unnatural Biosynthesis by an Engineered Microorganism with Heterologously Expressed Natural Enzymes and an Artificial Metalloenzyme *Nature Chemistry* **2021**
23. Keasling JD*[§], Martin HG[§], Lee TS[§], **Mukhopadhyay A[§]**, Singer SW[§], Sundstrom E[§] Microbial production of advanced biofuels *Nature Microbiology Reviews* **2021**
24. Banerjee D, Eng T, Sasaki Y, Srinivasan A, Oka A, Herbert RA, Trinh J, Singan VR, Sun N, Putnam D, Scown CD, Simmons B, **Mukhopadhyay, A***. Genomics Characterization of an Engineered *Corynebacterium glutamicum* in Bioreactor Cultivation Under Ionic Liquid Stress. *Frontiers in bioengineering and biotechnology* **2021**
25. Kothari A, Roux S, Zhang H, Prieto A, Soneja D, Chandonia J-M, Spencer S, Wu X, Sara Altenburg, Fields MW, Deutschbauer AM, Arkin AP, Alm EJ, Chakraborty R, **Mukhopadhyay A*** Ecogenomics of groundwater phages suggests niche differentiation linked to specific environmental tolerance *mSystems* **2021**
26. Eng T[§], Banerjee D[§], Lau AK, Herbert RA, Prah JP, Deutschbauer AM, Tanjore D, and **Mukhopadhyay A***. Determinants of Bioreactor Fitness in *Pseudomonas putida* KT2440 Via Fitness Profiling Enables Optimized Indigoidine Production from Lignin-Derived Monomers. *Metabolic Engineering*, **2021**
27. Lim HY, Eng T, Banerjee D, Alarcon G, Lau AK, Park MR, Simmons BA, Palsson BO, Singer SW, **Mukhopadhyay A**, and Feist AM*. Generation of *Pseudomonas putida* KT2440 Strains with Efficient Utilization of Xylose and Galactose via Adaptive Laboratory Evolution. *ACS Sus Chemistry & Engineering* **2021**
28. Baral NR, Yang M, Harvey BG, Simmons BA, **Mukhopadhyay A**, Lee TS, Scown CD* Production Cost and Carbon Footprint of Biomass-Derived Dimethylcyclooctane as a High-Performance Jet Fuel Blendstock *ACS Sus Chemistry & Engineering* **2021**
29. Gauttam R, **Mukhopadhyay A**, Simmons BA, Singer SW* Development of dual-inducible duet-expression vectors for tunable gene expression control and CRISPR interference-based gene repression in *Pseudomonas putida* KT2440 *Microbial Biotechnology* **2021**
30. Wang X, Pereira, JH, Tsutakawa S, Fang X, Adams, PD. **Mukhopadhyay, A**. Lee, T S Efficient production of oxidized terpenoids via engineering fusion proteins of terpene synthase and cytochrome P450 *Metabolic Engineering* **2021**
31. Kim J, Baidoo EEK, Amer B, **Mukhopadhyay A**, Adams PD, Simmons BA, Lee TS Engineering *Saccharomyces cerevisiae* for isoprenol production, *Metabolic Engineering*, **2021**
32. Geiselman GM and Kirby J Landera A, Otoupal P, Papa G, Barcelos C, Sundstrom ER, Das L, Magurudeniya HD, Wehrs M, **Mukhopadhyay A**, Blake Simmons, Gladden JD, Conversion

- of poplar biomass into high-energy density tricyclic sesquiterpene jet fuel blendstocks *Microbial cell factories* **2020**
33. Banerjee, D[§]Eng, T[§], Lau, A.K., Sasaki, Y., Wang, B., Chen, Y., Prahl, J-P., Singan, VR., Herbert, RA., Liu, Y., Tanjore, D., Petzold, CJ., Keasling, JD., **Mukhopadhyay, A*** Genome-scale metabolic rewiring improves titers rates and yields of the non-native product indigoidine at scale. *Nat. Commun.* **2020**
 34. Wehrs, M[§], Thompson, MG[§], Banerjee, D[§], Prahl, J-P., Morella, NM., Barcelos, CA., Moon, J., Costello, Z., Keasling, JD., Shih, PM., Tanjore D*, **Mukhopadhyay A*** Investigation of Bar-seq as a method to study population dynamics of *Saccharomyces cerevisiae* deletion library during bioreactor cultivation *Microbial cell factories* **2020**
 35. Thompson, MG., Incha, MR., Pearson, AN., Schmidt, M., Sharpless, WA., Eiben, C.B., Cruz-Morales, P., Blake-Hedges, JM., Liu, Y., Adams, CA., Haushalter, RW., Krishna, RN., Lichtner, P., Blank, LM., **Mukhopadhyay, A.**, Deutschbauer, AM., Shih, PM., Keasling JD* Functional analysis of the fatty acid and alcohol metabolism of *Pseudomonas putida* using RB-TnSeq *AEM* **2020**
 36. Lim, HG., Fong, B., Alarcon, G., Magurudeniya, HD., Eng, T., Szubin, R., Olson, CA., Palsson, BO., Gladden, JM., Simmons, BA., **Mukhopadhyay, A.**, Singer, SW., Feist AM., Generation of ionic liquid tolerant *Pseudomonas putida* KT2440 strains via adaptive laboratory evolution *Green Chemistry* **2020**
 37. Mohamed, ET., Werner, Allison Z; Salvachúa, D., Singer, C., Szostkiewicz, K., Jiménez-Díaz, M., Eng, T., Radi, MS., Simmons, BA., **Mukhopadhyay, A.**, Herrgård, MJ., Singer, SW., Beckham, GT., Feist AM., Adaptive laboratory evolution of *Pseudomonas putida* KT2440 improves p-coumaric and ferulic acid catabolism and tolerance, *Metabolic Engineering Communications* **2020**
 38. Eng T, Herbert RA, Martinez U, Wang B, Chen J, Brown JB, Deutschbauer A, Bissell MJ, Mortimer JC* **Mukhopadhyay A*** Iron Supplementation Eliminates Antagonistic Interactions Between Root Associated Bacteria *Frontiers Microbiology*, **2020**
 39. Rajeev, L., Garber, ME. and **Mukhopadhyay, A***. Tools to map target genes of bacterial two-component system response regulators. *Environmental Microbiology Reports*. **2020**
 40. Gauttam R, **Mukhopadhyay A**, Singer SW* Construction of a novel dual-inducible duet-expression system for gene (over) expression in *Pseudomonas putida* *Plasmid*, **2020**
 41. Chiniquy, J., Garber, M.E., **Mukhopadhyay, A.** Hillson N*. Fluorescent amplification for next generation sequencing (FA-NGS) library preparation. *BMC Genomics* **2020**
 42. Chen Y, Banerjee D, **Mukhopadhyay A**, Petzold CJ* Systems and synthetic biology tools for advanced bioproduction hosts, *Current Opinion in Biotechnology*, **2020**
 43. Eng T, Sasaki Y, Herbert RA, Lau A, Trinh J, Chen Y, Mirsiaghi M, Petzold CJ, **Mukhopadhyay A*** Production of tetra-methylpyrazine using engineered *Corynebacterium glutamicum*, *Met Eng Comm*, **2020**
 44. Thompson MG, Pearson AM, Barajas JF, Cruz-Morales P, Sedaghatian N, Costello Z, Garber ME, Incha MR, Valencia LE, Baidoo EEK, Garcia-Martin H, Mukhopadhyay, A, Keasling JD* Identification, Characterization, and Application of a Highly Sensitive Lactam Biosensor from *Pseudomonas putida* *ACS Synthetic Biology* **2020**
 45. Kothari A, Soneja D, Tang A, Carlson H, Deutschbauer AM, **Mukhopadhyay A*** Native plasmid-encoded mercury resistance genes are functional and demonstrate natural transformation in environmental bacterial isolates *mSphere* **2019**
 46. Rigual V, Papa G, Rodriguez A, Wehrs M, Kim K, Oliet M, Alonso M, Gladden J, Mukhopadhyay A, Simmons B, Singh S* Evaluating protic ionic liquid for woody biomass one-

- pot pretreatment + saccharification, followed by *Rhodospiridium toruloides* cultivation *ACS Sus Chem & Eng* 2019
47. Rodrigues AV, Tantillo DJ, **Mukhopadhyay A**, Keasling JD, Beller HR* Insights into the Mechanism of Phenylacetate Decarboxylase (PhdB), a Toluene-Producing Glycyl Radical Enzyme. *Chembiochem* **2019**
 48. Kang A, Mendez-Perez D, Goh E-B, Baidoo EEK, Benites VT, Beller HR, Keasling JD, Adams PD, **Mukhopadhyay A**, Lee TS* Optimization of the IPP-bypass mevalonate pathway and fed-batch fermentation for the production of isoprenol in *Escherichia coli* *Metabolic Engineering* **2019**
 49. Langley S, Eng T, Wan K, Herbert RA, Klein A, Yoshikuni Y, Tringe S, Brown JB, Celniker S, Mortimer JC*, and **Mukhopadhyay A*** Complete Genome Sequence of *Agrobacterium sp.* 33MFTa1.1 isolated from the roots of *Thlaspi arvense*. *Microbiology Resource Announcements* **2019**
 50. Baral NR, Kavvada, O, Mendez-Perez D, **Mukhopadhyay A**, Lee TS, Simmons BA Scown CD* Greenhouse Gas Footprint, Water-Intensity, and, Production Cost of Bio-Based Isopentenol as a Renewable Transportation Fuel *ACS Sus. Chem & Eng.* **2019**
 51. Czamanski Nora L, Wehrs M, Kim J-H, Cheng J-F, Tarver A, Simmons BA, Magnuson J, Harmon-Smith M, Silva-Rocha R, Gladden JM, **Mukhopadhyay A**, Skerker JM*, Kirby J* A toolset of promoters for metabolic engineering of *Rhodospiridium toruloides* *Microbial Cell Factories* **2019**
 52. Wehrs, M., Gladden JM, Liu Y, Platz L, Prah J-P, Moon J, Papa G, Sundstrom E, Geiselman GM, Tanjore D, Keasling JD, Pray TR, Simmons BA **Mukhopadhyay A*** Sustainable bioproduction of the blue pigment indigoidine: Expanding the range of heterologous products in *R. toruloides* to include non-ribosomal peptides *Green Chemistry* **2019**
 53. Herbert RA, Eng T, Martinez U, Wang B, Langley S, Wan K, Pidatala V, Hoffman E, Chen JC, Bissell MJ, Brown JB, **Mukhopadhyay A*** Mortimer JC* Rhizobacteria mediate the phytotoxicity of a range of biorefinery-relevant compounds *Environmental Toxicology and Chemistry* **2019**
 54. Dong J, Chen Y, Benites VT, Baidoo EE, Petzold CJ, Beller HR, Eudes A, **Mukhopadhyay A**, Singer SW* Methyl ketone production by *Pseudomonas putida* is enhanced by plant-derived amino acids, *Biotech and Bioeng* **2019**
 55. Barajas JF, Wehrs M, To M, Cruickshanks L, Urban R, McKee A, Gladden J, Goh E-B, Brown ME, Pierotti D, Carothers JM, **Mukhopadhyay A**, Keasling JD, Fortman JL, Singer SW*, Bailey CB* Isolation and Characterization of Bacterial Cellulase Producers for Biomass Deconstruction: A Microbiology Laboratory Course” *Journal of Microbiology and Biology Education* **2019**
 56. Baral, NR, Sundstrom E, Das L, Gladden J, Eudes, A, Mortimer JC, Singer SW, **Mukhopadhyay A**, Scown CS* Approaches for More Efficient Biological Conversion of Lignocellulosic Feedstocks to Biofuels and Bioproducts *ACS Sus. Chem. & Eng.* **2019**
 57. Rajeev L, Luning EG, Zane GM, Juba TR, Kazakov AE, Novichkoc P, Wall J, **Mukhopadhyay A*** LurR is a regulator of the central lactate oxidation pathway in sulfate-reducing *Desulfovibrio* species. *PLOS ONE* **2019**.
 58. Sasaki Y, Eng T, Herbert RA, Trinh J, Chen Y, Rodriguez, A, Gladden, JM, Simmons BA, Petzold CJ, **Mukhopadhyay, A*** Engineering *Corynebacterium glutamicum* to produce the biogasoline isopentenol from plant biomass hydrolysates. *Biotechnology for Biofuels.* **2019**
 59. Kothari A, Wu Y-W, Chandonia J-M, Charrier M, Rajeev L, Rocha AM, Joyner DC, Hazen TC, Singer SW, **Mukhopadhyay A*** Large circular plasmids from groundwater plasmidomes

- span multiple incompatibility groups and are enriched in multimetal resistance genes. *mBio* **2019**
60. Wehrs M, Tanjore D, Eng T, Lievens J, Pray TR, **Mukhopadhyay A*** Engineering robust production microbes for large scale cultivation *Trends in Microbiology* **2019**
 61. Baral, N. R., Kavvada, O., Mendez-Perez, D., **Mukhopadhyay, A.**, Lee, T. S., Simmons, B. A., Scown, C. D., Techno-economic analysis and life-cycle greenhouse gas mitigation cost of five routes to bio-jet fuel blendstocks. *Energy & Environmental Science* **2019**
 62. Wang, S, Cheng G, Dong J, Tian T, Lee TS, **Mukhopadhyay A**, Simmons BA, Yuan Q, Singer SW* NaCl enhances *Escherichia coli* growth and isoprenol production in the presence of imidazolium-based ionic liquids, *Bioresource Technology Reports*, **2019**
 63. Wehrs M, Prahl JP, Moon J, Li Y, Tanjore D, Keasling JD, Pray T, **Mukhopadhyay A*** Production efficiency of the bacterial non-ribosomal peptide indigoidine relies on the respiratory metabolic state in *S. cerevisiae* *Microbial Cell Factories* **2018**
 64. Rajeev L, Garber M, Zane G, Wall JD, Dubchak I, Novichkov P, **Mukhopadhyay A**, Kazakov A* A new family of transcriptional regulators of tungstoenzymes and molybdate/tungstate transport *Environmental Microbiology*, **2018**
 65. Wang S, Cheng G, Dong J, Tian T, Lee TS, **Mukhopadhyay A**, Simmons BA, Yuan Q, Singer S Tolerance characterization and isoprenol production of adapted *Escherichia coli* in the presence of ionic liquids *ACS Sustainable Chem. Eng*, **2018**
 66. Eng T, Demling P, Herbert RA, Chen Y, Benites V, Martin J, Lipzen A, Baidoo EEK, Blank LM, Petzold CJ, **Mukhopadhyay A*** Restoration of Biofuel Production Levels and Increased Tolerance Under Ionic Liquid Stress is Enabled by a Mutation in the Essential *Escherichia coli* gene *cydC*. *Microbial Cell Factories* **2018**
 67. Xu F, Sun J, Wehrs M, Kim KHO, Rau SS, Chan AM, Simmons BA, **Mukhopadhyay A**, Singh S* Biocompatible choline-based deep eutectic solvents enable one-pot production of cellulosic ethanol. *ACS Sustainable Chem. Eng*, **2018**
 68. Garber ME, Rajeev L, Kazakov AE, Trinh J, Masuno D, Thompson MG, Kaplan, N, Luk, J, Novichkov PS and **Mukhopadhyay A*** Multiple signaling systems target a core set of transition metal homeostasis genes using similar binding motifs. *Mol Microbiol* **2018**
 69. Thompson MG, Sedaghatian N, Barajas JF, Wehrs M, Bailey CB, Kaplan N, Hillson NJ, **Mukhopadhyay A**, Keasling JD* Isolation and characterization of novel mutations in the pSC101 origin that increase copy number. *npj Scientific Reports* **2018**
 70. Jensen, H. M., Eng, T., Chubukov, V., Herbert, R. A. & **Mukhopadhyay, A*** Improving membrane protein expression and function using genomic edits. *npj Sci. Reports* **2017**
 71. Dossani ZY, Reider Apel A, Szmidt-Middleton H, Hillson NJ, Deutsch S, Keasling JD, **Mukhopadhyay A*** A combinatorial approach to synthetic transcription factor-promoter combinations for yeast strain engineering. *Yeast* **2017**
 72. Morrell, WC., Birkel, GW., Forrer, M, Lopez, T, Backman, TWH., Dussault, M, Petzold, CJ., Baidoo, EEK., Costello, Z, Ando, D, Alonso-Gutierrez, J, George, KW., **Mukhopadhyay, A**, Vaino, I, Keasling, JD., Adams, PD., Hillson, NJ. and Garcia Martin, H* The Experiment Data Depot: A Web-Based Software Tool for Biological Experimental Data Storage, Sharing, and Visualization. *ACS Synthetic Biology* **2017**.
 73. d’Espaux L, Ghosh A, Runguphan W, Wehrs M, Xu F, Konzock O, Dev I, Nhan M, Gin J, Reider Apel A, Petzold CJ, Singh S, Simmons BA, **Mukhopadhyay A**, Martín HG, Keasling JD* Engineering high-level production of fatty alcohols by *Saccharomyces cerevisiae* from lignocellulosic feedstocks *Metabolic Engineering* **2017**

74. Parisutham V, Sathesh-Prabu C, **Mukhopadhyay A**, Lee SK*, Keasling JD Intracellular cellobiose metabolism and its applications in lignocellulose-based biorefineries *Bioresource Technology* **2017**
75. Liang Y, Richardson S, Yan J, Benites VT, Cheng-Yue C, Tran T, Mortimer J, **Mukhopadhyay A**, Keasling JD, Scheller HV, Loqué D* Endoribonuclease-Based Two-Component Repressor Systems for Tight Gene Expression Control in Plants *ACS Syn Bio* **2017**
76. Chubukov V, Desmarais JJ, Wang G, Chan LJG, Baidoo EEK, Petzold CJ, Keasling JD, **Mukhopadhyay A*** Engineering glucose metabolism of *Escherichia coli* under nitrogen starvation. *npj Systems Biology and Applications* **2017**
77. Reider Apel A, d'Espaux L, Wehrs M, Sachs D, Li R, Tong G, Garber M, Nnadi O, Zhuang W, Hillson N, Keasling JD, **Mukhopadhyay, A*** A Cas9-based toolkit to program gene expression in *Saccharomyces cerevisiae* *NAR* **2016**
78. Thorgersen MP, Lancaster WA, Rajeev L, Ge X, Vaccaro BJ, Poole FL, Arkin AP, **Mukhopadhyay A**, Adams MWW* A Highly Expressed High Molecular Weight S-Layer Complex of Pelosinus Strain UFO1 Binds Uranium *AEM*. **2016**
79. Hollinshead WD, Rodriguez S, Martin HG, Wang G, Baidoo EEK, Keasling JD, **Mukhopadhyay A***, Tang YJ* *Escherichia coli* glycolytic strategies, catabolite repression, and metabolite channeling *Biotechnology for biofuels* **2016**
80. Kothari A, Charrier M, Wu Y-W, Malfatti S, Zhou CE, Singer SW, Dugan L, **Mukhopadhyay A***. Transcriptomic analysis of the highly efficient oil-degrading bacterium *Acinetobacter venetianus* RAG-1 reveals genes important in dodecane uptake and utilization. *FEMS Microbiology Letters* **2016**
81. Brown ME, **Mukhopadhyay A**, Keasling JD*. Engineering bacteria to catabolize the carbonaceous component of sarin: teaching *E. coli* to eat isopropanol. *ACS Synthetic Biology* **2016**
82. Frederix M, Mingardon F, Sun N, Pray T, Singh S, Simmons BA, Keasling JD, **Mukhopadhyay A*** Development of an *E. coli* strain for one-pot biofuel production from ionic liquid pretreated cellulose and switchgrass. *Green Chemistry* **2016**
83. Fortman JL and **Mukhopadhyay A***, Future of Antibiotics: Emerging technologies, in Science & Society, *Trends in Microbiology* **2016**
84. Chubukov V, **Mukhopadhyay A**, Petzold CJ, Keasling JD, Garcia-Martín HG* Synthetic and systems biology for microbial production of commodity chemicals, *npj Systems Biology and Applications* **2016**
85. Reider-Apel A, Ouellet M, Szmidt-Middleton H, Keasling JD, **Mukhopadhyay A***, Evolved hexose transporter enhances xylose uptake and glucose/xylose co-utilization in *Saccharomyces cerevisiae*, *npj Sci Rep* **2016**
86. Kazakov A, Rajeev L, Chenn A, Luning EJ, Dubchak I, **Mukhopadhyay A**, Novichkov P*, σ 54-dependent Regulome in *Desulfovibrio vulgaris* Hildenborough *BMC Genomics* **2015**
87. Rajeev L, Chen A, Kazakov AE, Luning EG, Zane GM, Novichkov PS, Wall JD, **Mukhopadhyay A*** Regulation of nitrite stress response in *Desulfovibrio vulgaris* Hildenborough, a model sulfate-reducing bacterium *J. Bact.* **2015**
88. **Mukhopadhyay A*** Tolerance engineering in bacteria for the production of advanced biofuels and chemicals *Trends in Microbiology* **2015**
89. Garcia-Martin H*, Kumar VS, Weaver D, Ghosh A, Chubukov V, **Mukhopadhyay A**, Arkin AP, Keasling JD. A method to constrain genome-scale models with ¹³C labeling data. *PLoS Comput Biol* **2015**
90. Chubukov V, Mingardon F, Schackwitz W, Baidoo EEK, Alonso-Gutierrez J, Hu Q, Lee TS, Keasling JD, **Mukhopadhyay A*** Acute limonene toxicity in *Escherichia coli* is caused by

- limonene-hydroperoxide and alleviated by a point mutation in alkyl hydroperoxidase (AhpC) *Appl Environ Microbiol.* **2015**
91. Mingardon F, Clement C, Hirano K, Nhan M, Luning EG, Chanal A, **Mukhopadhyay A*** Improving olefin tolerance and production in *E. coli* using native and evolved AcrB. *Biotechnology and Bioengineering.* **2015**
 92. Rocha UN*, Cadillo-Quiroz H, Karaoz U, Rajeev L, Klitgord N, Dunn S, Truong V, Buenrostro M, Bowen BP, Garcia-Pichel F, **Mukhopadhyay A**, Northen TR and Brodie EL, Isolation of a significant fraction of non-phototroph diversity from a desert Biological Soil Crust *Front. Microbiol* **2015**
 93. Jensen HM#, Foo JL#, Dahl RH, George K, Keasling JD, Lee TS, Leong SSJ, **Mukhopadhyay A***. Improving microbial bio-gasoline production in *Escherichia coli* using tolerance engineering. *mBio* **2014**
 94. Ghosh A, Nilmeier J, Weaver D, Adams PD, Keasling JD, **Mukhopadhyay A**, Petzold CJ, García-Martín H*. A Peptide-Based Method for ¹³C Metabolic Flux Analysis in Microbial Communities. *PLoS Comput Biol* **2014**
 95. Rajeev L, Luning, EG, Altenburg S, Zane GM, Baidoo EE, Catena M, Keasling JD, Wall JD, Fields MW, **Mukhopadhyay A***. Identification of a cyclic-di-GMP-modulating response regulator that impacts biofilm formation in a model sulfate reducing bacterium. *Frontiers in Microbiology* **5. 2014**
 96. Frederix M, Hutter K, Leu J, Batth TS, Turner WJ, Rüegg TL, Blanch H, Simmons BA, Adams PD, Keasling JD, Thelen MP, Dunlop MJ, Petzold CJ, **Mukhopadhyay A*** Development of a native *Escherichia coli* induction system for ionic liquid tolerance *Plos One* **2014**
 97. Rajeev, L.*, Luning, E. G., **Mukhopadhyay, A.** DNA-affinity-purified Chip (DAP-chip) Method to Determine Gene Targets for Bacterial Two component Regulatory Systems. *J. Vis. Exp.* **2014**
 98. Ray J, Keller KL, Catena M, Juba TR, Zemla M, Rajeev L, Knierim B, Zane GM, Robertson J, Auer M, Wall JD, **Mukhopadhyay A*** Exploring the role of CheA3 in *Desulfovibrio vulgaris* Hildenborough motility *Frontiers in Microbiology* **2014**
 99. Dahl RH, Zhang F, Alonso-Gutierrez J, Baidoo E, Batth TS, Redding-Johanson AM, Petzold CJ, **Mukhopadhyay A**, Lee TS, Adams PD, Keasling JD* Engineering dynamic pathway regulation using stress-response promoters. *Nat Biotechnol* **2013**.
 100. Kazakov A, Rajeev L, Luning EG, Zane G, Siddartha K, Rodionov D, Dubchak I, Arkin A, Wall J, Mukhopadhyay A, Novichkov P. A new family of tungstate-responsive transcriptional regulators in sulfate-reducing bacteria" *J Bact* **2013**
 101. Zhou A, Baidoo E E, He Z, Mukhopadhyay A, Baumohl J, Benke P I, Joachimiak M, Xie M, Song R, Arkin A, Hazen T, Keasling J, Wall J, Stahl D, Zhou J Characterization of NaCl-tolerance in *Desulfovibrio vulagris* Hildenborough through experimental evolution *ISME J* **2013**
 102. Szmids-Middleton HL, Ouellet M, Adams PD, Keasling JD, **Mukhopadhyay A***. Utilizing a highly responsive gene, *yhjX*, in *E. coli* based production of 1,4-Butanediol *CES* **2013**
 103. Rajeev L, da Rocha U, Klitgord N, Luning E, Fortney J, Axen S, Shih P, Bouskill N, Bowen B, Kerfeld C, Garcia-Pichel F, Brodie E, Northen T*, **Mukhopadhyay A***. Dynamic cyanobacterial response to hydration and dehydration in a desert biological soil crust. *ISME J* **2013**
 104. Zhang F, Ouellet M, Batth TS, Adams PD, Petzold CJ, **Mukhopadhyay A**, Keasling J Enhancing fatty acid production by the expression of the regulatory transcription factor FadR. *Metab Eng* **2012**

105. Park JI, Steen EJ, Burd H, Evans SS, Redding-Johnson AM, Batth T, Benke PI, D'haeseleer P, Sun N, Sale KL, Keasling JD, Lee TS, Petzold CJ, **Mukhopadhyay A**, Singer SW, Simmons BA, Gladden JM*. A Thermophilic Ionic Liquid-Tolerant Cellulase Cocktail for the Production of Cellulosic Biofuels. *PLoS ONE* **2012**
106. Clark ME, He Z, Redding AM, Joachimiak MP, Keasling JD, Zhou J, Arkin AP, **Mukhopadhyay A**, Fields MW*. Transcriptomic and Proteomic Analyses of *Desulfovibrio vulgaris* Biofilms: Carbon and Energy Flow Contribute to the Distinct Biofilm Growth State. *BMC Genomics*. **2012**
107. Eudes A, George A, Mukerjee P, Kim JS, Pollet B, Benke PI, Yang F, Mitra P, Sun L, Cetinkol OP, Chabout S, Mouille G, Soubigou-Taconnat L, Balzergue S, Singh S, Holmes BM, **Mukhopadhyay A**, Keasling JD, Simmons BA, Lapierre C, Ralph J, Loqué D* Biosynthesis and incorporation of side-chain-truncated lignin monomers to reduce lignin polymerization and enhance saccharification *Plant Biotechnol J*. **2012**
108. Parsons HT, Christiansen K, Knierim B, Carroll A, Ito J, Batth TS, **Mukhopadhyay A**, Petzold CJ, Scheller HV, Loque D, Heazlewood JL*. Isolation and Proteomic Characterization of the Arabidopsis Golgi Defines Functional and Novel Components Involved in Plant Cell Wall Biosynthesis. *Plant Physiol*. **2012**
109. Rautengarten C, Ebert B, Ouellet M, Nafisi M, Baidoo EE, Benke P, Stranne M, **Mukhopadhyay A**, Keasling JD, Sakuragi Y, Scheller HV* Arabidopsis Deficient in Cutin Ferulate Encodes a Transferase Required for Feruloylation of ω -Hydroxy Fatty Acids in Cutin Polyester. *Plant Physiol*. **2012**
110. **Mukhopadhyay A** Microbial host engineering: beyond the metabolic pathway **2012** Special Issue: New Science of Synthetic and Systems Biology, Science And Culture Journal, Indian Science News Association, ed. R. Bhadra.
111. Rutherford, B.J and **Mukhopadhyay, A***. **2012** Engineering Stress Tolerance in Microbial Systems for Bioproduction of Fuels, In: Microbial Biotechnology: Energy and Environment. CABI, Wallingford, UK. ed. Arora, R.
112. Juminaga D, Baidoo EEK, Redding-Johanson AM, Batth TS, Burd H, **Mukhopadhyay A**, Petzold CJ, Keasling JD* Modular Engineering of L-Tyrosine Production in *Escherichia coli*. *Appl Environ Microbiol* **2012**
113. Rajeev L, Luning EG, Dehal PS, Price MN, Arkin AP, **Mukhopadhyay A***. Systematic mapping of two component response regulators to gene targets in a model sulfate reducing bacterium. *Genome Biology* **2011**
114. Dunlop MJ, Dossani ZY, Szmids H, Chu HC, Lee TS, Keasling JD, Hadi MZ, **Mukhopadhyay A***. Engineering microbial biofuel tolerance and export using efflux pumps. *Mol Syst Biol*. **2011**
115. Peralta-Yahya P, Ouellet M, Chan R, **Mukhopadhyay A**, Keasling J, Lee TS*. Identification and microbial production of a terpene-based advanced biofuel. *Nature Communications* **2011**
116. **Mukhopadhyay A**, Hillson NJ, Keasling JD* Control of Stress tolerance in bacterial host organisms for bioproduction of fuels **2011** Microbial Stress Tolerance: From Genomics to Biofuels, Microbiology Monographs (Springer series) ed. Z. Lewis Liu
117. Zhou J*, He Q, Hemme CL, **Mukhopadhyay A**, Hillesland K, Zhou A, He Z, Van Nostrand JD, Hazen TC, Stahl DA, Wall JD, Arkin AP. How sulphate-reducing microorganisms cope with stress: lessons from systems biology. *Nat Rev Microbiol*. **2011**
118. Rautengarten C, Ebert B, Herter T, Petzold CJ, Ishii T, **Mukhopadhyay A**, Usadel B, Scheller HV*. The Interconversion of UDP-Arabinopyranose and UDP-Arabinofuranose is Indispensable for Plant Development in Arabidopsis. *Plant Cell*. **2011**

119. Ouellet M, Datta S, Dibble DC, Tamrakar PR, Benke PI, Li CL, Singh S, Sale KL, Adams PD, Keasling JD, Simmons BD, Holmes BM*, **Mukhopadhyay A**. Impact of ionic liquid pretreated plant biomass on *Saccharomyces cerevisiae* growth and biofuel production. *Green Chemistry* **2011**
120. Redding-Johanson AM, Bath TS, Chan R, Krupa R, Szmidt HL, Adams PD, Keasling JD, Lee TS, **Mukhopadhyay A**, Petzold CJ*. Targeted proteomics for metabolic pathway optimization: application to terpene production. *Metab Eng.* **2011**
121. Rutherford BJ, Dahl R, Price R, Szmidt HL, Benke PI, **Mukhopadhyay A***, and Keasling JD. Functional Genomic Study of Exogenous n-Butanol Stress in *Escherichia coli*. *Appl Environ Microbiol.* **2010**.
122. Ito J, Bath TS, Petzold CJ, Redding-Johanson AM, **Mukhopadhyay A**, Verboom R, Meyer EH, Millar AH, Heazlewood JL*. Analysis of the Arabidopsis Cytosolic Proteome Highlights Subcellular Partitioning of Central Plant Metabolism. *J Proteome Res.* **2010**
123. Ito J, Petzold CJ, **Mukhopadhyay A**, Heazlewood J*. The role of proteomics in the development of cellulosic biofuels. *Current Proteomics.* **2010**
124. Cong Y, Baker ML, Jakana J, Woolford D, Miller EJ, Reissmann S, Kumar RN, Redding-Johanson AM, Bath TS, **Mukhopadhyay A**, Ludtke SJ, Frydman J, Chiu W*. 4.0-Å resolution cryo-EM structure of the mammalian chaperonin TRiC/CCT reveals its unique subunit arrangement. *Proc Natl Acad Sci U S A.* **2010**
125. Zhou A, He Z, Redding-Johanson AM, **Mukhopadhyay A**, Hemme CL, Joachimiak MP, Luo F, Deng Y, Bender KS, He Q, Keasling JD, Stahl DA, Fields MW, Hazen TC, Arkin AP, Wall JD, Zhou J*. Hydrogen peroxide-induced oxidative stress responses in *Desulfovibrio vulgaris* Hildenborough. *Environ Microbiol.* **2010**
126. He Z, Zhou A, Baidoo E, He Q, Joachimiak MP, Benke P, Phan R, **Mukhopadhyay A**, Hemme CL, Huang K, Alm EJ, Fields MW, Wall J, Stahl D, Hazen TC, Keasling JD, Arkin AP, Zhou J*. Global transcriptional, physiological, and metabolite analyses of the responses of *Desulfovibrio vulgaris* Hildenborough to salt adaptation. *Appl Environ Microbiol.* **2010**
127. Dunlop MJ, Keasling JD, **Mukhopadhyay A***. A Model for Improving Microbial Biofuel Production using a Synthetic Feedback Loop. *Systems and Synthetic Biology* **2010**.
128. Ouellet M, Adams PD, Keasling JD and **Mukhopadhyay A***. A Rapid and Inexpensive Labeling Method for Microarray Gene Expression Analysis. *BMC Biotechnology* **2009**
129. Shaikh AS[#], Tang YJ[#], **Mukhopadhyay A[#]**, García Martín H, Gin J, Benke PI, Keasling JD* Study of stationary phase metabolism via isotopomer analysis of amino acids from an isolated protein. *Biotechnology Progress* **2009**
130. Elias DE*, **Mukhopadhyay A[#]**, Joachimiak MP[#], Redding AM, Yen H-CB, Fields MW, Hazen TC, Arkin AP, Keasling JD, Wall JD. Expression profiling of hypothetical genes in *Desulfovibrio vulgaris* leads to improved functional annotation. *Nucleic Acids Research* **2009**
131. Borglin S, Joyner DC, Jacobsen JS, **Mukhopadhyay A**, Hazen TC*. Overcoming the anaerobic hurdle in phenotypic microarrays: Generation and visualization of growth curve data for *Desulfovibrio vulgaris* Hildenborough. *J Microbiol Methods.* **2009**
132. Gaucher S[#], Redding AM[#], **Mukhopadhyay A**, Keasling JD, Singh AK*. Post-translational Modifications of *Desulfovibrio vulgaris* Hildenborough Sulfate Reduction Pathway Proteins. *Journal of Proteomic Research* **2008**
133. **Mukhopadhyay A**, Redding AM, Rutherford BJ, Keasling JD*. Importance of systems biology in engineering microbes for biofuel production. *Curr Opin Biotechnol.* **2008**
134. Fortman JL[#], Chhabra S[#], **Mukhopadhyay A[#]**, Chou H, Lee TS, Steen E, Keasling JD*. Biofuel alternatives to ethanol: pumping the microbial well. *Trends Biotechnol.* **2008**

135. Shaikh AS[#], Tang YJ[#], **Mukhopadhyay A**, Keasling JD*. Isotopomer Distributions in Amino Acids from a Highly Expressed Protein as a Proxy for Those from Total Protein. *Analytical Chem* **2008**
136. **Mukhopadhyay A**, Redding AM, Joachimiak MP, Arkin AP, Borglin SE, Dehal PS, Chakraborty R, Geller JT, Hazen TC, He Q, Joyner DC, Martin VJ, Wall JD, Yang ZK, Zhou J, Keasling JD*. Cell-wide responses to low-oxygen exposure in *Desulfovibrio vulgaris* Hildenborough. *J Bacteriol.* **2007**
137. Tang YJ[#], Pingitore F[#], **Mukhopadhyay A**[#], Phan R, Hazen TC, Keasling JD*. Pathway confirmation and flux analysis of central metabolic pathways in *Desulfovibrio vulgaris* Hildenborough using GC-MS and FT-ICR mass spectrometry. *J. Bacteriol.* **2007**
138. Redding A-M, **Mukhopadhyay A**, Joyner DC, Hazen TC, Keasling JD* Study of nitrate stress in *Desulfovibrio vulgaris* Hildenborough using iTRAQ proteomics. *Brief Funct Genomic Proteomic* **2006**
139. **Mukhopadhyay A**, He Z, Alm EJ, Arkin AP, Baidoo EE, Borglin SC, Chen W, Hazen TC, He Q, Holman H-Y, Huang K, Huang R, Joyner DC, Katz N, Keller M, Oeller P, Redding AM, Sun J, Wall J, Wei J, Yang J, Yen H-C, Zhou J, Keasling JD*. Salt Stress in *Desulfovibrio vulgaris* Hildenborough: an Integrated Genomics Approach *J. Bacteriol.* **2006**
140. Gao R, **Mukhopadhyay A**, Fang F, Lynn DG* Constitutive Activation of Two-Component Response Regulators: Characterization of VirG Activation in *Agrobacterium tumefaciens*. *J Bacteriol* **2006**,
141. **Mukhopadhyay A**, Gao R, Lynn DG*. Integrating Input from Multiple Signals: The VirA/VirG Two-Component System of *Agrobacterium tumefaciens*. *ChemBioChem* **2004**
142. Wang Y, **Mukhopadhyay A**, Howitz VR, Binns AN, Lynn DG*. Construction of an efficient expression system for *Agrobacterium tumefaciens* based on the coliphage T5 promoter. *Gene* **2000**

Reports/commentaries/ Strategic Plans

1. Mukhopadhyay A, Hauser Loren Workflow 4: Signaling, in the DOE Systems Biology Knowledgebase Implementation Plan. U.S. Department of Energy Office of Science. DOE Genomic Science Microbial Systems Biology Knowledgebase Workshop, Feb. 9–10, **2010**
2. Lee TS, Keasling JD, Beller HR, Mukhopadhyay A. New methods to modify or control regulation of engineered pathways for biofuel production www.jbei.org/wp-content/uploads/2016/03/Q2-Report_full_v4.pdf. **2016**
3. Mukhopadhyay A, Perspective on the future of biofuels using microbial platforms, Biofuels International, Volume 11 (1) Jan **2017**
4. Designing for Deep Decarbonization: Accelerating the US Bioeconomy Workshop Report.
5. Biological Science and Engineering Strategic Plan 2022-2027

Theses

- **Mukhopadhyay A**, Initiating lateral gene transfer: analysis of the VirA/VirG two component system *in vivo*. (Ph. D.) Department of Chemistry, University of Chicago, Chicago, IL, USA **2002**. Adv. David G. Lynn
- **Mukhopadhyay A**, Synthesis of chiral bioactive molecules using enzymes and microorganisms. (M. Sc) Department of Chemistry Indian Institute of Technology, Powai, Mumbai, Maharashtra, India, **1996**. Adv. S. V. Bhatt

Pre-prints

1. Garber ME, Frank V, Kazakov AE, Zhang H, Incha MR, Keasling JD, Rajeev L, Mukhopadhyay A Evolutionarily Driven Domain Swap Alters Sigma Factor Dependence in Bacterial Signaling System *BioRxiv* doi: 10.1101/2020.09.30.321588

Patents (applications and granted)

1. Eng, TT, Banerjee, D, **Mukhopadhyay, A** GENETICALLY MODIFIED BACTERIAL CELLS AND METHODS USEFUL FOR PRODUCING INDIGOIDINE *U.S. Patent 11,767,521* (2023/09/23)
2. Huang, J, Liu, Z, Clark, DS, Keasling, JD, **Mukhopadhyay, A**, Hartwig, JF. Novel Artificial Metalloenzyme chemistry in biological systems *U.S. Patent Application Ser. No: 62/989,568* (2020/03/13)
3. Eng T, **Mukhopadhyay A**, "Production of Tetramethyl Pyrazine in the Industrial Host *Corynebacterium glutamicum* *U.S. Patent Application Ser. No: 62/982,001* (2020/02/26)
4. Budin, I, Reider A, Hummel NFC **Mukhopadhyay, A**, Keasling, JD Methods for mitochondria and organelle genome editing *U.S. Patent Application Ser. No: 62/673,597* (2020/1/16)
5. Mortimer, JC, Herbert, RA, **Mukhopadhyay, A**, Eng, TT, Use of Cholinium Lysinate as a Broad-Spectrum Herbicide. *US, Patent Application Ser. No. 62/842,737* (2019/05/03)
6. Wehrs, M, Gladden, J, **Mukhopadhyay, A** Host yeast cells and methods useful for producing indigoidine *U.S. Patent Application Ser. No 16/417,499* (2019/04/20)
7. **Mukhopadhyay A**, Mingardon F, Chanal A. Modified Host Cells Having tolerance to α -Olefins. *US Patent 20,170,051,317*, (2017/02/23)
8. **Mukhopadhyay A**, Reider-Apel A, Ouellet M, Keasling JD, Synthetic Polypeptide Having A Xylose Import Activity *US Patent 20170015714 A1* (2017/01/19)
9. Dunlop, MJ. Keasling, JD. **Mukhopadhyay, A**. Modified Host Cells with Efflux Pumps. *U.S. Patent No. 9428726* (2016/8/30)

Professional community service (external)

- Director (incoming 2025), Society for Industrial Microbiology and Biotechnology (SIMB)
- ASM Scientific Advisory Group, Role of microbes in mitigating Climate Change, 2024
- ASM Expert Panel for Biomanufacturing, August 2023
- Program Chair, SIMB Annual Meeting 2023
- Session Convener, Automated and Computational Approaches to Metabolic Engineering SIMB Annual Meeting 2022
- Session Chair for 44th SBFC 2022
- Session Co-Chair, Metabolic Engineering 14, Jul 2021
- Session Chair for 43rd SBFC 2021
- Co-Chair, Session Chair for ACS BIOT 2020
- Scientific Advisory Committee, Center for Advanced Bioenergy and Bioproducts Innovation (CABBI) 2019+
- Chair, Division O of the American Society of Microbiology (2015/16)
- Co-chair Organizing committee for the Indo-US Science and Technology Forum workshop on Cell Factories (IIT Mumbai India, March 2016).
- Editorial positions

- Frontiers in Microbiology Journal, 2011+
- *npj* Scientific Reports, 2017+
- Metabolic Engineering Communications
- JIMB Special Issue
- Reviewer for peer-reviewed articles (Nature Biotech, Nature Microbiol., Mol Sys Biol, PNAS, AEM, Mol Microb, mBio, J Bact, JMB, Scientific Reports, Biotechnology for Biofuels, Metabolic Engineering, Metabolic Engineering Communications, Applied Microbiology and Biotechnology, Microbial Cell Factories, etc).
- Reviewer for funding agencies (DOE BER, DOD IARPA).
- Reviewer for the JGI SynBio Internal Review Process 2014+
- Co-chair conference symposia session (ASM general conference 2010).
- Mentor for graduate students, exchange students/ postdocs from
 - FASEB Brazil 2023-24
 - SULI
 - Visiting Faculty 2022
 - DOE SCGSR exchange student program. 2016, 2021, 2022
 - B-ACER Fellowship, India 2020
 - CAPES Brazil 2019
 - FAPESP BEPE Research Project, Brazil 2018
 - Heidelberg University Biochemistry Centre, Germany, 2018
 - IIT Mumbai India 2018
 - Kyoto University 2017-18
 - University of California, Berkeley 2016-
 - Technical University of Braunschweig 2016-2020
 - SULI/ BLUR programs 2015+
 - RWTH Aachen University 2015-16
 - Khorana Program 2014+
 - EPFL Switzerland 2012-16
 - ETH Zurich, 2016
 - Mines Paristech France 2012-13,
 - NTU Singapore 2012,
 - Mannheim University, Germany 2012, 2011
 - IIT Kharagpur India 2009
 - University of Chicago Externship program (2012)
 - Biotech Partners program (2009)
- Thesis Advisory Committees
 - Arizona State University, Tempe, AZ, USA
 - Indian Institute of Technology, Mumbai, India
 - Leiden University, The Netherlands
 - DUSustain, Denmark

Professional community service (internal)

- Development of the BSE Strategic Plan, 2022-2027
- Committee for selection of the LBNL BSA ALD 2022
- Proposal preparation, presentation and defense team; BER SFA m-CAFEs 2022 review

- Proposal preparation, presentation and defense team; BER BRC JBEI 2022 review
- Proposal preparation, presentation and defense team; BER SFA ENIGMA 2017 review
- Proposal preparation, presentation and defense team for competitive BRC FOA 30M/ year proposal 2016-2017
- Chair, Divisional Staff Committee, Biological Systems and Engineering, LBNL, Berkeley, CA, 2017+
- Scientific Focus group for selection of the LBNL Lab Director 2015
- Committee for Biosciences Mentoring Program 2014-15
- Mentor for the Biosciences Mentoring Program 2015+
- Committee for suitable search for the JBEI COO and JBEI CSTO
- Committee for suitable search for the JBEI Director for Plant wall biosynthesis
- JBEI Volunteer, Berkeley Lab Open house 2011
- Committee for LBNL Directors Award 2011
- Committee for selection of the LBNL Lab Director 2007

Invited talks/ Panels/ podcasts (Since 2007)

1. Gas Fermentation Conference, Heron Island. Australia, Feb 21-25 2024
2. DARPA DUF Workshop, Boston, MA, Dec 12, 2023
3. Comparative Biochemistry Seminar, UC Berkeley, Oct 17th 2023
4. SynBYSS Seminar Series, Sept 7th 2023
5. CAFFI seminar on BRC overview, Aug 15th 2023
6. JBIMS (Joint Berkeley Initiative for Microbiome Sciences) Synthetic Communities Workshop, UC Berkeley Campus, Nov 10th, 2022
7. Women in Biotechnology Panel: BioEngineering - Engineering solutions forging new paths in multi-industry innovations, Newark, CA, Oct 12th, 2022
8. Career Exploration Seminar Series in the Institute of Molecular Biology (IMB), University of Oregon on Oct 11th, 2022
9. Review with the NATO Parliamentary Assembly Joint Committee, LBNL visit, September 20, 2022
10. Lake Arrowhead Microbial Genomics Sept 2022
11. Presentation to DOE Sec. of Energy Granholm and SEAB April 19th 2022
12. 44th SBFC, 2021
13. Seminar Series, Edinburgh June 2021
14. ASM Microbe Meeting June 2021
15. EBRC Seminar Series, May 13th 2021
16. Lignin Conversion, 43rd SBFC, April 26-28, 2021
17. Bio-Manufacturing Solutions workshop, BU-ISE and ITIF Boston, Feb 10th 2021
18. Radio talkshow with Julie Motz, Hot Tech – Cool Science, KWMR FM Feb 9th 2021
19. Virtual Sci Foo Camp, Oct 23-25, 2020
20. Indo-US workshop on Recent Developments in Bioenergy Research, Oct 19th 2020
21. Amazing Microbes, Finding Genius Podcast with Richard Jacobs, Jul 20th 2020
22. Gordon Research Seminar Mentorship Panel, Ventura Beach, CA, Jan 11th 2020
23. National Lab Day, Toledo, OH, Oct 11-12th 2019
24. CCST Biomass Expert Briefing, Sacramento, Sept 19th 2019
25. Pseudomonas 2019, Kuala Lumpur, Malaysia, July 22nd 2019
26. GapSummit, Boston, MA, June 18th, 2019
27. DOE JGI User meeting, San Francisco, CA, April 5th 2019

28. Tech Mini Colloquia JGI User meeting, San Francisco, CA, April 2th 2019
29. IGI Seminar, Berkeley, CA, March 12th 2019
30. Google team Offsite Keynote, San Francisco, CA, Jan 10th 2019
31. ABLC, San Francisco, CA, Nov 8th 2018
32. Synthetic Biology for Defense, Arlington, VA, Sept 25-27th 2018
33. Lignin Gordon Research Conference, Easton, MA, Aug 5th 2018
34. DTRA CB Tech Watch Seminar, Ft. Belvoir, VA, April 11th 2018
35. Departmental Seminar, Iowa State University, Ames, IA, Oct 12th 2017
36. SFSU Department of Chemistry Colloquium, San Francisco, CA, Sept 22nd 2017
37. BESC retreat, Plenary speaker for JBEI, Chattanooga, TN, July 11-13th 2017
38. Biology colloquium, Sonoma State University, Sonoma, CA, April 18th 2017
39. Comparative Biochemistry Seminar course, UC Berkeley, Berkeley, CA, Oct 27th 2016
40. Gordon Conference Green chemistry, Stowe, VT, July 31-Aug-5, 2016.
41. Beyond Academia, UC Berkeley, Berkeley CA, April 27th 2016
42. SFSU Department of Biology Colloquium in Microbiology and Cell & Molecular Biology, San Francisco, CA, Apr 7th 2016
43. Indo-US Bilateral Conference in Cell Factories, Mumbai, India, March 18-20th 2016
44. John Lawrence Seminar Series, LBNL, Berkeley, CA Oct 6th 2015
45. Gordon research Conference, Lucca, Italy April 24-May 1 2015
46. JGI, User meeting Walnut Creek, CA, March 25 2015
47. Genomic Science Contractors-Grantees Meeting XIII, Washington DC, Feb 22-25 2015
48. Departmental Seminar, Chemical Engineering, IIT, Mumbai, India, Feb 10th 2015
49. Indo-US Conference in Systems and Synthetic Biology, New Delhi, India, Nov 9th 2014
50. Society for Industrial Microbiology Annual Meeting, St Louise MO, Jul 24th 2014
51. Bioenergy and Photosynthesis Seminar, ASU, Tempe, AZ Feb 20th 2014
52. 12th Biennial Conference of Science and Management on the Colorado Plateau Northern Arizona University, Flagstaff, Sept 18th 2013
53. EBI Seminar series, UC Berkeley, Berkeley, Sept 3rd 2013
54. Eight Big Ideas, Berkeley Repertory Theater, Berkeley CA, May 13th 2013
55. ChemE class, University of Washington Seattle, Feb 8th 2013
56. Bioenergy and Biotechnology Team, Reliance India Limited, Mumbai, India Jan 3rd 2013
57. DBT-ICT Center for Energy Biosciences, Mumbai, India, Dec 31st 2012
58. Departmental Seminar, Washington University at St Louis, Missouri, Sept 21, 2012
59. Society for General Microbiology, Fall Conference, Warwick, UK, Sept 3-5 2012
60. Biobased Materials and Chemical, ITRI Forum 2012, Milpitas, CA, June 27th 2012
61. ASM Conference for Undergraduate Educators, San Mateo, CA June 14-17, 2012
62. Departmental Seminar, NCBS, Bangalore, India, April 10th 2012.
63. Departmental Seminar, MBU, IISc, Bangalore, India, April 9th 2012.
64. Departmental Seminar, CESE, IIT Powai, Mumbai, India, March 28th 2012.
65. Plenary session speaker, Genomic Science Meeting X, Bethesda, MD, Feb 26-29, 2012
66. Sci-Ops Talk, Physical Biosciences Division, LBNL, Berkeley, Jan 12th 2012
67. Society for Industrial Microbiology Annual Meeting, New Orleans, MI, July 27th 2011
68. Yeast Synthetic biology Workshop, San Francisco, CA, Oct 16th 2010.
69. Society for Industrial Microbiology Annual Meeting, San Francisco, CA, Aug 5th 2010
70. Indo-American Frontiers of Engineering Symposium, Agra, India, March 10-13th 2010
71. Departmental Seminar, Department of Chemistry, IIT Powai, India, March 8th 2010
72. Knowledge Economy Institute (KE2) Summit, Emeryville, CA Jan 27-28th 2010
73. American Geophysical Union (AGU) conference, San Francisco, CA, Dec 15-19 2008

74. Society for Industrial Microbiology Annual Meeting, San Diego, CA, August 10-14 2008
75. NAE workshop, Wisconsin, Madison, March 14th 2008
76. World Congress on Industrial Biotechnology and Bioprocessing, Orlando, FL, March 21-24, 2007
77. Human Genome Conference, Zeta NEF Foundation, Los Angeles CA, October 26th 2007

Awards and Honors

- AAAS Fellow class of 2022
- LBNL Spot award: Developing the BSE 7-year Strategic Plan (2022)
- Finalist C3E Awards: Mid-career women in clean energy (2019)
- LBNL Spot award: Contribution to the successful completion of the JBEI proposal (2017)
- LBNL Spot award: Exceptional leadership, service and support of the Biosciences reorganization enterprise (2016)
- LBNL Spot Award: Committee for Biosciences Mentoring Program (2015)
- UC Berkeley and Berkeley Lab Leadership Development Program, UC Berkeley, Center for Executive Education (2010)
- Recognized among Women @ The Lab 2013 event at Berkeley Lab (LBNL)
- Recognized among Women in Energy 2013 by the US Department of Energy
- Quayle Award for excellence in Research (Emory University) for the Academic year 2001-2002

Memberships

American Society for Microbiology, American Chemical Society, American Association for the Advancement of Science, Society for Industrial Microbiology, Women in Biotech (WIB)

Funding (since 2007)

United States Department of Energy via JBEI, ENIGMA, ENIGMA discovery, m-CAFEs, and LBNL LDRD funds (DE-AC02-05CH11231). WFO (LLNL, Exxon Mobile, Rhodium), SBIR (DOE), seedling grants, CERES program (DARPA), STTR Phase II (NASA), CRADA (Total New Energies), Conference funds (IUSSTF, NSF), and UC Berkeley QB3.