Thomas T. Eng, Ph.D. *Curriculum Vitae*
Lawrence Berkeley National Laboratory (LBNL)
1 Cyclotron Road MS 978 Berkeley, CA 94720
Email: tteng@lbl.gov

Professional Appointments:

2021-Present **Deputy Director of Host Engineering**
Joint Bioenergy Institute (JBEI), Emeryville, CA.

2020-Present **Career Biologist Research Scientist**
Biological Systems Engineering Division. Biosciences Area, Lawrence Berkeley National Lab. Berkeley, CA.

2018-2020 **Biologist Project Scientist**
Biological Systems Engineering Division. Biosciences Area, Lawrence Berkeley National Lab. Berkeley, CA.

2010-2011 **Graduate Student Instructor**
Undergraduate Genetics (MCB.140), Department of Molecular and Cell Biology, University of California, Berkeley. Berkeley, CA.

2007-2009 **Technical Assistant I**
Laboratory of Terry Orr Weaver, PhD.
Whitehead Institute for Biomedical Research. Cambridge, MA.

2006-2007 **Laboratory Teaching Assistant**
Undergraduate Molecular Biology Laboratory (7.02L) Department of Biology, Massachusetts Institute of Technology. Cambridge, MA.

Education and Training:

2016-2018 **Post-doctoral research** in Microbial Systems Biology, LBNL. Berkeley, CA.
Supervisor: Aindrila Mukhopadhyay.

2009-2015 ***Ph.D.* in Molecular and Cell Biology**, UC Berkeley. Berkeley, CA.
Supervisor: Douglas E. Koshland.

2004-2007 ***S.B.* in Biology,** Massachusetts Institute of Technology. Cambridge, MA.
Supervisor: Hidde Ploegh.

Research Grants:

2022-2025 PI: Eng. LBNL Early Career Laboratory Directed Research and Development Award. "Developing SynBio Tools for Nitrogen Fixing Microbes." *Research funding, $450,000.*

2021 PI: Eng. Environmental Molecular Sciences Laboratory + BRC Proposal No. 51792, "Pseudomonas putida KT2440 Fluxomics." *In-kind Metabolomics and Proteomics Award.*

2021 PI: Eng. DOE-Joint Genome Institute. Proposal No. 507230, "Genome Mining Candidate Biofuel Pathways and Efflux Pumps." *In-kind DNA Synthesis Award.*

2020 PI: Eng. DOE-Joint Genome Institute. Proposal No. 507093, "Small Noncoding RNA Sequencing of Pseudomonas putida Mutants." *In-kind RNAseq and transcriptomics award.*

2019 PI: Eng. DOE-Joint Genome Institute. Proposal No. 505977, "Assessment of Multiplex CRISPRi Knockdown Efficiency." *In-kind RNAseq and transcriptomics award.*

Publications (Google Scholar h-index = 15; 2,367 total citations):

§ *denotes co-first authorship.*

1. D. Banerjee[§], **T. Eng**[§], Y. Sasaki, A. Srinivasan, A. Oka, R.A. Herbert, J. Trinh, V.R. Singan, N. Sun, D. Putnam, C.D. Scown, B.A. Simmons, and A. Mukhopadhyay. Genomics Characterization of

an engineered *Corynebacterium glutamicum* in Bioreactor Cultivation under Ionic Liquid Stress. Submitted. Preprint available: doi.org/10.1101/2021.09.29.462453

2. **T. Eng**[§], D. Banerjee[§], A.K. Lau, E. Bowden, R.A. Herbert, J.P. Prahl, A .Deutschbauer, D.Tanjore, and A. Mukhopadhyay. Determinants of Bioreactor Fitness in Pseudomonas putida KT2440 Via Fitness Profiling Enables Optimized Indigoidine Production From Lignin-Derived Monomers. *Metabolic Engineering*, 2021 July 66; 229-238. doi: 10.1016/j.ymben.2021.04.015

3. H.G. Lim, **T. Eng**, D. Banerjee, G. Alarcon, A.K. Lau, M.R. Park, B.A. Simmons, B.O. Palsson, S.W. Singer, A. Mukhopadhyay, and A.M. Feist. Generation of Pseudomonas putida KT2440 Strains with Efficient Utilization of Xylose and Galactose via Adaptive Laboratory Evolution. *In Press, ACS Sustainable Chemistry & Engineering*.

4. E.T. Mohamed, A.Z. Werner, D. Salvachúa, C. Singer, K. Szostkiewicz , M. Jiménez-Díaz, **T. Eng**, M.S. Radi, A. Mukhopadhyay, M.J. Herrgård, S.W. Singer, G.T. Beckham, and A.M. Feist. Adaptive laboratory evolution of Pseudomonas putida KT2440 improves hydroxycinnamic acid catabolism and tolerance. *Metabolic Engineering Communications,* 2020 August 29. doi: 10.1016/j.mec.2020.e00143

5. **T. Eng**, R.A. Herbert, B. Wang, U. Martinez, J. Chen, B. Brown, M. Bissell, J.M. Mortimer, and A. Mukhopadhyay. Iron Limitation Drives Antagonistic Interactions Between Root Associated Bacteria. *Frontiers in Microbiology,* 2020 July 22. doi: 10.3389/fmicb.2020.01742

6. D. Banerjee[§], **T. Eng**[§], A.K. Lau, Y. Sasaki, B. Wang, Y. Chen, J.P. Prahl, V.R. Singan, R.A. Herbert, Y. Liu, D. Tanjore, C.J. Petzold, J.D. Keasling and A. Mukhopadhyay. Genome-scale Metabolic Rewiring to Achieve Predictable Titers Rates and Yields of a Non-Native Product at Scale. *Nature Communications*, 2020; 11, 5385. doi: 10.1038/s41467-020-19171-4

7. H.G. Lim, B. Fong, G. Alarcon, H. Magurudeniya, **T. Eng**, C.A. Olson, R. Szubin, B.O. Palsson, S.W. Singer, and A.M. Feist. Generation of an Ionic Liquid Tolerant *Pseudomonas putida* KT2440 strain via Adaptive Laboratory Evolution. *Green Chemistry*, 2020; vol 22; pg 5677 – 5690. doi: 10.1039/D0GC01663B

8. **T. Eng**[§]**,** Y. Sasaki[§], R.A. Herbert, A. Lau, J. Trinh, Y. Chen, M. Mirsiaghi, C.J. Petzold, and A. Mukhopadhyay. Production of Tetra-methylpyrazine Using Engineered *C. glutamicum*. *Metabolic Engineering Communications*. 2020 June 10. doi: 10.1016/j.mec.2019.e00115.

9. S. Langley, **T. Eng,** K.H. Wan, R.A. Herbert, A.P. Klein, Y. Yoshikuni, S.G. Tringe, J.B. Brown, S.E. Celniker, J.C. Mortimer, and A. Mukhopadhyay. Complete Genome Sequence of *Agrobacterium* sp. 33MFTa1.1 Isolated From the Roots of *Thlaspi arvense*. *Microbiology Resource Announcements*, 2019 September 12. doi: 10.1128/MRA.00432-19

10. R.A. Herbert, **T. Eng**, U. Martinez, B. Wang, S. Langley, K. Wan, V. Pidatala, E. Hoffman, J. Chen, M.J. Bissell, J.B. Brown, A. Mukhopadhyay, and J. C. Mortimer. Rhizobacteria mediate the phytotoxicity of a range of biorefinery-relevant compounds. *Environmental Toxicology and Chemistry*, 2019 May 20. doi: 10.1002/etc.4501

11. M. Wehrs, D. Tanjore, **T. Eng**, J. Lievense, T. R. Pray, and A. Mukhopadhyay. Engineering Robust Production Microbes for Large-scale Cultivation. *Trends in Microbiology*, 2019 June. doi.org/10.1016/j.tim.2019.01.006

12. Y. Sasaki[§], **T. Eng**[§], R.A. Herbert, J. Trinh, Y. Chan, C.J. Petzold, B. Simmons, and A. Mukhopadhyay. Engineering Corynebacterium glutamicum to produce the biogasoline isopentenol from plant biomass hydrolysates. *Biotechnology for Biofuels,* 2019 February 18. doi.org/10.1186/s13068-019-1381-3

13. **T. Eng**, P. Demling, R.A. Herbert, Y. Chen, V. Benites, J. Martin, A. Lipsen, E.E.K. Baidoo, L. Blank, C.J. Petzold, and A. Mukhopadhyay. 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 Oct 8;17(1):159. doi: 10.1186/s12934-018-1006-8.

14. H.M. Jensen, **T. Eng**, V. Chubukov, R.A. Herbert, and A. Mukhopadhyay. Improving membrane protein expression and function using genomic edits. *Scientific Reports,* 2017 Oct 12;7(1):13030. doi: 10.1038/s41598-017-12901-7.

15. **T. Eng,** V. Guacci, D. Koshland. Inter-allelic Complementation Provides Evidence for Cohesin Oligomerization on DNA. *Molecular Biology of the Cell*. 2015 Nov 15;26(23):4224-35. doi: 10.1091/mbc.E15-06-0331.

16. O. Orgil, A. Matityahu, **T. Eng**, V. Guacci, D. Koshland, and I. Onn. A conserved domain in the Scc3 subunit of cohesin mediates the interaction with both Mcd1 and the cohesin loader complex. *PLoS Genetics*, 2015 Mar 6;11(3):e1005036. doi:10.1371/journal.pgen.1005036

17. **T. Eng**, V. Guacci, D. Koshland. ROCC, a conserved region in cohesin's Mcd1 subunit, is essential for the proper regulation of the maintenance of cohesion and establishment of condensation. *Molecular Biology of the Cell*. 2014 Aug 15;15(16):2351-64.

18. N. Sher, S. Li, G. Bell, **T. Eng**, M. Eaton, D. MacAlpine, and T.L. Orr-Weaver. Developmental Control of Gene Copy Number by Repression of Replication Initiation and Fork Progression. *Genome Research*. 2012 Jan;22(1):64-75.

19. A.M. McGehee, E. Guillen, O. Kirak, **T. Eng,** and H.L. Ploegh. Ubiquitin-Dependent Control of Class II MHC Localization is Dispensable for Antigen Presentation and Antibody Production. *PLoS One*. 2011 Apr 20;6(4):e18817.

20. J.C. Kim, J. Nordman, F. Xie, H. Kashevsky, **T. Eng**, D.M. MacAlpine, and T.L. Orr-Weaver. Integrative analysis of gene amplification in Drosophila follicle cells: parameters of origin activation and repression. *Genes and Development*. 2011 Jul 1;25(13):1384-98.

21. J. Nordman, S. Li, **T. Eng**, David MacAlpine, and T.L. Orr-Weaver. Developmental Control of the DNA Replication and Transcription Programs. *Genome Research*. 2011 Feb;21(2):175-81.

22. **modENCODE Consortium** *et al*. Identification of functional elements and regulatory circuits by Drosophila modENCODE. *Science*. 2010 Dec 24;330(6012):1787-97.

23. S.E. Celniker, L.A. Dillon, M.B. Gerstein, K.C. Gunsalus, S. Henikoff, G.H. Karpen, M. Kellis, E. C. Lai, J.D. Lieb, D.M. MacAlpine, G. Micklem, F. Piano, M. Snyder, L. Stein, K.P. White, R.H. Waterston, **modENCODE Consortium**. Unlocking the Secrets of the Genome. *Nature*. 2009 Jun 18;459(7249):927-30.

Conference & Seminar Presentations

2021 Washington University in St. Louis, McKelvey School of Engineering, Department of Energy, Environmental and Chemical Engineering. Invited Seminar. November 5, 2021.
2020 Engineering Conferences International: Microbial Engineering II. Albufeira, Portugal. September 13-19, 2020. *Conference rescheduled*.
2019 Engineering Conferences International: Biochemical and Molecular Engineering XXI. Mont Tremblant, Quebec, Canada. July 14-18th 2019.
2018 Society for Industrial Microbiology, Annual Meeting and Exhibition. Chicago, IL, USA. August 12-16th 2018.
2018 Department of Energy Genome Sciences Annual Principal Investigators' Meeting. Tysons Corner, VA, February 25-28th, 2018
2017 Department of Energy Genome Sciences Annual Principal Investigators' Meeting. Crystal City, VA, February 5-8th, 2017.
2013 Cold Spring Harbor Symposium: Cell Biology of the Yeasts. Cold Spring Harbor, NY, November 5-9th, 2013.
2013 Cohesin Biology and the Cohesinopathies. Certosa di Pontignano Centro Congressi, Pontignano, Siena, Italy. July 12-15th, 2013.
2012 Federation of American Societies for Experimental Biology (FASEB): Yeast Chromosome Structure, Replication & Segregation. Steamboat Springs, CO, July 15-20th, 2012.
2009 Third Meeting of the Model Organism ENCODE (modENCODE) and ENCODE Consortia. Bethesda, MD, March 25-27th, 2009.
2008 Second Meeting of the Model Organism Encode (modENCODE) and ENCODE Consortia. Rockville, MD, June 16-19, 2008.
2008 49th Annual Drosophila Research Conference. San Diego, CA, April 2-6, 2008.

Awards, Honors, Inventions

2020 Provisional U.S. Patent Application 62/982,001.
2020 Provisional U.S. Patent Application 62/980,054.
2019 Filed U.S. Patent Application 16/866,453.
2010 National Science Foundation Graduate Research Fellowship (2010-2013)
2003 Robert and Mona Dillon Scholarship for Worthy Students (Internal, MIT)

Professional Service & Synergistic Activities

NSF Peer Reviewer, (2020).
Society for International Microbiology and Biotechnology, Annual Meeting Session Convener, Metabolic Engineering for Alternative Feedstocks (2021).
Joint Genome Institute, Functional Genomics Proposal Scientific Review Committee, Member (2021).
Peer referee for journals including Metabolic Engineering Communications, Microbial Cell Factories, Biotechnology for Biofuels, Frontiers Biotechnology, Frontiers Microbiology, Current Opinion in Biotechnology, Scientific Reports.
Review Editor for Frontiers in Microbiology (2021-2023).
LBNL Biosciences Strategic Plan Strategy Lead (2021).
LBNL Biomaterials and Biomanufacturing Visioning Workshop, Contributor (2021).
LBNL Biosciences Area Annual Meeting Steering Committee, Member (2019-2020).
DOE Summer Undergraduate Laboratory Internship Program (SULI), Mentor (2017-present).
UC Berkeley MCB Career Panelist, Invited Speaker (February 2020).
LBNL Lambda Alliance Employee Resource Group, Member (2018-present).
LBNL/ESE4 Lab Operations Advisory Committee, Member (2021-present).
LBNL/ESE4 Lab EH&S Committee, Member (2016-present).
MIT Educational Council Office, Educational Counselor (2010-2013).

MIT Committee on Discipline, Member (2005-2007).
Trainees since 2015:
Undergraduate level: Peyton Freeman (2016), Brenda Wang (2017-2019), Andrew Lau (2018-2020), Jessica Trinh (2018), Robin Herbert (2016-2018), Angela Wei (2019), Emily Bowen (2019), Josephine Gollin (2020), Javier Menasalvas (2020-present), Vishnu Viswanathan (2021), Chunsheng Yan (2020-2021).
Graduate level: Philipp Demling (2016), Yusuke Sasaki PhD (2017), Alberto Lopes (2018), Juhi Sharma (2019).