

I. PERSONAL INFORMATION

RYAN T. GILL
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Chemical and Biological Engineering
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II. EMPLOYMENT HISTORY

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|--------------|---|
| 2015-Present | Slade Professor, Chemical and Biological Engineering, Univ. of Colorado |
| 2015-Present | Associate Director, Renewable and Sustainable Energy Institute ⁱ . Director of Biotechnology and the BioDesign Works Center. |
| 2015-Present | Professor, Chemical and Biological Engineering, University of Colorado |
| 2012-Present | Associate Director, Renewable and Sustainable Energy Institute - Interim Director (Fall 2013)- |
| 2009-Present | Fellow, Executive Board, Renewable and Sustainable Energy Institute |
| 2008-2015 | Associate Professor with Tenure, Chemical and Biological Engineering, University of Colorado, Boulder, CO |
| 2007-2010 | Dupont Young Professor |
| 2006-2012 | Founder, Managing Director, Colorado Center for Biorefining and Biofuels |
| 2005-2008 | Patten Assistant Professor. Chemical and Biological Engineering. University of Colorado, Boulder, CO. |
| 2001-2005 | Assistant Professor. Chemical and Biological Engineering. University of Colorado, Boulder, CO. |
| 1999-2001. | Post-doctoral Associate. Chemical Engineering. Massachusetts Institute of Technology. Advisor: Professor Gregory Stephanopoulos |

III. EDUCATION

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| August, 1999. | <i>Doctor of Philosophy.</i> Chemical Engineering. University of Maryland. College Park, MD. Advisor: Professor William E. Bentley Thesis: <i>Dynamic analysis of global stress gene transcription during recombinant Escherichia coli fermentation.</i> |
| August, 1997. | <i>Masters of Science.</i> Chemical Engineering. University of Maryland. College Park, MD. Advisor: Professor William E. Bentley Thesis: <i>An investigation of E. coli stress: The physiological response to DTT addition and the partial purification of a stress induced protease.</i> |
| May, 1993. | <i>Bachelor of Science.</i> Chemical Engineering. The Johns Hopkins University, Baltimore, MD. |

IV. ACADEMIC AND PROFESSIONAL ACTIVITIES

Awards

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| 2016 | Keynote Address, American Institute of Chemical Engineers, Genome Engineering |
| 2016 | Severo Ochoa Fellow, EU Centre for Genomic Regulation, Barcelona, Spain |
| 2015 | Keynote Address, American Chemical Society Synthetic Biology Track |
| 2015 | Keynote Address, Peptalk, Synthetic Biology Track |
| 2012 | Research Rockstar, Colorado Cleantech Industry Association |

ⁱ RASEI is a joint institute founded in 2010 between the University of Colorado and the National Renewable Energy Laboratory comprised of 35 fellows focused on the development of energy technologies in sustainable fuels, solar, wind, storage, and natural gas application areas.

- 2011 Founder's Award, Opxbio
- 2011 Provost's Award for Achievement Associate Professor (CU)
- 2010 Inventor of the Year, University of Colorado
- 2009 Visiting Professor, Ecole Polytechnique Federal de Lausanne
- 2008 University of Colorado Faculty Fellowship
- 2007 Dupont Young Professor Award
- 2007 Rising Star Award, Big 12 Center for Economic Dev., Innovation and Commercialization
- 2006 Provosts Award for Achievement Assistant Professor (CU)
- 2005 National Science Foundation CAREER Award
- 2005 National Institutes of Health CAREER (K) Development Award
- 2004 Subaru Educator Spotlight Award
- 2003 CU-Boulder, Department of Chemical Engineering, Undergraduate Advising Award
- 2001 Vern Norviel Junior Faculty Award

National and International Service Activities

- 2017-2018 Conference Chair, SBE Synthetic Biology SEED Conference, Phoenix, AZ.
- 2013-Present Founding Co-Editor in Chief, Metabolic Engineering Communications
- 2011-Present Associate Editor (Synthetic Biology/Metabolic Engineering), Biotechnology and Bioengineering
- 2011-Present Editorial Board, ACS Synthetic Biology
- 2011-Present Editorial Board, Metabolic Engineering
- 2012-2014 Conference Chair, SBE Intl. Metabolic Engineering Conference, Vancouver, CA
- 2010-2011 Section Co-Chair, Biofuels Section, ACS Spring National Meeting (2011)
- 2010-Present Scientific Advisory Board, SBE Biomolecular Engineering Conference
- 2010-2011 Editorial Advisory Board, Biotechnology and Bioengineering
- 2008-2011 Editorial Advisory Board, Metabolic Engineering
- 2008-2009 Conference Chair, Biomolecular Engineering II International Conference, Society for Biological Engineering (AIChE).
- 2008-Present Scientific Advisory Board, International Conference on Metabolic Engineering
- 2008-2011 Strategic Planning Board, American Chemical Society, Biotechnology Division.
- 2007-2010 Chair, Scientific Advisory Board, Opx biotechnologies.
- 2007 Biomolecular Engineering I International Conference, San Diego, CA. Society for Biological Engineering (AIChE), Session Chair. Molecular Methods in Strain Engineering
- 2005 Biochemical Engineering XIV International Conference. Harrison Hot Springs, B.C., Canada. Session chair. Evolutionary approaches in biochemical engineering.
- 2005 American Chemical Society (ACS). National Meeting. Co-chair. Session on Microbial Process Development – Application of New Tools in Process R&D.
- 2004. Metabolic Engineering V International Conference. Lake Tahoe, Ca. Co-Chair for session on Evolutionary approaches in Metabolic Engineering.
- 2004. Guest Editor *Metabolic Engineering*. Special Edition on Inverse Metabolic Engineering.
- 2003. American Chemical Society (ACS). National Meeting. Chair. Session on Advances in Metabolic Engineering
- 2002. American Institute of Chemical Engineers (AIChE). National Meeting. Chair. Session on Advances in Genomics
- 2001. American Institute of Chemical Engineering National Meeting. Co-chair. Session on Advances in Genomics

V. **PUBLICATIONS**ⁱⁱ (key publications in bold)

| Authors | Title | Publication | V | # | Pages | Year |
|--|--|---|----|---|----------------------------|-------------|
| Liu, R., Liang, L., Garst, A.D., Choudhury, A., Beckham, G., and Gill, R.T. | Combinatorial engineering of 3-hydroxypropionate production from hemicellulose | Submitted | | | | 2016 |
| Liang, L., Liu, R., and Gill, R.T. | CRISPR Enabled Trackable genome Engineering for isopropanol production in E. coli | Metabolic Engineering | | | Accepted pending revisions | 2016 |
| Winkler, J., Edwards, A., Erickson, K., Choudhury, A., and Gill, R.T. | The Resistome: A comprehensive database of E. coli resistance phenotypes | ACS Synthetic Biology | | | 8/2016 | 2016 |
| Bassalo, M. and Gill, R.T. | Integrating Entire Metabolic Pathways in E. coli | Cell Systems | | | In-Press | 2016 |
| Winkler, J., Edward, A., Gill, R.T. | Quantifying complexity in metabolic engineering designs | Metabolic Engineering Communication | 3 | | 227-233 | 2016 |
| Pines, G., Edwards, A., Winkler, J., and Gill, R.T. | A web interface for codon compression | ACS Synthetic Biology | | | 5/2016 | 2016 |
| Zeitoun, R. and Gill, R.T. | Barcoded tracking of combinatorially engineered populations | ACS Synthetic Biology | | | In-Review | 2016 |
| Garst, A., Edwards, A., and Gill, R.T. | Trackable Genome-Engineering at single nucleotide resolution | Nature Biotechnology | | | 12/1 | 2016 |
| Edwards, A., Bassalo, M., Winkler, J. and Gill, R.T. | Biotechnological strategies for advanced biofuel production: enhancing tolerance phenotypes through genome scale modifications | Ch. 9 in Biotechnology for Biofuel Production and Optimization (Elsevier) | | | 227-263 | 2016 |
| Bassalo, M., Liu, R., and Gill, R.T. | Directed evolution and synthetic biology applications to microbial systems | Current Opinion in Biotechnology | 39 | | 126-133 | 2016 |
| Bassalo, M., Garst, A., Halweg-Edwards, A., Domaille, D., Mutalik, V., Arkin, A., and Gill, R.T. | Rapid and efficient one-step metabolic pathway integration in E. coli. | ACS Synthetic Biology | | | 4/2016 | 2016 |
| Gill, R.T., Edwards, A. Way, S., and Clauaset, A. | Synthesis Aided Design: A biological design-build-test paradigm? | Biotechnology and Bioengineering | | | 113:7-10 | 2016 |
| Mansell, T., Weiss, S., Knight, R., and Gill, R.T. | Parallel Mapping of Antibiotic Resistance Alleles in Escherichia coli | PLoS ONE | | | 11(1) | 2016 |

ⁱⁱ Impact Factors: Nature Biotechnology (~39), Nature Methods (~23-24), PNAS (~10), Metabolic Engineering (~8), Biotechnology and Bioengineering (~4-5), PLOS ONE (~4-5), Biotechnology and Biofuels (~5-6), Current Opinion in Biotech. (~8), Gen. Bio (~10).

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|---|---|--------------------------------------|---|---|----------------------|-------------|
| Groot, A.J., Cepress-Mclean, S.C., Robbins-Pianka, A., Knight, R., and Gill, R.T. | Multiplex growth rate phenotypic of synthetic mutants in selection to engineering glucose and xylose co-utilization in <i>E. coli</i> . | Biotechnology and Bioengineering | | | In-Press | 2016 |
| Lynch, S., Eckert, C., Yu, J, Gill, R.T., and Maness, P. | Overcoming substrate limitations for improved production of ethylene in <i>E. coli</i> | Biotechnol Biofuels | | | 9(1):1 | 2016 |
| Liu, R., Bassalo, M., and Gill, R.T. | Genome Scale engineering techniques for Metabolic Engineering | Metabolic Engineering | | | 32:143-154 | 2015 |
| Winkler, J., Erickson, K., Choudhury, A., Edwards, A., and Gill, R.T. | Complex Systems in Metabolic Engineering | Current Opinion in Biotechnology | | | 36:107-114 | 2015 |
| Freed, E., Winkler, J., Garst, A., Mutalik, V., Knight, R., Arkin, A., and Gill, R.T. | Genome-wide tuning of protein expression levels to rapidly engineering microbial traits | ACS Synthetic Biology | | | 4:1244-53 | 2015 |
| Winkler, J., Edward, A., Gill, R.T. | LASER Database: Formalizing design rules for Metabolic Engineering. | Metabolic Engineering Communication | | | 2:30-38 | 2015 |
| Pines, G., Freed, E., Winkler, J. and Gill, R.T.> | Bacterial Recombineering-genome engineering via phage based homologous recombination | ACS Synthetic Biology | | | 11/10 | 2015 |
| Freed, E. and Gill, R.T. | Genome wide methods for trait mapping | Springer Book Chapter (ed. M. Lynch) | | | | 2015 |
| Garst, A., Bassalo, M. and Gill, R.T. | Emerging strategies for Rational Genome Engineering | Springer Book Chapter (ed. M. Lynch) | | | | 2015 |
| Edwards, A., Grau, W.C., Winkler, J., Garst, A.D., and Gill, R.T. | The Emergence of Commodity-scale Genetic Manipulation | Current Opinion in Chemical Biology | | | 28:150-155 | 2015 |
| Reynolds, T., Boyle, N., and Gill, R.T. | Quantifying impact of Chromosome Copy number on Recombination in <i>E. coli</i> . | ACS Synthetic Biology | | | 4:776-780 | 2015 |
| Zeitoun, R., Garst, A., and Gill, R.T. | Multiplex Tracking of Combinatorial Genome Engineered Populations | Nature Biotechnology | | | 33:631-637 | 2015 |
| Glebes, T., Sandoval, N., Boyle, N., Reeder, P., Zhang, M., and Gill, R.T. | Comparison of genome-wide selection strategies to identify furfural tolerance genes in <i>E. coli</i> | Biotechnology and Bioengineering | | | 112:129 | 2015 |
| Pines, G., Pines, A., Garst, A., Zeitoun, R., and Gill, R.T. | Codon compression algorithms for tailored saturation mutagenesis libraries | ACS Synthetic Biology | | | 5/15 | 2015 |
| Gill, R.T. and Hatzimanikatis, V. | Introduction to Metabolic Engineering Communications | Metabolic Engineering Communication | 1 | 1 | 1 | 2014 |
| Erickson, K.E., Gill, R.T., and Chatterjee, A. | Constrictor: Constraint modification provides insight into design of biochemical networks | PLoS ONE | | | Appd 12/3/14 0113820 | 2014 |

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|--|---|----------------------------------|-----------|---|-------------|-------------|
| Eckert, C. Wu, X., Wei, X., Lynch, S., Ungerer, J., Tao, L, Gill, R.T., Maness, P., and Yu, J. | Ethylene forming enzyme and bio-ethylene production | Biotechnol Biofuels | | | 7:33 | 2014 |
| Glebes, Tirzah Y; Sandoval, Nicholas R; Reeder, Philippa J; Schilling, Katherine D; Zhang, Min; Gill, Ryan T; | Genome-Wide Mapping of Furfural Tolerance Genes in <i>Escherichia coli</i> | PLoS ONE | 9 | 1 | e87540 | 2014 |
| Woodruff, Lauren; Pandhal, Jagroop; Ow, Saw Y; Karimpour-Fard, Anis; Weiss, Sophie J; Wright, Phillip C; Gill, Ryan T; | Genome-scale identification and characterization of ethanol tolerance genes in <i>Escherichia coli</i> | Metabolic engineering | 15 | | 124-133 | 2013 |
| Nordwald, Erik M; Garst, Andrew; Gill, Ryan T; Kaar, Joel L; | Accelerated protein engineering for chemical biotechnology via homologous recombination | Current opinion in biotechnology | 24 | 6 | 1017-1022 | 2013 |
| Garst, Andrew; Lynch, Michael; Evans, Ron; Gill, Ryan T; | Strategies for the multiplex mapping of genes to traits | Microbial cell factories | 12 | 1 | 99 | 2013 |
| Woodruff, Lauren; May, Brian L; Warner, Joseph R; Gill, Ryan T; | Towards a metabolic engineering strain “commons”: an <i>Escherichia coli</i> platform strain for ethanol production | Biotechnology and bioengineering | 11 | 5 | 1520-1526 | 2013 |
| Woodruff, Lauren; Boyle, Nanette R; Gill, Ryan T; | Engineering improved ethanol production in <i>Escherichia coli</i> with a genome-wide approach | Metabolic engineering | 17 | | 1-11 | 2013 |
| Pandhal, Jagroop; Woodruff, Lauren; Jaffe, Stephen; Desai, Pratik; Ow, Saw Y; Noirel, Josselin; Gill, Ryan T; Wright, Phillip C; | Inverse metabolic engineering to improve <i>Escherichia coli</i> as an N-glycosylation host | Biotechnology and bioengineering | 11 | 9 | 2482-2493 | 2013 |
| Boyle, Nanette R; Reynolds, T Steele; Evans, Ron; Lynch, Michael; Gill, Ryan T; | Recombineering to homogeneity: extension of multiplex recombineering to large-scale genome editing | Biotechnology journal | 8 | 5 | 515-522 | 2013 |
| Zeitoun, Ramsey I; Langelier, Sean M; Gill, Ryan T; | Implications of variable fluid resistance caused by start-up flow in microfluidic networks | Microfluidics and Nanofluidics | | | 1-10 | 2013 |
| Chaput, Catherine; Spindler, Eileen; Gill, Ryan T; Zychlinsky, Arturo; | O-Antigen Protects Gram-Negative Bacteria from Histone Killing | PloS one | 8 | 8 | e71097 | 2013 |
| Spindler, Eileen C; Boyle, Nanette R; Hancock, Robert EW; Gill, Ryan T; | Genome-wide identification of genes conferring energy related resistance to a synthetic antimicrobial Peptide (bac8c) | PloS one | 8 | 1 | e55052 | 2013 |
| Freed, Emily F; Gill, Ryan T; | Next Generation Multiplex Genome Engineering | Wiley Biotechnology Series | | | | 2013 |
| Lynch, Sean A; Gill, Ryan T; | Synthetic biology: New strategies for directing design | Metabolic engineering | 14 | 3 | 205-211 | 2012 |
| Boyle, Nanette R; Gill, Ryan T; | Tools for genome-wide strain design and construction | Current Opinion in Biotechnology | 23 | 5 | 666-671 | 2012 |

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|--|--|--|-----------|-----------|--------------------|-------------|
| Sandoval, Nicholas R; Kim, Jaoon YH; Glebes, Tirzah Y; Reeder, Philippa J; Aucoin, Hanna R; Warner, Joseph R; Gill, Ryan T; | Strategy for directing combinatorial genome engineering in Escherichia coli | Proceedings of the National Academy of Sciences | 10 | 26 | 10540-10545 | 2012 |
| Warnecke, TE; Lynch, MD; Lipscomb, ML; Gill, RT; | Identification of a 21 amino acid peptide conferring 3-hydroxypropionic acid stress-tolerance to Escherichia coli | Biotechnology and bioengineering | 10 | 5 | 1347-1352 | 2012 |
| Lipscomb, Tanya Warnecke; Lipscomb, Matthew L; Gill, Ryan T; Lynch, Michael D; | Metabolic Engineering of Recombinant E. coli for the Production of 3-Hydroxypropionate | Engineering Complex Phenotypes in Industrial Strains | | | 185-200 | 2012 |
| Handke, Paul; Lynch, Sean A; Gill, Ryan T; | Application and engineering of fatty acid biosynthesis in Escherichia coli for advanced fuels and chemicals | Metabolic engineering | 13 | 1 | 28-37 | 2011 |
| Singh, Amarjeet; Cher Soh, Keng; Hatzimanikatis, Vassily; Gill, Ryan T; | Manipulating redox and ATP balancing for improved production of succinate in E. coli | Metabolic engineering | 13 | 1 | 76-81 | 2011 |
| Sandoval, Nicholas R; Mills, Tirzah Y; Zhang, Min; Gill, Ryan T; | Elucidating acetate tolerance in E. coli using a genome-wide approach | Metabolic engineering | 13 | 2 | 214-224 | 2011 |
| Spindler, EC; Hale, JDF; Giddings, TH; Hancock, REW; Gill, RT; | Deciphering the mode of action of the synthetic antimicrobial peptide Bac8c | Antimicrobial agents and chemotherapy | 55 | 4 | 1706-1716 | 2011 |
| Woodruff, Lauren; Gill, Ryan T; | Engineering genomes in multiplex | Current opinion in biotechnology | 22 | 4 | 576-583 | 2011 |
| Warner, Joseph R; Reeder, Philippa J; Karimpour-Fard, Anis; Woodruff, Lauren BA; Gill, Ryan T; | Rapid profiling of a microbial genome using mixtures of barcoded oligonucleotides | Nature Biotechnology | 28 | 8 | 856-862 | 2010 |
| Warnecke, TE; Lynch, MD; Karimpour-Fard, A; Lipscomb, ML; Handke, P; Mills, T; Ramey, CJ; Hoang, T; Gill, RT; | Rapid dissection of a complex phenotype through genomic-scale mapping of fitness altering genes | Metabolic engineering | 12 | 3 | 241-250 | 2010 |
| Prior, Jamie E; Shokati, Touraj; Christians, Uwe; Gill, Ryan T; | Identification and characterization of a bacterial cytochrome P450 for the metabolism of diclofenac | Applied microbiology and biotechnology | 85 | 3 | 625-633 | 2010 |
| Prior, Jamie E; Lynch, Michael D; Gill, Ryan T; | Broad-host-range vectors for protein expression across gram negative hosts | Biotechnology and bioengineering | 10 | 2 | 326-332 | 2010 |
| Singh, Amarjeet; Karimpour-Fard, Anis; Gill, Ryan T; | Increased mutation frequency in redox-impaired Escherichia coli due to RelA-and RpoS-mediated repression of DNA repair | Applied and environmental microbiology | 76 | 16 | 5463-5470 | 2010 |
| Mills, Tirzah Y; Sandoval, Nicholas R; Gill, Ryan T; | Cellulosic hydrolysate toxicity and tolerance mechanisms in Escherichia coli | Biotechnol Biofuels | 2 | 1 | 26 | 2009 |

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|--|--|---------------------------------|----|----|---------|------|
| Singh, Amarjeet; Lynch, Michael D; Gill, Ryan T; | Genes restoring redox balance in fermentation-deficient <i>E. coli</i> NZN111 | Metabolic engineering | 11 | 6 | 347-354 | 2009 |
| Warner, Joseph R; Patnaik, Ranjan; Gill, Ryan T; | Genomics enabled approaches in strain engineering | Current opinion in microbiology | 12 | 3 | 223-230 | 2009 |
| Struble, Julie M; Gill, Ryan T; | Genome-scale identification method applied to find cryptic aminoglycoside resistance genes in <i>Pseudomonas aeruginosa</i> | PloS one | 4 | 11 | e6576 | 2009 |
| Drevinek, Pavel; Holden, Matthew TG; Ge, Zhaoping; Jones, Andrew M; Ketchell, Ian; Gill, Ryan T; Mahenthiralingam, Eshwar; | Gene expression changes linked to antimicrobial resistance, oxidative stress, iron depletion and retained motility are observed when <i>Burkholderia cenocepacia</i> grows in cystic fibrosis sputum | BMC infectious diseases | 8 | 1 | 121 | 2008 |
| Warnecke, TE; Lynch, MD; Karimpour-Fard, A; Sandoval, N; Gill, RT; | A genomics approach to improve the analysis and design of strain selections | Metabolic engineering | 10 | 3 | 154-165 | 2008 |
| Gall, S; Lynch, MD; Sandoval, NR; Gill, RT; | Parallel mapping of genotypes to phenotypes contributing to overall biological fitness | Metabolic engineering | 10 | 6 | 382-393 | 2008 |
| Karimpour-Fard, Anis; Leach, Sonia M; Gill, Ryan T; Hunter, Lawrence E; | Predicting protein linkages in bacteria: which method is best depends on task | BMC bioinformatics | 9 | 1 | 397 | 2008 |
| Bonomo, Jeanne; Lynch, Michael D; Warnecke, Tanya; Price, James V; Gill, Ryan T; | Genome-scale analysis of anti-metabolite directed strain engineering | Metabolic Engineering | 10 | 2 | 109-120 | 2008 |
| Karimpour-Fard, Anis; Leach, Sonia M; Hunter, Lawrence E; Gill, Ryan T; | The topology of the bacterial co-conserved protein network and its implications for predicting protein function | BMC genomics | 9 | 1 | 313 | 2008 |
| Lynch, Michael D; Warnecke, Tanya; Gill, Ryan T; | SCALES: multiscale analysis of library enrichment | Nature Methods | 4 | 1 | 87-93 | 2007 |
| Karimpour-Fard, Anis; Hunter, Lawrence; Gill, Ryan T; | Investigation of factors affecting prediction of protein-protein interaction networks by phylogenetic profiling | BMC genomics | 8 | 1 | 393 | 2007 |
| Coenye, Tom; Drevinek, Pavel; Mahenthiralingam, Eshwar; Shah, Shiraz Ali; Gill, Ryan T; Vandamme, Peter; Ussery, David W; | Identification of putative noncoding RNA genes in the <i>Burkholderia cenocepacia</i> J2315 genome | FEMS microbiology letters | 27 | 1 | 83-92 | 2007 |
| Karimpour-Fard, Anis; Detweiler, Corrella S; Erickson, Kimberly D; Hunter, Lawrence; Gill, Ryan T; | Cross-species cluster co-conservation: a new method for generating protein interaction networks | Genome Biol | 8 | 9 | R185 | 2007 |

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|---|---|--|-----------|-----------|------------------|-------------|
| Leiske, Danielle L; Karimpour-Fard, Anis; Hume, Patrick S; Fairbanks, Benjamin D; Gill, Ryan T; | A comparison of alternative 60- mer probe designs in an in-situ synthesized oligonucleotide microarray | BMC genomics | 7 | 1 | 72 | 2006 |
| Lynch, Michael D; Gill, Ryan T; | Broad host range vectors for stable genomic library construction | Biotechnology and bioengineering | 94 | 1 | 151-158 | 2006 |
| Bonomo, Jeanne; Warnecke, Tanya; Hume, Patrick; Marizcurrena, Alex; Gill, Ryan T; | A comparative study of metabolic engineering anti- metabolite tolerance in <i>E. coli</i> | Metabolic engineering | 8 | 3 | 227-239 | 2006 |
| Struble, Julie M; Gill, Ryan T; | Reverse engineering antibiotic sensitivity in a multidrug- resistant <i>Pseudomonas</i> <i>aeruginosa</i> isolate | Antimicrobial agents and chemotherapy | 50 | 7 | 2506-2515 | 2006 |
| Lynch, Michael D; Gill, Ryan T; | MINI-REVIEW: MAPPING PHENOTYPIC LANDSCAPES USING DNA MICRO-ARRAYS | | | | | 2006 |
| Warnecke, Tanya; Gill, Ryan T; | Organic acid toxicity, tolerance, and production in <i>Escherichia</i> <i>coli</i> biorefining applications | Microbial Cell Factories | 4 | 1 | 25 | 2005 |
| Dai, MingHua; Ziesman, Sara; Ratcliffe, Thomas; Gill, Ryan T; Copley, Shelley D; | Visualization of protoplast fusion and quantitation of recombination in fused protoplasts of auxotrophic strains of <i>Escherichia coli</i> | Metabolic engineering | 7 | 1 | 45-52 | 2005 |
| Bonomo, Jeanne; Gill, Ryan T; | Amino acid content of recombinant proteins influences the metabolic burden response | Biotechnology and bioengineering | 90 | 1 | 116-126 | 2005 |
| Bonomo, Jeanne; Gill, Ryan T; | Antibiotic resistance as a model for strain engineering | Computers & chemical engineering | 29 | 3 | 509-517 | 2005 |
| Lynch, Michael D; Gill, Ryan T; Stephanopoulos, Gregory; | Mapping phenotypic landscapes using DNA micro-arrays | Metabolic engineering | 6 | 3 | 177-185 | 2004 |
| Gill, Ryan T; Dodge, Tim; | Special issue on inverse metabolic engineering | Metabolic Engineering | 6 | 3 | 175-176 | 2004 |
| Gill, Ryan T; | Enabling inverse metabolic engineering through genomics | Current opinion in biotechnology | 14 | 5 | 484-490 | 2003 |
| Gill, Ryan T; Katsoulakis, Eva; Schmitt, William; Taroncher-Oldenburg, Gaspar; Misra, Jatin; Stephanopoulos, Gregory; | Genome-wide dynamic transcriptional profiling of the light-to-dark transition in <i>Synechocystis</i> sp. strain PCC 6803 | Journal of bacteriology | 18 | 13 | 3671-3681 | 2002 |
| Gill, Ryan T; Wildt, S; Yang, YT; Ziesman, S; Stephanopoulos, G; | Genome-wide screening for trait conferring genes using DNA microarrays | Proceedings of the National Academy of Sciences | 99 | 10 | 7033-7038 | 2002 |

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|---|--|---|----|----|-----------|------|
| Stephanopoulos, Gregory; Misra, Jatin; Hwang, Daehee; Schmitt, William A; Alevizos, Ilias; Silva, Saliya Sudharshana; Gill, Ryan T; | Defining biological states and related genes, proteins and patterns | | | | | 2002 |
| Gill, RT; DeLisa, MP; Valdes, JJ; Bentley, WE; | Genomic analysis of high-cell-density recombinant Escherichia coli fermentation and "cell conditioning" for improved recombinant protein yield | Biotechnology and bioengineering | 72 | 1 | 85-95 | 2001 |
| Stephanopoulos, Gregory; Gill, Ryan T; | After a decade of progress, an expanded role for metabolic engineering | Metabolic Engineering | | | 1-8 | 2001 |
| DeLisa, Matthew P; Gill, Ryan T; Bentley, William E; | Mapping Stresses in Escherichia Coli to Improve Yield | Recombinant Protein Production with Prokaryotic and Eukaryotic Cells. A Comparative View on Host Physiology | | | 43-54 | 2001 |
| Gill, RT; Valdes, JJ; Bentley, WE; | A Comparative Study of Global Stress Gene Regulation in Response to Overexpression of Recombinant Proteins in Escherichia coli | Metabolic engineering | 2 | 3 | 178-189 | 2000 |
| Gill, RT; DeLisa, MP; Shiloach, M; Holoman, TR; Bentley, WE; | OmpT expression and activity increase in response to recombinant chloramphenicol acetyltransferase overexpression and heat shock in E. coli | Journal of molecular microbiology and biotechnology | 2 | 3 | 283-289 | 2000 |
| Taroncher-Oldenburg, Gaspar; Gill, Ryan T; Stephanopoulos, Gregory; | GREEN BIOSYNTHESIS OF POLYHYDROXYALKANOATES: ENGINEERING OF CYANOBACTERIA FOR BIOPOLYMER PRODUCTION | 4th Annual Green Chemistry & Engineering Conference | | | 61 | 2000 |
| Gill, RT; Valdes, JJ; Bentley, WE; | Reverse transcription-PCR differential display analysis of Escherichia coli global gene regulation in response to heat shock | Applied and environmental microbiology | 65 | 12 | 5386-5393 | 1999 |
| Gill, Ryan T; | Dynamic analysis of global stress gene transcription during recombinant escherichia coli fermentation | | | | | 1999 |
| Valdes, JJ; Gill, RT; | Reverse transcription-PCR differential display analysis of Escherichia coli global gene | Applied and Environmental Microbiology | 65 | 12 | 5386-5393 | 1999 |

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|---|---|--|----|---|---------|------|
| Gill, Ryan T; Cha, Hyung Joon; Jain, Alok; Rao, Govind; Bentley, William E; | Generating controlled reducing environments in aerobic recombinant Escherichia coli fermentations: effects on cell growth, oxygen uptake, heat shock protein expression, and in vivo CAT activity | Biotechnology and bioengineering | 59 | 2 | 248-259 | 1998 |
| Bentley, WE; Madurawe, RD; Gill, RT; Shiloach, M; Chase, TE; Pulliam-Holoman, TR; Valdes, JJ; | Generation of a histidine-tagged antitoxin toxin antibody fragment in E. coli: effects of post-induction temperature on yield and IMAC binding-affinity | Journal of Industrial Microbiology and Biotechnology | 21 | 6 | 275-282 | 1998 |
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VI. ENTREPRENEURSHIP AND TECHNOLOGY TRANSFER

- Muse Biotechnologies, Inc. Co-founder, Founding CEO, Board Member (2015-Present)
 - Muse was founded by Gill, T. Lipscomb, and A. Garst in July, 2015.
 - Muse is a venture backed company focused on the development of technologies for automated genome engineering.
- Biota, Inc. (formerly UC2, Inc.), Co-Founder, Chair, Scientific Advisory Board (2012-Present)
 - UC2 was founded by Gill in 2012 based on commercializing microbiome technology and knowledge develop in Rob Knight's lab (CU-Biochemistry)
 - The UC2 concept evolved with the addition of Ajay Khastriya (CEO), Rob Chess (Board member), and Joel Moxley (SAB) as co-founders (along with Gill and Knight) into Biota, Inc., which was formally founded and funded in September 2013.
- Opxbio, Inc., Co-founder., Board Member (2007-2011) (Acquired by Cargill, Summer 2015)
 - Opx was founded by Gill and former student Mike Lynch in 2007 with initial investment raised by Gill and Lynch from Xseed Ventures (Palo Alto) and Mohr Davidow Ventures (Palo Alto).
 - Member of Board of Directors through 2011 as Opxbio grew to ~75 people, completed successful B and C financing rounds, and signed a joint development agreement with Dow Chemical. Opxbio raised approximately \$75 MM during this time.
 - Opxbio exclusively licensed a package of approximately ten pieces of intellectual property from the Gill Lab at CU (stemming from the SCALEs method invented in the Gill lab by Gill and Lynch).
 - Opxbio has generated international impact; including, Biofuels Digest top 30 hottest companies, Global Cleantech 100, Colorado Cleantech breakout company of the year, AlwaysON GoingGreen Global 200, Univ. of Colorado Company of the year, Governors Excellence Award in Renewable Energy, among others.
- Colorado Center for Biorefining and Biofuels (C2B2). Founding Managing Director. (2006-2012)
 - C2B2 was founded by Gill, W. Medlin, and A. Weimer in 2006 on the capital steps with participation from the Colorado delegation and executives of founding sponsors
 - C2B2 is a collaborative, industry sponsored research center that includes Univ. of Colorado. Colorado School of Mines, Colorado State University, and the National Renewable Energy Lab
 - C2B2 is funded by private company sponsors, which have included Shell Oil, ConocoPhillips, Chevron, Valero, Dupont, Dow, Weyerhaeuser, ADM, Gevo, Opxbio, Cobalt, LS9 among several dozen others (a total of ~40 sponsors since 2007).
 - Gill led (and was initial PI) the successful recruitment of ConocoPhillips as the first major research sponsor at C2B2 (an up to \$5 million over 5 year sponsored research agreement).

Intellectual Property

1. Gill, R.T. and Bentley, W.E. 1999. RTPCR Kit for Prokaryotic Differential Display. **Patent awarded** in 2004.
2. Gill, R.T., Wildt, S., and Stephanopoulos, G. 2001. A parallel gene-trait mapping method using DNA micro-arrays. Patent Pending.
3. Lynch, M. and Gill, R.T. 2004. Broad host range plasmid vectors. Patent Pending.
4. Copley, S., Dai, M. and Gill, R.T. 2004. Protoplast fusion techniques in gram-negative bacteria. Patent pending.
5. Lynch, M., Warnecke, T. and Gill, R.T. 2004. Mixed-Library Parallel Gene Mapping Quantitative Micro-Array Technique for Genome-Wide Identification of Trait Conferring Genes. US Patent 8,467,975. Issued, June 2013.
6. Lynch, M. and Gill, R.T. 2004. A panel of growth enhancing genes. Patent pending.
7. Warnecke, T. and Gill, R.T. 2005. Ethanol tolerance genes in *E. coli*. **Patent awarded** 2010.
8. Lynch, M. and Gill, R.T. 2006. A novel tool for linking screens with selections. Patent Pending.
9. Warnecke, T. and Gill, R.T. 2006. Patent Pending.
10. Warnecke, T., Lynch, M., and Gill, R.T. 2008. Patent Pending.
11. Warnecke, T., Lynch, M., and Gill, R.T. 2008. Patent Pending.
12. Sandoval, N. and Gill, R.T. 2008. Methods for engineering acetate tolerance. Provisional filed May, 2008. Converted to application in 2009.
13. Prior, J, Christians, U. and Gill, R.T. P450 enzyme for drug modification. Provisional Patent filed February, 2009.
14. Mills, T. and Gill, R.T. 2009. Methods for engineering aldehyde tolerance. Provisional filed July, 2009.
15. Gill, R.T. and Medlin, W. 2009. Molecular biorefining approach to biofuels. Provisional filed in July, 2009.
16. Gill, R.T. and Warner, J. 2010. Method for assigning relevance to genes for metabolic engineering applications. Provisional filed in May, 2010.
17. Gill, R.T., Reeder, P. and Warner, J. 2010. Genes for increasing strain performance in cellulosic hydrolysate. Provisional filed in May, 2010.
18. Andrews, L.A., and Gill, R.T. 2010. Genes for increasing ethanol tolerance. Provisional filed in November, 2010.
19. Lynch, S. and Gill, R.T. 2010. A method for in vivo protein sequence activity relationship mapping. Provisional filed November 2010.
20. Garst, A., Lynch, S., and Gill. 2013. CRISPR assisted protein engineering method. Provisional filed in February 2014.
21. Zeitoun, R. Garst, A., and Gill, R.T. 2013 Method for linking, emulsion based PCR for tracking combinatorial genomic scale mutations. Provisional filed in February, 2014.

Licenses

1. Lynch, M. and Gill, R.T. 2006. Broad host range plasmid vectors. Exclusive license granted to Lucigen, Inc., Middleton, Wisconsin.
2. Intellectual property #3 and #5-9 exclusively licensed to Opxbio, Boulder, CO
3. Intellectual property #10-11 exclusively licensed to Opxbio, Boulder, CO
4. #19-20 exclusively licensed to Muse bio.

VII. INVITED PRESENTATIONS

1. Massachusetts Institute of Technology, Summer, 2000. DNA microarray seminar series.
2. Fall, 2000. *Metabolic Engineering III*. Colorado Springs, CO. Panelist DNA Microarrays.
3. Princeton University, Spring, 2001. Department of Chemical Engineering
4. University of California-Berkeley. Spring, 2001. Department of Chemical Engineering.
5. University of Massachusetts-Amherst, Spring, 2001. Department of Chemical Engineering
6. University of Colorado-Boulder, Spring, 2001. Department of Chemical Engineering
7. University of Connecticut, Spring, 2001. Department of Chemical Engineering
8. University of Michigan, Spring, 2001. Department of Chemical Engineering
9. Rutgers University, Spring, 2001. Department of Chemical Engineering
10. University of Delaware, Spring, 2001. Department of Chemical Engineering
11. University of Colorado, Fall, 2001. Dept. of Molecular, Cellular, and Developmental Biology.
12. Colorado State University. Spring, 2002. Department of Chemical Engineering.
13. Fall, 2002. *Metabolic Engineering IV*. Tuscany, Italy.
14. University of Colorado Health Sciences Center. Spring, 2003. Bioinformatics Program.
15. Summer, 2003. *Biochemical Engineering XIII*. Boulder, CO.
16. Spring, 2004. *International Burkholderia cepacia working group annual meeting*. Vancouver, B.C., Canada.
17. Summer, 2004. *Cystic Fibrosis Foundation Williamsburg Conference*.¹
18. Spring, 2005. *International Burkholderia cepacia working group annual meeting*. Oklahoma.
19. Summer, 2005. *Society for Industrial Microbiology National Meeting*. Chicago, IL.
20. Summer, 2005. *Biochemical Engineering XIV*. Harrison Hot Springs, Canada.
21. Cargill, Inc. Biotechnology Development Center, Corporate R&D, August, 2005.
22. The Johns Hopkins University, Dept. of Chemical and Biomolecular Engineering, Oct. 2005.
23. University of Colorado Health Sciences Center, Dept. of Microbiology, January, 2006.
24. Cornell University, Department of Chemical and Biomolecular Engineering, February, 2006.
25. University of Wisconsin, Dept. of Chemical and Biomolecular Engineering, March, 2006.
26. University of Colorado, Molecular Biotechnology Initiative Symposium, May, 2006
27. Fall, 2006. *Metabolic Engineering VI*. Amsterdam, Netherlands. (New Tools Workshop)
28. Fall, 2006. Invited PodCast for the Journal *Genetic Engineering News*.
29. January, 2007. 1st International Conference on Biomolecular Engineering. San Diego, CA.
30. University of Pennsylvania, Department of Chemical Engineering. April, 2007.
31. Colorado School of Mines. Department of Chemical Engineering. April, 2007.
32. Merck, Inc., May, 2007
33. Dupont, Inc., June, 2007
34. Genencor, Inc., June, 2007
35. University of Tennessee, Department of Chemical Engineering, October, 2007
36. October, 2007. University of Colorado Energy Event. Houston, TX.
37. May, 2008. 5th Intl. Chemical Engineering Conference of Eastern Med. Countries. Italy.
38. August, 2008. TransAtlantic Froniers in Chemistry. United Kingdom.
39. September, 2008. Metabolic Engineering VI. Mexico. Strain Engineering Workshop Lead
40. Shell Oil, Exeter, United Kingdom, July, 2008.
41. Dupont, Inc. August, 2008.
42. Ecole Polytechnique Federal Lausanne (EPFL), December, 2008
43. Opx Bioproducts, March 2009.
44. Codexis, Inc. California, March 2009.

45. May, 2009. International Conference on Microbial Stress Tolerance, Austria.
46. September 2009. Society for General Microbiology. Edinburgh, Scotland.
47. Washington University, Dept. of Chemical Engineering. November 2009.
48. Joint Bioenergy Institute, Univ. California Berkeley, LBNL, Sandia Nat. Lab. December 2009
49. Chalmers University, Sweden. May 2010.
50. Shell Oil Global Biofuels R&D Center, Thornton, UK. May, 2010.
51. National Renewable Energy Laboratory, July 2010.
52. Dupont, Inc. July, 2010.
53. August, 2010. Society for Industrial Microbiology, San Francisco, CA.
54. Texas A&M University, Dept. Chemical Engineering. October, 2010.
55. Iowa St. University, Dept. Chemical Engineering. October, 2010.
56. University of Maryland. Dept. of Chemical Engineering/Bioengineering. December, 2010.
57. Codexis, Inc. January, 2011.
58. January, 2011. CHI PepTalk, San Diego, CA.
59. January, 2011. SBE Biomolecular Engineering Conference.
60. Pennsylvania State University, Dept. of Chemical Engineering. April, 2011.
61. Univ. California Berkeley, Energy Bioscience Institute, April, 2011. Berkeley, CA.
62. November, 2011. Cold Spring Harbor Asia, Shanghai, Synthetic Biology.
63. University of California, Riverside. Dept. of Chemical Engineering. January, 2012.
64. University of Illinois, Energy Biosciences Institute. March, 2012
65. University of Wisconsin, Dept. Chemical Engineering, April, 2012.
66. International Conference on Stress Tolerance. Piedemonte, Italy. May, 2012.
67. International Metabolic Engineering VII. Biarritz, France. June, 2012.
68. University of California, Berkeley. Dept. of Chemical Engineering. Feb. 2013.
69. Copenhagen Biosciences Conferences, Cell Factories, Copenhagen, Denmark, May, 2013.
70. Intl. Symposium on the Genetics of Industrial Microorganisms, Cancun, Mexico, June, 2013.
71. Gordon Research Conferences, Synthetic Biology I, Vermont, June, 2013.
72. National Science Foundation Workshop on Advanced Biomanufacturing, July 2013.
73. American Institute of Chemical Engineering, Special Session: Paradigms in Systems Biology, San Francisco, CA, November, 2013.
74. Rensselaer Polytechnical Institute, Dept. of Chemical Engineering, December, 2013.
75. North Carolina State University, Dept. of Chemical Engineering, February, 2014.
76. University of Minnesota, Dept. of Chemical Engineering and Biotechnology Series, April 2014.
77. Gordon Research Conferences, Photobiology, Piedemonte, Italy, April, 2014.
78. University of Washington, Dept. Chemical Engineering, June, 2014.
79. Synthetic Biology: Ev13olution, Engineering, and Design (SEED). July, 2014.
80. PepTalk. Keynote in Synthetic Biology Track. January, 2015.
81. University of California, San Diego. Dept. of Bioengineering. January, 2015.
82. ACS National Meeting, Keynote in Synthetic Biology Track. March, 2015.
83. Vanderbilt University, Dept. Chemical Engineering, April, 2015.
84. University of California, San Diego. Dept. of Pediatrics. May, 2015.
85. International Biochemical Engineering Conference (ECI), Puerto Vallarta, Mexico, July 2015.
86. National Sustainability Conference, Aspen, CO. September, 2015.
87. Northwestern University, Dept. Chemical Engineering, November, 2015.
88. Novo Nordisk Foundation Center for Biosustainability, October, 2016.
89. AIChE National Meeting, Featured Presentation in Genome Engineering, November, 2016.

Contributed Presentations: Approximately 15-20 per year presented by group members.