Dr. Amit Ghosh
Assistant Professor (School of Energy Science and Engineering)
Associate-faculty (P. K. Sinha Center for Bioenergy and Renewables)
Address: School Energy Science & Engineering
Indian Institute of Technology (IIT) Kharagpur
E-mail: amitghosh@iitkgp.ac.in; itsamit08@gmail.com
Phone: +91-3222-260804;
http://www.energy.iitkgp.ac.in/~amitghosh/

AREAS OF RESEARCH

- Metabolic Engineering and Synthetic Biology
- Multi-Omics Systems Biology
- ^{13}C Metabolic Flux Analysis
- Computer Simulation of Biomolecular Systems
- Bio-Energy

WORK EXPERIENCE

July 2015 – Present	**Assistant Professor**, School Energy Science & Engineering, IIT Kharagpur, West Bengal, India
May 2011 – July 2015	**Postdoctoral Research Associate** Joint BioEnergy Institute (JBEI), Lawrence Berkeley National Laboratory, California, USA
January 2009 – May 2011	**Postdoctoral Research Associate** Dept. of Chemical and Biomolecular Engineering, University of Illinois at Urbana Champaign, Illinois, USA

EDUCATION

Indian Institute of Science, Bangalore 2009
PhD, Biophysics & Molecular Biology
Molecular BioPhysics Unit (MBU)

Indian Institute of Technology, Kharagpur 2003
5-year integrated M.Sc, Physics
Department of Physics

AWARDS AND HONOURS

- **Faculty Excellence Award –** 2020, awarded by IIT Kharagpur for Outstanding Contribution Towards Teaching & Research
- **Early Career Research Award –** 2017-2020**,** awarded by SERB, DST, India
- **Ramalingaswami Re-entry Fellowship –** 2015 to 2021, awarded by Department of Biotechnology, India.
- **Prof. B. H. Iyer Medal –** 2009 awarded by IISc, Bangalore for best PhD thesis
- **Eli Lilly Asia Outstanding Thesis Award –** 2009 from Eli Lilly and Company, USA

PUBLICATIONS

Number of papers in International Journals: 47 **No of Citations Received**: 2180
H – index (Till April 2023): **22**
Number of papers under review in Journals: 4

PUBLICATIONS in Journals

1. Rokesh Radhakrishnan, Bharat Manna, Amit Ghosh (**2023**). Molecular insights into dissolution of lignin bunch in ionic liquid-water mixture for enhanced biomass conversion. ***Renewable Energy***, 206: 47-59. doi: https://doi.org/10.1016/j.renene.2023.02.036. **IF 8.63**

2. Pritam Kundu, **Amit Ghosh** (**2023**). Genome-scale community modeling for deciphering the inter-microbial metabolic interactions in fungus-farming termite gut microbiome. ***Computers in Biology and Medicine***, 106600. doi: https://doi.org/10.1016/j.compbiomed.2023.106600. **IF 6.69**

3. Abhijit Bera, Bharat Manna, Debabrata Ganguly, S.K.P.Amarnath, Samik Nanda, **Amit Ghosh**, Santanu Chattopadhyay (**2023**). Pretreatment of Hevea Latex by Sorbitol: Improving the Efficacy of Silica Dispersion by a Biomimetic Approach. ***ACS Applied Polymer Materials***, 5, 1, 441-451. doi: https://doi.org/10.1021/acsapm.2c01588. **IF 4.85**

4. Pradipta Patra, B.R. Disha, Pritam Kundu,Manali Das, **Amit Ghosh** (**2023**). Recent advances in machine learning applications in metabolic engineering. ***Biotechnology Advances***, 62, 108069. doi: https://doi.org/10.1016/j.biotechadv.2022.108069. **IF 17.68**

5. P Kundu, S Mondal, **Amit Ghosh** (**2022**). Bacterial species metabolic interaction network for deciphering the lignocellulolytic system in fungal cultivating termite gut microbiota. ***BioSystems***, 221: 104763. doi: https://doi.org/10.1016/j.biosystems.2022.104763. **IF 1.97**

6. Satyajit Beura, Pritam Kundu, Amit Kumar Das, **Amit Ghosh** (**2022**). Metagenome-scale community metabolic modelling for understanding the role of gut microbiota in human health. ***Computers in Biology and Medicine***, 149: 105997. doi: https://doi.org/10.1016/j.compbiomed.2022.105997. **IF 6.69**

7. S Mondal, P Kundu, **Amit Ghosh (2022)**. Understanding the biomass conversion processes of bovine gut microbiota through community-wide metabolic interaction network. ***Bioresource Technology Reports,*** 17: 100989. doi: https://doi.org/10.1016/j.biteb.2022.100989. **IF: 5.16**

8. Gourab Bhattacharje, **Amit Ghosh**, Amit Kumar Das **(2022)**. In-silico identification of critical residues in the mannose-transfer mechanism of phosphatidyl-myo-inositol mannosyltransferase B'. ***Biochemical and Biophysical Research Communications***, 629: 14-19. doi: https://doi.org/10.1016/j.bbrc.2022.06.087 **IF 3.32**

9. R Chakraborty, G Bhattacharje, J Baral, B Manna, J Mullick, B S Mathapati, P Abraham, Madhumathi J, Y Hasija, **Amit Ghosh**, Amit Kumar Das (2022). In-silico screening and in-vitro assay show the antiviral effect of Indomethacin against SARS-CoV-2. ***Computers in Biology and Medicine***, 147: 105788. doi: https://doi.org/10.1016/j.compbiomed.2022.105788 **IF 6.69**

10. Gourab Bhattacharje, **Amit Ghosh**, Amit Kumar Das **(2022)**. Understanding the Mannose Transfer Mechanism of Mycobacterial Phosphatidyl-myo-inositol Mannosyltransferase A from Molecular Dynamics Simulations. ***ACS Omega***, 7: 19288-19304. doi: https://doi.org/10.1021/acsomega.2c00832 **IF 4.13**

11. T Mondal, K Das, P Singh, M Natarajan, B Manna, **Amit Ghosh**, P Singh, SK Saha, K Dhama, T Dutt, S Bag (2022). Thin films of functionalized carbon nanotubes support long-term maintenance and cardio-neuronal differentiation of canine induced pluripotent stem cells. ***Nanomedicine: Nanotechnology, Biology and Medicine***, 40: 102487. doi: https://doi.org/10.1016/j.nano.2021.102487 IF**: 6.5**

12. Rokesh R, Bharat Manna, **Amit Ghosh** (**2022**). Solvent Induced Conformational Changes for the Altered Activity of Laccase: A Molecular Dynamics Study. ***Journal of Hazardous Materials***, 423: 127123. doi: https://doi.org/10.1016/j.jhazmat.2021.127123 IF**: 10.58**

13. Ayusmita Ray, Manoranjan Nayak, **Amit Ghosh** (**2022**). A review on co-culturing of microalgae: A greener strategy towards sustainable biofuels production. ***Science of The Total Environment***, 802: 149765. doi: https://doi.org/10.1016/j.scitotenv.2021.149765 IF**: 7.96**

14. Shubhasish Goswami, Bharat Manna, Krishnananda Chattopadhyay, **Amit Ghosh**, Supratim Datta (**2021**). Role of Conformational Change and Glucose Binding Sites in the Enhanced Glucose Tolerance of *Agrobacterium tumefaciens* 5A GH1 beta-Glucosidase Mutants. ***Journal of Physical Chemistry B***, 125: 9402-9416. doi: https://doi.org/10.1021/acs.jpcb.1c02150 IF**: 2.99**

15. Rokesh Radhakrishnan, Pradipta Patra, Manali Das, **Amit Ghosh** (**2021**). Recent advancements in the Ionic liquid mediated lignin valorization for the production of renewable materials and value-added chemicals. ***Renewable and Sustainable Energy Reviews***. 149:111369. doi:https://doi.org/10.1016/j.rser.2021.111368 IF**: 11.24**

16. Bharat Manna, **Amit Ghosh (2021)**. Understanding the Dissolution of Softwood Lignin in Ionic Liquid and Water Mixed Solvents. ***International Journal of Biological Macromolecules***, 182: 402-412. doi: https://doi.org/10.1016/j.ijbiomac.2021.04.006 IF**: 5.16**

17. Piyush Nanda, **Amit Ghosh (2021)**. Genome Scale-Differential Flux Analysis reveals deregulation of lung cell metabolism on SARS Cov2 infection. ***PLoS Computational Biology***, 17(4):e1008860. doi: https://doi.org/10.1371/journal.pcbi.1008860 IF**: 4.43**

18. Bharat Manna, **Amit Ghosh** (**2021**). Understanding the conformational change and inhibition of hyperthermophilic GH10 xylanase in ionic liquid. ***Journal of Molecular Liquids,*** 332:115875. doi: https://doi.org/10.1016/j.molliq.2021.115875 IF**: 5.06**

19. Pradipta Patra, Manali Das, Pritam Kundu, **Amit Ghosh** (**2021**). Recent Advances in Systems and Synthetic Biology Approaches for Developing Novel Cell-factories in Non-Conventional Yeasts. ***Biotechnology Advances***, 47: 107695. doi: https://doi.org/10.1016/j.biotechadv.2021.107695 IF**: 10.74**

20. Bharat Manna, **Amit Ghosh** (**2021**). Molecular Insight into glucose induced conformational change to investigate uncompetitive inhibition of GH1 beta-glucosidase. ***ACS Sustainable Chemistry & Engineering***, 9:1613-1624. doi: https://doi.org/10.1021/acssuschemeng.0c06865 IF**: 7.63**

21. Piyush Nanda, Pradipta Patra, Manali Das, **Amit Ghosh** (**2020**) Reconstruction and analysis of genome-scale metabolic model of weak Crabtree positive yeast Lachancea kluyveri. ***Scientific Reports***. 10: 16314. doi: https://doi.org/10.1038/s41598-020-73253-3 IF**: 5.13**

22. Das M, Patra P, **Amit Ghosh**. (**2020**) Metabolic engineering for enhancing microbial biosynthesis of advanced biofuels. ***Renewable and Sustainable Energy Reviews***. 119: 109562. doi: https://doi.org/10.1016/j.rser.2019.109562 IF**: 11.23**

23. Gangopadhyay K, Manna B, Roy S, Kumari S, Debnath O, Chowdhury S, **Amit Ghosh**, Das R. (**2020**) An allosteric hot spot in the tandem-SH2 domain of ZAP-70 regulates T-cell signaling. ***Biochemical Journal*** 477, 1287–1308. doi: https://doi.org/10.1042/BCJ20190879 IF**: 4.33**

24. Manna B, **Amit Ghosh**. (2020) Structure and dynamics of ionic liquid tolerant hyperthermophilic endoglucanase Cel12A from Rhodothermus marinus. ***RSC Advances***: 10, 7933-7947 doi: https://doi.org/10.1039/C9RA09612D IF**: 3.36**

25. Pritam Kundu, Bharat Manna, Subham Majumder, **Amit Ghosh**. (**2019**) Species-wide Metabolic Interaction Network for Understanding Natural Lignocellulose Digestion in Termite Gut Microbiota. ***Scientific Reports***. 9: 16329. doi: https://doi.org/10.1038/s41598-019-52843-w IF**: 5.13**

26. Manna B, **Amit Ghosh**. (**2019**) Dissolution of Cellulose in Ionic Liquid and water mixtures as revealed by Molecular Dynamics Simulations.***Journal of Biomolecular Structure and Dynamics***. 431: 1353-1369. doi: https://doi.org/10.1080/07391102.2018.1533496 IF**: 3.39**

27. Maiti S, Acharya B, Boorla VS, Manna B, **Amit Ghosh**, De S. (**2019**) Dynamic Studies on Intrinsically Disordered Regions of Two Paralogous Transcription Factors Reveal Rigid Segments with Important Biological Functions." ***Journal of Molecular Biology***. 43: 1353-1369. doi: https://doi.org/10.1016/j.jmb.2019.02.021 IF**: 5.06**

28. K. Duraivelan, A. J. Basak, **Amit Ghosh**, D. Samanta. (**2018**) Molecular and structural bases of interaction between extracellular domains of nectin-2 and N-cadherin. ***Proteins: Structure, Function, and Bioinformatics***. 86: 1157-1164. doi: https://doi.org/10.1002/prot.25596 IF**: 3.5**

29. Muddassir M, Manna B, Singh P, Singh S, Kumar R, **Amit Ghosh**, Sharma D. (**2018**) Single-molecule force-unfolding of titin I27 reveals a correlation between the size of the surrounding anions and its mechanical stability. ***Chemical Communications***. 54: 9635-9638. doi: https://doi.org/10.1039/C8CC05557B IF**: 6.3**

30. d'Espaux L, **Amit Ghosh**, 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, García Martín H, Keasling JD. (**2017**) Engineering high-level production of fatty alcohols by Saccharomyces cerevisiae from lignocellulosic feedstocks. ***Metabolic Engineering***. 42: 115. doi: https://doi.org/10.1016/j.ymben.2017.06.004 IF**: 8.49**

31. Birkel GW, **Amit Ghosh**, Kumar VS, Weaver D, Ando D, Backman TW, Arkin AP, Keasling JD, Martín HG. (**2017**) The JBEI quantitative metabolic modeling library (jQMM): a python library for modeling microbial metabolism. ***BMC Bioinformatics***. 18(1): 205. doi: https://doi.org/10.1186/s12859-017-1615-y IF**: 3.17**

32. Amit Ghosh, Ando D, Gin J, Runguphan W, Denby C, Wang G, Baidoo E, Shymansky C, Keasling JD, Martin HG. (**2016**) ^{13}C Metabolic Flux Analysis for systematic metabolic engineering of *S. cerevisiae* for overproduction of fatty acids. ***Frontiers in Bioengineering and Biotechnology***, 4: 76. doi: https://doi.org/10.3389/fbioe.2016.00076 IF: **5.89**

33. Amit Ghosh. (**2016**) Systems and Synthetic Biology for the Microbial Production of Biofuels. ***Current Metabolomics***, 4(1): 5-13. https://doi.org/10.2174/2213235X03666151012192823

34. Yang Y, Liang Y, Han X, Chiu TY, **Amit Ghosh**, Chen H & Tang M. (**2016**) The roles of arbuscular mycorrhizal fungi (AMF) in phytoremediation and tree-herb interactions in Pb contaminated soil. ***Scientific Reports***, 6: 20469. doi: https://doi.org/10.1038/srep20469 IF: **5.13**

35. Yang Y, Han X, Liang Y, **Amit Ghosh**, Chen J, Tang M. (**2015)** The Combined Effects of Arbuscular Mycorrhizal Fungi (AMF) and Lead (Pb) Stress on Pb Accumulation, Plant Growth Parameters, Photosynthesis, and Antioxidant Enzymes in Robinia pseudoacacia L. ***PLoS One***. 10(12), e0145726. doi: https://doi.org/10.1371/journal.pone.0145726 IF: **3.24**

36. Y Yang, Y Liang, **Amit Ghosh**, Y Song, H Chen, M Tang (**2015)** Assessment of arbuscular mycorrhizal fungi status and heavy metal accumulation characteristics of tree species in a lead-zinc mine area: potential applications for phytoremediation. ***Environmental Science and Pollution Research***, 22, 13179-13193. doi: https://doi.org/10.1371/journal.pone.0145726 IF: **4.3**

37. Yang Y, Song Y, Schellerd HV, **Amit Ghosh**, Ban Y, Chen H, Tang M. (**2015)** Community structure of arbuscular mycorrhizal fungi associated with Robinia pseudoacacia in uncontaminated and heavy metal contaminated soils. ***Soil Biology and Biochemistry***, 86, 146–158. doi: https://doi.org/10.1016/j.soilbio.2015.03.018 IF: **6.06**

38. Martín HG, Kumar VS, Weaver D, **Amit Ghosh**, Chubukov V, Arkin A, Keasling JD. (**2015)** A ^{13}C-based method for metabolic flux measurement and prediction in genome-scale models. ***PLoS Computational Biology***, 11(9), e1004363. doi: https://doi.org/10.1371/journal.pcbi.1004363 IF: **4.43**

39. Amit Ghosh, Nilmeier J, Weaver D, Adams PD, Keasling JD, Mukhopadhyay A, Petzold CJ, Martín HG. (**2014**) A peptide-based method for 13C metabolic flux analysis in microbial communities. ***PLoS Computational Biology***. 10(9), e1002827. doi: https://doi.org/10.1371/journal.pcbi.1003827 IF **4.43**

40. Amit Ghosh, Zhao H, and Price ND. (**2011)** Genome-scale Consequences of Cofactor Balancing in Engineered Pentose Utilization Pathways in Saccharomyces. ***PLoS One***. 6(11), e27316. doi: https://doi.org/10.1371/journal.pone.0027316 IF **3.24**

41. Amit Ghosh, Sakaguchi R, Liu C, Vishveshwara S and Hou YM. (**2011**) Allosteric communication in CysteinyltRNASynthetase: A network of direct and indirect readout. ***Journal of Biological Chemistry.*** 286,37721-31. doi: https://doi.org/10.1074/jbc.M111.246702 IF **5.16**

42. Bhattacharyya M, **Amit Ghosh**, Hansia P, Vishveshwara S. (**2010**) Allostery and conformational free energy changes in human tryptophanyl-tRNAsynthetase from essential dynamics and structure networks. ***Proteins: Structure, Function, and Bioinformatics***. 78(3), 506-17. doi: https://doi.org/10.1002/prot.22573 IF **3.5**

43. Hansia P, **Amit Ghosh**, Vishveshwara S. (**2009**) Ligand dependent Intra and Inter subunit Communication in Human TryptophanyltRNASynthetase as Deduced from the Dynamics of Structure Networks. ***Molecular BioSystems***. 5(12), 1860-72. doi: https://doi.org/10.1039/b903807h IF **3.74**

44. Vishveshwara S, **Amit Ghosh** and Hansia P. (**2009**) Intra and Inter molecular communications through Protein Structure Network. ***Current Protein & Peptide Science***. 10(2), 146-160. doi: https://doi.org/10.2174/138920309787847590 IF **3.27**

45. Amit Ghosh and Vishveshwara S. (**2008**) Variations in clique and community patterns in protein structures during allosteric communication: Investigation of dynamically equilibrated structures of

methionyltRNAsynthetase complexes. ***Biochemistry***, 47(44), 11398-407. doi: https://doi.org/10.1021/bi8007559 IF **3.19**

46. Amit Ghosh and Vishveshwara S. (**2007)** A study of Communication Pathways in MethionyltRNASynthetase by Molecular Dynamics Simulations and Structure Network analysis. ***Proceedings of the National Academy of Sciences USA.*** 104, 15711-15716. doi: https://doi.org/10.1073/pnas.0704459104 IF **11.2**

47. Amit Ghosh, Brinda KV, and Vishveshwara S. (**2007)** Dynamics of Lysozyme Structure Network: Probing the process of Unfolding. ***Biophysical Journal***, 92(7):2523-2535. doi: https://doi.org/10.1529/biophysj.106.099903 IF **4.03**