

NAME	ABHISHEK SENGUPTA	
DESIGNATION	Assistant Professor	
EMAIL ID	asengupta@amity.edu	
CONTACT NUMBER	+91-8800662904	

RESEARCH INTERESTS

My research involves biological network construction and integration, constraint-based modelling, predictive modeling and multi-omics integration through Systems Biology and Machine Learning, and further data-driven hypothesis generation. My research group at Amity University, Noida works on computational methods to study metabolic and gene regulatory disease networks, understanding disease pathogenesis and progression, molecular mechanisms and determine new drug targets and propose novel insights. My research goal is broadly focused on the development and application of predictive computational models and associated web-tools/databases for predicting and analyzing the behaviors of complex physiological systems ranging over multiple scales of organization from molecular level to the tissue/organ/organism/population level.

- Condition-specific and personalized modeling through Genome-scale Metabolic models based on integration of transcriptomic, proteomic and metabolomic data.
- Biological network inference, community and topology analysis and visualization.
- Identification of key biological functions and pathways.
- Identification of potential biomarkers and targetable genes through modeling and biological network analysis.
- Application of key machine learning methods for multi-omics analysis.

EDUCATIONAL QUALIFICATIONS:

Name of College / University	Degree	Year
AUUP, Noida	B. Sc (Hons) Biotechnology	2006
Nottingham Trent University, Nottingham, United Kingdom	M. Sc Bioinformatics	2007
Amity University, Uttar Pradesh, Noida	Ph. D	2015

Title of Ph.D. thesis: “Modeling and Analysis of Human Energy Metabolic Network”

EXPERIENCE (in chronological order)

Designation	Type of post held (teaching/ research)	Name of the Institute	Year (From – To)
Assistant Professor	Teaching and Research	Systems Biology and Data Analytics Research Lab, Centre for Computational Biology and Bioinformatics, Amity Institute of Biotechnology, Amity University, Noida. (Lab website: www.sbdaresearch.com)	2009-till date
PhD Scholar	Research	Systems Biology, Centre for Computational Biology and Bioinformatics, Amity Institute of Biotechnology, Amity University, Noida.	2011- 2015

Lecturer	Teaching	Krupanidhi Degree College, Bangalore.	2008-2009	
<p>PUBLICATIONS:20</p>		<p>1.Kamboj, Himanshu, Lovely Gupta, Pawan Kumar, Pooja Sen, Abhishek Sengupta, and Pooja Vijayaraghavan. "Gene expression, molecular docking, and molecular dynamics studies to identify potential antifungal compounds targeting virulence proteins/genes VelB and THR as possible drug targets against <i>Curvularia lunata</i>." <i>Frontiers in Molecular Biosciences</i> 9 (2022).</p> <p>2. Narad, Priyanka, Romasha Gupta, Sabyasachi Mohanty, Ritika Sharma, Nagma Abbasi, and Abhishek Sengupta. "Systems Biology Paradigm for Exploring the Relation Between Obesity and Ovarian Cancer with a Focus on Their Genome-Scale Metabolic Models." In <i>Emerging Technologies in Data Mining and Information Security: Proceedings of IEMIS 2022, Volume 2</i>, pp. 613-624. Singapore: Springer Nature Singapore, 2022.</p> <p>3.Saroha, A., Pal, D., Gomashe, S.S., Kaur, V., Ujjainwal, S., Rajkumar, S., Aravind, J., Radhamani, J., Kumar, R., Chand, D. and Sengupta, A., 2022. Identification of QTNs associated with Flowering time, Maturity and Plant height traits in <i>Linum usitatissimum</i> L. using Genome Wide Association Study. <i>Frontiers in Genetics</i>, p.1275.</p> <p>4. Saroha, A., Pal, D., Kaur, V., Kumar, S., Bartwal, A., Aravind, J., Radhamani, J., Rajkumar, S., Kumar, R., Gomashe, S.S. and Sengupta, A., 2021. Agro-morphological variability and genetic diversity in linseed (<i>Linum usitatissimum</i> L.) germplasm accessions with emphasis on flowering and maturity time. <i>Genetic Resources and Crop Evolution</i>, pp.1-19.</p> <p>5. Bharti, S., Sengupta, A., Chugh, P., & Narad, P. (2020). PluriMetNet: A dynamic electronic model decrypting the metabolic variations in human embryonic stem cells (hESCs) at fluctuating oxygen concentrations. <i>Journal of Biomolecular Structure and Dynamics</i>, 1-9.</p> <p>6. Abhishek Sengupta, Pooja Vijayaraghavan, Priyansh Srivastava, Lovely Gupta, Chaitanya Chandwani and Priyanka Narad*, "In-</p>		

Silico Structure-Based Drug Discovery of Candidate Drugs against Novel Protein Receptor Complex Nsp10-Nsp16 of SARS-CoV-2 using Drug Repurposing Approach”, *Coronaviruses*(2020)1:1.

<https://doi.org/10.2174/2666796701999201014161604>

7. Srivastava, P., Talwar, M., Yadav, A., Choudhary, A., Mohanty, S., Bharti, S., ... & Sengupta, A. (2020). **VIRdb 2.0: Interactive analysis of comorbidity conditions associated with vitiligo pathogenesis using co-expression network-based approach.** *F1000Research*, 9(1055), 1055.

8. Srivastava, P., Choudhury, A., Talwar, M., Mohanty, S., Narad, P., & Sengupta, A. (2020). **VIRdb: a comprehensive database for interactive analysis of genes/proteins involved in the pathogenesis of vitiligo.** *PeerJ*, 8, e9119.

9. Bharti, S., Narad, P., Chugh, P., Choudhury, A., Bhatnagar, S., & Sengupta, A. (2020). **Multi-parametric disease dynamics study and analysis of the COVID-19 epidemic and implementation of population-wide intrusions: The Indian perspective.** *medRxiv*.

10. Narad, P., Anand, L., Gupta, R., & Sengupta, A. (2018). **Construction of Discrete Model of Human Pluripotency in Predicting Lineage-Specific Outcomes and Targeted Knockdowns of Essential Genes.** *Scientific reports*, 8(1), 11031.

11. Sengupta, Abhishek, Monendra Grover, Amlan Chakraborty, and Sarika Saxena. **"HEPNet: A Knowledge Base Model of Human Energy Pool Network for Predicting the Energy Availability Status of an Individual."** *PloS one* 10, no. 6 (2015): e0127918.

12. Sengupta, A., & Narad, P. (2016, March). **Glucose concentration varies logarithmically under both glycemic conditions in a computationally reconstructed human energy pool network (HEPNet).** In *Bioinformatics and Systems Biology (BSB), International Conference proceedings on* (pp. 1-4). IEEE.

13. Narad, P., Kumar, A., Chakraborty, A., Patni, P., Sengupta, A., Wadhwa, G., & Upadhyaya, K. C. (2016). **Transcription Factor**

Information System (TFIS): A Tool for Detection of Transcription Factor Binding Sites. *Interdisciplinary Sciences: Computational Life Sciences*, 1-14.

14. Mitra, J., Narad, P., Sengupta, A., Sharma, P. D., & Paul, P. K. (2015). **In silico Identification of Ergosterol as a Novel Fungal Metabolite Enhancing RuBisCO Activity in *Lycopersicon esculentum*.** *Interdisciplinary Sciences: Computational Life Sciences*, 1-12.

15. Jain A., Sengupta A., Narad P. (2015), **Constitutively Activated Tyrosine Kinase Inhibitor Drug Design: Homology Modeling And Docking Studies On Chronic Myelogenous Leukemia Bcr-Abl Fusion Protein.** *International J. of Pharma and BioSciences*, 6 (2): 1215-1225.

16. Sengupta, Abhishek, and Sarika Saxena. "A Computational Model of Mitochondrial Beta-Oxidation Highlighting the Implications on Uremia Disease in Human." *IJSCE*. (2014): 188-192.

17. Sengupta, Abhishek, Sarika Saxena, Gaurav Singh, Priyanka Narad, Ayushi Yadav, and Monendra Grover. "A Computational Systems Biology Approach to Decipher Significant Intricacies of Dihydrolipoamide Dehydrogenase Deficiency in Human." *IJSCE* (2014) Volume-4, Issue-1: 166-170.

18. Narad, P., Jain, A., Sengupta, A. (2014); **Docking studies for tuberculosis taking alanine racemase as a receptor and a novel plant source quercetin as a potential drug source,** *International J. of Pharma and BioSciences*, Vol.5, Issue 3: B31-B39.

19. Narad, P., Malpani, M., Chakraborty, V., & Sengupta, A. (2012). **Comparative Homology Modeling and Docking of Lamin A Molecule and its Incidence in Progeria.** *Int J Pharm Bio Sci*, 1164-1170.

20. Narad, P., Sengupta, A., & Wadhwa, G. (2011). **Evolution of homeobox protein sequence (Hoxa9) across different species using phylogenetic analysis and expression analysis of the**

sequence in reference to the occurrence of Acute Myeloid Leukemia. *Journal of Natural Science, Biology and Medicine*, 2(3), 32.

BOOK CHAPTERS

1. Sengupta, Abhishek, Payal Gupta, Payal Priyadarshini, Sudeepti Kulshrestha, Ankur Chaurasia, and Priyanka Narad. **"Integrating artificial intelligence techniques for analysis of next-generation sequencing data."** *Artificial Intelligence and Computational Dynamics for Biomedical Research* 8 (2022): 67.
2. Narad, Priyanka, Romasha Gupta, and Abhishek Sengupta. **"Plant metabolomics: a new era in the advancement of agricultural research."** In *Bioinformatics in Agriculture*, pp. 139-160. Academic Press, 2022.
3. Narad, Priyanka, G. Naresh, and Abhishek Sengupta. **"Metabolomics and flux balance analysis."** In *Bioinformatics*, pp. 337-365. Academic Press, 2022.
4. Chaurasia, Ankur, Vats, Sakshi, Sengupta, Abhishek, Bansal, Abhay and Priyanka Narad. **"Practical Applications of Artificial Intelligence for Disease Prognosis and Management."** In *Artificial Intelligence and Machine Learning in Healthcare*, pp. 1-36. Springer, Singapore, 2021.
5. Sengupta, Abhishek, G. Naresh, Astha Mishra, Diksha Parashar, and Priyanka Narad. **"Proteome analysis using machine learning approaches and its applications to diseases."** *Advances in Protein Chemistry and Structural Biology* 127 (2021): 161-216.
6. Sengupta, Abhishek, and Priyanka Narad. **"Metabolomics."** In *Omic Approaches, Technologies and Applications*, pp. 75-97. Springer, Singapore, 2018.

RESEARCH PROJECTS

Completed: *(total no.)* 00

Ongoing: *(total no.)* 01

Ongoing: DBT, Govt. of India, A hybrid Bayesian approach to address socio-economic challenges in Assisted Reproductive Techniques across Indian sub population through a web-based implementation **amounting to (ongoing) 24.67 lakhs. 2020-2023: Co-Investigator**

<p>COPYRIGHTS/PATENTS</p>	<ol style="list-style-type: none"> 1. Copyright Registered: ARTPRE: An Online Tool To Predict The Success Rates Of Assisted Reproductive Procedures In Indian Subcontinent (Registration number: L-109979/2021) 2. Copyright Registered: Fertility Predictor: Web Application For Prediction Of The Likelihood Of Successful Sperm Retrieval, Fertilization, Clinical Pregnancy And Live Birth In Males With "Y" Chromosome Microdeletions (Registration number: L-116225/2022)
<p>AWARDS & HONOURS/ DISTINCTIONS</p>	<ul style="list-style-type: none"> • DST SERB Young Scientist Travel Award • Selected for Advanced Course on In-silico Systems Biology at WellCome Trust Genome Campus, EMBL-EBI, UK. • Resource Person/Instructor, DBT Sponsored Short Term Training Course on “Application of Metagenomics Tools for Bioremediation Towards Environmental Restoration” on November 14th - 29th, 2017. • Resource Person, DST INSPIRE Internship Program for school students. • Reviewer: PLoS One • Reviewer: Computers in Biology and Medicine (Elsevier) • Reviewer: BMC Medical Genomics • Reviewer: Journal of Biomolecular Structure & Dynamics (Taylor & Francis)
<p>MEMBERSHIP with Professional/ Academic bodies</p>	<ul style="list-style-type: none"> • Member of Society of Mathematical Biology • Member of European Systems Biology Community • Member of International Society of Computational Biology • Member of Nordic Metabolomics Society • Member of Swiss Metabolomics Society • Member of the Asia Pacific Bioinformatics Network (APBioNET)