Curriculum-Vitae

Mr. Atul Kumar Jaiswal Assistant Professor Bioinformatics Jamia Hamdard University New Delhi Mobile: +91-7982204700 E-mail: <u>atulj91@gmail.com</u>

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To pursue career in Computational biology and bio-informatics where I can utilized my

knowledge to teach and solve complex biological problems.

Reseach and Teaching interest

In my PhD and post-PhD research journey, I have been curious about a variety of scientific problems. I've been deeply engaged in unraveling the mysteries of molecular mechanisms, particularly focusing on the groundbreaking CRISPR-Cas9 and CRISPR-Cpf1 technologies. Using computational methods, I've delved into the intricate details of how these gene-editing tools precisely hit their targets while also exploring the factors influencing off-target effects. My curiosity extends to the aromatic world of essential oils, where I've sought to identify and understand how plant-based components can play a pivotal role in limiting food contamination and prolonging the lifetime of a variety of food. During my PhD, I was introduced to the fascinating world of nucleic acid solvation which immediately grabbed my attention and this is the area I still want to work on. We studied a very complex problem of solvation patterns and the thermodynamic aspect of solvation of nucleic acids in a dilute and crowded environment. Along with this, I have a great interest in understanding the physicochemical properties of nucleic acids which can help us identify and classify different types of DNA/RNA sequences which could be of great help for functional annotation of these sequences. Overall I have a diverse set of research interests which reflects my dedication to unravelling various molecular intricacies of biological molecules to understand molecular structure and function.

My interest in teaching has been cultivated through diverse experiences in academic and non-academic settings. During three semesters from 2016 to 2018, I worked as a Teaching Assistant for Professor Pradipta Bandyopadhyay in the course "Statistical Mechanics for Biomolecules" at Jawaharlal Nehru University, New Delhi's School of Computational and Integrative Science. In this position, I was able to help students grasp some very basic statistical mechanics ideas applied in the field of molecular dynamics simulation while also engaging with them. Teaching 10+2 kids maths was something I enjoyed doing both my undergraduate and graduate degrees. Through these experiences, I have developed my educational abilities and gained a profound understanding of the transforming power of education. I am motivated to create a positive and enriching learning environment, where I can share my passion for scientific concepts and inspire students to explore the intricacies of their chosen fields.

PhD Thesis:

Title: A Computational Study of Physicochemical Features of Nucleic Acids and DNA-Solvent Interactions.

Place: School of Computational and Integrative Sciences, Jawaharlal Nehru University, New Delhi, India.

Overview: The present thesis deals with nucleic acids, their solvation, and thermodynamics of solvation and how these calculated thermodynamical properties can be used to classify different types of nucleic acid segments such as promoters, autonomous replicating sequences (ASR), long noncoding RNA (lncRNA) etc. at the very sequence level. Sequence and structure are highly connected and we made an attempt to explore these using structural, dynamical, and thermodynamic properties of nucleic acid. In a way, it can be said that this thesis follows a top- down approach in which we first study the structural level properties of nucleic acids and then with the obtained information we develop discriminatory methods to classify nucleic acid sequences.

Patents:

1. Patent No: 202531013999

Title: "A method for genome editing using CRISPR-Cas systems to enhance stress resilience and crop yield"

Filing date: 18-Feb-2025

Publication date: 07-March-2025

Status: Patent yet to be granted.

2. Patent No: 202441091332

Title: "A microorganism formulation and method for efficient plastic waste degradation and sustanable recycling"

Filing date: 23- Nov-2024

publicaiton date: 29-Nov-2024

Status: Patent yet to be granted.

Publications:

- Singh, P. P., Jaiswal, A. K., Singh, R., Kumar, A., Gupta, V., Raghuvanshi, T. S., ... & Prakash, B. (2024). Assessment of Trachyspermum ammi essential oil against Aspergillus flavus, aflatoxin B1 contamination, and post-harvest quality of Sorghum bicolor. *Food Chemistry*, 138502.
- Jaiswal, A. K., Singh, P. P., & Prakash, B. (2023). Prospects of Bioinformatics and Data Acquirement Tools in Boosting the Application of Phytochemicals in Food Sciences. In *Plant Essential Oils: From Traditional to Modern-day Application* (pp. 281-302). Singapore: Springer Nature Singapore.
- 3. Singh, P. P., **Jaiswal, A. K.**, Raghuvanshi, T. S., & Prakash, B. (2023). Insights into the antimicrobial efficacy of Coleus aromaticus essential oil against food-borne microbes: Biochemical and molecular simulation approaches. *Food and Chemical Toxicology*, *182*, 114111.
- Vora, D. S., Jaiswal, A. K., & Sundar, D. (2023). Implementing accelerated dynamics to unravel the effects of high-fidelity Cas9 mutants on target DNA and guide RNA hybrid stability. *Journal of Biomolecular Structure and Dynamics*, *41*(13), 6178-6190.
- Jaiswal, A. K., & Prakash, B. (2023). Bioinformatics approaches: elucidation of novel sites of action, toxicity prediction tool, and perception of bioactive compounds. In *Green Products in Food Safety* (pp. 309-327). Academic Press.
- Kumar, M., Singh, S. K., Singh, P. P., Singh, V. K., Rai, A. C., Srivastava, A. K., ... & Kumar, A. (2021). Potential anti-Mycobacterium tuberculosis activity of plant secondary metabolites: insight with molecular docking interactions. *Antioxidants*, 10(12), 1990.
- Singh, P. P., Jaiswal, A. K., Kumar, A., Gupta, V., & Prakash, B. (2021). Untangling the multi-regime molecular mechanism of verbenol-chemotype Zingiber officinale essential oil against Aspergillus flavus and aflatoxin B1. *Scientific Reports*, *11*(1), 6832.
- Jaiswal, A. K., & Krishnamachari, A. (2019). Physicochemical property based computational scheme for classifying DNA sequence elements of Saccharomyces cerevisiae. *Computational Biology and Chemistry*, 79, 193-201.
- Jaiswal, A. K., Srivastava, R., Pandey, P., & Bandyopadhyay, P. (2018). Microscopic picture of water-ethylene glycol interaction near a model DNA by computer simulation: Concentration dependence, structure, and localized thermodynamics. *PloS one*, *13*(11), e0206359.

- 10.Jaiswal, A. K., Husaini, S. H. A., Kumar, A., & Subbarao, N. (2018). Designing novel inhibitors against Mycobacterium tuberculosis FadA5 (acetyl-CoA acetyltransferase) by virtual screening of known anti-tuberculosis (bioactive) compounds. *Bioinformation*, 14(6), 327.
- Sohana Najrin, Atul Kumar Jaiswal*, Bhanu Prakash, and Prem Pratap Singh*, Machine Intelligence for Safer Food: Integrating AI in Chemical Risk Assessment and Food Safety Practices.
- 12.Divya raj Prasad, Atul Kumar jaiswal Jeetu Narware, Bipin Maurya, Satyendra P. Singh, JS. Tripathi, Epigenetic Regulation of plant micro RNA and Stress Tolerence.

- 13.Pooja Rani Aggarwal, Archana Sharma, Atul kumar jaiswal, Rajul Tayal, Niranjan Chakraborty, Subhra Chakraborty, Basic helix loop helix proteins in legumes: a superfamily of transcription factor with diverse functional networks and evolutionary significance. —under communication
- 14.**Atul Kumar jaiswal**, Chetan, kanika Narula, RiceIntDB: an integrative database for rice metabolome. –under prepration
- 15.Akriti Sapra, Sohana Najrin, Akshat Bhatt, Atul Kumar jaiswal, A systematic review of CRISPR-Cas9 on-target and off-target efficacy. —under prepration

Scholarships and awards

- 1. Awarded scholarship (Merit Cum Means) in B.Sc 2nd and 3rd year by University of Allahabad in 2009.
- 2. Awarded Department of Biotechnology(DBT) Scholarship in M.Sc Biotechnology.
- 3. Awarded first consolation award for oral presentation in 17th international conference on Bioinformatics, 2018 (Incob2018)

Symposium/Workshop and Poster presentation:

- 1. National Seminar and workshop on, 'Metabolic Networks and Drug Designing' conducted at Banaras Hindu University, Banaras from 28-30 November 2008 .
- 2. Second Science Conclave: A Congregation of Nobel Laureates(An MHRD and DST Initiative) organized by IIIT, Allahabad from 08-14 December 2009.
- 3. International Symposium-cum-Training Workshop on "Interactions and Computer Aided Drug Design'" at Nehru Science Center, IIDS, Center of Bio-informatics, and University of Allahabad, India from 20-22 March 2010.
- National training cum workshop on "Computational methods in physical, Geological Modeling and Drug Designing" at National Academy of Science, India from 29-01 October,20011
- International Symposium-cum-Training Workshop on "Recent Trends in Bioinformatics, Systems Biology & Biomolecular Interactions" at Nehru Science Center, IIDS, Center of Bioinformatics, and University of Allahabad, India from 08- 10 January 2012.
- 6. Presented poster in "Annual open day 2016" organized by Jawaharlal Nehru University on 21st November, 2016.
- 7. Presented poster at "Accelerating Biology 2017: Delivering Precision", C-DAC Pune, during January 17-19, 2017.
- 8. Gave an oral presentation entitled as "*Physicochemical property based computational scheme for classifying DNA sequence elements of Saccharomyces cerevisiae*" in 17th International conference on Bioinformatics 26-28 September, 2018 and won 4th best oral presentation award.

Educational Qualification:

Academics	Year	Percentage and Institute
Research Associate	July-2021 to March 2023	NIPGR, New Delhi
Research Associate	April-2019 to September-2021	IIT Delhi
PhD (Bioinformatics)	2012-2019	Awarded (Jawaharlal Nehru University)
M.Sc. (Biotechnology)	2010-2012	78% (University of Allahabad)
B.Sc. (Applied Sciences)	2007-2010	74% (University of Allahabad)
Senior Secondary	2004-2006	65% (UP Board)
High School	2004	66% (UP Board)

Personal details:

Name:	Atul Kumar jaiswal	
Father's Name:	Ram Kumar jaiswal	
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Date of Birth:	25-Jun-1989	
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Recommendation

1 Prof. Pradipta Bandyopadhyay

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2 Dr. A. Krishnamachari

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