Saurav Kumar Choudhary

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RESEARCH INTERESTS

Next Generation Sequencing Data Analysis (RNA-seq and scRNA-seq), Spatial transcriptomics, Genome Assembly, AI in Biomedical field

EDUCATION

Institute of Bioinformatics | University of Georgia | Athens, Georgia, USA **Aug 2022 – Present**
Doctor of Philosophy (Ph.D. in Bioinformatics) GPA: 4.0/4.0

- Relevant coursework: Programming and data structures for informatics (C++), Statistical inference for the life sciences, Bioinformatics algorithms, Introduction to grant writing, Human genetics, Applied genome analysis

Indraprastha Institute of Information Technology| Delhi, India **Jul 2020 – Present**
Masters in Technology in Computational Biology GPA: 8.25/10

- Relevant coursework: Foundations of modern biology, Machine learning for biomedical applications, Data sciences for genomics, Algorithms in bioinformatics, Introduction to mathematical biology, Object oriented programming and design, Biomedical image processing

Amity Institute of Biotechnology | Noida, India **Jul 2015 – Jun 2019**
Bachelor of Technology in Biotechnology GPA: 7.02/10

- Relevant coursework: Genomics and proteomics, Genome engineering, Introduction to computational Biology, JAVA and Perl for biologist.

RESEARCH EXPERIENCE

Institute of Bioinformatics | University of Georgia | Athens, Georgia, USA **Aug 2022 – Present**
Graduate Student Researcher
Advisor – Dr. Kaixiong Ye

- Actively researching techniques to integrate scRNA-seq data with GWAS data to identify disease/trait relevant cell types.
- Applying advanced data analysis techniques to analyze multiple single-cell RNA sequencing datasets obtained from collaborators.
- Conducting de novo genome assembly and comprehensive annotation of *Hymenolepis diminuta* at the chromosome level, employing PacBio's HiFi reads.
- Exploring concepts of AI and Deep learning to integrate chromatin accessibility, gene expression, and GWAS data to identify causal genes and regulatory mechanisms.

Indraprastha Institute of information Technology | Delhi, India **Jun 2021-Present**
Student Researcher
Advisor – Dr. Vibhor Kumar

- Conducted computational analysis on high-throughput sequencing datasets (scRNA-seq, nuc-seq, Bulk-RNA, ChiP-seq) generated from in-vitro and in-vivo models of disease and normal states using human data, mouse and organoid models.
- Performed analysis involves preprocessing (demultiplexing, sequence alignment, and quantification), statistical analysis, functional annotation, and interpretation of multiple datasets from multiple projects.

Eminent Biosciences | Indore, India **Feb 2020 – July 2020**
Bioinformatics Analyst
Advisor - Dr. Anuraj Nayarisseri

- Learned Python, R, Unix and NGS data analysis
- Transcriptome expression data analysis of MCF7 and normal breast cancer cells

Amity Institute of Biotechnology | Noida, India **Jan 2019 – Apr 2019**
Student Researcher
Advisor – Dr. Archana Chaturvedi

- **Title**- In Silico Prediction, Molecular Docking and Dynamics Studies of Steroidal Alkaloids for Diarrhea
- Performed protein modeling, active site prediction, molecular docking, model visualization and ADMET

property analysis for GCC-ECD receptor

CSIR- Institute of Genomics and Integrative Biology | New Delhi, India **Jan 2019 – Apr 2019**
Research Intern
Advisor – Dr. S Ramachandarn

- **Title-** Text mining for Type 2 Diabetes
- Worked with T2DiACoD database and executed text mining using several R functions from package 'pubmed.mineR'.
- Curated and reported 30 contributing genes with supporting evidence from articles submitted on PubMed database.

BioDiscovery Group, Bangalore, India **May 2018 -July 2018**
Internship trainee
Advisor – Dr. Asif Naqvi

- **Title** - Structure based drug design of P53 stabilizing drugs.
- Performed molecular docking for 60 molecules and conducted ADMET studies for selected molecules and prepared manuscript.

TEACHING EXPERIENCE

Graduate Teaching Assistant| IIIT-Delhi **Jan 2022 – June 2022**
Course- Data science for genomics (BIO541)
Faculty- Dr. Vibhor Kumar

- Grading the assignments, preparing question papers, and conducting weekly tutorials for clearing doubts in the subject.

Graduate Teaching Assistant | IIIT-Delhi **Jun 2021 - Sep 2021**
Course- Probability and statistics (MTH-201)
Faculty- Dr. Sanjit Kaul

- Conducted weekly tutorial for a class of 40 students. Graded assignments and exam papers.

Graduate Teaching Assistant | IIIT-Delhi **Jan 2021 – May 2021**
Course- Cognitive psychology (PSY-301)
Faculty- Dr. Sonia Baloni Ray

- Evaluated class assignments, prepared weekly quiz, term question papers, and conducted office hours for clarifying doubts.
- Managed a class of 110 undergraduate students and maintained Google Classroom.

PUBLICATIONS

- *Gupta, N.;* **Choudhary, S.K.;** Bhagat, N.; Karthikeyan, M.; Chaturvedi, A. "In Silico Prediction, Molecular Docking and Dynamics Studies of Steroidal Alkaloids of Holarrhena pubescens Wall. ex G. Don to Guanylyl Cyclase C", MDPI Molecules 2021, 26, 4147. https://doi.org/10.3390/molecules26144147
- ***Choudhary, S.K.,*** *Gupta, N.,* and Naqvi, S.A.H., "Study of 1, 8- Diamino - 2, 4, 5, 7 - tetrachloroanthraquinone and its derivatives on Y220C Mutant," Asian Journal of Biochemical and Pharmaceutical Research, 2019, pp. 64-70.
- Yu W, Kastriti ME, Ishan M, **Choudhary SK**, Rashid MM, Kramer N, Do HGT, Wang Z, Xu T, Schwabe RF, Ye K, Adameyko I and Liu H-X (2024) The duct of von Ebner's glands is a source of *Sox10*$^{+}$ taste bud progenitors and susceptible to pathogen infections. *Front. Cell Dev. Biol.* 12:1460669. doi: 10.3389/fcell.2024.1460669.
- Fu, Z., Huang, Z., Xu, H., Liu, Q., Li, J., Song, K., Deng, Y., Tao, Y., Zhang, H., Wang, P., Li, H., Sheng, Y., Zhou, A., Han, L., Fu, Y., Wang, C., **Choudhary, S. K**., Ye, K., Veggiani, G., Peng, H. (2024). IL-2–inducible T cell kinase deficiency sustains chimeric antigen receptor T cell therapy against tumor cells. Journal of Clinical Investigation, 135(4). https://doi.org/10.1172/jci178558.

SKILLS

Bioinformatics techniques	**Computational**	**R & Bioconductor packages**
Single cell RNA seq (scRNA) data analysis	Shell scripting	Seurat
RNA-seq data analysis	Python	DESeq2
Genome assembly and annotation	R	Dplyr

Chip-seq data analysis
Machine learning
Drug discovery & Molecular docking
Protein modeling

Operating System
Linux/UNIX
MacOS
Windows

Bioinformatics Tools & Softwares
Genome assembly tools
UCSC Genome Browser
IGV
AutoDockTools
Discovery Studio

Tidyverse
ggplot2
stringr

Python Library
NumPy
Pandas
Matplotlib
Scikit-learn

HONORS & CERTIFICATIONS

- Selected to attend and participate in the UCLA Computational Genomics Summer Institute (CGSI) 2024, focused on advanced techniques and research in computational genomics.
- Secured a position in top 25 participants selected from all over India for B4: Young Scientist Development Course Workshop - Big Data in Life Sciences and Healthcare conducted by Harvard University and IBAB, India.
- Received GATE Scholarship for securing All India Rank 1117 for entire master's program.
- Completed Coursera online course on R Programming from Johns Hopkins University.
- Participated in 2-Day workshop on Drug Discovery and Molecular Docking conducted by BioDiscovery Group, Bangalore, India
- Presented posters at various prestigious institutes like Jawaharlal Nehru University, Hindu College, Jamia Millia Islamia and Jaypee Institute of Information Technology.