Indra Singh

PhD Bioinformatics

A self-motivated researcher with more than five years of experience in genomics and proteomics

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TECHNICAL SKILLS

Computational Biology-Genomics:	GWAS data analysis, NGS data analysis, RNAseq data analysis, Metagenomics data analysis, Phylogenetic binning, Exom data analysis, Chip-seq data analysis, single cell data analysis, miRNA prediction, SSR markers,	**Proteomics:**	Proteomic data analysis (mass-spectra, Itraq), Protein structure modelling, Protein-ligand docking, Drug designing, Protein-protein interaction, Protein network prediction, Protein-DNA docking, Molecular Dynamics Simulations
Experimental	Enzyme and protein extraction, purification, and characterization, Centrifugation, Nanodrop and spectrophotometric, methods	**Tools:**	Bowtie, Tophat, Cufflink, GATK, Picard, AnnoVAR, Varscan, snpeff, snpSift, Trinity, Beagle, Plink, Saige, BWA, QIIME2, GALAXY, CLC workbench, Autodock, Discovery Studio, Schrodinger, Gromacs, Bioconductor package for genome analysis
Computational	R, Linux, Python, Machine Learning		

WORK EXPERIENCE

1. Research Associate

Gujarat Biotechnology Research Centre (GBRC)

03/2021 – 08/2021,   *Gandhinagar, Gujarat, India*
Achievements/Tasks

- GWAS data analysis of Covid-19 patients genotype data and Alzheimer's disease data
- Metagenomics data analysis
- Designing probes for smart panel for detection of bacterial enzymes

2. Visiting Postdoctoral Fellow

Indrapratstha Institute of Information Technology Delhi (IIITD)

02/2018 - 04/2019,   *New Delhi, India*
Achievements/Tasks

- ChIPseq data analysis of Glioblastoma patients
- Single cell RNA data analysis of Glioblastoma patients RNAseq data analysis

3. Research Associate

Indian Agriculture Statistical Research Institute (IASRI)

05/2016 - 01/2018,   *New Delhi, India*
Achievements/Tasks

- Metagenomics data analysis for taxonomic diversity of bacteriophages involved in keeping Ganga River clean mir-markers identification using NGS data analysis, SNP Mining, miRNA identification
- Proteomic Mass-spectra (ITRAQ) data analysis for identification of heat responsive proteins

4. Research Associate

Indian Agriculture Statistical Research Institute (IASRI)

11/2013 - 03/2016,   *New Delhi, India*
Achievements/Tasks

- Assisted in development of automated pipeline for NGS data analysis
- Deciphered FMD virus-host Tropism in Foot and mouth disease (FMD), contagious viral disease using structural Bioinformatics approach (Docking and Molecular Dynamic Simulations studies)
- Prediction of miRNA, their targets, SNP and SSR prediction, gene enrichment study, pathway study
- NGS data analysis (de novo and reference-based assembly), Metagenomics data analysis, Microarray data analysis

PUBLICATIONS

Research Article
Genome wide association study of COVID-19 patients in Indian population
(under communication)
2021

Research Article
Deciphering Foot-and-Mouth Disease (FMD) virus- host Tropism
Author(s)
Indra Singh, Rajib Deb, Sanjeev Kumar, Rani Singh, Jerome Andonissamy, Dwijesh C Mishra & Anil Rai
2019
Journal of Biomolecular Structure and Dynamics DOI:
10.1080/07391102.2019.1567386

Research Article
Reduced activity of nitrate reductase under heavy metal cadmium stress in rice: An In silico answer
Author(s)
Singh, P, Indra Singh, and Kavita Shah
2018
Frontiers in Plant Science https://doi.org/10.3389/fpls.2018.01948

Research Article
Prediction of novel putative miRNAs and their targets in buffalo
Author(s)
Mishra, D. C., Shuchi Smita, Indra Singh, M. Nandhini Devi, Sanjeev Kumar, M. S. Farooqi, K. K. Chaturvedi, and Anil Rai
2017
Indian Journal of Animal Sciences

Research Article
Evidences for structural basis of altered ascorbate peroxidase activity in cadmium-stressed rice plants exposed to jasmonate
Author(s)
Indra Singh and Kavita Shah
Vol 27(2) pp 247-263, 2014
Biometals
DOI: 10.1007/s10534-014-9705-z

Research Article
In silico study of interaction of PAD4 with EDS1 a regulator of salicylic acid signalling pathway
Author(s)
Indra Singh and Kavita Shah
2012
Journal of Biosciences
DOI: 10.1007/s12038-012-9208-4

Research Article
Designing Self-Inhibitory Fusion Peptide Analogous to Viral Spike Protein Against Novel Severe Acute Respiratory Syndrome (SARS-CoV-2)
Author(s)

Indra Singh, Shalini Singh, Krishna Kumar Ojha and Neetu Singh Yadav
2021
Journal of Biomolecular Structure & Dynamics 2021
10.1080/07391102.2021.1960192 (under print)

Research Article
Quantitative proteomic analysis reveals novel stress-associated active proteins (SAAPs) and pathways involved in modulating tolerance of wheat under terminal heat
Author(s)

Kumar, Ranjeet R., Khushboo Singh, Sumedha Ahuja, Mohd Tasleem, Indra Singh, Sanjeev Kumar, Monendra Grover et al.
2019
Functional & integrative genomics DOI:
10.1007/s10142-018-0648-2

Research Article
Abiotic Stress Responsive miRNA-Target Network and Related Markers (SNP, SSR) in Brassica juncea
Author(s)

Indra Singh, Shuchi Smita, Dwijesh C. Mishra, Sanjeev Kumar, Binay K. Singh and Anil Rai
2017
Frontiers in Plant Science doi:
10.3389/fpls.2017.01943

Research Article
Exogenous application of methyl jasmonate lowers the effect of cadmium induced oxidative injury in rice seedlings
Author(s)
Indra Singh and Kavita Shah
2014
Photochemistry https://doi.org/10.1016/j.phytochem.2014.09.007

Research Article
Expression of ZAT12 transcripts in transgenic tomato under various abiotic stresses and modelling of ZAT12 protein in silico
Author(s)
Avinash Chandra Rai, Indra Singh, Major Singh, Kavita Shah
2014
Biometals
DOI: 10.1007/s10534-014-9785-9

EDUCATION

PhD Bioinformatics

Banaras Hindu University, Varanasi, India

2010 - 2014,
Courses

- Biochemical and Bioinformatics approach to study the effect of Salicylic avid and Jasmonic acid on cadmium toxicity in rice

- Enzyme extraction, purification and characterization

- GC-MS for signaling molecule detection

- Protein structure-function relationship, molecular modelling based on three-dimensional structure, Signature sequence analysis, Protein ligand docking, protein-protein docking, protein-DNA docking, Molecular dynamics simulations

- Biomolecule estimation and assay, enzymatic assay, and statistical analysis etc

MSc Bioinformatics

Banaras Hindu University, Varanasi, India

2008,

CERTIFICATES

Data Science: R Basics (09/2020)
HarvardX -21c775eeaff84afbac5a3fec3d53b684

R programming and its application in Biomedical research (08/2020)
IIITD and Pathfinder

Tools for regulatory genomics (04/2020)
SIB Swiss Institute of Bioinformatics

R programming from John Hopkins University (online) (12/2018)
https://www.coursera.org/account/accomplishments/verify/ZFWL8A Y87WE4

Bioinformatics workshop on Proteomics (07/2011)
upercomputing Facility for Bioinformatics and Computational Biology, IIT, Delhi

Bioinformatics: Application in Agriculture and Medical Sciences"
Centre for Bioinformatics, School of Biotechnology, BHU, Varanasi
Comparative Genomics (09/2020)
SIB Swiss Institute of Bioinformatics

Single cell RNAseq data analysis (06/2020)
IIITD and Pathfinder

Introduction to genome technologies from John Hopkins University(online) (11/2019)
coursera.org/verify/3FEV4ESHN4QF

Linux and HPC, (02/2014)
Indian Agricultural Statistics Research Institute, PUSA, organized by Hewlett-Packar

REFERENCES

Prof. Radha Chaube
"Department of Zoology, Banaras Hindu University, Varanasi, Pin-221005"
Contact: : radhachaube72@gmail.com - +91-9336847252

Prof. Kavita Shah
"Institute of Environment and Sustainable Development Banaras Hindu University, Varanasi 221005"
Contact: kavitashah@bhu.ac.in - +919450955423

Motivation Letter

Dear Hiring Manager

I am Dr Indra Singh, PhD in Bioinformatics, Banaras Hindu University, Varanasi, India. My interest to know about life and the importance of having the knowledge to have a healthy life begins during school days. The motivation started after seeing people suffering from various diseases and having less understanding about a healthy body and its healing in diseased conditions. Despite limited resources, since I born and grew up in one of the most backward places in India where the literacy rate for the female was too low and it was beyond imagination for me to get the answers of my all questions immerging about the life versus a good life. With all these thoughts I started having enormous interest in science and since then I am interested in research and discoveries. Because of my genuine interest, I got various good opportunities for research and education. Slowly and gradually, I started understanding more and more. I did my B.Sc in Biology which was very fascinating to learn the real application of biological knowledge, During this time I developed much more interest in Biochemistry and more specifically in a question: How important it is to have "correct fold of a protein" with "correct amount" "at correct time and place" to perform the essential functions for cells. To have a very clear understanding about these questions I joined an Apex university of India, Banaras Hindu University where I got research experience from several labs and worked on a computational study on Mycoorizal associations for my M.Sc project work. After my M.Sc, my interest to know the structural detail of proteins and it's aggregates increased and I joined a PhD in structure bioinformatics at Banaras Hindu Univeristy, where I have worked on structural alterations of antioxidant enzymes. After that I have joined as a postdoctoral researcher at Indian Agricultural Statistical Research Institute (IASRI), Indraprastha Institute of Information Technology (IIITD) and Gujarat Biotechnology Research Institute (GBRC) and worked on various aspects of NGS and proteomic data analysis.

Yours sincerely,

Indra Singh

I would like to express my interest for the post-doctoral opportunity at your laboratory. I am Dr Indra Singh, and have completed PhD in Bioinformatics from Banaras Hindu University, Varanasi. During PhD I have worked in structural Bioinformatics to understand the structural alterations in the ascorbate peroxidase enzyme in presence and absence of cadmium metal. My PhD work included both wet lab and dry lab.

After that I have joined Indian Agricultural Statistical Research Institute (IASRI), Pusa New Delhi as Research Associate. At IASRI, I have work on various NGS data analysis, metagenomics data analysis, miRNA, SSRs, miR-markers etc. After that I have Joined Indraprastha Institute of Information Technology (IIIT) Delhi, as visiting Postdoctoral fellow, where I have worked on chIPseq and single cell data analysis of glioblastoma.

After that I have joined Gujarat Biotechnology Research Institute, Gandhinagar, Gujarat as Research Associate where I have worked in the area of Genome wide studies (GWAS) of COVID-19 patients of South Asian Population and Alzheimer's patients. In this project, I have analyzed the significant markers present in the deceased verses recovered patients, deceased verses asymptomatic as well as recovered verses asymptomatic patients. For genotyping, we used Axiom™ Precision Medicine Diversity Array (PMDA) Plus Kit. I have used both PLINK as well as SAIGE pipeline for the analysis. For imputation beagle and topmed servers were used to impute the data. We got better results with topmed server imputed data. Several significant SNPs were identified which are associated with gene that encodes a cytokine of the tumor necrosis factor (TNF) ligand family. Another gene TNFSF4 is associated with Myocardial Infarction and Systemic Lupus Erythematosus etc. For Alzheimer's disease data a different GWAS methodology was followed. Here I have used reference merge step to write missing genotype in our data instead of imputation. In addition to this I have also worked with another 3 projects on metagenomics data analysis using QIIME pipeline as well as RNAseq data analysis. I am having experience of various omics data analysis, ITRAQ data analysis, noncoding RNAs, Metagenomics, mass spectra, Itraq proteomics, structural bioinformatics, SNPs and SSRs etc. My future project is GWAS analysis of ORAL cancer. I am fluent in working with Python and R. I am also having experience with machine learning. It would be very helpful If, I could get an opportunity to work and learn.

I will be pleased to hear a positive response from you.

Yours sincerely,

Indra Singh

Recommendations

1. Prof. Kavita Shah, Professor Institute of Environment and Sustainable Development Banaras Hindu University, Varanasi 221005
   Contact no- +919450955423
   Email: kavitashah@bhu.ac.in,

2. Prof. Radha Chaube Professor Department of Zoology, Banaras Hindu University, Varanasi, Pin-221005
   Contact no-+91-9336847252
   Email: radhachaube72@gmail.com

3. Dr Monendra Grover Scientist, ICAR-Indian Agricultural Statistics Research Institute, Pusa, New Delhi
   Contact no-+91 9899965285
   Email: monendra_grover@yahoo.com