

## CAREER SUMMARY

I am currently investigating the impact of transposable elements on the adaptation of the rice genome under fungal pathogen challenges and genome duplication. Experienced in using next-generation sequencing technologies like shotgun sequencing, linked reads, and long-read sequencing for whole-genome resequencing, variant calling, transcriptome assembly, differential expression analysis, and developing pipelines. Interested in working on next-generation approaches, solving complex problems relating to genomic plasticity and epigenetics.

## EDUCATION

- **PhD**, Biotechnology, National Institute of Technology Durgapur, Sept 2014 – present (Thesis Submitted)
- **Master of Technology**, Biotechnology, Indian Institute of Technology Guwahati, 2011 - 2013, 7.82/10
- **Master of Science**, Biotechnology, SRTM University Nanded, 2007 - 2009, 56.91/100
- **Bachelor of Science**, Chemistry, Botany, Zoology, SRTM University Nanded, 2004 - 2007, 69.51/100, First Class with Distinction

## EXPERIENCE IN LIEU

### Research Assistant, TDU Bengaluru, April 2019 - Sep 2019

- Supervised graduate and undergraduate students for projects on transposable element analysis in the rice genome
- Planned, monitored the executed techniques, protocols, and analyzed the outputs

### Teaching Assistant, TDU Bengaluru, Feb 2018 - June 2018

- Taught Ecology and Evolution course to MSc Students
- Orchestrated classroom activities, including tutoring, grading assignments, and reviewing exams

### Teaching Assistant, NIT Durgapur, Feb 2016 - April 2019

- Taught Bioinformatics Laboratory course to MTech Students
- Designed course content, evaluated assignments, and invigilate
- Oversaw batch of 25 students per semester for four years

### Intern, EGICORE Lucknow, Aug 2014 - Nov 2014

- Developed and released a database on ayurvedic plants with medicinal applications, A-plants 1.0: (Home remedies by our grand's)

## SKILLS

### Research

- Experimental design
- Coordinating scientific projects
- Reproducible Science
- Communicating science

### Interests

- NGS data analysis
- Transposable Elements
- Genetics
- Computational Biology

## PROGRAMMING

- **Languages:** Linux, Bash Scripting, R, Python
- **Data visualization:** ggplot2, Plotly, IGV
- **Tools:** Rstudio, Pycharm, Visual Studio code
- **Version control system:** Git and GitHub
- **Workflow management system:** Galaxy

## COMPUTATIONAL BIOLOGY

- **Secondary and tertiary analysis of sequencing data:** Illumina, Oxford Nanopore
- **Genomics:** Bioconductor
- **Genomic databases:** RGAP, Ensembl, UCSC, Expasy, NCBI, HGVS, dbSNP
- **WGS:** FastQC, SPAdes, QUAST, PROKKA
- **RNA seq:** Trinity, RSEM, edgeR, Trinotate
- **Repeats analysis:** RepeatModeler, RepeatMasker
- **SSR mining:** MISA, GMATA
- **Variant calling:** GATK, BWA, VarScan, SnpEff, ClinVar, Mutalyzer, VariantValidator, Ensembl VEP
- **Phylogenetic analysis:** MEGA
- **Molecular docking:** AutoDock vina
- **Molecular simulation:** GROMACS
- **Digital image analysis:** ImageJ, Fiji, CellProfile

## AWARDS AND HONORS

- GYAN Scholarship Award by SciGenom Research Foundation, 2019
- Institute fellowship for PhD by Ministry of Education, 2014 - 2019
- ICMR-Junior Research Fellow by Indian Council for Medical Research, 2014
- ICAR-National Eligibility Test by Indian Council for Agricultural Research, 2014
- Best Poster Award by International conference ICMS Imphal, 2012
- GATE fellowship for MTech by Ministry of Education, 2011 - 2013

## PUBLICATIONS

- Subhankar Roy Barman, **Ravindra A Raut**, et al., Recent Advances in the Development of Transgenic Crop Plants, Biosafety Aspects, and Future Perspectives, Apple Academic Press, 2017, vol 2, pg 294
- **Ravindra Raut**, Silk statistics of India, Mejankari ICMS, 2012, pg 24

## RESEARCH EXPERIENCE

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**PhD Project:** Study of Transposable Elements in rice (*Oryza sativa* L.) and their association in host resistance for diseases

- Investigated, identified and analyzed transposons in 29 rice varieties
- Discovered that the TEs showed association with disease resistance R-genes in the *O. sativa* Nipponbare.

**Internship Project:** Development of Ayurvedic Medicinal Plant database, A-PLANTS 1.0

- Designed and developed the web-based repository for the scientific and experimentally proven applications of dietary spices and ayurvedic medicinal plants

**MTech Project:** Development of Seri Bioresource Database (SBDB)

- Constructed and designed the flat file-based database containing information such as silkworm distribution, all the diseases, pathogens, pests, predators, and parasites of silkworms

**MSc Project:** Isolation and purification of peroxidase from the hull of soybean (*Glycine max* L.)

- Investigated and tested the various biochemical tests and physiological conditions affecting enzyme activity of soybean hull peroxidase (EC1.11.1.7)
- Discovered that soybean hull peroxidase is a novel thermostable enzyme

## POSTER PRESENTATION

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- Genome-Wide Analysis of Transposable elements in different Rice species and its association in Plant disease resistance (R) genes in *Oryza sativa* Nipponbare, NextGen Genomics, Biology, Bioinformatics and Technologies (NGBT) Conference, Sept. 2019, Mumbai, India
- Genome-wide analysis of transposons in *Oryza sativa* L., National Symposium and Workshop on Future of functional genomics, Oct. 2017, Bengaluru, India
- Development of Seri-Bioresource database, International Consultative Meeting on Seri Biotechnology, Dec. 2012, Imphal, India

## TALKS AND HANDS-ON

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- Transposon Discovery and Annotation, 8th training on NGS and Analysis on Genomics, Transcriptome and transposons, Nov. 2018, Bengaluru, India
- Transposon Discovery and Annotation, Hands-on Training on Next Generation Sequencing, Analysis & Its Applications, Feb. 2019, Bengaluru, India
- Transposon Discovery and Annotation, 12th training on Whole Genome Sequencing & Data Analysis, May 2019, Bengaluru, India
- Genome Browser and Databases, 14th Advanced Training Program on Genomics & Metagenomics, July 2019, Bengaluru, India

## EXTRACURRICULAR ACTIVITIES

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- Organizing Secretary for the 8th Training on NGS and Analysis on Genomics, Transcriptome and Transposons at The University of Transdisciplinary Health Sciences & Technology (TDU) Bengaluru, November 26 - December 1, 2018
- One of the organizers for eleven workshops on NGS Data Analysis on Genomics, Transcriptomics, MetaGenomics, Transposons and National Symposium on Future of Functional Genomics in The University of Transdisciplinary Health Sciences & Technology (TDU) Bengaluru, 2017 – 2019
- Volunteer for International Symposium on Bioengineering 2012 at Centre for the Environment, Indian Institute of Technology Guwahati, December 10, 2012
- Conferences/ Workshops participated: 30

## ONLINE CERTIFICATION

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### Coursera

- Bioconductor for Genomic Data Science, Aug 14, 2020
- Genomic Data Science with Galaxy, Aug 11, 2020
- Introduction to Genomic Technologies, July 2020
- Introduction to Git and GitHub, July 18, 2020
- Data Visualization with Plotly Express, June 11, 2020
- Graphing with ggplot2, June 1, 2020

### IBM

- Data Visualization Using Python, June, 2020
- Data Visualization with R, June, 2020

### Datacamp

- Introduction to the Tidyverse, August 17, 2020

## REFERENCES

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Available upon request