Ravindra Raut, Computational Biologist

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CAREER SUMMARY

A Computational biologist, 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.

EXPERIENCE IN LIEU

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

- Supervised graduate and undergraduate students working on research projects on transposable element analysis in the rice genome
- Planned and executed research techniques, procedures, and tests

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

- Assisted MSc Students for Ecology and Evolution course work
- Supported classroom activities, including tutoring, grading assignments, and reviewing exams

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

- Assisted MTech Students for Bioinformatics Laboratory course
- Prepared lessons according to course, supported classroom activities, including tutoring, grading assignments, and reviewing exams
- Oversaw batch of 25 students per semester for four years

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

- Developed and released a database on Ayurvedic Plant Database with its Medicinal Applications, A-plants 1.0: (Home remedies by our grand's)

EDUCATION

- PhD Student, National Institute of Technology Durgapur, Sept 2014 – present (Pursuing)
- 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

GRANTS AND AWARDS

- GYAN Scholarship Award by SciGenom Research Foundation, 2019
- Institute fellowship | PhD, MHRD, 2014 - 2019
- ICMR-JRF 2014
- ICAR-NET 2014
- Best Poster Award by International conference ICMS Imphal, 2012
- GATE fellowship | MTech, MHRD, 2011 - 2013

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
- **Version control system:** Git and GitHub

Computational Biology

- **Secondary and tertiary analysis of sequencing data**: Illumina, Oxford Nanopore
- **Genomics**: Galaxy, 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, Mutalyze, VariantValidator, Ensembl VEP
- **Phylogenetic analysis:** MEGA
- **Molecular docking:** AutoDockvina
- **Molecular simulation:** GROMACS
- **Digital image analysis:** ImageJ, Fiji, CellProfiler

Experimental Biology

- DNA-Seq, RNA-Seq
- PCR methods
- Bacterial and Plant tissue culture
- Microscopy

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

PROJECTS

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

- Studied and analyzed soybean hull peroxidase (EC1.11.1.7), resulting in datasets performed for various biochemical tests to see the chemical agents and physiological conditions affecting enzyme activity
- Research and observations confirm that soybean hull peroxidase is a novel thermostable enzyme

MTech Project: Development of Seri Bioresource Database (SBDB)

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

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

- It is a web-based repository for the scientific and experimentally proven applications of dietary spices and ayurvedic medicinal plants

POSTERS

- 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 genomic, Oct. 2017, Bengaluru, India
- Development of Seri-Bioresource database, International Consultative Meeting on Seri Biotechnology, Dec. 2012, Imphal, India

TALKS AND HANDS-ON

- 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

- 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

Coursera

- Bioconductor for Genomic Data Science, August 14, 2020
- Genomic Data Science with Galaxy, August 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