N. Arun Prasanna

Personal Data

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Research & Work Experience

Mar 2018 - Present — Post-doctoral Fellow at Coral Symbiomics Lab, RSRC, KAUST, Thuwal, KSA

Working on identifying genetic drivers of thermal tolerance plasticity in the coral model Exaiptasia. Awarded with competitive research grant (CRG 2018)- Award amount: US$. 255,568.

Produced high-quality genomes (from *in vitro* to *in silico*) for sea anemones using **pacbio long-reads tech.** and **10X chromium tech.**

Genome improvement using **IsoSeq tech.** and Dovetail **HiC**

Oct 2015 - Sep 2017 — Post-doctoral researcher at Laboratory of Fungal genomics and Evolution, BRC, Szeged

Comparative transcriptomics, Fungal Evolution & Pathogenicity

Extracted RNA from 10 different stages of pathogenic mushroom, quantified transcriptome using **RNASeq technology** and analyzed gene groups to infer biological events.

Collected genomes for group of fungi with different lifestyle, constructed orthogroups (MCL), inferred species tree (Supermatrix), reconciled with gene trees (FastTree, Treefix), mapped gene family gain/loss patterns, reconstructed ancestral genome sizes to infer **evolutionary events** and their implication in pathogenicity.

Devoloped in-house pipelines using **Python & command-line tools** to pre-process **RNASeq** datasets, annotated, requantified transcript abundance with **Kallisto** for analyses and comparison across species.

Inferred maximum likelihood trees for different supermatrix datasets using **MrBayes, Phylobayes** with complex model parameters, computed posterior probabilities, performed convergent diagnostics and classified tree topologies.

Feb 2015-Sep 2015 — Project Scientist at DBT-AU Builder programme, Anna University, Chennai, India

Developed working hypothesis to identify secretory pathway propensity of *Pichia pastoris* during recombinant protein production.

Identified key genes involved in SRP-dependent and SRP-independent pathways, quantified their gene expression between wild type strain and a mutant overexpressing lipase enzyme.

Jul 2007-Aug 2014 — Doctoral Researcher at IIT Bombay, Mumbai, India

Studied the metaphysics of Mycobacterium through systems biology approach to arrive at a complementary understanding of the physiology of the genus.

Developed high-throughput viability assay using Resazurin kinetics to enumerate bacterial cells.

Recorded multi-stress phenotypic & genotypic response of wild-type and sigma factor mutants of *M. smegmatis*.

Carried out comparative phylogenomics studies to study the **unique nature of pathogenic & non-pathogenic Mycobacterial** species.

Jan 2007-Jul 2007 — Assistant Lecturer at BITS-Pilani, Pilani Campus, Rajasthan, India

Taught a course to post-graduate students in capacity of Co-instructor

Associated course: BIO C412- Introduction to Bioinformatics and Biomolecular modelling.

Aug 2004-Dec 2006 | Teaching Assistant at BITS-Pilani, Pilani Campus, Rajasthan, India

Taught courses and conducted laboratory exercises to undergraduate students.

Associated courses were: BIO C111-General Biology, BIO C332-Genetics, BIO C241-Microbiology, BIO C391-Instrumental methods of Analysis.

Publications

1. Herrera, M ... **Arun N Prasanna**, et al. Temperature transcends partner specificity in the symbiosis establishment of a cnidarian. **ISME J** (2020). [Read].
2. Zsolt Merényi, **Arun N Prasanna**, *et al* (2020), "Unmatched level of molecular convergence among deeply divergent complex multicellular fungi." **Molecular Biology and Evolution**,msaa077. [Read].
3. **Arun N Prasanna**, Daniel Gerber, Teeratas Kijpornyongpan, M Catherine Aime, Vinson P Doyle, Laszlo G Nagy (2019), "Model Choice, Missing Data, and Taxon Sampling Impact Phylogenomic Inference of Deep Basidiomycota Relationships", **Systematic Biology**, syz029. [Read].
4. Kiss, Eniko ... **Arun N Prasanna**, *et al* (2019). "Comparative Genomics Reveals the Origin of Fungal Hyphae and Multicellularity." **Nature Communications** 10, no. 1: 4080. [Read].
5. Gyorgy Sipos, **Arun N. Prasanna**, *et al* (2017). Genome expansion and lineage-specific genetic innovations in the forest pathogenic fungi Armillaria. **Nature Ecology & Evolution**. [Read].
6. **Prasanna AN** and Mehra S (2013). Comparative Phylogenomics of Pathogenic and Non-Pathogenic Mycobacterium. **PLOS ONE** 8(8): e71248. [Read].
7. **Prasanna AN** and Mehra S (2013). Comprehensive phylogenetic analysis of Mycobacteria. **12th IFAC Symposium on Computer Applications in Biotechnology** 12(1): 101-106.

Core Competence

Broad Subject Area:	Bioinformatics, NEXT GENERATION SEQUENCING, Molecular Biology
Expert user :	NGS pipelines, Genome assemblers, Kallisto, MCL, MrBayes, PhyloBayes
Workflow:	snakemake, Nextflow
Computer Languages:	Python, Pandas, Matplotlib, Basic R, MATLAB, Regex, Command-line tools
Operating System:	MacOSx, Linux, PC
Cluster environment:	HPC, Slurm, PBS

Honors and Scholarships

October 2004	Teaching Assistant Scholarship, BITS-Pilani, India
July 2007	Teaching Assistant Scholarship, IIT Bombay, India
April 2014	Research Associate Scholarship, IIT Bombay, India
November 2018	Competitive Research Grant 2018 (Award amount: US$. 255,568), KAUST, KSA
August 2019	Scholarship Award by MBL, Woodshole MA to attend GRN course (Award: US$. 1625.00)
September 2019	Travel grant by BESE division for conducting a course (Award: US$. 2500), KAUST, KSA

Education

August 2014 — PhD in Systems Biology, **IIT Bombay**, India
Thesis: "Systems biology of *Mycobacterium smegmatis* mc2 155: Comparative Genomics and Multistress response" | Advisor: Dr.Sarika Mehra
Gpa: 8.25/10.0

March 2007 — Master of Engineering in Biotechnology, **BITS-Pilani**, India
Thesis: Characterization of heavy metal induced proteins in cyanobacteria | Advisor: Dr.S.K. Verma
Self-Interested Research: Molecular modeling and structural analysis of NS3 Helicase of West Nile Virus | Advisor: Dr.Biplab Bose
Gpa: 8.04/10.0

April 2004 — Bachelor of Technology in Biotechnology
Bharathidasan University, Trichirapalli, India
Thesis: Quality control of Hepatitis-B vaccine
Shanta Biotechnics, Hyderabad | Advisor: V.M. Kotbagi
Summer Research: Vitellogenin induction by natural (Animal & Plant Origin) as well as synthetic extracts in *X. maculatus* (Platy fish),
Dept.of Biotechnology, BARD University | Advisor:Dr.Rajendiran
percentage:77.1

Conferences

1. **Arun Prasanna. N** *et al.* 'A study on DNA methylation changes in *Exaiptasia pallida* in response to long term heat acclimation'. ASLO 2019, 24 Feb - 1 March 2019, San Juan, Puerto Rico. (ORAL Presentation).
2. **Arun Prasanna. N** *et al.* 'Decoding the pathogenicity of Armillaria species through phylogenomics and transcriptomics'. 29 th Fungal Genetics Conference, 2017, California, USA.
3. E. Kiss, **A. Prasanna N**, K. Krizsan, L.G. Nagy. 'Early origins of fungal multicellularity-related genes in eukaryotic evolution'. 29 th Fungal Genetics Conference, 2017, California, USA.
4. **Prasanna AN** and Thawfeek MV, Mehra S. 'A systems approach to decipher stress response networks in mycobacteria. AIChE, 2011, Minneapolis, USA
5. **Prasanna AN** and Mehra S.'Comparative genomics of mycobacterium smegmatis with important pathogenic mycobacteria'. 8th APBC, 2010. Bangalore, India
6. **Prasanna AN** and Mehra S.'Metabolic pathway comparison of pathogenic and non-pathogenic mycobacteria'. ICSB, 2010. Edinburg,UK
7. Pankaj Jain,**N. Arun Prasanna**, S. Ramachandran and S.K Verma. Chromium (VI) and Zinc (II) Regulated Protein Expression in the Cyanobacterium Nostoc calcicola. ASM 107th meeting 2007, Canada.
8. **N. Arun Prasanna** and Biplab bose. Molecular modeling and structural analysis of NS3 Helicase of West Nile Virus. Poster presented at IFBM 2006, Bengaluru, India

Workshop and Courses

1. '**Next Generation Sequencing (NGS)** – Bioinformatics and Data Analysis' (2014), 15 - 19 July 2014, AU-KBC Centre, Chennai. **(onsite)**.

2. **Gene Regulatory Networks for Development**. MBL Course. Woods Hole, MA, 13-26 October 2019. **(onsite)**.
3. **Nextflow** course in reproducible and scalable bioinformatics. SeqeraLabs, Barcelona, Spain, 7-11 June 2020. **(onsite)**.
4. Molecular Evolution (Bioinformatics IV), University of California, San Diego. **(Coursera)**.
5. Python for Genomic Data Science, Johns Hopkins University. **(Coursera)**.
6. Data Science: Foundations using R, Johns Hopkins University. (5-course series). **(Coursera)**.
7. Understanding and Visualizing Data with Python. Univ. of Michigan.**(Coursera)**.
8. Data Visualization with ggplot2, Intermediate Python for Data Science, Pandas Foundation, Merging Dataframes with pandas, Cleaning Data in Python. **(online)**.

Academic Service

- Reviewed a manuscript (2020) for **BMC Biology**
- Conducted a course titled "Bioinformatics course on genome assembly and transcriptomics" at KAUST (18-22nd August 2019).
- Reviewed a manuscript (2017) for **New Phytologist**
- Delivered an Institute talk (August 22 2017), Department of Biochemistry, BRC, Szeged
- Delivered a 'Guest lecture' (November 8 2017), VIT University, India