

Dr. Purushothaman Natarajan, PhD

Associate Faculty Member and Bioinformatician and, 225, Hamblin Hall, West Virginia State University, Institute, WV 25112, USA

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a) Education

Ph.D., 2011 - Biotechnology & Genomics, SRM University, Chennai, India.

M.Sc., 2007 -Medical Biochemistry, University of Madras, Chennai, India.

B.Sc., 2005 - Biochemistry, University of Madras, Chennai, India

b) Professional Experience

2018-Present Associate Faculty Member and Bioinformatician, West Virginia State University, WV, USA

2016-2018 Assistant Professor (Research), SRM University, Chennai, India

2012-2013 Postdoctoral Research Fellow, University of Toronto, Canada

2011-2016 Assistant Professor, SRM University, Chennai, India

2009-2011 Senior Research Fellow, SRM University, Chennai, India

2008-2009 Junior Research Fellow, SRM University, Chennai, India

c) Professional activities

- Editorial Board: Nature Scientific Reports, Plants, Diversity
- Reviewer for high-impact peer-reviewed journals (70 Reviews completed) (BMC Genomics, Nature Scientific Reports, Plant Molecular biology Reporter, Journal of Genetics, Gene, PeerJ, PLoS ONE, Plants, Diversity, The Journal of Horticultural Science and Biotechnology, International journal of molecular sciences, Physiology and molecular biology of plants, BMC Plant Biology, Gene Reports, Mitochondrial DNA).
- Grant Reviewer: Research projects for Department of Science and Technology (DST-SERB), Govt. of India
- Graduate and PhD thesis Committee member
- Member: American Society of Plant Biologists (ASPB)
- Member: Canadian Society of Plant Biologists (CSPB)
- Member: Indian Science Congress Association (ISCA)
- Member: Indian Society for Human Genetics (ISHG)
- Sectional Secretary, Indian Genetics Congress
- Local Sectional Secretary, Indian Science Congress
- Collaborator: Genome Asia 100K consortium
- Mentor (Undergraduate, Post Graduate and PhD students)

d) Research Grant Awards Received

1. **Principal Investigator/Project Director**, Integrating Data Science with Speed Breeding for Gummy Stem Blight Resistance in Watermelon and Nurturing Next Generation Minority Scientists, **USDA-NIFA, USD \$ 599,708** (2020-2023)
2. **Principal Investigator/Project Director**, Empowering Next Generation Plant Geneticists and Crop Breeders: Machine Learning Tools and Techniques in Data Driven Genomics Research, **USDA-NIFA, USD \$ 299,973** (2022-2025)
3. **Co-Principal Investigator/Co-Project Director**, exploring wild germplasm for introgression and grafting to combat biotic and abiotic stress for watermelon, **USDA-NIFA, USD \$ 599,679** (2021-2024)
4. **Co-Principal Investigator/Co-Project Director**, Translational genomics using Drosophila model for obesity and human health by linking gut microbiome with the benefits of various phytochemicals, **USDA-NIFA, USD \$ 599,808** (2022-2025)

e) Synergistic Activities:

- Guiding PhD, graduate and undergraduate students – PhD completed-2, 20 undergraduates and 10 graduate students in plant genomics.
- Organized several workshops on Next Generation Sequencing for genome and transcriptome analysis in plants for PhD students, graduate, undergraduate students and faculty members.
- Taught several courses on genetics and genomics to graduate, undergraduate and PhD students.
- Organized several national and international conferences.
- Presented invited lectures in genomics in universities and conferences.
- Reviewed more than 70 research articles for various high impact journals.

f) Peer-Reviewed Publications

1. Manzanero BR, Kulkarni KP, Vorsa N, Reddy UK, **Natarajan P**, Elavarthi S, Iorizzo M, Melmaiee K (2023) Genomic and evolutionary relationships among wild and cultivated blueberry species. **BMC Plant Biology** 23: 126. (**Impact factor: 5.5**)
2. Reddy UK, Lopez-Ortiz C, Talavera-Caro AG, **Natarajan P**, Tomason Y, Alaparathi S, Levi A, Nimmakayala P (2023) GWAS resolves molecular mechanisms underlying natural

variation for carotenoids in *Cucurbita maxima* Duchesne. **Scientia Horticulturae** 312: 111881. (Impact factor: 5.5)

3. Gupta A, Balakrishnan B, Karki S, Slayton M, Jash S, Banerjee S, Grahn THM, Jambunathan S, Disney S, Hussein H, **Natarajan P**. (2022). Human CIDEC transgene improves lipid metabolism and protects against high-fat diet-induced glucose intolerance in mice. **Journal of Biological Chemistry** 298. (Impact factor: 5.5)
4. Hopson CA, **Natarajan P**, Shinde S, Kshetry AO, Challa KR, Valenciana AP, Nimmakayala P, Reddy UK. (2022). Physiological and Transcriptomic Analysis of *Arabidopsis thaliana* Responses to Ailanthone, a Potential Bio-Herbicide. **International journal of molecular sciences** 23, 11854. (Impact factor: 6.20)
5. Lopez-Ortiz C, Edwards M, **Natarajan P**, Pacheco-Valenciana A, Nimmakayala P, Adjero DA, Sirbu C, Reddy UK. (2022). Peppers in Diet: Genome-Wide Transcriptome and Metabolome Changes in *Drosophila melanogaster*. **International journal of molecular sciences** 23, 9924. (Impact factor: 6.20)
6. Padmanabhan D, Lateef A, **Natarajan P**, Palanisamy S. (2022). *De novo* transcriptome analysis of *Justicia adhatoda* reveals candidate genes involved in major biosynthetic pathway. **Molecular biology reports**, 1-8. (Impact factor: 2.70)
7. Padmanabhan D, **Natarajan P**, Palanisamy S. (2022). Integrated Metabolite and Transcriptome Profiling-Mediated Gene Mining of *Sida cordifolia* Reveals Medicinally Important Genes. **Genes** 13, 1909. (Impact factor: 4.14)
8. Potlannagari RS, Parashuram S, Patil PG, Karuppannan DB, Sharma J, Sangnure VR, Mundewadikar D, **Natarajan P**, Marathe RA, Reddy UK. (2022). Reference quality genome sequence of Indian pomegranate cv.'Bhagawa'(Punica granatum L.). **Frontiers in plant science**, 2678. (Impact factor: 6.63)
9. Reddy UK, **Natarajan P**, Abburi VL, Tomason Y, Levi A, Nimmakayala P. (2022). What makes a giant fruit? Assembling a genomic toolkit underlying various fruit traits of the mammoth group of *Cucurbita maxima*. **Frontiers in genetics** 13, 1005158-1005158. (Impact factor: 4.28)
10. Chandrasekar S, **Natarajan P***, Mhatre PH, Mahajan M, Nivitha S, Palanisamy VE, Reddy UK, Sundararaj P (2022) RNA-Seq of Cyst Nematode Infestation of Potato (*Solanum tuberosum* L.): A Comparative Transcriptome Analysis of Resistant and Susceptible Cultivars. **Plants** 11: 1008. (*Equal authorship) (Impact factor: 4.658)
11. Pacheco-Valenciana A, Lopez-Ortiz C, **Natarajan P**, Saminathan T, Nimmakayala P, Reddy UK (2022) Stress responses and comparative transcriptome analysis of *Arabidopsis thaliana* ecotypes exposed to BTEX compounds. **Environmental and Experimental Botany**: 104953. (Impact factor: 6.02)

12. **Natarajan P**, Ahn E, Reddy UK, Perumal R, Prom LK and Magill C (2021). RNA-Sequencing in Resistant (QL3) and Susceptible (Theis) Sorghum Cultivars Inoculated With Johnsongrass Isolates of *Colletotrichum sublineola*. **Frontiers in Genetics**. 12:722519. (Impact Factor: 4.6)
13. **Natarajan P**, Murugesan AK, Govindan G, Gopalakrishnan A, Kumar R, Duraisamy P, Balaji R, Tanuja, Shyamli PS, Parida AK, Parani M (2021). A reference-grade genome identifies salt-tolerance genes from the salt-secreting mangrove species *Avicennia marina*. **Nature Communications Biology**. 2021 Jul 8;4(1):851. (Impact Factor 6.3)
14. Garcia-Lozano M*, **Natarajan P***, Levi A, Katam R, Lopez-Ortiz C, Nimmakayala P, Reddy UK. (2021). Altered chromatin conformation and transcriptional regulation in watermelon following genome doubling. **The Plant Journal**. 106(3):588-600. (Impact Factor 6.42) *Equal first Author
15. Peña-Garcia Y, Shinde S, **Natarajan P**, Lopez-Ortiz C, Balagurusamy N, Chavez ACD, Saminathan T, Nimmakayala P, Reddy UK (2021) Arsenic Stress-Related F-Box (ASRF) Gene Regulates Arsenic Stress Tolerance in *Arabidopsis thaliana*. **Journal of Hazardous Materials**:124831. (Impact Factor: 10.59)
16. Nimmakayala P, Lopez-Ortiz C, Shahi B, Abburi VL, **Natarajan P**, OjhaKshetry A, Shinde S, Davenport B, Stommel J, Reddy UK. (2021) Exploration into natural variation for genes associated with fruit shape and size among *Capsicum chinense* collections. **Genomics**. 113 (5): 3002-3014. (Impact Factor: 5.74)
17. Singh NV, Patil PG, Parashuram S, **Natarajan P**, Babu KD, Pal RK, Sharma J, Reddy UK. (2021) Chloroplast Genome Sequencing, Comparative Analysis and Discovery of Unique Cytoplasmic Variants in Pomegranate (*Punica granatum* L.). **Frontiers in Genetics**. 12: 1238. (Impact Factor: 4.6)
18. Joshi V, Nimmakayala P, Song Q, Abburi V, **Natarajan P**, Levi A, Crosby K, Reddy UK (2021). Genome-wide association study and population structure analysis of seed-bound amino acids and total protein in watermelon. **PeerJ** 9: e12343. (Impact factor: 3.06)
19. Parasar NR, Kumar R, **Natarajan P**, Parani M (2021) De novo assembly, annotation and molecular marker identification from the leaf transcriptome of *Ocimum gratissimum* L. **Plant Genetic Resources** 19: 469-476. (Impact factor: 1.279)
20. Kulkarni KP, Vorsa N, **Natarajan P**, Elavarthi S, Iorizzo M, Reddy UK, Melmaiee K (2021) Admixture Analysis Using Genotyping-by-Sequencing Reveals Genetic Relatedness and Parental Lineage Distribution in Highbush Blueberry Genotypes and Cross Derivatives. **International Journal of Molecular Sciences**, 22(1):163. (Impact Factor: 5.92)
21. Lopez-Ortiz C, Peña-Garcia Y, Bhandari M, Abburi VL, **Natarajan P**, Stommel J, Nimmakayala P, Reddy UK (2021). Identification of miRNAs and Their Targets Involved in

- Flower and Fruit Development across Domesticated and Wild Capsicum Species. **International Journal of Molecular Sciences** 22, 4866. (Impact Factor: 5.92)
22. Callwood J, Melmaiee K, Kulkarni KP, Vennapusa AR, Aicha D, Moore M, Vorsa N, **Natarajan P**, Reddy UK, Elavarthi S (2021) Differential Morpho-Physiological and Transcriptomic Responses to Heat Stress in Two Blueberry Species. **International Journal of Molecular Sciences**. 22(5):2481. (Impact Factor: 5.92)
 23. **Natarajan P**, Tolulope AA, Nimmakayala P, Lopez-Ortiz C, Garcia-Lozano M, Thompson BJ, John S, Reddy UK (2020) Integrated Metabolomic and Transcriptomic Analysis to Characterize Cutin Biosynthesis between Low- and High-Cutin Genotypes of *Capsicum chinense* Jacq. **International Journal of Molecular Sciences**, 21 (4), 1397. (Impact Factor: 5.92)
 24. Lopez-Ortiz C, Peña-Garcia Y, **Natarajan P**, Bhandari M, Abburi V, Dutta SK, Yadav L, Stommel J, Nimmakayala P, Reddy UK (2020) The ankyrin repeat gene family in Capsicum spp: Genome-wide survey, characterization and gene expression profile. **Nature Scientific reports** 10, 4044. (Impact factor: 4.38)
 25. Islam S, Reddy UK, **Natarajan P**, Abburi VL, Bajwa AA, Imran M, Zahoor MY, Abdullah M, Bukhari AM, Iqbal S (2020) Population demographic history and population structure for Pakistani Nili-Ravi breeding bulls based on SNP genotyping to identify genomic regions associated with male effects for milk yield and body weight. **Plos one**, 15(11):e0242500. (Impact factor: 3.24)
 26. Garcia-Lozano M, Haynes J, Lopez-Ortiz C, **Natarajan P**, Peña-Garcia Y, Nimmakayala P, Stommel J, Alaparthi SB, Sirbu C, Balagurusamy N, Reddy UK (2020) Effect of Pepper-Containing Diets on the Diversity and Composition of Gut Microbiome of *Drosophila melanogaster*. **International Journal of Molecular Sciences**, 21, 945. (Impact Factor: 5.92)
 27. Garcia-Lozano M, Dutta SK, **Natarajan P**, Tomason YR, Lopez C, Katam R, Levi A, Nimmakayala P, Reddy U (2020) Transcriptome changes in reciprocal grafts involving watermelon and bottle gourd reveal molecular mechanisms involved in increase of the fruit size, rind toughness and soluble solids. **Plant Molecular Biology**, 102 213-223. (Impact Factor: 4.1)
 28. GenomeAsia100K Consortium, **Natarajan P** (2019) The GenomeAsia 100K Project enables genetic discoveries across Asia. **Nature** 576, 106-111. (Impact factor: 49.96)
 29. Wall J D, Ratan A, Stawiski E and GenomeAsia100K Consortium, **Natarajan P**. (2019). Identification of African-Specific Admixture between Modern and Archaic Humans. **The American Journal of Human Genetics**, 105(6), 1254-1261. (Impact factor: 11.02)
 30. Umapathy D, Balashanmugam P, Vanniya SP, Rajan T, **Natarajan P**, Krishnamoorthy E, Viswanathan V, Kunka MR (2019) Association of SNP rs7181866 in the nuclear

respiratory factor-2 beta subunit encoding GABPB1 gene with obesity and type-2 diabetes mellitus in South Indian population. **International journal of biological macromolecules**, 132, p.606. (Impact factor: 6.95)

31. Lopez-Ortiz C, Dutta SK, **Natarajan P**, Peña-Garcia Y, Abburi V, Saminathan T, Padma Nimmakayala, Umesh K. Reddy (2019) Genome-wide identification and gene expression pattern of ABC transporter gene family in *Capsicum* spp. **PLoS ONE** 14(4): e0215901. (Impact factor: 3.24)
32. A Lateef, SK Prabhudas, **Natarajan P*** (2018) RNA sequencing and de novo assembly of *Solanum trilobatum* leaf transcriptome to identify putative transcripts for major metabolic pathways. **Nature Scientific reports** 8 (1), 15375. (Impact factor: 4.38) *Corresponding author
33. Sangeetha V, Leema G, **Natarajan P**, Ganguly K (2018) A candidate gene identification strategy utilizing mouse to human big-data mining: "3R-Tenet" in COPD genetic research. **Respiratory Research**, 19:92. (Impact factor: 5.63)
34. **Natarajan P**, M Parani (2018) De novo assembly of complete genome sequence of *Bacillus subtilis* from a probiotic capsule using Illumina sequencing. **Research Journal of Biotechnology** 13 (4), 47-50. (Impact factor: 0.3)
35. M Saravanan, V Gopinath, CM Kumar, S Asad, A Fuad, **Natarajan P** (2018) Green synthesis of anisotropic zinc oxide nanoparticles with antibacterial and cytofriendly properties. **Microbial Pathogenesis**, 115, 57–63. (Impact factor: 3.74)
36. G Bindusree, **Natarajan P**, S Kalva, P Madasamy (2017) Whole genome sequencing of *Oryza sativa* L. cv. Seeragasamba identifies a new fragrance allele in rice, **PLoS ONE**, e0188920. (Impact factor: 3.24)
37. Sudheesh KP, Prayaga S, Madasamy P, **Natarajan P*** (2016) Shallow whole genome sequencing for the assembly of complete chloroplast genome sequence of *Arachis hypogaea* L. **Frontiers in Plant Science** 7:1106 (Impact factor: 5.75) *Corresponding author
38. Rathinasabapathi P*, **Natarajan P***, Parani M (2016) Genome-wide DNA polymorphisms in Kavuni, a traditional rice cultivar with nutritional and therapeutic properties. **Genome**. 59 (5), 363-366 (Impact factor: 2.16) * Equal first Author
39. Sudheesh KP, Balaji R, Shahid KT, Parani M, **Natarajan P*** (2016) The complete chloroplast genome sequence of Indian mustard (*Brassica juncea* L.). **Mitochondrial DNA PartA**. 27(6):4622-4623 (Impact factor: 1.51) *Corresponding author
40. Pasupathi R, **Natarajan P**, Ramprasad VL, Parani M (2015) Whole genome sequencing and analysis of Swarna, a widely cultivated indica rice variety with low glycemic index. **Nature Scientific Reports** 5, 11303 (Impact factor: 4.38)

41. **Natarajan P**, Parani M (2014) First complete genome sequence of a probiotic *Enterococcus faecium* strain T-110 and its comparative genome analysis with pathogenic and non-pathogenic *Enterococcus faecium* genomes. **Journal of Genetics and Genomics**, 42(1):43-6 (**Impact factor: 4.28**)
42. **Natarajan P**, Newmaster. S.G, Ragupathy. S, Stalin. N, Suresh. D, Rex Arunraj. D, Gnanasekaran. G, Vassou. S.L, Narasimhan. D, Parani. M (2014) A Tiered Barcode Authentication Tool to Differentiate Medicinal Species of Cassia in India. **Genetics and Molecular Research** 13 (2): 2959-2968 (**Impact factor: 1.0**)
43. **Natarajan P** and Madasamy P (2011) *De novo* assembly and transcriptome analysis of five major tissues of *Jatropha curcas* L. using GS FLX titanium platform of 454 pyrosequencing. **BMC Genomics**, 12:191. (**Impact factor: 3.97**) (**Highly accessed article**)
44. **Natarajan P**, Kanagasabapathy D, Gunadayalan G, Panchalingam J, Shree N, Sugantham PA, Singh KK, Madasamy P (2010) Gene discovery from *Jatropha curcas* by sequencing of ESTs from normalized and full-length enriched cDNA library from developing seeds. **BMC Genomics**, 11:606. (**Impact factor: 3.97**) (**Highly accessed article**)

g) Student Training: Thesis Advisor

Served as a major advisor for 10 graduate student's thesis research and supervised 20 undergraduate students' independent research projects. Supervised two PhD scholars.

(h) Expertise

I have strong expertise (more than 12 years) in both wet lab (Library preparation and sequencing) and dry lab (Bioinformatics analysis) in genomics