

Arun Kumaran Anguraj Vadivel
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Education

PhD (Biology), Western University, Canada. 2011-2017.

Thesis title: *GmMYB176 interactome and regulation of isoflavonoid biosynthesis in Soybean.*

- Genome-wide identification of soybean *CHS* gene family
 - Tissue-specific expression, RNAseq data analysis and phylogenetic analysis.
- GmMYB176 interactome: Key factors involved in the isoflavonoid biosynthesis
 - Interactome identified by co-immunoprecipitation and protein-protein interactions validated *in planta*.
 - The transcriptional complex regulating isoflavonoid metabolic gene, *GmCHS8* was identified.
- GmMYB176 regulates multiple steps in isoflavonoid biosynthesis
 - Transcriptomics (RNA-seq) and Metabolomics (LC-MS/MS) approach to identify differentially expressed genes and differentially accumulated metabolites in *GmMYB176* RNAi silenced and overexpressed transgenic lines.

M.Sc (Biotechnology), SKASC, Coimbatore, India. 2006-2008.

Thesis title: *Analysis Of Human Genetic Variation Amongst South Indians.*

- Mitochondrial hypervariable regions among South Indian population analyzed by Restriction Fragment Length Polymorphism.

B.Sc (Biochemistry), Karpagam University, India. 2003-2006.

Experience

Postdoctoral fellow, Brain Tumour Research Centre, SickKids Hospital, Toronto, ON. Current.

- Proteome and phosphoproteome profiling of DIPG.
- Single-cell proteome profiling of brain tumor cells.

Biomedical Data Analyst, BenchSci, Toronto, ON. August 2019 - present.

- Analyzing and categorizing biomedical product data.
- Labeling biomedical data for machine learning training.

Research Associate, Department of Biology, Western University, London, ON. 2018- 2019.

- Protein expression and purification of His-tagged proteins by FPLC.
- Determining the sequence-specific DNA binding of transcription factors by EMSA.
- Transcriptomic and Metabolomic analysis of soybean hairy roots.

Scientist, Thomas Gold Pettingill LLP, Toronto, ON. February 2018 and February 2019.

- qPCR analysis of classified samples.

Research Assistant, Department of Biology, Western University, London, ON. 2017- 2018.

- RNAi silencing and overexpression of *bZIP* transcription factors.
- Transcriptomic analysis of *bZIP*-silenced and -overexpressed soybean hairy roots.
- Transcriptomic analysis of *MYB-bZIP* fusion gene overexpressed soybean hairy roots.

Graduate Teaching Assistant, Department of Biology, Western University, London, ON. 2011-2017.

- Biology undergraduate course 2290F: Teaching, marking assignment, lab books, and final exams.

Senior Research Fellow, Plant pathology, Sugarcane Breeding Institute, India. 2009-2011.

- Molecular characterization of *Colletotrichum falcatum* isolates that cause Red Rot disease in sugarcane.
- Proteomic analysis of *C. falcatum* isolates that differ in virulence.

Honorary Research Worker, Plant Pathology, Sugarcane Breeding Institute, India. 2008-2009.

- Collection of different *C. falcatum* pathotypes.
- Molecular characterization of *C. falcatum* during host x pathogen interaction.

Skills/Hands-on Experience

Proteomics

- Protein extraction
- Protein purification
- SDS-PAGE
- 2DE, Western blot
- Co-Immunoprecipitation
- Protein-protein interaction
- Protein localization
- Single cell proteomics

Bioinformatics

- DNA/RNA sequencing and analysis
- NGS analysis on CLC genomic workbench
- R Studio: DESeq2, ggplot2 etc.
- UNIX: NGS analysis
- Python: HTseq count

Microscopy

- Confocal microscopy
- Fluorescence microscopy

Metabolomics

- Metabolite extraction
- HPLC
- LC-MS/MS

Other skills

- Microsoft office
- Public presentation
- Organization
- Manuscript writing

Molecular biology

- PCR
- Real-time PCR (qPCR)
- DNA/RNA extraction and purification
- Cloning: TA, Gateway.
- Site-directed mutagenesis
- Yeast one/two/three - hybrid assays
- EMSA-Electrophoretic mobility shift assays
- Bacterial/yeast transformation

Software skills

- DNASTAR Lasergene
- CLC genomic workbench (Qiagen)
- MEGA 7.0
- BioEdit
- CFX Manager (Biorad)
- QuantStudio 3&5 (Applied Biosystems)
- Image Lab 6.0
- GelCapture (DNR)
- Confocal LAS AF (Leica)
- Cytoscape
- Agilent ChemStation
- Xcalibur (Thermo Scientific)

Online tools

- NCBI Genbank (Seq. retrieval and BLAST)
- NCBI GEO datasets
- BoxShade (ExPASy)
- SWISS-MODEL: Protein 3D structure
- STRING (Protein interactome network)
- Restriction mapper
- Clustal Omega

Papers in Peer-reviewed journals

Anguraj Vadivel, A. K., Renaud, J., Kagale, S. and Dhaubhadel, S. (2019). GmMYB176 Regulates Multiple Steps in Isoflavonoid Biosynthesis in Soybean. *Frontiers in Plant Science*, 10, 562.

Anguraj Vadivel, A. K., Krysiak, K., Tian, G. and Dhaubhadel, S. (2018). Genome-wide identification and characterization of chalcone synthase gene family in soybean (*Glycine max* [L.] Merr). *BMC Plant Biology*, 18, 325.

Mainali, H., **Anguraj Vadivel, A. K.**, Li, X., Gijzen, M. and Dhaubhadel, S. (2017). Soybean cyclophilin GmCYP1 interacts with an isoflavonoid regulator GmMYB176. *Scientific Reports* 7, 39550.

Anguraj Vadivel, A. K. (2015). Gel-based proteomics in plants: time to move on from the tradition. *Frontiers in Plant Science*, 6, 369.

Anguraj Vadivel, A.K., Sukumaran, A., Li, X. and Dhaubhadel, S. (2015). Soybean isoflavonoids: role of GmMYB176 interactome and 14-3-3 proteins. *Phytochemistry Reviews*, pp. 1-13.

Conference presentations (Selection)

*-Presenter

Anguraj Vadivel, A. K., Renaud, J., Kagale, S. and Dhaubhadel, S*. (2018) Transcriptomics and metabolomics of soybean roots provide insights into the GmMYB176-mediated regulation of isoflavonoid biosynthesis. Plant and Animal Genome XXV, San Diego, CA, USA. *January 13-17*.

Anguraj Vadivel, A. K*. and Dhaubhadel, S. (2017) GmMYB176 interactome and regulation of isoflavonoid biosynthesis in soybean. CSPB Eastern Regional Meeting, McGill University, Montreal, QC, Canada. *November 24-25*.

Anguraj Vadivel, A. K. and Dhaubhadel, S*. (2017) GmMYB176 interactome: identification of key factors involved in isoflavonoid biosynthesis in soybean. PAG XXV, San Diego, CA, *January 14-18*.

Dhaubhadel, S*. and **Anguraj Vadivel, A. K.** (2016) Omics Insights into Regulation of Isoflavonoid Biosynthesis in Soybean. 55th Annual Meeting of the Phytochemical Society of North America, Davis, CA, USA. *August 6-10*.

Anguraj Vadivel, A. K*. and Dhaubhadel, S. (2016) Regulation of isoflavonoid biosynthesis and GmMYB176 interactome in soybean. CSPB Annual Meeting 2016. Kingston, ON, Canada. *June 19-21*.

Lama, P*., **Anguraj Vadivel, A.K.** and Dhaubhadel, S. (2015) Functional characterization of GmMYB176 interacting protein kinases in soybean. CSPB Annual Meeting 2015. Edmonton, AB, Canada. *July 25-29*.

Anguraj Vadivel, A. K. and Dhaubhadel, S*. (2015) Identification of key regulatory factors involved in isoflavonoid biosynthesis in soybean, Gordon Research Conference- Plant Metabolic Engineering. Waterville valley, NH, USA. *July 18-24*.

Anguraj Vadivel, A.K*. and Dhaubhadel, S. (2014). Regulation of isoflavonoid biosynthesis and GmMYB176 interactome in soybean. 1st INPPO world congress. Hamburg, Germany. *August 31-September 4*.

Anguraj Vadivel, A.K. and Dhaubhadel, S*. (2014) Regulation of isoflavonoid biosynthesis: Identification of the key factors-GmMYB176 interactome. Banff Conference on Plant Metabolism. Banff, AB, Canada. *June 26-30*.

Anguraj Vadivel, A.K*. and Dhaubhadel, S. (2013). Identification and characterization of GmMYB176 interactome in soybean. Annual meeting of Canadian Society of Plant Biologists. Québec City, QC, Canada. *June 26-28*.

Anguraj Vadivel, A.K., Li, X. and Dhaubhadel, S*. (2014) soybean 14-3-3 proteins and GmMYB176 interactome: the key players involved in the regulation of isoflavonoid biosynthesis. 53rd Annual Meeting of the Phytochemical Society of North America. North Carolina, Raleigh, USA, *August 9-13*.

Dhaubhadel, S*., Li, X. and **Anguraj Vadivel, A.K.** (2013). Isoflavonoid Biosynthesis: Role of 14-3-3 proteins and GmMYB176 interactome. 9th Canadian Plant Genomics Workshop. Halifax, NS, Canada. *August 12-15*.

Anguraj Vadivel, A.K*. and Dhaubhadel, S. (2012). Identification and characterization of GmMYB176 interactome in soybean. Phytochemical society of North America conference. London, Ontario, Canada. *August 12-15*.

Extra-curricular activities

- Reviewer for the journal *Scientific reports* (Nature publishing group). *Since January 2019.*
- Lead judge of poster presentations at Eastern Regional meeting of the Canadian Society of Plant Biologists at McGill University, Montreal. *November 2017.*
- Event Organizer and Social Committee Coordinator, as a Board Member of Society of Biology Graduate Students, Department of Biology, Western University, London, ON, Canada. *2015.*
- Internship training on Molecular Biology & Bio-Informatics, BioMinds LifeScience, Hyderabad, India. *2007-2008.*
- An internship thesis, "Study On Antimicrobial Activity Of *Allium sativum* (Garlic) Against Selected Poultry Bacteria". Suguna poultry farms pvt ltd, Udumalpet, India. *May-June 2007.*

Membership

- International Plant Proteomics Organization, *Since 2011.*
- Canadian Society of Plant Biologists, *2013-2017.*
- Phytochemical Society of North America, *2011-2012.*
- Society of Biology Graduate Students, *2011-2017.*

Awards and Achievements

- PhD comprehensive exam
 - Passed with Distinction in 2014.
- Canadian Society of Plant Biologists
 - The George H. Duff Travel Bursaries for the conference held at Quebec City in 2013.
- International Plant Proteomics Organization
 - Travel award to present my work at the conference held at Hamburg, Germany in 2014.
- Society of Biology Graduate Students
 - 'Publication of the year' (Mainali et al 2017), and 'Most likely to stay in the lab overnight' in 2017.

Academic mentor

Substantial experience in delivering academic support and mentoring students,
Undergraduate thesis student, Jordan VanderBurgt.

- Genome wide identification of *GmC4H* genes in soybean.

Intern student, Kevin Krysiak

- Subcellular localization of GmCHS proteins in soybean

Intern students, Serina Dai and Amelia Aitken.

- Identification of *GmCHS8* promoter binding factors by Y1H cDNA library screening in soybean.
- Cloning and protein-protein interaction studies *in planta.*

References are available upon request.