

Ratnakar Vallabhaneni

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Education

- **Expecting Ph.D. in Biology (Plant Sciences)***, Graduate Center, The City University of New York, NY, USA (2002 - Present).

Dissertation title: Combining comparative genomics, bioinformatics and plant genetic diversity to investigate regulation of pro-vitamin A carotenoid content and composition in the Poaceae (under the supervision of Dr. Eleanore T. Wurtzel).

- **Master of Philosophy in Biology (Plant Sciences)**, Graduate Center, The City University of New York, NY, USA (2002 - 2005).
- **Master of Arts in Biology**, Lehman College of the City University of New York, NY, USA (2001 - 2002).
- **Master of Science in Biotechnology**, University of the West of England, Bristol, England (1997 - 1998).
- **Bachelor of Science in Microbiology and Biochemistry**, Nagarjuna University, Andhra Pradesh, India (1994 - 1997).

Awards & Honors

- Best poster presentation awarded by Gordon Research Conference (award sponsored by American Society of Plant Biologists).
- “Look who’s teaching and learning at CUNY” ads throughout NYC and in major news papers.
- Recipient of the Mina Rees distinguished dissertation fellowship in sciences. It is given based on the academic merit and scholarly research.
- Best poster presentation award by SIGMA XI – The scientific Research Society

Publications

Harjes CE, Rocheford TR, Bai L, Brutnell TP, Kandianis CB, Sowinski SG, Stapleton AE, **Vallabhaneni R.**, Williams M, Wurtzel ET, Yan J, Buckler ES. (2008) Natural genetic variation in lycopene epsilon cyclase tapped for maize biofortification. *Science* 319(5861):330-3.

Li, F., **Vallabhaneni, R.**, and Wurtzel, E.T. (2008) PSY3, a new member of the phytoene synthase gene family conserved in the Poaceae and a key regulator of abiotic-stress-induced root carotenogenesis. *Plant Physiology* 146:1333–1345.

Li, F., **Vallabhaneni, R.**, Yu, J., Rocheford TR., and Eleanore T. Wurtzel (2008) The maize phytoene synthase gene family: overlapping roles for carotenogenesis in endosperm, photomorphogenesis, and thermal stress-tolerance. *Plant Physiology* Published on May 28, 2008, as DOI:10.1104/pp.108.122119

Manuscripts in preparation

Two manuscripts as a primary author are under final phases towards submission.

Technical expertise

Molecular and Biochemical skills: Gene cloning, Vector construction, hybridization (DNA and RNA) analysis, Protein expression and Western analysis, Enzyme assays (ELISA), Plant transformation, Plant tissue culture, RNA isolation and Quantitative RT-PCR and other enabled technologies, HPLC and UPLC (Waters millennium), Microscopy (Flourescence, Electron (SEM and TEM), and Confocal

Bioinformatics: Vector NTI (Invitrogen), Access database and Microsoft Front page, Endnote, Molecular databases and similarity searching, sequence alignment and contig assemblies; comparative gene mapping, Gene finding strategies, Protein secondary structure, Homology modeling, Phylogenetic evolution and inference (PHYLIP, PAUP, MEGA 3), gene network analysis (Cytoscape), Genevestigator, and thorough understanding of systems biology.

Biostatistics: JMP 5.1 (SAS Institute Inc.)

Field Work: Maize field operations and follow up procedures for research

Teaching Experience: Taught Plant Physiology, Molecular Biology and Bioinformatics lab
Good at data interpretation and trouble shooting, team work, excellent communication skills, record keeping and keen to learn new topics and technologies.

Research Presentations

Vallabhaneni, R.,* Li, F., Rocheford, T., and Wurtzel, E.T. (2008) Timing biosynthetic potential of pro-vitamin A accumulation in a maize genetic diversity panel. NYAPMB- New York area plant molecular biology meeting, held (June 07, 2008 Adelphi University, Garden City, New York) (*talk*)

Vallabhaneni, R.,* Li, F., Rocheford, T., and Wurtzel, E.T. (2008) Timing biosynthetic potential of pro-vitamin A accumulation in a maize genetic diversity panel. SIGMA XI – The scientific Research Society (May 07, 2008 Lehman College, New York) (poster presenter* and winner of SIGMA XI best poster presentation – The scientific Research Society) (*poster*)

Vallabhaneni, R.,* Li, F., Rocheford, T., and Wurtzel, E.T. (2008) Timing biosynthetic potential of pro-vitamin A accumulation in a maize genetic diversity panel. The 9th Annual Celebration of Science Engineering and Mathematics, The Graduate Center, CUNY (April 11, 2008) (*Poster*)

Vallabhaneni, R. (2008) Maize diversity and development of metabolic engineering strategies to enrich maize endosperm with beta-carotene, a precursor of vitamin A. Invited talk, Fairleigh Dickinson University, University Campus, Faculty of Natural Sciences (Apr 17, 2008) (*talk*)

Vallabhaneni, R.,* Li, F., Rocheford, T., and Wurtzel, E.T. (2008) Natural genetic diversity as a tool towards developing metabolic engineering strategies to improve or modulate endosperm carotenogenesis 50th Maize Genetics Conference (Feb 27- Mar02, The Marriott – Wardman Park, Washington D.C) (*poster*)

Vallabhaneni, R.,* Li, F., Rocheford, T., and Wurtzel, E.T. (2007) Timing biosynthetic potential of pro-vitamin A accumulation in a maize genetic diversity panel. Gordon Research Conference-Conference on Plant Metabolic Engineering (July 15-20, 2007 Tilton, New Hampshire) (poster presenter* and winner of ASPB best poster award) (*poster*)

Vallabhaneni, R.,* Li, F., Rocheford, T., and Wurtzel, E.T. (2007) Timing biosynthetic potential of pro-vitamin A accumulation in a maize genetic diversity panel. Gordon Research Conference-Graduate Research Seminar on Plant Metabolic Engineering (July 13-15, 2007 Tilton, New Hampshire) (poster presenter* and winner of ASPB best poster award) (*poster*)

Vallabhaneni, R. (2007) Genetic diversity as a resource for rational metabolic engineering Gordon Research Conference-Graduate Research Seminar on Plant Metabolic Engineering (July 13-15, 2007 Tilton, New Hampshire) (*talk*)

Vallabhaneni, R. (2007) Maize diversity and development of metabolic engineering strategies to enrich maize endosperm with beta-carotene, a precursor of vitamin A. Interlab Research seminar series, Lehman College and NYBG, (Jan 18, 2007) Lehman College, New York (*talk*)

Vallabhaneni, R., Cervantes-Cervantes, M. and Wurtzel, E. T. (2005) Promiscuous enzymes in isoprenoid biosynthesis: functional screening vs. data mining. Plant Biology 2005, Annual Meeting of the American Society of Plant Biology (July 16-20, 2005, Seattle, Washington) (*poster*)

Vallabhaneni, R., Cervantes-Cervantes, M. and Wurtzel, E. T. (2005) Promiscuous enzymes in isoprenoid biosynthesis: functional screening vs. data mining. First Gordon Research Conference on Plant Metabolic Engineering (July 10-15, 2005, Tilton, New Hampshire; *Chair: E. Wurtzel*) (*poster*)

Jaradat, T.T., Gallagher, C.E., **Vallabhaneni, R.,** Licciardello, N., and Wurtzel, E.T. (2005) Characterization of the maize gene family encoding β -carotene hydroxylase (di-iron monooxygenase type). Maize Genetics Conference (March 10-13, 2005, Lake Geneva, Wisconsin) (*poster*)

Vallabhaneni, R., Li, F., Murillo, C., and Wurtzel, E.T. (2005) Mining genome data to reconstruct gene families controlling plastid isoprenoid biosynthesis in the Poaceae. Maize Genetics Conference (March 10-13, 2005, Lake Geneva, Wisconsin) (*poster*)

Miguel Cervantes-Cervantes, **Vallabhaneni, R.,** Wurtzel, E.T. (2002) Characterization of maize gene family encoding geranyl geranyl pyrophosphate synthase gene, a key enzyme in biosynthesis of plant isoprenoids. Maize Genetics Conference (March 14-17, The Hyatt Orlando, Kissimmee, Florida) (*poster*)

Gen Bank submissions

[AY641394](#): A complete gene sequence of *Zea mays* zeta-carotene desaturase (ZDS).

[AY714266](#): *Sorghum bicolor* zeta-carotene desaturase (ZDS) mRNA, complete cds.

EE417573: *Zea mays* geranylgeranyl pyrophosphate synthase (GGPPS1) mRNA, complete cds.

EE417574: *Zea mays* geranylgeranyl pyrophosphate synthase (GGPPS2) mRNA, complete cds.

EE417575: *Zea mays* geranylgeranyl pyrophosphate synthase (GGPPS3) mRNA, complete cds.

EE417576: *Zea mays* GGPPS-related (GGR) mRNA, complete cds.

EU638325: *Zea mays* Carotenoid hydroxylase (HYD1), complete gene sequence.

EU638326: *Zea mays* Carotenoid hydroxylase (HYD2), complete gene sequence.

Professional Societies

American Society of Plant Biologists

American Association of Advancement of Science

International Carotenoid Society

SIGMA XI