

Sujith Puthiyaveetil
Assistant Professor of Biochemistry
College of Agriculture/Department of Biochemistry
Purdue University
175 S University Street
Email: spveetil@purdue.edu
Phone: 7654948339
ORCID: 0000-0001-7505-4511

Education and Training

Calicut University	Kerala, India	Botany	BSc, 1997
Kannur University	Kerala, India	Botany	MSc, 1999
Queen Mary University of London	United Kingdom	Plant Biochemistry	PhD, 2008
Queen Mary University of London	United Kingdom	Plant Biochemistry	2009-2012
Washington State University	Pullman, USA	Plant Biochemistry	2012-2016

Research and Professional Experience

2016-present, Assistant Professor, Department of Biochemistry and Center for Plant Biology, Purdue University

2009-2012, Leverhulme Trust Early Career Research Fellow, School of Biological and Chemical Sciences, Queen Mary University of London

Awards and Honors

2010, Best talk by a postdoctoral research fellow at the 2010 Plastid Preview meeting, held at Imperial College, London, UK on 22-23 September

2009-2012, Leverhulme Trust Early Career Research Fellowship

2009, Wellcome Trust Value In People (VIP) award for undertaking postdoctoral research

2007, The Gatsby Charitable Foundation. The Gatsby Prize for best presentation by a graduate student in the field of plant biology

2004, Lawskis stipend for a period of six months to undertake research at Lund University, Lund, Sweden.

1999, University Grants Commission National Eligibility Test (UGC-NET) for the post of Assistant Professor and Junior Research Fellowship (JRF), India.

Invited meeting and seminar presentations

2021, 4-7 January. Invited speaker, 30th Western Photosynthesis Conference, Tucson, AZ.

2020, 23 September. Invited webinar, "Of electrons and genes: how I came to study photosynthesis and its regulation", Sree Narayana College, Kerala, India.

2020, 5-7 June. Invited talk "Photosynthesis in the shade: genetic and molecular control mechanisms", Plant Functional Biology Webinar, Sir Syed College, Kerala, India.

2018, 26-28 October. Session chair "Structure and Physiology", 44th Midwest/Southeast Photosynthesis Meeting, Turkey Run State Park, Indiana.

2017, 27-29 October. Session chair "Physiology and Regulation", 43rd Midwest/Southeast Photosynthesis Meeting, Turkey Run State Park, Indiana.

2015, 8-11 January. Invited talk "Compartmentalization ensures order and efficiency in PS II repair cycle", 24th Western Photosynthesis Conference, Pacific Grove, CA.

2013, 11-16 August. Invited talk “Remodeling of the photosynthetic membrane during high light acclimation”, 16th International Photosynthesis Congress, St. Louis, USA.

2013, 3-6 January. Invited talk “Supramolecular structure and dynamics in the photoinhibited grana”, 22nd Western Photosynthesis Conference, Pacific Grove, CA.

2012, 12-13 November. Invited Plenary Lecture “How evolutionary tinkering rewires chloroplast gene regulation” at Royal Society Discussion Meeting “Energy transduction and genome function - an evolutionary synthesis”. The Royal Society of London, U.K.

2007, 22-27 July. 14th International congress of photosynthesis, “A bacterial-type sensor kinase couples electron transport to gene expression in chloroplasts”, Scottish Exhibition and Conference Centre, Glasgow, U.K.

Formal Courses Taught or Extension Activities

2018-present, Purdue Biochemistry Department, Instructor for BCHM 562 (Metabolic Biochemistry) at the Undergraduate and graduate level

Number of students mentored

Undergraduate mentees: 13

Graduate mentees: 2

Postdoctoral mentees: 1

Professional and Synergistic Activities

- Reviewer for National Science Center Poland (NCN) Cellular and Developmental biology grant proposal (2020)
- Reviewer for Trainee Early-career Award for Mentoring in Unexplored Problems (TEAM-UP) Postdoctoral Award, Department of Biochemistry and Molecular Biology, Michigan State University (2020)
- Reviewer for Department of Energy Basic Energy Sciences (DOE-BES) grant proposal (2020)
- Review editor for Plant Cell Biology, *Frontiers in Plant Science* journal (2018-present)
- Judge for Indiana FFA state agriscience fair, Purdue University, 20 June, 2017
- Reviewer for *Trends in Genetics, Photosynthesis Research, Environmental and Experimental Botany, Plant Science, Biological Chemistry, Frontiers in Plant Science, Journal of Experimental Botany, Molecular Plant, New Phytologist and Genome Biology and Evolution* journals
- Reviewer for Austrian Science Fund grant proposal (2016)
- Invited talk “Wandering in the gardens of the mind: Peter Mitchell and his chemiosmotic theory”, Purdue Biochemistry Club, 26 October 2016
- EXploring College Emerging Leaders (EXCEL) outreach activity to encourage and promote higher education for Native American students, Washington State University, Oct 17-19, 2014

Publications

1. Müh F, van Oort B, **Puthiyaveetil S**, Kirchhoff H (2020) Thylakoid membrane stacking to grana in plants: physicochemical forces at work. *Nat Plants* (in press).
2. Höhner R, Pribil M, Herbstová M, Lopez LS, Kunz HH, Meng L, Wood M, Svoboda V, **Puthiyaveetil S**, Leister D, Kirchhoff H (2020) Plastocyanin is the long-range electron carrier between photosystem II and photosystem I in plants. *Proc. Natl. Acad. Sci. USA* 117(26):15354-15362. doi: 10.1073/pnas.2005832117

3. McKenzie SD, Ibrahim IM, Aryal UK, **Puthiyaveetil S*** (2020) Stoichiometry of protein complexes in plant photosynthetic membranes. *BBA - Bioenergetics* 1861(2): 148141. doi: 10.1016/j.bbabi.2019.148141
4. Ibrahim IM, Wu H, Ezhov R, Kayanja G, Zakharov S, Du Y, Tao WA, Pushkar Y, Cramer WA, **Puthiyaveetil S*** (2020) An evolutionarily conserved iron-sulfur cluster underlies redox sensory function of the Chloroplast Sensor Kinase. *Commun Biol* 3(1):13. doi: 10.1038/s42003-019-0728-4
5. Macadlo LA, Ibrahim IM, **Puthiyaveetil S*** (2020) Sigma factor 1 in chloroplast gene transcription and photosynthetic light acclimation. *J. Exp. Bot.* 71(3): 1029-1038. doi: 10.1093/jxb/erz464
6. Ness J, Naurin S, Effinger K, Stadnytskyi V, Ibrahim IM, **Puthiyaveetil S**, Cramer WA (2019) Structure-based control of the rate limitation of photosynthetic electron transport. *FEBS Lett.* 593: 2103-2111. doi: 10.1002/1873-3468.13484
7. Koochak H[†], **Puthiyaveetil S[†]**, Mullendore D, Li M, Kirchhoff H (2019) The structural and functional domains of plant thylakoid membranes. *Plant J.* 97(3): 412-429. doi: 10.1111/tpj.14127
8. Ibrahim IM, Wang L, **Puthiyaveetil S**, Krauß N, Nield J, Allen JF (2018) Oligomeric states in sodium ion-dependent regulation of cyanobacterial histidine kinase-2. *Protoplasma* 255(3): 937-952. doi: 10.1007/s00709-017-1196-7
9. Kirchhoff H, Li M, **Puthiyaveetil S** (2017) Sublocalization of cytochrome b6f complexes in photosynthetic membranes. *Trends Plant Sci.* 22(7): 574-582. doi: 10.1016/j.tplants.2017.04.004
10. **Puthiyaveetil S[†]**, van Oort B[†], Kirchhoff H (2017) Surface charge dynamics in photosynthetic membranes and the structural consequences. *Nat Plants* 3, 17020. doi: 10.1038/nplants.2017.20. doi: 10.1038/nplants.2017.20
11. Ibrahim IM, **Puthiyaveetil S**, Khan C, Allen JF (2016) Probing the nucleotide-binding activity of a redox sensor: two-component regulatory control in chloroplasts. *Photosynth Res.* 130(1): 93-101. doi: 10.1007/s11120-016-0229-y.
12. Ibrahim IM, **Puthiyaveetil S**, Allen JF (2016) A Two-Component Regulatory System in Transcriptional Control of Photosystem Stoichiometry: Redox-Dependent and Sodium Ion-Dependent Phosphoryl Transfer from Cyanobacterial Histidine Kinase Hik2 to Response Regulators Rre1 and RppA. *Front. Plant Sci.* 7:137. doi: 10.3389/fpls.2016.00137.
13. Tietz S, **Puthiyaveetil S**, Enlow HM, Yarbrough R, Wood M, Semchonok DA, Lowry T, Li Z, Jahns P, Boekema EJ, Lenhert S, Niyogi KK, Kirchhoff H (2015) Functional implications of photosystem II crystal formation in photosynthetic membranes. *J. Biol. Chem.* 290(22): 14091-106. doi: 10.1074/jbc.M114.619841
14. **Puthiyaveetil S**, Tsabari O, Lowry T, Lenhert S, Lewis RR, Reich Z, Kirchhoff H (2014) Compartmentalization of the protein repair machinery in photosynthetic membranes. *Proc. Natl. Acad. Sci. USA* 111(44): 15839-44. doi: 10.1073/pnas.1413739111
15. **Puthiyaveetil S**, Woodiwiss T, Knoerdel R, Zia A, Wood M, Hoehner R, Kirchhoff H (2014) Significance of the photosystem II core phosphatase PBCP for plant viability and protein repair in thylakoid membranes. *Plant Cell Physiol.* 55(7): 1245-54. doi: 10.1093/pcp/pcu062
16. **Puthiyaveetil S*** and Kirchhoff H (2013) A phosphorylation map of the photosystem II supercomplex C2S2M2. *Front. Plant Sci.* 4:459. doi: 10.3389/fpls.2013.00459.
17. **Puthiyaveetil S***, Ibrahim IM, Allen JF (2013) Evolutionary rewiring: a modified prokaryotic gene regulatory pathway in chloroplasts. *Phil. Trans. R. Soc. B* 368(1622):20120260. doi:

10.1098/rstb.2012.0260

18. **Puthiyaveetil S**, Ibrahim IM, Allen JF (2012) Oxidation-reduction signalling components in regulatory pathways of state transitions and photosystem stoichiometry adjustment in chloroplasts. *Plant Cell Environ.* 35, 347-359. doi: 10.1111/j.1365-3040.2011.02349.x
19. Allen JF, de Paula W, **Puthiyaveetil S**, Nield J (2011) A structural phylogenetic map for chloroplast photosynthesis. *Trends Plant Sci.* 16(12): 645-55. doi: 10.1016/j.tplants.2011.10.004
20. Allen JF, Santabarbara S, Allen C, **Puthiyaveetil S** (2011) Discrete redox signaling pathways regulate photosynthetic light-harvesting and chloroplast gene transcription. *PLoS ONE* 6(10): e26372. doi: 10.1371/journal.pone.0026372
21. **Puthiyaveetil S*** (2011) A mechanism for regulation of chloroplast LHC II kinase by plastoquinol and thioredoxin. *FEBS Lett.* 585: 1717-21. doi: 10.1016/j.febslet.2011.04.076
22. **Puthiyaveetil S**, Ibrahim IM, Jelacic B, Tomašić A, Fulgosi H, Allen JF (2010) Transcriptional control of photosynthesis genes: the evolutionarily conserved regulatory mechanism in plastid genome function. *Genome Biol. Evol.* 2: 888-96. doi: 10.1093/gbe/evq073
23. Juric S, Hazler-Pilepic K, Tomasic A; Lepedus H, Jelacic B, **Puthiyaveetil S**, Bionda T, Vojta L, Allen JF, Schleiff E, Fulgosi H (2009) Tethering of ferredoxin:NADP⁺ oxidoreductase to thylakoid membranes is mediated by novel chloroplast protein TROL. *Plant J.* 60(5): 783-94. doi: 10.1111/j.1365-313X.2009.03999.x
24. **Puthiyaveetil S**, Allen JF (2009) Chloroplast two-component systems: evolution of the link between photosynthesis and gene expression. *Proc. R. Soc. B* 276 (1665): 2133-45. doi: 10.1098/rspb.2008.1426
25. **Puthiyaveetil S**, Kavanagh TA, Cain P, Sullivan JA, Newell CA, Gray JC, Robinson C, van der Giezen M, Rogers MB, Allen JF (2008) The ancestral symbiont sensor kinase CSK links photosynthesis with gene expression in chloroplasts. *Proc. Natl. Acad. Sci. USA* 105: 10061-10066. doi: 10.1073/pnas.0803928105
26. **Puthiyaveetil S***, Allen JF (2008) A bacterial-type sensor kinase couples electron transport to gene expression in chloroplasts. In *Photosynthesis. Energy from the Sun* (Allen JF, Gantt E, Golbeck JH, Osmond B, eds.), Springer, Heidelberg, p. 1181–1186. doi: 10.1007/978-1-4020-6709-9_258
27. Allen JF, Allen CA, **Puthiyaveetil S** (2008) Redox switches and evolutionary transitions. In *Photosynthesis. Energy from the Sun* (Allen JF, Gantt E, Golbeck JH, Osmond B, eds.), Springer, Heidelberg, p.1155–1160. doi: 10.1007/978-1-4020-6709-9_253
28. **Puthiyaveetil S**, Allen JF (2008) Transients in chloroplast gene transcription. *Biochem. Biophys. Res. Commun.* 368: 871-874. doi: 10.1016/j.bbrc.2008.01.167
29. Allen JF, **Puthiyaveetil S**, Strom J, Allen CA (2005) Energy transduction anchors genes in organelles. *Bioessays* 27: 426-435. doi: 10.1002/bies.20194

†Equal contribution

*Corresponding author