SOUMITRA PAUL, Ph.D.
psoumitra@ymail.com
sopbot@caluniv.ac.in

Assistant Professor
Molecular Plant Physiology Laboratory (MPP lab)
Department of Botany, University of Calcutta
35, Ballygunge Circular Road
Kolkata 700019, West Bengal, India
Personal home page: https://www.mpplaboratory.com/

Mobile: +91-9748605305
Permanent address:
34, Central Road, Shyamnagar, 24 Pgs.(N)
Pin 743127, West Bengal, India
D.O.B.: 26.12.1980

EDUCATION

University of Calcutta — Kolkata, India
PhD in Botany — 2007-2013

University of Calcutta — Kolkata, India
M.Sc. in Botany (Special paper: Plant Physiology, Biochemistry and Molecular Biology) — 2003-2005

Rishi Bankim Chandra College, University of Calcutta — Naihati, India
B.Sc. in Botany (Honours) — 2000-2003

NATIONAL LEVEL EXAMINATIONS QUALIFIED

- CSIR/UGC NET: Year: June, 2006; December, 2006
- GATE: Year: 2006; All India Rank: 392

RESEARCH INTEREST

Regulation of iron and phosphate transport in plants: Iron is an essential element for all living organism. In plants, iron after being absorbed from soil, are transported from root to seed via shoot or leaves with the help of a number of transporters. On the other hand, phosphate being an important macronutrient regulates plant growth and development. The deficiency of iron and phosphate in soil can activate a series of signalling cascades that finally modulate plant responses. A better understanding is necessary to know how a plant root can determine to grow or regulate the transport during iron and phosphate deficiency condition. Which signalling molecules play pivotal role in plants to maintain iron and phosphate homeostasis or crosstalk between these two nutrients are still open questions to answer. We have found that one of the PHT family members is critically regulated by glutathione under depleted phosphate condition. We are actively engaged to unravel this regulatory mechanism. My group (MPP lab) also currently focuses on how small RNAs play crucial role to acclimatize plants in iron and phosphate deficient condition.

Crosstalk between plant growth, development and osmotic stress tolerance regulation: Food security is a major challenging issue in India. Several abiotic stress factors like drought, salinity, and temperature stress hamper the crop production thus affecting food security. A number of lectin proteins are known to play crucial role in stress tolerance in plants. The R40 group of lectin proteins is a novel family consisting of 5 functional isoforms in rice which has been identified to be strongly induced in response to osmotic stress. However, the detailed mechanism of how OsR40 proteins impart tolerance during drought stress still remains elusive. One of the OsR40 family members, OsR40c1, imparts drought tolerance in rice by forming a multi-protein complex with several chromatin associated proteins under drought stress. However, how this complex regulates the downstream drought responsive genes still remains to be explored. On the other hand, another member, OsR40g3, imparts salinity and drought tolerance in rice by regulating a cell wall modification protein. Interestingly, it can also negatively regulate seed development by inhibiting the activity of a 14-3-3 family protein. However, many questions remain unanswered about its dual regulation which needs to be dissected.

RESEARCH GRANTS

UGC-BSR Start-up Grant
University Grant Commission, Government of India
Project title: Signaling crosstalk between iron and phosphate transport in *Arabidopsis thaliana*

Extramural Research Grant
Department of Biotechnology (DHESTBT), Government of West Bengal
Project title: Molecular regulation of drought tolerance in rice with special reference to functional aspect of OsR40C1 protein

Extramural Research Grant
CSIR, Government of India
MicroRNA mediated regulation of iron transport in *Arabidopsis thaliana*

PUBLICATIONS

Sahid S, Roy C, Shee D**,** Datta R, **Paul S. 2020.** Jacalin domain-containing protein OsSalT interacts with OsDREB2A and OsNAC1 to impart drought stress tolerance in planta. **Environmental and Experimental Botany** (in press)

Sahid S, Roy C, **Paul S*,** Datta R*. **2020**. Rice lectin protein Osr40c1 imparts drought tolerance by modulating OsSAM2, OsSAP8 and chromatin-associated proteins. **Journal of Experimental Botany** (in press)

Roy C, Sahid S**,** Datta R**, Paul S. 2020.** Spatial distribution of the lectin protein Osr40g3 determines its dual regulatory function in imparting salinity tolerance while impeding seed development in rice (**bioRxiv**)

Datta R**, Paul S**. **2019**. Long non-coding RNAs: Fine-tuning the developmental responses in plant. **Journal of Biosciences** 44:77

Gayen D, Ghosh S, **Paul S**, Sarkar SN, Datta SK, Datta K. **2016**. Metabolic regulation of carotenoid-enriched golden rice line. **Frontiers in Plant Science** 7: 1622

Paul S, Gayen D, Datta SK, Datta K. **2016**. Analysis of high iron rice line reveals new miRNAs that targets iron transporters in roots. **Journal of Experimental Botany** 67: 5811-5824

Gayen D, **Paul S**, Sarkar SN, Datta K, Datta SK. **2016**. Comparative nutritional compositions and proteomics analysis of transgenic Xa21 rice seeds compared to conventional rice. **Food Chemistry** 203: 301-307

Datta R, **Paul S***. **2015**. Plant microRNAs: master regulator of gene expression mechanisms. **Cell Biology International** 39: 1185-1190

Paul S, Datta SK, Datta K. **2015**. miRNA regulation of nutrient homeostasis plants. **Frontiers in Plant Science** 5:588

Paul S, Gayen D, Datta SK, Datta K. **2015**. Dissecting root proteome of transgenic rice cultivars unravels metabolic alteration and accumulation of novel stress responsive proteins under drought stress. **Plant Science** 234: 133-143

Paul S, Ali N, Datta SK, Datta K. **2014**. Development of iron enriched high yielding *indica* rice cultivar by introgression of high iron trait from transgenic iron biofortified rice. **Plant Foods for Human Nutrition** 69: 203 -208**.**

Gayen D, Ali N, Ganguly M, **Paul S,** Datta K, Datta SK. **2014**. RNAi mediated silencing of lipoxigenase gene to maintain rice nutritional quality and viability during storage. **Plant Cell Tissue and Organ Culture** 118: 229-243.

Paul S, Ali N, Sarkar SN, Datta SK, Datta K. **2013**. Loading and bioavailability of iron in cereal grains. **Plant Cell Tissue and Organ Culture** 113: 363-373.

Ali N, **Paul S,** Gayen D, Sarkar SN, Datta SK, Datta K. **2013**. Development of low phytate rice by RNAi mediated seed-specific silencing of inositol 1,3,4,5,6-penta kis phosphate 2-kinase gene (IPK1). **PLoS One** 8 (7): 12.

Ali N, **Paul S,** Gayen D, Sarkar SN, Datta SK, Datta K. **2013**. RNAi mediated down regulation of myo-1nositol 3 phosphate synthase to generate low phytate rice. **Rice** 6: 12.

Paul S, Ali N, Gayen D, Datta SK, Datta K. **2012**. Molecular breeding of *Osfer2* gene to increase iron nutrition in rice. **GM Crops & Food** 3: 310-316.

BOOK CHAPTER

Datta R, Sahid S, **Paul S. 2020**. Networking by small molecule hormones during drought stress in plants 'in' Khan M.I.R; Singh A; Poor P. Improving abiotic stress tolerance in plants. CRC Press

Paul S. 2018. GM Crops: Recent advancement in plant biotechnology. In Recent trends in life sciences. UGC-HRDC, Gauhati University, pp. 151-156 [ISBN: 978-93-87263-67-3]

PROFESSIONAL MEMBERSHIPS

- Life Member, Indian Society for Plant Physiology
- Life Member, Indian Science Congress Association
- Life Member, Society of Biological Chemists (India)
- Life Member, Botanical Society of Bengal

CONTRIBUTION TO POPULAR SCIENCE

Wood wide web. Datta R, **Paul S**. Science Reporter. April, 2016.

CRISPR Cures: Technology promises to rewrite genome reversing genetic disorders. Datta R, **Paul S**. Biotecnika. July, 2014

GM Crops: "Alternative paradigm" for food security show. **Paul S**, Datta R. Biotecnika. May, 2014