

Dr. Ronita Nag Chaudhuri

Associate Professor | Molecular & Cell Biology

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About

The Ronita Nag Chaudhuri Lab (Team_RNC) investigates transcription factor networks, chromatin regulation, and hormonal crosstalk governing plant development and environmental stress responses. We also explore chromatin dynamics and epigenetic mechanisms regulating DNA damage repair and gene expression regulation using yeast as the model system.

Specialization: Molecular and Cell Biology

Teaching in the Department

Epigenetics and chromatin biology, Plant physiology and biochemistry, Molecular biology, Recombinant DNA technology, DNA damage and repair mechanisms, Post-transcriptional gene regulation.

Professional & Academic Background

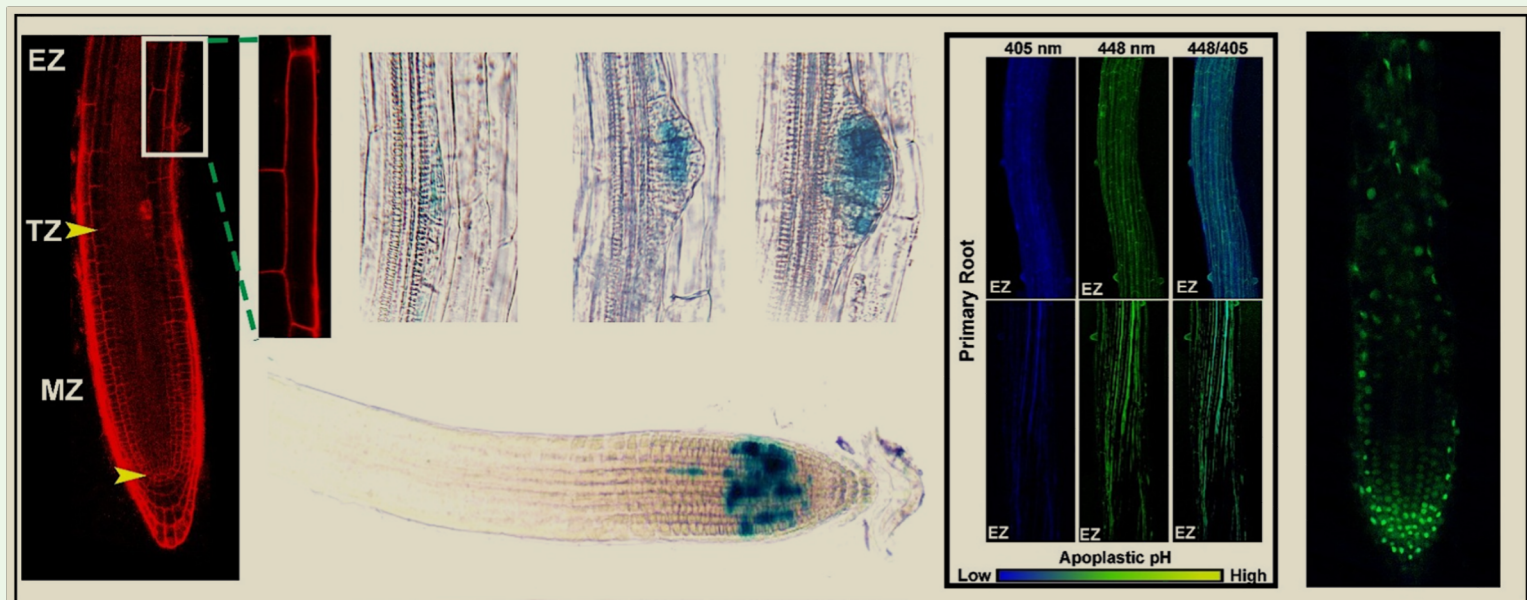
- **Year of joining:** 2010
- **Post-Doctoral training**
School of Molecular Biosciences, Washington State University, USA (2005-2009)
- **Ph.D. in Molecular Biology, Biophysics and Genetics**
Department of Biochemistry, University of Calcutta (2005)

Awards & Honors

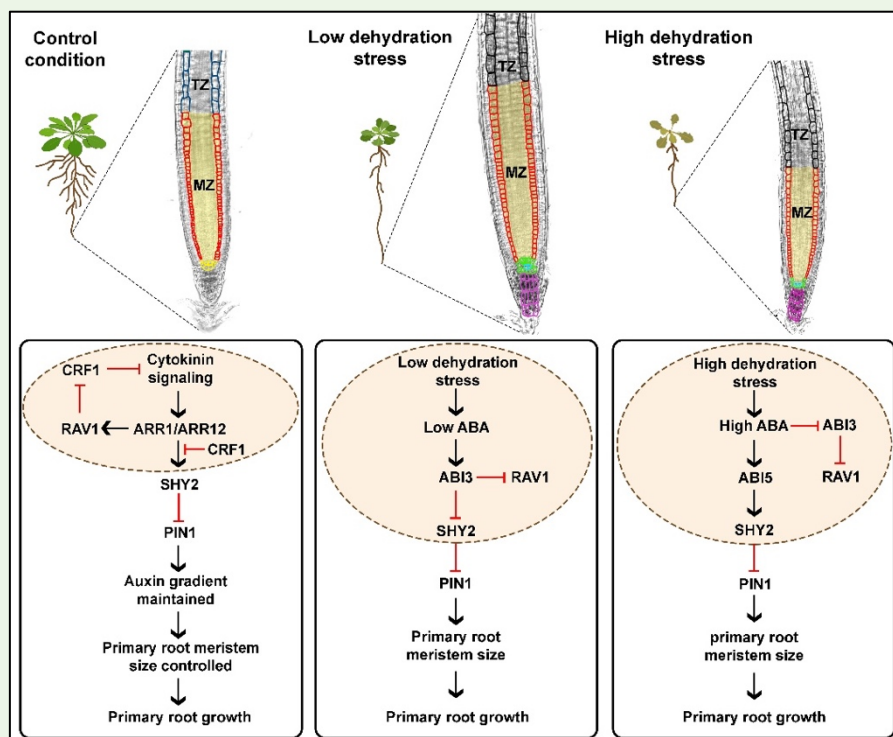
- ❑ 2024: Elected Fellow, West Bengal Science Academy (FAScT)
- ❑ 2021 – Present: Associate Editor, *The Nucleus* (Springer Nature)
- ❑ 2019: American Society of Plant Biologists (ASPB) Travel Grant Award
- ❑ 2012: DST Fast-Track Young Scientist Award
Department of Science & Technology (DST), Government of India.
- ❑ 2000–2005: CSIR Junior & Senior Research Fellowship
Council of Scientific & Industrial Research (CSIR), India.
- ❑ 1997: University Merit Fellowship
Awarded for outstanding academic performance in the B.Sc. examination.



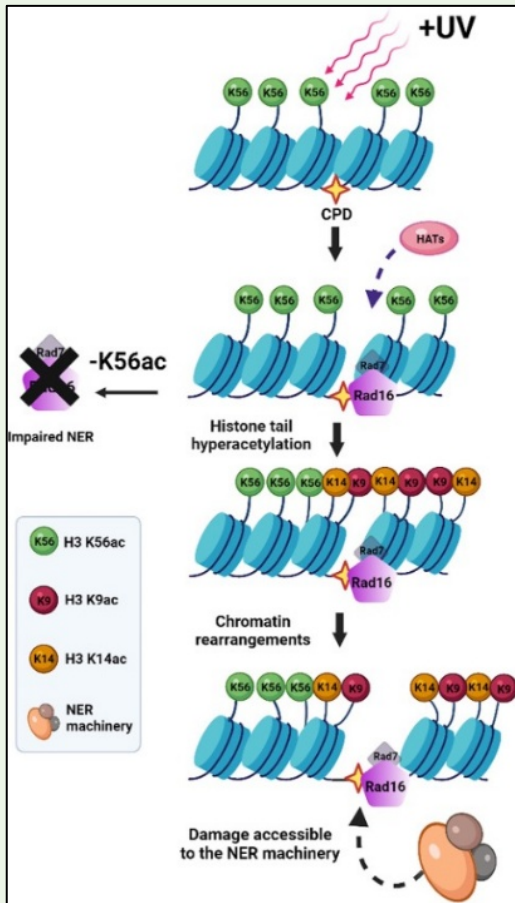
Investigating genetic and epigenetic regulatory mechanisms involved in developmental and environmental signaling



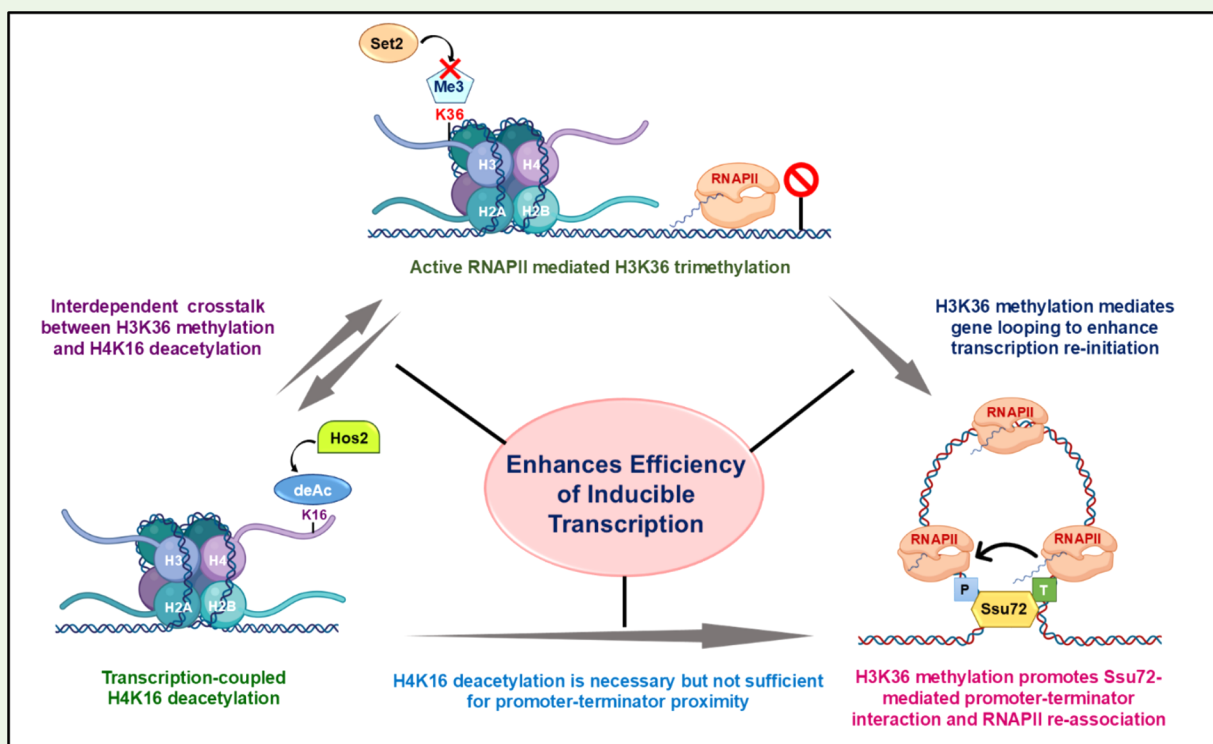
Plants being sessile organisms counteract the plethora of unfavorable environmental conditions through a sophisticated repertoire of stress response mechanisms. Central to such stress signaling pathway is reprogramming of gene expression. Regulation of gene expression in response to an environmental cue or associated developmental changes is functionally controlled by transcription factors. Ability of the transcription factors to control gene expression is again dependent on chromatin regulation that may render a genomic landscape conducive or non- conducive for transcription. *Our lab works towards understanding the interplay of transcription factors and hormonal crosstalk during reprogramming of gene expression in response to stress signals and developmental cues* (Bedi et al., 2016, 2018; Sengupta et al., 2020; Sengupta and Nag Chaudhuri, 2020; Mandal et al., 2023; Mandal et al., 2024; Datta et al., 2024; Mandal et al., 2025, 2026; Chakraborty et al., 2026).



Epigenetic regulation during DNA damage response and gene expression



Genome of all living organisms faces constant assault from various endogenous and exogenous DNA damaging agents. The DNA damage repair mechanisms play a crucial role in prevention of both spontaneous and environmentally induced damages at the molecular level. Defects in DNA damage repair in mammalian cells may lead to increased cancer frequency, neurological abnormalities as well as growth and developmental defects, among others. Organization of DNA into nucleosomes and the higher order chromatin architecture affects regulation of nuclear functions, like DNA damage repair, transcription, etc. The dynamic nature of chromatin plays an important role in modulating the access of these regulatory factors to the genetic template and maintenance of genomic stability. DNA damage repair pathway is no exception to this general rule. Regulated chromatin accessibility during start of the process followed by restoration of the chromatin structure at the end of the process is the underlying key for successful removal of DNA lesions. ***Our lab works towards understanding the role of chromatin modifications and remodeling during DNA damage response and transcription regulation through analyses of histone structural mutants*** (Ray et al., 2018, 2020; Khan and Nag Chaudhuri, 2022; Khan et al., 2023; Singha and Nag Chaudhuri, 2026).



Publications

2026

- ❑ ***Auxin modulates ABI3 expression as part of a negative feedback loop during lateral root development in Arabidopsis.*** Swarnavo Chakraborty, Sicon Mitra, Saptarshi Datta, Drishti Mandal and Ronita Nag Chaudhuri*. *New Phytologist*, DOI: 10.1111/nph.71548.
 - ❑ ***H3K36 Methylation is Essential for Promoter-terminator Interaction and Re-association of RNAPII to Gene Promoter During Inducible Transcription in Yeast.*** Priyabrata Singha and Ronita Nag Chaudhuri*. *Journal of Molecular Biology*, DOI: <https://doi.org/10.1016/j.jmb.2026.169861>
 - ❑ ***Cytokinin response factor 1 acts as a negative regulator of cytokinin-mediated developmental pathways in Arabidopsis.*** Drishti Mandal, Swarnavo Chakraborty and Ronita Nag Chaudhuri*. *Planta*, DOI: <https://doi.org/10.1007/s00425-026-04974-4>
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2025

- ❑ ***To grow or not to grow: the enigma of plant root growth dynamism.*** Drishti Mandal, Saptarshi Datta, Sicon Mitra, Swarnavo Chakraborty and Ronita Nag Chaudhuri*. *Plant Molecular Biology*, DOI: <https://doi.org/10.1007/s11103-025-01631-4>
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2024

- ❑ ***ABI3 regulates ABI1 function to control cell length in primary root elongation zone.*** Saptarshi Datta, Drishti Mandal, Sicon Mitra, Swarnavo Chakraborty and Ronita Nag Chaudhuri*. *The Plant Journal*, DOI: <https://doi.org/10.1111/tbj.17121>.
 - ❑ ***ABSCISIC ACID INSENSITIVE 3 promotes auxin signaling by regulating SHY2 expression to control primary root growth in response to dehydration stress.*** Drishti Mandal, Saptarshi Datta, Sicon Mitra and Ronita Nag Chaudhuri*. *Journal of Experimental Botany*, DOI: <https://doi.org/10.1093/jxb/erae237>
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2023

- ❑ ***RNA Polymerase II dependent crosstalk between H4K16 deacetylation and H3K56 acetylation promotes transcription of constitutively expressed gene.*** Preeti Khan, Priyabrata Singha and Ronita Nag Chaudhuri*. *Molecular and Cellular Biology*, DOI: <https://doi.org/10.1080/10985549.2023.2270912>
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2022

- ❑ ***RAV1 mediates cytokinin signalling for regulating primary root growth in Arabidopsis.*** Drishti Mandal, Saptarshi Datta, Giridhar Raveendar, Pranab Kumar Mondal and Ronita

Nag Chaudhuri*. *The Plant Journal*, DOI: <https://doi.org/10.1111/tpj.16039>. **THE ARTICLE WAS A "FEATURED ARTICLE OF THE ISSUE"**.

- ***Acetylation of H3K56 orchestrates UV-responsive chromatin events that generate DNA accessibility during Nucleotide Excision Repair.*** Preeti Khan and Ronita Nag Chaudhuri*. *DNA Repair*, DOI: <https://doi.org/10.1016/j.dnarep.2022.103317>

2021

- ***DNA methylation and regulation of gene expression: Guardian of our health.*** Invited Review as a part of Special Thematic Issue. Gaurab Aditya Dhar, Shagnik Saha, Parama Mitra and Ronita Nag Chaudhuri*. *The Nucleus*, DOI: <https://doi.org/10.1007/s13237-021-00367-y>

2020

- ***Deacetylation of H4 lysine16 affects acetylation of lysine residues in histone H3 and H4 and promotes transcription of constitutive genes.*** Anagh Ray, Preeti Khan and Ronita Nag Chaudhuri*. *Epigenetics*, DOI: <https://doi.org/10.1080/15592294.2020.1809896>
- ***ABI3 plays a role in de-novo root regeneration from Arabidopsis thaliana callus cells.*** Sourabh Sengupta and Ronita Nag Chaudhuri*. *Plant Signaling & Behavior*, DOI: <https://doi.org/10.1080/15592324.2020.1794147>
- ***ABI3 mediated repression of RAV1 gene expression promotes efficient dehydration stress response in Arabidopsis thaliana.*** Sourabh Sengupta, Anagh Ray, Drishti Mandal and Ronita Nag Chaudhuri*. *BBA Gene Regulatory Mechanism*, DOI: <https://doi.org/10.1016/j.bbagr.2020.194582>

2018

- ***Regulated acetylation and deacetylation of H4 K16 is essential for efficient NER in Saccharomyces cerevisiae.*** Anagh Ray, Preeti Khan and Ronita Nag Chaudhuri*. *DNA Repair*, DOI: <https://doi.org/10.1016/j.dnarep.2018.09.009>
 - ***Transcription factor ABI3 autoactivates its own expression during dehydration stress response.*** Sonia Bedi and Ronita Nag Chaudhuri*. *FEBS Letters*, DOI: <https://doi.org/10.1002/1873-3468.13194>. **THE ARTICLE WAS SELECTED AS "FEATURED ARTICLE OF THE ISSUE"**.
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2016

- ❑ ***ABI3 mediates dehydration stress recovery response in Arabidopsis thaliana by regulating expression of downstream genes.*** Sonia Bedi, Sourabh Sengupta, Anagh Ray and Ronita Nag Chaudhuri*. ***Plant Science***, DOI: <https://doi.org/10.1016/j.plantsci.2016.06.006>

2013

- ❑ ***Rad26, the Transcription-Coupled Repair Factor in yeast, is required for removal of stalled RNA Polymerase-II following UV irradiation.*** Sounak Ghosh-Roy, Dhiman Das, Debarati Chowdhury, Michael J. Smerdon and Ronita Nag Chaudhuri*. ***PLOS ONE***, DOI: <https://doi.org/10.1371/journal.pone.0072090>

Postdoctoral and Ph.D. Research

- ❑ ***A cassette of N-terminal amino acids of histone H2B are required for efficient cell survival, DNA repair and Swi/Snf binding in UV irradiated yeast.*** Ronita Nag, McKenna Kyriss, John Smerdon John Wyrick and Michael J. Smerdon. ***Nucleic Acids Research*** (2010), Vol. 38:1450-1460. DOI: [10.1093/nar/gkp1074](https://doi.org/10.1093/nar/gkp1074)
- ❑ ***Altering the chromatin landscape for Nucleotide Excision Repair.*** Ronita Nag and Michael J. Smerdon. ***Mutation Research Reviews*** (2009), Vol. 682(1):13-20. DOI: [10.1016/j.mrrev.2009.01.002](https://doi.org/10.1016/j.mrrev.2009.01.002)
- ❑ ***A single amino acid change in histone H4 enhances UV survival and DNA repair in yeast.*** Ronita Nag, Feng Gong, Deirdre Fahy and Michael J. Smerdon. ***Nucleic Acids Research*** (2008), Vol. 36 (11): 3857-66. DOI: [10.1093/nar/gkn311](https://doi.org/10.1093/nar/gkn311)
- ❑ ***Protein turnover in response to transient exposure to exogenous auxin is necessary for restoring auxin autotrophy in a stressed Arachis hypogea cell culture.*** Ronita Nag, Manas Kanti Maity, Anindita Seal, Amit Hazra and Maitrayee DasGupta. ***Plant Cell Tissue Organ Culture*** (2006), Vol. 84, pg 17-26.
- ❑ ***Dual DNA binding property of ABA insensitive 3 like factors targeted to promoters responsive to ABA and auxin.*** Ronita Nag, Manas Kanti Maity, and Maitrayee DasGupta. ***Plant Molecular Biology*** (2005), Vol. 59. DOI: [10.1007/s11103-005-1387-z](https://doi.org/10.1007/s11103-005-1387-z)
- ❑ ***Exogenous auxin depletion renders an Arachis hypogea suspension culture sensitive to water loss without affecting cell growth.*** Anindita Seal, Amit Hazra, Ronita Nag, Subho Chaudhuri and Maitrayee DasGupta. ***Plant Cell Reports*** (2001) Vol 20 pg 567-573.

Extramural Research Grants:

ONGOING

1. “Molecular mechanism of ABI3-mediated regulation of root architecture in Arabidopsis and its implication in drought stress response: translation of the knowledge to rice”, funded by DBT (Govt. of India) Grant # BT/PR58500/BSA/33/546/2025.
2. “Investigating the mechanistic role of epigenetic switch ULTRAPETALA in regulating developmental pathways in indica rice variety: impact on growth and crop yield”, funded by ANRF (Govt. of India) Grant # [ANRF/ARG/2025/003729/LS](#).

COMPLETED

1. 5-year DBT, India sponsored project entitled “DBT-BUILDER- St. Xavier’s College (Autonomous), Kolkata, Department of Microbiology & Biotechnology - Interdisciplinary Life Science Programme for Advance Research and Education”. Co-PI and Program leader.
2. “Role of B3 domain transcription factor in regulating root growth during dehydration stress response”, funded by SERB (DST, India) Grant # SPG/2021/002264.
3. “Development and leveraging small-scale fluidic Platform towards understanding the plant root system: A Convergence of Engineering and Biology”, funded by SERB (DST, India) Grant # CRG/2022/000762.
4. “Investigating the role of histone acetylation during UV-induced Nucleotide Excision Repair”, funded SERB (Govt. of India) Grant # CRG/2018/000461.
5. “Investigating the mechanism of RAV1-mediated desiccation stress signaling and significance of ABI3-RAV1 crosstalk”, funded by DBT, (Govt. of West Bengal) [569(sanc)/BT-56/2014].
6. “Understanding the mechanism of ABI3 gene regulation during desiccation stress response”, funded by CSIR, (Govt. of India) Grant #38 (1411)/ 15/EMR-II.
7. “Mechanism of ABI3 mediated desiccation tolerance in plants: Genetic and Epigenetic Regulation”, funded by CSIR Grant [38 (1283)/ 11/EMR-II].
8. “Chromatin Regulation during DNA Damage Repair”, funded by SERB-Fast Track Scheme of Department of Science and Technology [SR/FT/LS-145/2009].

LAB MEMBERS:

PRESENT:



Saptarshi Datta (CSIR-Net Fellow, SRF)

Project: Genetic and epigenetic regulation of root system architecture and its dynamism in response to abiotic stress signals.



Priyabrata Singha (DBT Project Fellow)

Project: Elucidating the significance of crosstalk between histone methylation and histone acetylation in gene expression regulation.



Sicon Mitra (ANRF Project Fellow)

Project: Transgenic approach to improve quality traits for better adaptation to stress conditions.



Swarnavo Chakraborty (CSIR-NET Fellow, SRF)

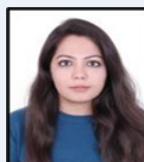
Project: Understanding the molecular mechanism of lateral root development and associated abiotic stress response mediated by B3 domain transcription factors.



Adrija Chakraborty (UGC-NET Fellow, JRF)

Project: Understanding the role of B3 domain transcription factor ABI3 in regulating root gravitropism

ALUMNI



Dr. Sonia Bedi:

*Genomic Informatics coordinator · Dartmouth Hitchcock Medical Center and Clinics
Bellevue, Washington, USA*



Dr. Anagh Ray:

*Post-Doctoral Fellow, Centre for Cancer Research, National Cancer Institute,
NIH, Bethesda, MD, USA*



Dr. Sourabh Sengupta

Post-Doctoral Fellow, University of Texas Southwestern Medical Centre, USA.



Dr. Preeti Khan

Post-Doctoral Fellow, University of Texas Southwestern Medical Centre, USA.



Dr. Drishti Mandal

Post-Doctoral Fellow, Institute for Plant Sciences of Montpellier (IPSiM), CNRS, Montpellier, France.

Invited Talks/Papers presented in conferences/seminars

International Conferences

- ❑ **International Conference on Current Trends and Future Prospects of Plant Biology (CTFPPB), 2023, organized by Department of Plant Sciences, University of Hyderabad, India.** Oral presentation of paper titled “The AP2/ERF family transcription factor RAV1 functions at a crucial nodal point to determine primary root meristem size in Arabidopsis”. Drishti Mandal, Saptarshi Datta and Ronita Nag Chaudhuri. Ms. Drishti Mandal won the third best prize for her talk.
- ❑ **ASBMB - The Interplay Between Epigenetic Regulation and Genome Stability 2022, Seattle, Washington State, USA.** Oral Presentation of Paper Titled: Acetylation of H3 K56 aids chromatin accessibility during UV-induced Nucleotide Excision Repair in *Saccharomyces cerevisiae*. Preeti Khan and Ronita Nag Chaudhuri. Ms. Preeti Khan received ASBMB, 2022 travel grant award.
- ❑ **Cancer International Webinar 2022, organized by Unite Scientific Explores, USA.** Oral Presentation of Paper Titled: Acetylation of H3 K56 aids chromatin accessibility during UV-induced Nucleotide Excision Repair in *Saccharomyces cerevisiae*. Preeti Khan and Ronita Nag Chaudhuri.
- ❑ **ASPB Plant Biology 2019 meeting, held in San Jose, California, USA.** Presentation titled “Decoding ABI3 gene regulation and its novel role in dehydration stress and recovery response in *Arabidopsis thaliana*”. Sonia Bedi, Sourabh Sengupta and Ronita Nag Chaudhuri; ASPB, 2019 travel grant awardee.
- ❑ **INDO-US conference 2018 on “Transcription, Chromatin structure, DNA repair and Genomic instability”.** Anagh Ray and Ronita Nag Chaudhuri

- ❑ **“Epigenetics and Human Disease”, Indo-Japan International Conference (2018), organized by Bose Institute, India.** Invited oral presentation of paper entitled “Loss of regulated acetylation and deacetylation of H4 K16 residue affects chromatin accessibility and DNA damage repair efficiency”. Anagh Ray, Preeti Khan and Ronita Nag Chaudhuri
- ❑ **International Conference on “Insight to Plant Biology in Modern Era”, Bose Institute Centenary Celebration, India (2017).** Presentation of paper entitled “Decoding the genetic and epigenetic regulation of ABI3 in desiccation stress response”. Sonia Bedi, Sourabh Sengupta and Ronita Nag Chaudhuri.
- ❑ **VISCEA (Vienna International Scientific Conference and Events Association) (2015),** International conference on Plant Abiotic Stress III held in Vienna. Presentation of paper entitled- “ABI3-mediated abiotic stress tolerance in *Arabidopsis thaliana*”. Sonia Bedi, Sourabh Sengupta and Ronita Nag Chaudhuri.
- ❑ **Keystone Symposia on “Chromatin Mechanisms and Cell Physiology” organized by Keystone in association with German Ministry (2014),** held in Oberstdorf, Germany. Presentation of paper entitled- “Significance of genetic & epigenetic control in understanding the mechanism of ABI3-mediated desiccation stress response”. Sonia Bedi, Anagh Ray, Sourabh Sengupta and Ronita Nag Chaudhuri.
- ❑ **Washington State University, Academic Showcase (2008),** held at Pullman, Washington State, USA. Presentation of paper entitled –“A Single Amino Acid Change in a DNA Packaging Protein Improves Cell Survival and DNA Repair in Yeast.” Ronita Nag, John M. Hinz and Michael J. Smerdon.
- ❑ **Gordon Research Conference on Mammalian DNA Repair held at Ventura, California, USA (2007).** Presentation of paper entitled - “Nucleotide Excision Repair in SWI/SNF-Independent (SIN) Histone mutants in *Saccharomyces cerevisiae*.” Ronita Nag, Feng Gong, Deirdre Fahy and Michael J. Smerdon.
- ❑ **The 37th Annual Meeting of Environmental Mutagenesis Society (EMS) held at Vancouver BC, Canada (2006).** Presentation of paper entitled - “Nucleotide Excision Repair in SWI/SNF-Independent (SIN) Histone mutants in *Saccharomyces cerevisiae*.” Ronita Nag, Feng Gong, Deirdre Fahy and Michael J. Smerdon.

National Conferences

- ❑ **Transcription Assembly Meeting, 2025** – invited talk on “Orchestration of histone modifications: the chromatin code for transcription regulation”, held at Bose Institute, Kolkata.
- ❑ **“The world of Microbes: pathogenesis, environment and evolution”- 100 years commemoration, Bose Institute, India (2016).** Presentation of paper entitled “Mutation of histone residue H4 K16 affects dynamism of chromatin structure-function in *Saccharomyces cerevisiae*.” Anagh Ray and Ronita Nag Chaudhuri. **Best Presentation Award- First Prize.**
- ❑ **National Conference organized by WAST (West Bengal Academy of Science and Technology), India 2016.** Presentation of paper entitled “Understanding the mechanism of ABI3 regulation during desiccation stress response”. Sonia Bedi and Ronita Nag Chaudhuri. **Best Presentation Award- First Prize.**

- ❑ **Interdisciplinary Approach to Biological Sciences, IABS (2015)** organized by Indian Association of Cultivation of Sciences. Presentation of paper entitled- "Role of H4 K16 acetylation status in affecting chromatin structure during Nucleotide Excision Repair." Anagh Ray and Ronita Nag Chaudhuri.
- ❑ **National Symposium on Plant Physiology & Biochemistry in Transgenic Era and Beyond, held at Bose Institute, Calcutta (2001).** Invited for oral presentation of paper entitled- "Molecular mechanism of auxin mediated stress tolerance in *Arachis hypogea* cell suspension culture." Ronita Nag, Anindita Seal, Shubho Chaudhuri and Maitrayee DasGupta.
- ❑ **The XXV All India Cell Biology Conference held at the Indian Institute of Science, Bangalore (2001).** Oral presentation of paper entitled- "Molecular analysis of auxin mediated stress tolerance in *Arachis hypogea* cell suspension culture". Ronita Nag, Anindita Seal, Shubho Chaudhuri and Maitrayee DasGupta.