
Sujit Roy (M.Sc., PhD)



Assistant Professor

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Career

- **CSIR Pool Scientist, - November 2012 – August 2014:** Department of Chemistry, Bose Institute, Kolkata, India.
- **Fulbright-Nehru Postdoctoral Fellow- 2011:** Department of Plant Cellular and Molecular Biology (Molecular Genetics), The Ohio State University, 244B Rightmire Hall, 1060 Carmack Road, Columbus, OH 43210, USA.
- **DST SERC FAST Track Young Scientist - 2008 – 2011:** Department of Chemistry, Bose Institute, Kolkata, India
- **DBT Postdoctoral Fellow - 2008 – June 2008:** Department of Chemistry, Bose Institute, Kolkata, India
- **Extended Senior Research Fellow - August 2006 - January 2007:** Division of Plant Biology (Department of Botany) Bose Institute, Kolkata, India

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- **Senior Research Fellow - 2003 – 2006:** Division of Plant Biology (Department of Botany) Bose Institute, Kolkata, India
 - **Junior Research Fellow - 2000 – May 2003:** Division of Plant Biology (Department of Botany) Bose Institute, Kolkata, India

Education

PhD: 2007: Plant Molecular Biology and Biochemistry, Department of Botany, Bose Institute, Kolkata, INDIA, (Degree awarded on 2007 from the University of Jadavpur, Kolkata, INDIA).

National Eligibility Test: 1999 (NET conducted by Council of Scientific and Industrial Research and University Grants Commission, Govt. of INDIA) for **PhD Research Fellowship and Lectureship**

Master of Science (M.Sc): 1998: - Botany, Specialization: Cytogenetics and plant breeding from University of Kalyani, Kalyani, Nadia, West Bengal, INDIA.

Rank 1st in First class in the University.

Bachelor of Science (B.Sc): 1995: Botany (major) Zoology and Chemistry (minor), from University of Kalyani, Kalyani, Nadia, West Bengal, INDIA.

Rank 1st in First class in the University.

Awards and Recognitions

- ✓ **2013: CSIR Senior Research Associateship under Pool Scientist' Scheme**
- ✓ **2011: Fulbright-Nehru Postdoctoral Fellowship Award** from United States-India Educational Foundation (USIEF) with a research fellowship grant of \$30,000 for 1 year.
- ✓ **2008: DST SERC FAST TRACK Young Scientist award** with independent research grant of Rs. 17,41,000/- for three years from the **Science and Engineering Research Council division, Department of Science and Technology, Govt. of India.**
- ✓ **2007: Post Doctoral Fellowship** from the **Department of Biotechnology, Govt. of India.**
- ✓ **2007: Best poster Award** in the New Biology Section in **94th Indian Science Congress** at the University of Annamalai, India.

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- ✓ **2001: Best poster Award** in “National Symposium on Plant Physiology and Biotechnology in Transgenic era and beyond” at Bose Institute, Kolkata, India.
 - ✓ **1999: PhD research fellowship** from University Grants Commission, Govt. of India for qualifying the “National Eligibility Test” (NET), jointly conducted by Council of Scientific and Industrial Research (CSIR) and University Grants Commission (UGC).
 - ✓ **1998: “Mitali memorial merit scholarship”** from the Dept. of Botany for getting **1st position in Master of Science in the University of Kalyani (1998)**.
 - ✓ **1997: University Merit Scholarship for First class First position in Botany in Master of Science (Phase I)** in the University of Kalyani (1995).
 - ✓ **1995: National merit Scholarship** from the Human Resource Development Group, Govt. of India for **First class First position in Botany in Bachelor of Science (Final exam)** in the University of Kalyani, Kalyani, India.
 - ✓ **1994: Merit scholarship** from the Department of Botany, University of Kalyani, for ranking **First class First position in Botany in Bachelor of Science (Phase I)**.



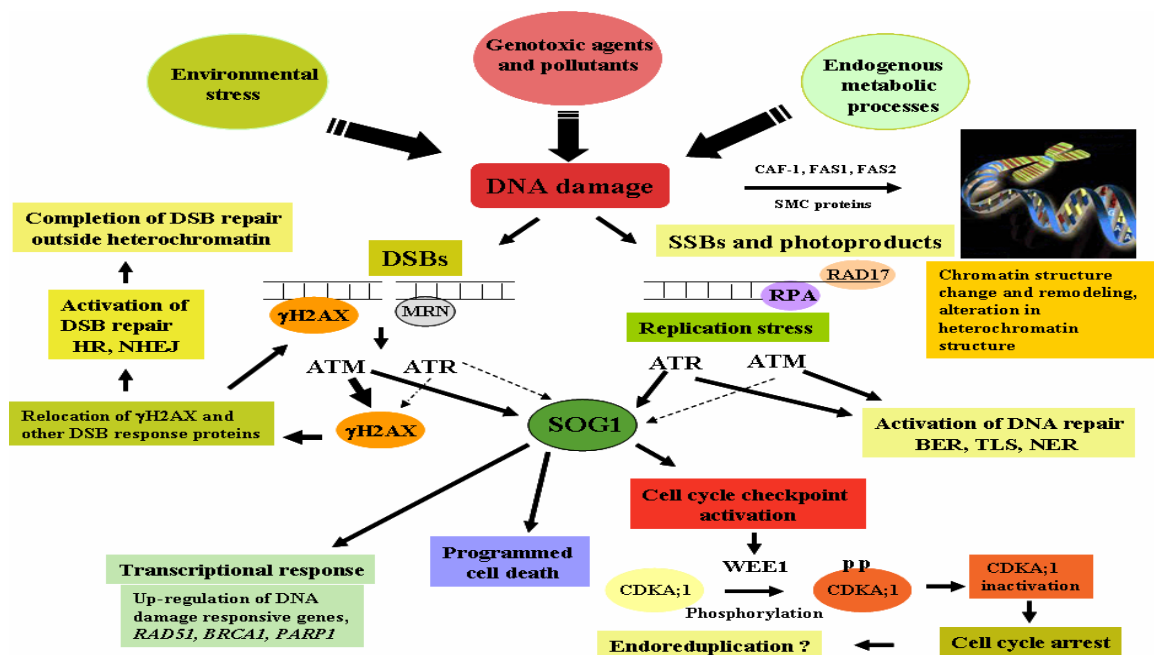
Research interest

Maintenance of genome stability in plants - **Molecular mechanisms of DNA damage repair in the context of environmental and genotoxic stress**

Plants, with their inherent immobility and obligatory dependence on sunlight for energy, face tremendous challenges in maintaining the integrity of the genome, which is under continuous assault from environmental factors like UV and ionizing radiation, high salinity, chemical mutagens, and free radicals or alkylating agents generated by endogenous processes. Lesions in the DNA, contributed by various damaging agents may result in changes in both the chemical and physical structures of DNA and thus generate both cytotoxic and genotoxic effects, which in turn reduces stability of plant genome, inhibits plant growth and development, and finally affects productivity.

DNA double strand breaks (DSBs) are considered one of the most serious forms of DNA damage which cause chromosomal breakage. DSBs have severe damaging effects on plant growth, with particularly extreme effects on actively dividing cells. DNA replication or progression through mitosis in the presence of a DSB can lead to loss of chromosome fragments or chromosome fusions, thus have the potential to inhibit plant growth as a result of inhibition of transcription and loss of cell viability. Therefore, effective detection and repair of DSBs are essential to ensure the stability of the genome.

In plants, the majority of DSBs in somatic cells are repaired via the non-homologous end joining (NHEJ) pathway in contrast to homologous recombination (HR), which repairs DSBs during meiotic recombination. Although homologs of many of the mammalian DSB repair genes have been identified in higher plant genome, comprehensive knowledge on the double strand break repair mechanism in plants is limited.



DNA damage response and chromatin remodeling activity in plants

I am particularly interested in exploring the following issues by the using the model plant system *Arabidopsis thaliana* in the context of maintenance of plant genome stability and crop productivity in response to abiotic and genotoxic stresses.

- The molecular mechanism about how plants detect, repair and/or tolerate DNA damages particularly double strand breaks (DSBs) generated by environmental and genotoxic stress.
- The interactions among the different components of DSB repair pathway

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- The transcriptional response to DSBs following exposure to abiotic stress such as UV-B radiation or high salinity
 - Post-translational regulation of core DSB repair proteins
 - Functional relevance of DNA repair proteins in environmental stress tolerance in plants

Publications (2004 – Date)

A. Genome stability and molecular mechanisms of DNA damage repair in plant genome

1. **Sujit Roy** (2014) Maintenance of genome stability in plants: repairing DNA double strand breaks and chromatin structure stability. *Frontiers in Plant Science*, doi: 10.3389/fpls.2014.00487 (**Impact Factor – 3.6**)
2. **Sujit Roy** (2014) DNA polymerase λ - a novel DNA repair enzyme in higher plant genome. *Plant Science Today*, **1**: 140-146
3. **Sujit Roy***, Swarup Roy Choudhury, Dibyendu N. Sengupta and Kali Pada Das (2013) Involvement of *AtPol λ* in repair of high salt and DNA cross linking agent induced double strand breaks in *Arabidopsis thaliana*. *Plant Physiology*, **162**:1195-1210 (*Corresponding author) (**Impact Factor – 6.53**)
4. **Sujit Roy***, Swarup Roy Choudhury, Kali Pada Das (2013) The interplay of DNA polymerase λ in diverse DNA damage repair pathways in higher plant genome in response to environmental and genotoxic stress factors. *Plant Signaling & Behavior*, 12/2012; 8(1)
5. **Sujit Roy***, Swarup Roy Choudhury, Sanjay Kumar Singh, Kali Pada Das (2012) Functional analysis of light regulated promoter region of *AtPol λ* gene. *Planta*, **235**: 411-432 (*Corresponding author) (**Impact Factor - 3.098**)
6. **Sujit Roy***, Swarup Roy Choudhury, Sanjay K Singh and Kali Pada Das (2011) *AtPol λ* , A Homologue Of Mammalian DNA Polymerase λ In *Arabidopsis thaliana*, Is Involved In The Repair Of UV-B Induced DNA Damage Through Dark Repair Pathway. *Plant and Cell Physiology*, **52**: 448-467 (*Corresponding author) (**Impact Factor -4.7**)
7. Sanjay K Singh, Swarup Roy Choudhury, **Sujit Roy*** and Dibyendu N. Sengupta (2011) Understanding DNA repair and recombination in higher plant genome: Information from genome-wide screens in *Arabidopsis* and rice. *Plant Signaling & Behavior*, **6**:1-3 (*Corresponding author) (**Impact Factor - 2.0**)

8. Sanjay K Singh, **Sujit Roy**, Swarup Roy Choudhury and Dibyendu N Sengupta (2010) DNA Repair and Recombination in Higher Plants: Insights from Comparative Genomics of Arabidopsis and Rice. *BMC Genomics*, **11**:443-454 (Impact Factor - 4.21)

9. **Sujit Roy***, Sanjay Kumar Singh, Swarup Roy Choudhury, Dibyendu N. Sengupta (2009) An insight into the biological functions of family X-DNA polymerase in DNA replication and repair of plant genome. *Plant Signaling & Behavior*, **4**:1-4 (*Corresponding author) (Impact Factor - 2.0)

10. **Sujit Roy**, Swarup Roy Choudhury and Dibyendu N. Sengupta (2008) Analysis of processivity of mungbean dideoxynucleoside-sensitive DNA polymerase and detection of the activity and expression of the enzyme in the meristematic and meiotic tissues and following DNA damaging agent. *Archives of Biochemistry and Biophysics*, **475**:55-65 (Impact Factor - 3.022)

11. Sanjay Kumar Singh, Swarup Roy Choudhury, **Sujit Roy** and Dibyendu N. Sengupta (2008) Sequential, Structural, and Phylogenetic Study of BRCT Module in Plants, *Journal of Biomolecular Structure and Dynamics*, **26**:163-272 (Impact Factor - 4.986)

12. **Sujit Roy**, Swarup Roy Choudhury, Sunil K. Mukherjee and Dibyendu N. Sengupta (2007) Tobacco PCNA interacts directly and stimulates both activity and processivity of mungbean DNA polymerase. *Archives of Biochemistry and Biophysics*, **468**:22-31 (Impact Factor - 3.022)

13. **Sujit Roy**, Sailendranath Sarkar, Sanjay Kumar Singh, Sengupta DN (2007) A dideoxynucleotide-sensitive DNA polymerase activity characterized from endoreduplicating cells of mungbean (*Vigna radiata* L.) during ontogeny of cotyledons. *FEBS Journal*, **274**: 2005-2023 (Impact Factor - 3.7)

14. Sailendranath Sarkar, Sankar Bakshi, Sanath K Mokkaapati, **Sujit Roy**, Sengupta DN (2004) Dideoxynucleoside triphosphate-sensitive DNA polymerase from rice is involved in base excision repair and immunologically similar to mammalian DNA pol. β . *Biochem Biophys Res Commun*, **320**: 145-155 (Impact Factor - 2.595)

B. Molecular Mechanism of Fruit Ripening In Banana (*Musa Acuminata*)

15. Swarup Roy Choudhury, **Sujit Roy** and Dibyendu N Sengupta (2013) C-terminal Phosphorylation is essential for regulation of ethylene synthesizing ACC synthase enzyme. *Plant Signaling & Behavior*, **8**:2, e23000

16. Swarup Roy Choudhury, **Sujit Roy** and Dibyendu N. Sengupta (2012) Characterization of an AGAMOUS like MADS box protein, a probable constituent of flowering and fruit ripening regulatory system in banana. *PLoS One* **7**(9):e44361 (Impact factor - 4.41)

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- 17. Swarup Roy Choudhury***, **Sujit Roy*** and Dibyendu N. Sengupta (2012) A Ser/Thr protein kinase phosphorylates MA-ACSI (Musa acuminata 1-Aminocyclopropane-1-Carboxylic Acid Synthase 1) during banana fruit ripening. *Planta* **236:491–511** (*Equally contributing authors) (Impact Factor - 3.098)
- 18.** Swarup Roy Choudhury, **Sujit Roy** and D.N. Sengupta (2011) *MA-ACSI*: a Key Operator in Ethylene Biosynthesis in Banana - Its Role and Regulation during Fruit Ripening. *Acta Hort.* **897, ISHS 2011**
- 19.** Swarup Roy Choudhury, **Sujit Roy**, Sanjay Kumar Singh, Dibyendu N. Sengupta (2010) Molecular characterization and differential expression of β -1,3-glucanase during ripening in banana fruit in response to ethylene, auxin, ABA, wounding, cold and light-dark cycles. *Plant Cell Reports*, **29: 813-828** (Impact Factor - 2.279)
- 20.** Swarup Roy Choudhury, Sanjay Kumar, Singh **Sujit Roy** and Dibyendu N. Sengupta (2010) An insight into the sequential, structural and phylogenetic properties of banana ACC synthase 1 and study of its interaction with PLP and AVG. *Journal of Biosciences*, **35: 281-294** (Impact Factor - 1.888)
- 21.** Swarup Roy Choudhury, **Sujit Roy**, Sanjay Kumar Singh, Dibyendu N. Sengupta (2010) Understanding the molecular mechanism of transcriptional regulation of banana Sucrose phosphate synthase (*SPS*) gene during fruit ripening: an insight into the functions of various *cis*-acting regulatory elements. *Plant Signaling & Behavior*, **5: 553-557** (Impact Factor - 2.0)
- 22. Swarup Roy Choudhury***, **Sujit Roy***, Dibyendu N. Sengupta (2009) Characterization of cultivar differences in beta-1, 3 glucanase gene expression, glucanase activity and fruit pulp softening rates during fruit ripening in three naturally occurring banana cultivars. *Plant Cell Reports*, **28: 1641-1653** (*Equal contribution) (Impact Factor - 2.279)
- 23.** Swarup Roy Choudhury, **Sujit Roy**, Dibyendu N. Sengupta (2009) A comparative study of cultivar differences in sucrose phosphate synthase gene expression and sucrose formation during banana fruit ripening. *Postharvest Biology and Technology*, **54: 15-24** (Impact Factor - 2.256)
- 24.** Swarup Roy Choudhury, **Sujit Roy**, Ranjan Das, Dibyendu N. Sengupta (2008) Differential transcriptional regulation of banana sucrose phosphate synthase gene in response to ethylene, auxin, wounding, low temperature and different photoperiods during fruit ripening and functional analysis of banana SPS gene promoter. *Planta*, **229: 207-223** (Impact Factor - 3.098)
- 25.** Swarup Roy Choudhury, **Sujit Roy** and Dibyendu N. Sengupta (2008) Characterization of transcriptional profiles of *MA-ACSI* and *MA-ACO1* genes in response

to ethylene, auxin, wounding, cold and different photoperiods during ripening in banana fruit. *Journal of Plant Physiology*, **165**:1865-1878 (**Impact Factor - 2.677**)

26. Swarup Roy Choudhury, **Sujit Roy**, Progya Paramita Saha, Sanjay K. Singh and Dibyendu N. Sengupta (**2008**) Characterization of differential ripening pattern in association with ethylene biosynthesis in the fruits of five naturally occurring banana cultivars and detection of a GCC-box specific DNA binding protein. *Plant Cell Reports*, **27**:1235-1249 (**Impact Factor - 2.279**)

Teaching

Plant Molecular Biology, Cytology, Genetics

❖ **Opportunities for PhD research:**

CSIR/ICMR/GATE qualified candidates, interested in PhD research in the area of plant DNA repair mechanisms in the context of plant growth response towards environmental stress may send their CV with cover letter at sujitroy2006@gmail.com

