Bio-data of Prof (DR.) SARMISTHA RAYCHAUDHURI NEE SEN

Name : Prof (**DR.) SARMISTHA RAYCHAUDHURI NEE SEN**

Date of Birth: 25.5.1959

Qualification: Ph. D.

Designation: PROFESSOR

Address: Dept. of Biophysics, Molecular Biology & Bioinformatics,

University College of Science, University of Calcutta,

92, A. P. C. Road, Kolkata – 700 009

Educational Qualifications:

Degree	Institution	Subject	Year	Award
B.Sc.	Calcutta University (Presidency College)	Botany (Hons.) Chemistry (A) Geology	1979	1st Class (3rd)
M.Sc.	Calcutta University	Botany	1982	1st Class (5th)
Ph.D	Calcutta University	Botany	1986	

Title of the thesis **"Chromosomal and cytochemical changes in relation to ageing in mammalian systems"** under the guidance of Prof. (Mrs.) Archana Sharma, Centre of Advanced Study in Cell & Chromosome Research, Dept of Botany , University of Calcutta , 35, B.C. Road , Kolkata 700019

Post Doctoral Research/Training experience

	Duration	Institution	Designation	Nature of work
(a)	13 months	Queen Mary College University of London	Post Doc Fellow	Electron microscopy of synaptonemal

		1987-1988		Complex under Dr. J. S. Parker
(b)	9 months	Yale University USA 1996-1997	Visiting Scientist	Screening of phytochrome A specific signaling using TDNA insertional Mutagenesis under Prof. Xing Wang

A brief outline of research work done by the investigator

During Ph.D dissertation, P.I. has worked on human and rat chromosomes, *in vitro* and *in vivo*, to investigate chromosomal anomalies during ageing in mammalian cells. Along with these studies, patients with known chromosomal anomalies showing shorter span of life were also analyzed for X-linked enzyme glucose 6 phosphate dehydrogenase and autosome linked alkaline phosphatase. The results have been published in international journals.

After joining the department of Biophysics, Molecular Biology & Genetics, University of Calcutta, she initiated research on plant tissue culture and successfully guided the PhD theses of fifteen candidates.

During the visit at Yale University, she carried out research mainly on *Arabidopsis thaliana*, screening for phytochrome A specific signaling component mutations using TDNA insertional mutagenesis and genetic mapping of a mutant locus Fhy3 using PCR based CAPS and SSLP mapping techniques.

At present she is working on various aspects of tissue culture and underlying molecular mechanism (RAPD and AFLP markers) of *Plantago ovata* and *Vigna radiata*. She is also interested in Induction of somatic embryogenesis and expression of Somatic Embryogenesis Receptor Kinase in *Momordica charantia* and *Plantago ovata*. She has guided two theses on *P. ovata* somatic

embryogenesis (Ultrastructure and Molecular Changes) and *Vigna radiata* in vitro regeneration and RAPD markers (Molecular Taxonomy).

Curcuma longa is another medicinal plant of her interest and she has guided a thesis on biodiversity of Curcuma in India using AFLP as a tool. She has guided another thesis on C4 Rice using PEPC by transformation protocol. This was a product of MOU between International Rice Research Institute, Philippines and University of Calcutta, India.

Molecular Taxonomy of the genus *Phyllanthus* is another project on which she is working using RAPD, AFLP and ITS sequences.

Her special interest revolves around Radiation Biology including different aspects of alterations in Macro and Micro Molecules following Gamma irradiation using ED XRF and PIXE technique, Cloning and sequencing of Metallothionein and SERK genes in relation to abiotic stress and SE, and radioprotective role of polyamines in *Vigna radiata*. She has guided three thesis on phytochemical prospecting of plants including Hypericum *perforatum* and *Plantago ovata*.

Achievements

1. DST CPSTIO Award of International collaboration with National University of Singapore 2008.
2. Uma Kant Sinha Memorial Award (ISCA) 1999
3. State Scholarship in Botany (West Bengal Govt.) 1986 (Post Doctoral Research in the U.K.)
4. ISCA Young Scientist Award (ISCA) 1986 (Indian Science Congress Association)
5. National Scholarship (Govt. of India) 1979

Administrative experience

Senatel Member, University of Calcutta (2016- 2021)

Convener Ph.D committee, Department of Biophysics, Molecular biology and Bioinformatics, University of Calcutta (2017- 2020)

Coordinator, Centre of Advanced Study, Department of Biophysics, Molecular biology and Bioinformatics, University of Calcutta (2017- 2020)

Member UG Council of the University of Calcutta in Molecular Biology.

b) **Teaching experience**

1. Professor Dept. of Biophysics, Molecular Biology 2007-till date
   University of Calcutta
2. Reader Dept. of Biophysics, Molecular Biology 1999-2007
   University of Calcutta
3. Sr. Lecturer Do 1994-1999
4. Lecturer Do 1989-1994
5. Guest Lecturer Special Paper-Plant Biotechnology 2002
   M. Tech in Biotechnology School of
   Life Sciences, Jadavpur University
6. Delivered lecturer in Orientation Programme and Refresher Course of Academic Staff College.

   At present teach Ecology & Environment, Plant Molecular Biology, Industrial Microbiology and Plant tissue culture theory and practical classes in M.Sc. Biophysics, Molecular Biology C.U.

Research Guidance

Research Guidance 1.Srimanta Pramanik (1997)	Cytochemical, cytological And biochemical studies on *Plantago ovata* Forsk in tissueculture under normal and gamma irradiated	University of Calcutta

	conditions	
2.Suhita Betal (2003)	*In vitro* Plant Regeneration and Molecular Biological Studies of *Vigna radiata* (L.) Wilczek	University of Calcutta
3.Madhumita Pal(2004)	Ultrastructural, molecular and biochemical changes during somatic embryogenesis of *Plantago ovata* Forsk	University of Calcutta
4.Sumana Roy (2006)	*In Vitro* Biochemical and Molecular Studies on *Curcuma longa* Under Normal and Gamma irradiated conditions	University of Calcutta
5.Anindya Bandyopadhyay (2007) (Co investigator Prof Swapan	Development and Molecular Characterization of Transgenic indica Rice with pepc Gene of C4 system	University of Calcutta And

K Datta)		International Rice Research Institute (IRRI), Philippines, under MOA signed between the two Institutes.
6. Yasmin Begum (2009)	Studies on Morphological, Biochemical and Molecular Changes Induced by Gamma Ray in *Vigna radiata* (L.) Wilczek	University of Calcutta
7. Urmi Roy (2009)	Studies on Polyamines in *Vigna radiata* (L.) Wilczek.	University of Calcutta
8. Ushri Roy (2009)	Studies on Plant Regeneration and Molecular Markers in *Plantago ovata*	University of Calcutta
9. Ananya Paul (2010)	In Vitro Somatic Embryogenesis and Identification of Different Varieties of *Momordica charantia* L. using Molecular	University of Calcutta

	Markers.	University of Calcutta
10. Priyanka Saha (2010)	In Vitro Somatic Embryogenesis Related Alterations In Trace Element Contents and Associated Metallothionein Expression Under Normal and Gamma Irradiated Conditions in *Plantago ovata* Forsk.	University of Calcutta
11. Subhendu Bandyopadhayay (2011)	Biochemical and molecular markers in five species of the genus Phyllanthus	University of Calcutta
12.Arpita Banerjee (2012)	In vitro and in vivo biochemical and molecular studies on the medicinal plant Hypericum perforatum.	University of Calcutta
13.Amitava Moulick (2013)	Studies of metallothioneins induced by copper in Plantago ovata Forsk.	University of Calcutta

14. Shonima Talapatra (2014)	Studies on biochemical changes and expression of serk gene during SE in Momordica charantia Linn.	University of Calcutta
15. Nirmalya Ghoshal (2015)	In vivo and in vitro study of abiotic stress induced gene expression in Plantago ovata Forsk.	University of Calcutta
16. Mandar Sengupta (2016)	In vivo and in vitro study of abiotic stress induced gene expression in Plantago ovata Forsk.	University of Calcutta
17. Pratik Talukder (2017)	. Polyphenols in *Plantago ovata* Forsk	University of Calcutta
18. Suman Kumar Roy (2018)	Study of Momordica charantia in relation to Environmental Variations.	University of Calcutta

Ongoing Research Projects:

1. Trace Elemental Profile variation in relation to Charantin content in fruits of *Momordica charantia* Linn using Proton induced Xray Emission (PIXE). UGC-DAE-CSR, KC, Collaborative Research Scheme. 2015.Grant No.: UGC-DAE-CSR-KC/CRS/15/IOP/02/0638/0653. Will be Completed in 2019.

2. Phytochemical prospecting of Plantago ovata. UGC UPE-II 2018. University of Calcutta.

3. Comparative Study of Ionizing Radiation and Chemical Elicitor induced Expression of the genes induced in Phytosterol Biosynthesis and Simultaneous Accumulation of antidiabetic component Charantin in *Momordica charantia* Linn. UGC-DAE-CSR-KC/CRS/19/RB-03/1046/1062 dt 10.05.19

Research Projects Carried Out

Title of the Project	Name of the Funding Agency	Duration	Remarks
Development of high yielding varieties of *Plantago ovata* through Tissue Culture Technique & Study of isozyme inheritance in different clones.	Council of Scientific and Industrial Research (CSIR)	4.8.92-31.8.95	1 PhD completed (Dr Srimanta Pramanik) 5 Research Articles published
2.Somatic Embryogenesis of Mung Bean	UGC (Minor)	April 1999-March 2001	On the basis of this minor project a major UGC project was awarded.
3.In vitro transformation of Vigna radiata (L.) Wilczek.	UGC (Major)	August 2003-July 2006	Papers presented in International Conferences
4. In vitro propagation of Curcuma Species with high Curcumin Content and determination of species specific RAPD and AFLP markers	Council for Scientific and Industrial Research (CSIR)	March 2003-February 2006	1 PhD completed (Dr Sumana Roy) 4 Research Articles published PhD Student Sumana Roy was Awarded Best Paper Award in the Section of Biotechnology In West Bengal Congress of Science & Technology 2006
5. Molecular Taxonomy of the	Department of Biotechnology (DBT),	2003-2006	1 PhD awarded .3 papers published .PhD Student

Genus *Phyllanthus*	Govt of India		Subhendu Bandyopadhyay (Ph.D 2011)was awarded First Prize in the POSTER session in the International Symposium on Medicinal Plants and Herbal Products and their Efficacy in the present Era , held in Science City , Kolkata 2005 1 Research Paper has been accepted for oral presentation in the International Conference of Biodiversity to be held in the Indian Statistical Institute Kolkata
6.Genetic Diversity & characterization of Momordica species Eastern and North Eastern India Through Morphological Characters and Molecular markers	UGC (under UPE Scheme) (Co PI)	October 2007- Till Date	1 PhD awarded(Lopamudra Bhattacharya.
7.Morphological , Biochemical and Molecular Changes in relation to in vitro plant regerenation of Vigna radiata (L.) Wilczek induced by gamma ray and heavy ions	UGC-DAE Consortium for Scientific Research Kolkata Centre	April2003-October 2006	Dr Yasmin Begum awarded PhD Of University of Calcutta (2009) .2 Research Article published in International Journal of Radiation Biology2009

8.*In vitro* Somatic Embryogenesis related alterations in Trace element contents and associated metallothionein expression under normal and gamma irradiated conditions in *Plantago ovata*	UGC-DAE Consortium for Scientific Research Kolkata Centre	January2006- Completed (2010)	Dr Priyanka Saha awarded Ph.D. , University of Calcutta2010
9. *In vitro* somatic embryogenesis of *Momordica charantia* Linn and expression of Somatic Embryogenesis Receptor kinase (SERK) gene during development	CSIR	Completed	PhD awarded 1.(Dr Shonima Talapatra)1paper in PCTOC
10. Radiation induced alterations in DNA, RNA and polyamine levels in plants	UGC-DAE Consortium for Scientific Research Kolkata Centre	Completed	1 PhD awarded Dr Nirmalya Ghjoshal 2 Articles in IJRB
11. Role of polyphenols during somatic embryogenesis and expression of polyphenol oxidase gene in *Plantago ovata* Forsk during development	UGC Major research project	Completed	

Journal Publications:

2018

1. Kundu D, Dey S, Sen Raychaudhuri S, Chromium (VI)- induced stress response in the plant *Plantago ovata* Forsk *in vitro*, **Genes and Environment**, DOI: 10.1186/s41021-018-0109-0 (In Press)

2. Kundu D, Talukder P, Sen Raychaudhuri S, *In Vitro* Biosynthesis of Polyphenols in the Presence of Elicitors and Upregulation of Genes of the Phenylpropanoid Pathway in *Plantago ovata*, Book Chapter (Elsevier) **Studies in Natural Products Chemistry Volume 60, Bioactive Natural Products** (Ed by Atta-Ur-Rahman, FRS).

2017

1. Pramanick P, Chakraborty A, Sen Raychaudhuri S, Phenotypic and biochemical alterations in relation to *MT2* gene expression in *Plantago ovata* Forsk under zinc stress, **Biometals**, 30(2): 171-184

2. Pratik Talukder and Sarmistha Sen Raychaudhuri. Effect of additive supplementation and age of callus on the expression pattern of three key genes of phenylpropanoid pathway in *P. ovata*. **Journal of Chemical, Biological and Physical Sciences** 7(2):578-592.

3. Sengupta M and Sen Raychaudhuri S. Partial alleviation of oxidative stress induced by gamma irradiation in *Vigna radiata* by polyamine treatment, **IJRB**, 93(8): 803-817

2016

1. "Role of *SERK* during somatic embryogenesis and its interaction with Brassinosteroids", Shonima Talapatra, Poorna Goswami, Subhasree Das and Sarmistha Sen Raychaudhuri. Somatic Embryogenesis in ornamentals and its applications, A.Mujib(Ed) 2016.Springer.ch.9: 141-154.

2. Talukder P, Talapatra S, Ghoshal N, Raychaudhuri SS. Antioxidant activity and high-performance liquid chromatographic analysis of phenolic compounds during in vitro callus culture of Plantago ovata Forsk. and effect of exogenous additives on accumulation of phenolic compounds . Journal of the Science of Food and Agriculture 96(1):232-44 (2016).

2015

1. Ghoshal N, Talapatra S, Talukder P, Sengupta M, Ray SK, Chakraborty A, Raychaudhuri SS. Cross adaptation to cadmium stress in Plantago ovata by pre exposure to low dose of gamma rays: effects on metallothionein and metal content. International journal of radiation biology, 2015; 1-35

2.Talapatra S, Gowami P, Das S and Sen RaychaudhuriSS . Invited Review. Book Chapter "Role of SERK during somatic embryogenesis and its interaction with Brassinosteroids." Mujib A (ed) Springer Verlag Berlin.

2014

1. Talapatra S, Ghoshal N, Raychaudhuri SS. Molecular characterization, modeling and expression analysis of a somatic embryogenesis receptor kinase (SERK) gene in Momordica charantia L. during somatic embryogenesis Plant Cell Tissue and Organ Culture, 2014;116:271–283

2013

1. Saha P, Das D, Roy S , Chakrabarti A, Raychaudhuri SS. Effect of gamma irradiation on metallothionein protein expression in Plantago ovata Forsk . International Journal of Radiation Biology, 2013; 89(2): 88–96

2. Bandyopadhyay S, Raychaudhuri SS.Development and comparison of RAPD, SCAR and AFLP markers for distinguishing some medicinally important species of the genus Phyllanthus. Plant Biosystems, 2013;147(1) :12–20.

3. Ghoshal N, Talapatra S, Moulick A, Chakraborty A, Raychaudhuri SS. Alterations in transcriptome and proteome on metallothioneins following oxidative stress induced by sublethal doses of cadmium and gamma rays in Plantago ovata. International journal of radiation biology, 2013; 89 (7):571-582.

4. Moulick A, Mukhopadhyay D, Talapatra T, Ghoshal N, Raychaudhuri SS. Molecular Cloning, Modeling, and Characterization of Type 2 Metallothionein from Plantago ovata Forsk.Sequencing 2013. Article ID 75698. http://dx.doi.org/10.1155/2013/756983

5. **Sengupta M**, **Chakraborty A**, **Raychaudhuri SS**. Ionizing radiation induced changes in phenotype, photosynthetic pigments and free polyamine levels in Vigna radiata (L.) Wilczek. **Applied Radiation and Isotopes. 2013;75:44-9.**

2012

1. Banerjee A, Bandyopadhyay S, Raychaudhuri SS. In vitro regeneration of Hypericum perforatum L. using thidiazuron and analysis of genetic stability of regenerants. Indian Journal of Biotechnology. 2012;11: 92-98.

2. Talapatra S, Raychaudhuri SS. In vitro enhanced accumulation of polyphenols during somatic embryogenesis in Plantago ovata Forsk . American Journal of Bio-pharmacology Biochemistry and Life Sciences.2012; 1(1):43-52

2011

1. Saha P, Bandyopadhyay S, Raychaudhuri SS. Formulation of Nutrient Medium for In Vitro Somatic Embryo Induction in Plantago ovata Forsk . Biological Trace Element Research. 2011; 140:225-243.
2. Bandyopadhyay S., and **Sen Raychaudhuri S** . 2011.Development and comparison of RAPD, SCAR and AFLP markers for distinguishing some medicinally important species of the genus *Phyllanthus.* **Plant Biosystems**. DOI 10.1080/11263504.2011.63571

2010

1. Paul A, Bandyopadhyay S, Acharyya P, Raychaudhuri SS. Studies on Genetic Diversity of Twelve Accessions of *Momordica charantia* L. using Morphological, RAPD and SCAR Markers. Asian Journal of Plant Sciences. 2010; 9(8): 471-478.

2. Paul A, Raychaudhuri SS. Medicinal Uses and Molecular Identification of Two Momordica charantia Varieties – a review. Electronic Journal of Biology. 2010;6(2): 43-51.

3. Saha P , Raychaudhuri SS, Chakraborty A , Sudarshan M. PIXE analysis of trace elements in relation to chlorophyll concentration in Plantago ovata Forsk. Applied Radiation and Isotopes.2010; 68:444–449.

4.Bandopadhyay S. **Sen Raychaudhuri S.** 2010. Development of ITS based SCAR Markers for Some Medicinally Important Species of *Phyllanthus*. **Asian Journal of Plant Sciences.** ISSN 1682-3974.

2009

1. Paul A, Mitter K, Raychaudhuri SS. Effect of polyamines on in vitro somatic embryogenesis in Momordica charantia L. Plant Cell Tissue and Organ Culture.2009; 97:303-311.

2. Saha P, Raychaudhuri SS, Sudarshan M, Chakraborty A. Analysis of Trace Elements During Different Developmental Stages of Somatic Embryogenesis in Plantago ovata Forssk Using Energy Dispersive X-ray Fluorescence. Biological trace element research, 2009; 135(1-3):283-94.