

Curriculum Vitae

Name (Prof./Dr./Mr./Mrs.) Dr. (Mrs.) Renu Deswal
Present or Last Designation **Associate Professor**
Plant Molecular Physiology & Proteomics
Laboratory (#21), Department of Botany,
University of Delhi, Delhi- 7
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Near Model Town III Delhi-9
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Academic/ Professional Qualification

Bioinformatics course*, 2005, Singapore University (online course)
Ph.D. 1994, Jawaharlal Nehru University, N. Delhi
M.Phil. 1988, Jawaharlal Nehru University, N. Delhi
M.Sc. 1987, Jawaharlal Nehru University, N. Delhi
B.Sc. 1985, University of Delhi, Delhi

Career Profile:

Associate Professor 2004-present, Department of Botany, University of Delhi, Delhi.
Reader 2001-2004, Department of Botany, University of Delhi, Delhi.
Staff Scientist III &II (Lecturer & Senior Lecturer scale), 1998-2001, National Centre for Plant Genome Research, JNU, New Delhi.
Research Scientist, Lecturer grade 1995-1998, Centre for Plant Molecular Biology, JNU, New Delhi.
Research Associate, 1994-1995, School of Life Sciences, JNU, New Delhi.

Field of Specializations: Proteomics, Functional Genomics Deciphering Nitroso-proteome of Brassica, Identifying and characterizing Nitrosative and Abiotic (cold) stress Signal Transduction components

AWARDS/Recognition/Memberships

- ❖ Department of Biotechnology, Govt. of India, Overseas Fellowship 2006/07 to Canada, University of Western Ontario
- ❖ Fellowship by German Govt for **International training programme** on Modern Biotechnological Methods at National Biotechnology Institute, Brunswick, Germany in 1999.
- ❖ **European Molecular Biology Organization (EMBO) and Federation of European Biochemical Society (FEBS)** fellowship for EMBO and FEBS course cum workshop on membrane receptors held in Hungary (Debrecen) in 1998.
- ❖ DST's Young scientists research project award.
- ❖ Invited Member, New York Academy of Sciences, New York, U.S.A.
- ❖ Full Member, Third World Organization for Women in Science, (TWOWS), Italy
- ❖ Member, of International Plant Growth Substances Association (2004-07)
- ❖ Member, European Federation of Biotechnology (EFB)
- ❖ Member, of Society of Biological chemist, (SBC), India.
- ❖ Life Member, Biotechnology Society of India.

- ❖ Life Member, Delhi University Botanical Society, Botany Department,
- ❖ Life Member, Indian Science Congress Association, Kolkata, India.
- ❖ Life member, Proteomics Society of India.
- ❖ Invited member and country representative, International Plant Proteomics Organization

Teaching Experience- Delhi University

Regular Courses (M.Sc. part I) :

Plant Physiology, Biochemistry & Molecular Biology (2001-2005)
 Plant Physiology and Biochemistry (2006-continuing)
 Cell biology & Genetics (Practicals only) (2001/02- 2004)
 Phycology, Microbiology & Biotechnology (2003-2006)
 Recombinant DNA technology and Proteomics (2008-continuing)

Special/Elective Papers (M.Sc. Part II):

Current Topics in Plant Molecular Biology (2001-05)
 Proteomics and Genomics (2006-08)
 Genomics and Proteomics (2008-continuing)
 Topics in Plant Physiology and Biochemistry (2011)

M.Phil:

Topics in Molecular Biology & Genetics (2001-05)

Publications (in refereed Journals):

Jasmeet Kaur Abat and Renu Deswal (2009) Differential modulation of S-nitrosoproteome of *Brassica juncea* by low temperature: Change in S-nitrosylation of Rubisco is responsible for the inactivation of its carboxylase activity. **Proteomics** 9, 4368–4380.

*Jasmeet Kaur Abat, Autar K. Mattoo and Renu Deswal (2008) S-Nitrosylated proteins of a medicinal CAM Plant *Kalanchoe pinnat-* Ribulose-1, 5-bisphosphate carboxylase/ oxygenase activity targeted for inhibition. **FEBS Journal** 275 : 2862-2872.

Jasmeet Kaur Abat, Pooja Saigal (Talwar) and Renu Deswal (2008) S-nitrosylation-another biological switch like phosphorylation. **Physiology and Molecular Biology of Plants** 14(1):119-130.

Girdhar K. Pandey, Vanga S.Reddy, Malireddy K. Reddy, **Renu Deswal**, Alok Bhattacharya and Sudhir Kumar Sopory (2007) Transgenic tobacco expressing antisense of *Entamoeba histolytica* calcium binding protein. **J. of Bioscience** 32, 251-260.

Ajaswarata Dutta, Jayanti Sen, **Renu Deswal** (2007) Down-regulation of terpenoid indole alkaloid biosynthetic pathway by low temperature and cloning of a AP2 type C-repeat binding factor (CBF) from *Catharanthus roseus*(L)G.Don **Plant Cell Reports**, 26, 1869-1878.

Pragya Sharma, Nidhi Sharma and **Renu Deswal (2005) Molecular Biology of Low temperature response in plants. **BioEssays**, 27,1048-1059

*****Renu Deswal**, Rohini Singh, Andrew Lynn and Ronald Frank (2005) Identification of immunodominant regions of *Brassica juncea* glyoxalase I as potential immunomodulation antitumor targets. **Peptides**, 26,395-405

Renu Deswal, Gopal K. Chowdhary and Sudhir K. Sopory (2004) Purification and characterization of a PMA stimulated kinase and identification of a polypeptide that is de-phosphorylated by low temperature in *Brassica juncea*. **Biochem. Biophys. Res. Commun.**,322, 420-427

Pragya Sharma and **Renu Deswal** (2004) Detection and characterization of Calcineurin like activity in **Brassica** seedlings and its activation by low temperature **Plant Physiology & Biochemistry** 42, 579-584

Girdhar K. Pandey, Vanga S.Reddy, Malireddy K. Reddy, **Renu Deswal**, Alok Bhattacharya and Sudhir Kumar Sopory (2002) Transgenic tobacco expressing *Entamoeba histolytica* calcium binding protein exhibits enhanced growth and tolerance to salt stress. **Plant Science**, 162, 41-47.

Deswal, R., Pandey G.K., Chandok, M.R, Yadav, N., Bhattacharya A. and Sopory S.K. (2000) Purification and characterisation of a novel Ca²⁺ stimulated Eh.CaBP binding kinase from *B. juncea*. **European Journal of Biochemistry**, 267, 3181-3189.

Deswal, R. and Sopory, S.K. (1999) *B. juncea* glyoxalase I is a calmodulin stimulated protein. **Biochemica et Biophysica Acta** ,1450, 460-467.

Deswal, R. and Sopory, S.K. (1998) Biochemical and immunochemical characterization of *Brassica juncea* glyoxalase I. **Phytochemistry**, 49, 2245-2253.

Deswal, R., Chakravarty, T.N. and Sopory, S.K.(1993) The glyoxalase system in higher plants: Regulation in growth and differentiation. **Biochem. Soc. Trans.** (UK) 21, 527-530.

Deswal,R and Sopory, S.K.(1991) Purification and characterization of glyoxalase I from a higher plant *B.juncea* **FEBS Lett.** 282, 277-280.

Other Publications:

Jasmeet Kaur Abat and Renu Deswal (2011) Nitric Oxide, S-nitrosoproteome and Abiotic Stress Signaling in Plants. In Omics and abiotic stress (Tuteja N.Eds.) Bentham publishers, USA (in press)

Jasmeet Kaur Abat and Renu Deswal (2010) Post Translational modifications of proteins by Nitric Oxide- a new tool for metabolome regulation. In Nitric Oxide in Plant Physiology. (S.Hayat, M Mori, J Pichtel, A Ahmad, Eds.) Wiley-Vch, Germany (pg 189-200)

Akhilesh K. Yadav¹, Renu Deswal^{1*} (2008) Deciphering the low temperature tolerance in seabuckthorn In Proc. of the 3rd International Seabuckthorn Association Conference, Université Laval, Québec City, QC, Canada, August 12-16, 2007., Université Laval, Québec McKenzie, D.B., Cenkowski, S., Utioh, A., Li, T.S.C., Letchamo, W., Ratti, C., and Belkacemi, K. (Eds.) pgs

Renu Deswal (2007) Low temperature stress and nitric oxide signal transduction in plants. In: Proc. Third World Organization for Women in Science (TWOWS) International conference on Women's Impact on Science and Technology in the New Millenium, 21-25th Nov. 2005 at Indian Institute of Science, Bangalore, India pg 811-813.

Deswal, R. and Saigal, P. (2006) Analysis of Plant Biodiversity and Evolution at Genome Level In Biodiversity, Conservation and Systematics (Ed. Prithipal Singh), Scientific Publishers, Jodhpur, India, pp 207-215.

Pandey, G.K., Veena, **Deswal, R.**, Reddy, V.S, Bhattacharya, A., Reddy, M.K., Sopory, S.K.(2003) Development of stress tolerance by manipulating the expression of calcium binding proteins. In: Biotechnology in sustainable biodiversity and food security (eds. B.N Prasad), Science Publishers Inc Enfield (NH) USA, pp 41-50

Pandey, G. K., Veena, **Deswal, R.**, Pandey, S., Tewari, S.B., Tyagi, W., Reddy, V. S., Bhattacharya, A. and Sopory, S. K. (2002). Current concepts in plant signal transduction (Eds. Sopory, S. K. Oelmuller, R., Maheshwari, S. C.) Kluwer Academic/Plenum publishers, New York, U.S.A pp 125-136.

Sudhir K. Sopory, **Renu Deswal**, Meena R.Chandok, Gayatri Venkataraman, Mamta Goswami and M.K. Reddy (2001) Transmembrane signalling in light-mediated gene expression: role of phospholipids. In Biophysical processes in living plants (Ed. G. Parathasardi) Science Publishers, Inc. Enfield (NH) U.S.A and Plymouth, U.K pp207-218.

Munshi M, Chandok MR, Pandey Sona, **Deswal R** and Sopory S.K. (1998) Plant Protein kinases-potential targets for gene manipulation. In Genetics and Biotechnology in crop improvement, (Eds. Gupta, P.K., Singh, S.P., Balyan, H. S., Sharma, P. C. and Ramesh, B.) Rastogi publications, India, Pp. 199-222

Deswal, R., Chakravarty, N. and Sopory, S.K. (1997) Role of methylglyoxal and glyoxalase system in higher plants. In Concurrent Researches in Plant Sciences (ed. Dr. Dhir K. K.) Kalyani publications, India Pp 81-93.

Deswal, R. and Sopory, S.K. (1996) Role of glyoxalase I in cell proliferation in higher plants. In Trends in Plant Tissue Culture and Biotechnology ed. Pareek, L.K. Agro Botanical Publishers, Rajasthan, India. Pp 126-136,

***The epitopes reported in this paper have been listed at IMMUNE EPITOPE DATABASE AND ANALYSIS RESOURCE (IEDB), a data resource for the Immunology community being maintained by NIH and five other research Institutes of USA.**

**** Was invited to contribute to a special volume of BioEssays on “Sensory systems” by the Editor (invitation attached with earlier application)**

***** The work published was covered in the press release of the FEBS Journal, USDA and Science Daily , USA.**

Was invited to edit a book on the low temperature response in plants by biosciences publishers, USA but declined due to other commitments. (Invitation attached with the earlier application)

US Patent: An Indian (# NF 1/ 2000) and Foreign (USA) (#09/503,191) patent has been awarded (2004) for the production of Transgenic plants with enhanced chlorophyll content and salt tolerance. Filed on Feb. 14, 2000
Authors: Giridhar Pandey, Shiva Reddy, Renu Deswal, Alok Bhattacharaya, SK Sopory.

Research Projects Undertaken

Title	Duration	Amount (in Lakhs)	Funding Agency
1. Delineating the components of calcium signalling in cold stress in <i>Brassica juncea</i> seedlings	2001-03	3.94	DSTYS
2. Delineating the components of calcium mediated signalling in epiphyllous bud formation in <i>Bryophyllum</i>	2001-03	0.5	UGC (MRP)
3. Functional analysis of calcium binding proteins from rice (as a co-P.I, Prof. Alok Bhattacharya is the P.I)	2002-05	15.0	DST
4. Molecular cloning of Cold binding Factors in tomato: Over-expression and purification to raise antibodies.	2004-07	20.6	DRDO
5. Nitric oxide signalling during <i>Bryophyllum</i> bud differentiation	2005-07	8.5	UGC
6. Proteomics approach for partial characterization of S-nitrosoproteome of <i>B.juncea</i> and to study expression of major S-nitrosylated proteins under abiotic and nitrosative stress conditions.	2006-09	15	CSIR
7. Comparison of CBF mediated signalling in two LT tolerant and two LT sensitive crops	2006-09	38	DST
8. A genomics and proteomics approach to identify, purify and clone antifreeze proteins from seabuckthorn seedling.	2009-11	47	DBT

9. Dioscorins, yam storage proteins-do they 2010-12 60 DST PURSE
have a defensive role to play? (As co-PI)

Research Guidance to Students:

Ph.D. Theses

Awarded – Six

Under progress- three

One Ph.D. student was awarded the ‘best thesis award’.

M.Phil dissertations –

Awarded -Eleven

Under progress - two

Reviewer for

- **FEBS journal**
- **Planta,**
- **Nitric oxide,**
- **Plant Growth Regulation,**
- **Plant Physiology and Molecular Biology,**
- **Botanica Helvetica (Swiss Botanical Society) ,**
- **In vitro Biology-plants,**
- **J of Biosciences**
- **Plant Science**
- **Plant Cell Reports**
- **Journal of Proteome Research**
- **Proteome Science Journal and**
- **Proteomics**

Invited Lecture/Paper Presentations in Conferences: (Last five years)

Chaired a session in National Conference on Seabuckthorn: Promoting Health and Protecting Environment (2010) at IARI, New Delhi.

Invited lecture Ravi Gupta and Renu Deswal (2010) Proteome analysis of seabuckthorn, the Himalayan gold bush to fish executors of cold tolerance for crop improvement in National Conference on Seabuckthorn: Promoting Health and Protecting Environment (26-27 Nov.2010) at IARI, New Delhi.

Invited lecture in TWOWS general assembly and international conference entitled *Women Scientists in a Changing World*, 27-30 June 2010.

Jasmeet Kaur Abat, Ankita Sherawat and Renu Deswal (2010) S-NITROSOPROTEOME ANALYSIS IN B.JUNCEA HINTS AT WIDE SPECTRUM METBOLOME REGULATION & SPATIAL DISTRIBUTION OF TARGETS. In N2010, 5th **International Nitrogen Conference 2010**, 3 to 7 December 2010, The Ashok, New Delhi **Organized by Indian Nitrogen Group (ING-SCON) & International Nitrogen Initiative (INI)**

Renu Deswal (2010) Cold stress induced S-nitrosylation- A potential mechanism for photosynthesis inhibition in *B.juncea* . In 5th AOHUPO Congress, 14th ADNAT Convention 1st PSI conference New perspectives in proteome research, Centre for Cellular and Molecular Biology, Hyderabad, India

Key note address (2009) “Identifying and characterizing antifreeze proteins in apoplastome of seabuckthorn seedlings” In 4th International Seabuckthorn Conference, Russia .

Invited lecture “Cold stress induced S-nitrosylation mediated Rubisco inhibition in *Brassica juncea* - a potential mechanism for photosynthetic inhibition and yield loss”, Centre for Plant Biotechnology, Hisar, Haryana, India 5th Dec,2009.

Paper presentation in 34th FEBS Congress “Life’s Molecular Interactions” at Prague, Czech Republic, 4-9th July 2009. Apoplastic S-nitrosylated proteins of *Brassica juncea*: the potential Nitric oxide sensors.

Invited lecture “Molecular And Biochemical Evidence For Nitric Oxide Signaling And Its Components in *Brassica juncea*” in National Seminar on Physiological and Biotechnological Approaches to Improve Plant Productivity, Centre for Plant Biotechnology, Hisar, Haryana, India 15th March,2008

Invited lecture “Novel targets and insights about S-nitrosylated proteins from a CAM plant *Kalanchoe pinnata*, indicating large scale metabolome modification by S-nitrosylation” in Trends in Cellular and Molecular Biology, Jawaharlal Nehru University, India , 6th Jan. 2008

Seminar on “Nitric oxide signaling (S-Nitrosylation), a novel dimension of metabolome regulation in plants” Department of Biology, University of Western Ontario, 24th Sep. 2007

Invited lecture on “The enigma of Low Temperature Tolerance in Seabuckthorn” In 3rd International Conference of International Seabuckthorn Association held in Quebec, Canada from 14-17, Aug.,2007

Invited Lecture on “A step towards growing crops where no crops grow: Fishing out targets for manipulation of low temperature stress signaling pathways in plants”, National symposium on Plant Biotechnology, Dehradun, 12-14 Oct. 2006, India.

Identification and purification of S-nitrosylated proteins in *Bryophyllum pinnatum* to decipher nitric oxide signalling, Paper presented at Society of Biological Chemist meeting on Dec. 10-14 (2006), JNU, New Delhi.

Invited lecture on “Low temperature stress and Nitric oxide signalling in plants” in TWOWS International conference on Women’s Impact on Science and Technology in the New Millenium, 21-25th Nov. 2005 at Indian Institute of Science, Bangalore, India.

Training/ Research Programme Organized/Attended in India:

Participating Faculty for Life Sciences Refresher Course (2011) for college teachers held in Zoolozy Department.

Attended and qualified “Radiation safety Officer Level 1” course ‘Radiation safety aspects of use of ionizing radiations in research applications, organised by AERB from 1-3rd Dec.2010 at Institute of Life Long Learning, University of Delhi, Delhi.

Participating Faculty for Molecular Biology in Refresher Course (2005) for college teachers.

Attended National Seminar on “Access to electronic Journals/databases” under UGC-INFONET E-JOURNAL CONSORTIUM on 14-15 Dec. 2004 at University of Delhi. organized by INFLIBNET, Ahmedabad and University of Delhi.

Attended workshop on Bio-informatics- “Current Research Applications and emerging Business opportunities” May (2003) at J.N.U organized by Dept. of IT, Mascon Life Sciences and J.NU

Participated in orientation course on Bio-Safety considerations for evaluation of transgenic crops” at National Bureau of Plant Genetic resources, New Delhi, July 17-26 (2000)

Was a member of the organizing team for the training workshop on “Molecular Marker techniques in Plant Genomics” at National Centre for Plant genome Research Mar. 3-17 (1999)

Organized Practical classes for protein gel electrophoresis for college teachers under refresher course organized by Academic Staff College, JNU, New Delhi.(1996)

Research Collaborators:

1. Prof. Neera Sarin, School of Life Sciences, Jawaharlal Nehru University, New Delhi
2. Late Dr. Jayanti Sen, National Institute for Plant Genome Research, JNU, New Delhi.
3. Prof. Sudhir K. Sopory, International Centre for Genetic Engineering and Biotechnology, New Delhi.
4. Dr. Ronald Frank, National Biotechnology Centre, Germany
5. Dr. Pravindra Kumar and Dr. H.S. Dhaliwal, IIT Roorkee, Roorkee, India.

Administrative Assignments:

In University

2011

- Deputy Proctor (Since Feb. 15, 2011) North Campus, University of Delhi, Delhi.
- Member, Interim Committee against Sexual Harassment, Science Cluster (2007-2010)
- Purchase Committee member for Biology Department C.I.F (2008/09)

In Department

- Member, Department Research Committee (2008 onwards)
- In-charge-Internet Connectivity in the Department for teaching and research. (2003-04)
- Member, M.Phil Committee of Department (2007 onwards)
- Member, Department Purchase Committee (2008/09)

- Secretary, Alumni Association (2003-2005)
- Member, syllabus revision Committee (2004,2008/09)
- Member, Planning: 9th Plan document
- Departmental store In-charge (2010)
- Member, Departmental Committee against Sexual Harassment, 2003-2007
- Member, The committee of Courses and Studies for Under-Graduate Studies in Botany