




University Faculty Details Page on DU Web-site

Title	DR.	First Name	ANIL	Last Name	GROVER	
Designation	PROFESSOR					
Department	DEPARTMENT OF PLANT MOLECULAR BIOLOGY					
Address (Campus)	UNIVERSITY OF DELHI SOUTH CAMPUS, BENITO JUAREZ ROAD, DHAULA KUAN, NEW DELHI-110021, INDIA					
(Residence)	C-1/96, JANAK PURI, NEW DELHI, 110058					
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Webpage	http://www.du.ac.in/du/index.php?page=plant-molecular-biology http://dpmb.ac.in/index.php?page=AG http://anilgroverlab.org/					
Education						
Subject	Institution	Year	Details			
Ph.D. PLANT PHYSIOL.	IARI, NEW DELHI	1984	THESIS TITLE: CARBON AND NITROGEN METABOLISM OF LEAVES SUPPORTING DEVELOPING PODS IN LEGUMES. [Supervisor: Late Prof. S.K. Sinha]			
M.Sc. BOTANY	DELHI UNIVERSITY	1979	Subject: BOTANY			
B.Sc. (Hons.) BOTANY	DELHI UNIVERSITY	1977	Subjects: BOTANY (Main); ZOOLOGY, CHEMISTRY (Subs.)			
Career Profile						
Organisation / Institution	Designation	Duration	Role			
JNU, NEW DELHI	RESEARCH ASSOCIATE	1984-85	RESEARCH			
TERI, NEW DELHI	RESEARCH ASSOCIATE	1985-87	RESEARCH			
GUELPH UNIV, CANADA	RESEARCH ASSOCIATE	1987-88	RESEARCH			
DELHI UNIVERSITY	SCIENTIST	1988-89	RESEARCH			
DELHI UNIVERSITY	LECTURER	1989-94	TEACHING AND RESEARCH			
CSIRO DIV PLANT INDUSTRY, AUSTRALIA	POST DOCTORAL FELLOW, ROCKEFELLER FOUNDATION, USA	1993-94	RESEARCH			
DELHI UNIVERSITY	SENIOR LECTURER	1994-96	TEACHING AND RESEARCH			
DELHI UNIVERSITY	READER	1996-2002	TEACHING AND RESEARCH			
CSIRO DIV PLANT INDUSTRY, AUSTRALIA	CAREER FELLOW, ROCKEFELLER FOUNDATION, USA	1996	RESEARCH			
CSIRO DIV PLANT INDUSTRY, AUSTRALIA	CAREER FELLOW, ROCKEFELLER FOUNDATION, USA	1997	RESEARCH			
CSIRO DIV PLANT INDUSTRY, AUSTRALIA	CAREER FELLOW, ROCKEFELLER FOUNDATION, USA	1998	RESEARCH			
DELHI UNIVERSITY	PROFESSOR	2002-	TEACHING AND RESEARCH			
UNIV CALIFORNIA DAVIS	VISITING FELLOW	2002-2004	RESEARCH			
Research Interests / Specialization						

PHYSIOLOGY, BIOCHEMISTRY, MOLECULAR BIOLOGY, BIOTECHNOLOGY AND GENOMICS OF PLANT ABIOTIC STRESS RESPONSES.

Teaching Experience (Subjects/Courses Taught)

TEACHING M.Sc. and Ph.D. STUDENTS AT DEPARTMENT OF PLANT MOLECULAR BIOLOGY, UNIVERSITY OF DELHI SOUTH CAMPUS, SINCE 1989. SUPERVISED 13 Ph.D., 7 M.Phil. AND 31 M.Sc. DISSERTATIONS. 6 Ph.D. STUDENTS CURRENTLY ENROLLED.

Honors & Awards

1. MEMBER, NATIONAL COMMITTEE, INSA-IUBS (2016-2020).
2. MEMBER, BOARD OF DIRECTORS, INTERNATIONAL SOCIETY OF PLANT MOLECULAR BIOLOGY (USA)
3. INDO-AUSTRALIA VISITING FELLOWSHIP AWARD, INDIAN NATIONAL SCIENCE ACADEMY
4. G.V. JOSHI MEMORIAL LECTURE AWARD, INDIAN SOCIETY OF PLANT PHYSIOLOGY
5. J.C. BOSE FELLOWSHIP AWARD, DEPARTMENT OF SCIENCE AND TECHNOLOGY, GOVERNMENT OF INDIA
6. FELLOW, INDIAN ACADEMY OF SCIENCES (IASc), BANGALORE
7. FELLOW, INDIAN NATIONAL SCIENCE ACADEMY (INSA), NEW DELHI
8. FELLOW, NATIONAL ACADEMY OF AGRICULTURAL SCIENCES (NAAS), NEW DELHI
9. FELLOW, NATIONAL ACADEMY OF SCIENCES (NASI), ALLAHABAD
10. NATIONAL BIOSCIENCE AWARD, DEPARTMENT OF BIOTECHNOLOGY (DBT), GOVERNMENT OF INDIA.
11. B.M. BIRLA SCIENCE PRIZE IN BIOLOGY, B.M. BIRLA SCIENCE CENTRE, INDIA
12. PROF. HIRALAL CHAKRAVARTHY AWARD FROM INDIAN SCI CONGRESS ASSOCIATION
13. ROCKFELLER FOUNDATION BIOTECHNOLOGY CAREER FELLOWSHIP
14. ROCKFELLER FOUNDATION BIOTECH POST DOCTORAL FELLOWSHIP
15. YOUNG SCIENTIST MEDAL, INDIAN NATIONAL SCIENCE ACADEMY, DELHI
16. CIDA – NSERC RESEARCH ASSOCIATESHIP AWARD FROM CANADA
17. NATIONAL SCHOLARSHIP, UNIV GRANTS COMMISSION, NEW DELHI

Publications (LAST FIVE YEARS)

In Indexed/ Peer Reviewed Journals

<u>Year of Publication</u>	<u>Title</u>	<u>Journal</u>	<u>Co-Author</u>
2019	Cpn60β4 protein regulates growth and developmental cycling and has bearing on flowering time in <i>Arabidopsis thaliana</i> plants	Plant Science 286: 78-88.	Tiwari LD and A Grover.
2019	Voyaging around ClpB/Hsp100 proteins and plant heat tolerance	Proceedings Indian National Science Academy (PINSAs). (DOI: 10.16943/ptinsa/2019/49592; in press)	Mishra RC and A. Grover.
2018	<i>In vivo</i> promoter engineering in plants: Are we ready?	Plant Science 277: 132-138.	Pandiarajan R and A Grover
2018	Mapping of domains of heat stress transcription factor OsHsfA6a responsible for its transactivation activity	Plant Science 274: 80-90.	Singh G, NK Sarkar and A Grover
2018	Analysis of transactivation potential of rice (<i>Oryza sativa</i> L.) heat shock factors	Planta 247: 1267-1276	Lavania D, A Dhingra, A Grover.
2016	Genetic improvement of rice crop under high temperature stress: bridging plant physiology with molecular biology	Indian J Plant Physiology 21: 391-408.	Lavania D, R Kumar, I Goyal, S Rana and A Grover.
2016	Pollen as a target of environmental changes	Plant Reproduction 29: 1-2.	Grover A, D Twell and E. Schlieff
2016	Constitutive over-expression of rice ClpD1 protein enhances tolerance to salt and desiccation stresses in transgenic <i>Arabidopsis</i> plants	Plant Science 250: 69-78.	Mishra RC, Richa and A Grover.

2016	Characterization of 5'UTR of rice ClpB-C/Hsp100 gene: evidence of its involvement in post-transcriptional regulation.	Cell Stress Chaperone 21: 271-283	Mishra RC, Richa, A Singh and A Grover
2016	ClpB/Hsp100 proteins and heat stress tolerance in plants.	Critical Reviews in Biotechnology 36: 862-874.	Mishra RC and A Grover
2016	Expression analysis of ClpB/Hsp100 gene in faba bean (<i>Vicia faba</i> L.) plants in response to heat stress.	Saudi Journal of Biological Sciences 23: 243-247.	Kumar R, AK Singh, D Lavania, MH Siddiqui, MH Al-Whaibi, A Grover.
2015	Constitutive over-expression of rice chymotrypsin protease inhibitor gene OCPI2 results in enhanced growth and osmotic stress tolerance of the transgenic Arabidopsis plants.	Plant Physiology and biochemistry 92: 48-55.	Tiwari LD, RC Mishra, D Mittal and A Grover.
2015	Current status of the production of high temperature tolerant transgenic crops for cultivation in warmer climates.	Plant Physiology and Biochemistry 86: 100-108.	Lavania D, Dhingra A, Siddiqui MH, Al-Whaibi MH, Grover A.
2014	Intergenic sequence between Arabidopsis ClpB-C/Hsp100 and choline kinase genes functions as a heat inducible bidirectional promoter.	Plant Physiology 166: 1646-1658.	Mishra RC and A Grover.

Articles:

Goyal I, Rana S, Khungar L, Shimphrui R and Grover A. 2018. Breeding for high temperature resistance in rice plants by transgenic approach. In: Modern Breeding Strategies for Crop Improvement. Proceedings of One-Day Dialogue on July 10, 2017. Professor Jayashankar Telangana State Agricultural University (PJTSAU), Rajendranagar, Hyderabad 500 030 India, 250p.

Conference Presentations

INTERNATIONAL

1. Attended International Plant Molecular Biology meeting at Montpellier, France (2018).
2. Talk at Goethe University, Germany (September 2016).
3. Attended International Plant Molecular Biology meeting at Brazil (2015).
4. Talk at Faculty of Agriculture, University of Mauritius, Mauritius (2015).
5. Talk at the Faculty of Agriculture, Hebrew University of Jerusalem, Israel (2015).
6. Talk at the Robert H. Smith Institute of Plant Sciences and Genetics in Agriculture, Hebrew University of Jerusalem, Israel (2015).
7. Talk at Naples University, Italy (2015)
8. Talk at SPOT-ITN conference "Stress biology and crop fertility", Italy (2015)
9. Talk at King Saud University, Riyadh, Saudi Arabia (2014)

NATIONAL

1. Talk at Deshbandhu College, Delhi University (2017).
2. Talk at School of Life Sciences, Pt. Ravishankar Shukla Univ, Raipur, Chhattisgarh (2017)
3. Talk at Inspire Camp, Pt. Ravishankar Shukla Univ, Raipur, Chhattisgarh (2017).
4. Talk at "Modern breeding strategies for crop improvement", PJTSAU, Hyderabad, Telangana (2017).
5. Talk at Inspire Camp, Ramjas College, Delhi University, Delhi (2017).
6. Chaired a workshop session and presented talk at InterDrought Conference in Hyderabad (2017).
7. Talk at Bose Institute, West Bengal (2017).
8. Talk at Biosparks, JNU, New Delhi (2016).
9. Talk at South Asian University, New Delhi (2016).
10. Talk at Hans Raj College, Delhi University, New Delhi (2016).
11. Talk at NRCPB, IARI Campus, New Delhi (2016)
12. Talk at Indian Plant Physiology Congress, JNU, New Delhi (2015).
13. Talk at ICGEB, New Delhi (2015).
14. Talk at Navy School, New Delhi (2015).

15. Talk at Shaheed Rajguru College of Applied Sciences for Women, Delhi University, Delhi (2015).
16. Talk at DAV College, Jalandhar, Punjab (2015).
17. Talk at M.D. University, Rohtak, Haryana (2014).
18. Talk at Indian Institute of Spices Research, Kozhikode, Kerala (2014).
19. Talk at M.D. University, Rohtak, Haryana (2014).
20. Talk at Fakir Mohan University, Balasore, Odisha (2014).
21. Talk at Refresher Course in Life Sciences, Academic Staff College, UGC, JNU, New Delhi (2014).

Total Publication Profile optional

In Indexed/ Peer Reviewed Journals

1. Tiwari LD and A Grover. 2019. Cpn60 β 4 protein regulates growth and developmental cycling and has bearing on flowering time in *Arabidopsis thaliana* plants. *Plant Science* 286: 78-88.
2. Mishra RC and A. Grover. 2019. Voyaging around ClpB/Hsp100 proteins and plant heat tolerance. *Proceedings Indian National Science Academy (PINSNA)*. (DOI: 10.16943/ptinsa/2019/49592; in press)
3. Ramakrishnan Pandiarajan and A Grover. 2018. *In vivo* promoter engineering in plants: Are we ready? *Plant Science* 277: 132-138.
4. Singh G, NK Sarkar and A Grover. 2018. Mapping of domains of heat stress transcription factor OsHsfA6a responsible for its transactivation activity. *Plant Science* 274: 80-90.
5. Lavania D, A Dhingra, A Grover. 2018. Analysis of transactivation potential of rice (*Oryza sativa* L.) heat shock factors. *Planta* 247: 1267-1276.
6. Lavania D, R Kumar, I Goyal, S Rana and A Grover. 2016. Genetic improvement of rice crop under high temperature stress: bridging plant physiology with molecular biology. *Indian J Plant Physiology* 21: 391-408.
7. Grover A, D Twell and E. Schleiff. 2016. Pollen as a target of environmental changes. *Plant Reproduction* 29: 1-2.
8. Mishra RC, Richa and A Grover. 2016. Constitutive over-expression of rice ClpD1 protein enhances tolerance to salt and desiccation stresses in transgenic *Arabidopsis* plants *Plant Science* 250: 69-78.
9. Mishra RC, Richa, A Singh and A Grover. 2016. Characterization of 5'UTR of rice ClpB-C/Hsp100 gene: evidence of its involvement in post-transcriptional regulation. *Cell Stress Chaperone* 21: 271-283 (DOI 10.1007/s12192-015-0657-1).
10. Mishra RC and A Grover. 2016. ClpB/Hsp100 proteins and heat stress tolerance in plants. *Critical Reviews in Biotechnology* 36: 862-874.
11. Kumar R, AK Singh, D Lavania, MH Siddiqui, MH Al-Whaibi, A Grover. 2016. Expression analysis of ClpB/Hsp100 gene in faba bean (*Vicia faba* L.) plants in response to heat stress. *Saudi Journal of Biological Sciences* 23: 243-247.
12. Tiwari LD, RC Mishra, D Mittal and A Grover. 2015. Constitutive over-expression of rice chymotrypsin protease inhibitor gene OCPI2 results in enhanced growth and osmotic stress tolerance of the transgenic *Arabidopsis* plants. *Plant Physiology and biochemistry* 92: 48-55.
13. Lavania D, Dhingra A, Siddiqui MH, Al-Whaibi MH, Grover A. 2015. Current status of the production of high temperature tolerant transgenic crops for cultivation in warmer climates. *Plant Physiology and Biochemistry* 86: 100-108.
14. Mishra RC and A Grover. 2014. Intergenic sequence between *Arabidopsis* ClpB-C/Hsp100 and choline kinase genes functions as a heat inducible bidirectional promoter. *Plant Physiology* 166: 1646-1658.
15. Sarkar NK, Y-K Kim and A Grover. 2014. Coexpression network analysis associated with call of rice seedlings for encountering heat stress. *Plant Molecular Biology* 84: 125-143.
16. Grover A, D Mittal, M Negi and D Lavania. 2013. Generating high temperature tolerant transgenic crops: achievements and challenges. *Plant Sci* 205-206: 38-47.
17. Sarkar NK, P Kundnani and A Grover. 2013. Functional analysis of Hsp70 superfamily proteins of rice (*Oryza sativa*). *Cell Stress and Chaperones*. 18:427-437.
18. Sarkar NK, U Thapar, P Kundnani, P Panwar and A Grover. 2013. Functional relevance of J-protein family of rice (*Oryza sativa*). *Cell Stress and Chaperones*. 18: 321-331.
19. Mittal D, DA Madhyastha, A Grover. 2012. Gene expression analysis in response to low and high temperature and oxidative stresses in rice: Combination of stresses evokes different transcriptional changes as against stresses applied individually. *Plant Science* 197 (2012) 102-113.
20. Mittal D, D Madhyastha and A Grover. 2012. Genome-wide transcriptional profiles during temperature and oxidative stress reveal coordinated expression patterns and overlapping regulons in rice. *PLoS ONE* 7(7): e40899. doi:10.1371/journal.pone.0040899.
21. Singh A, D Mittal, D Lavania, M Agarwal, RC Mishra, A Grover. 2012. OsHsfA2c and OsHsfB4b are involved in the transcriptional regulation of cytoplasmic OsClpB (Hsp100) gene in rice (*Oryza sativa* L.). *Cell Stress and Chaperones* 17: 243-254.
22. Mittal D, Y Enoki, D Lavania, A Singh, Hiroshi Sakurai and Anil Grover. 2011. Binding affinities and interactions among different heat shock element types and heat shock factors in rice (*Oryza sativa* L.). *FEBS Journal* 278: 3076-3085.
23. Upasana Singh, Debadutta Deb, Amanjot Singh and Anil Grover. 2011. Glycine-rich RNA binding protein of *Oryza sativa* inhibits growth of M15 *E. coli* cells. *BMC Research Notes* 4: 18.
24. Agarwal M, A Singh, D Mittal, C Sahi and A Grover. 2011. Cycloheximide-mediated superinduction of genes involves

- both native and foreign transcripts in rice (*Oryza sativa* L.). *Plant Physiology and Biochemistry* (Elsevier) 49: 9-12.
25. Singh A and A Grover. 2010. Plant Hsp100/ClpB-like proteins: poorly analyzed cousins of yeast ClpB machine. *Plant Molecular Biology* 74: 395-404.
 26. Singh A, U Singh, D Mittal and A Grover. 2010. Genome-wide analysis of rice ClpB/HSP100, ClpC and ClpD genes. *BMC Genomics* 11: 95.
 27. Singh A, Upasana Singh, Dheeraj Mittal and Anil Grover. 2010. Regulatory characteristics of rice glycosyltransferase family CAZy GT61 genes. *Plant Science* 179: 114-122.
 28. Sarkar NK, K Yeon-Ki and A Grover. 2009. Rice sHsp genes: genomic organization and expression profiling under stress and development. *BMC Genomics* 10: 393.
 29. Mittal D, Chakraborty S, Sarkar, A, Singh A and Grover A. 2009. Heat shock factor gene family in rice: genomic organization and transcript expression profiling in response to high temperature, low temperature and oxidative stresses. *Plant Physiology and Biochemistry* 47: 785-795.
 30. Singh A, C Sahi and A Grover. 2009. Chymotrypsin protease inhibitor gene family in rice: Genomic organization and evidence for the presence of a bidirectional promoter shared between two chymotrypsin protease inhibitor genes. *Gene* 428: 9-19.
 31. Nigam N, A Singh, C Sahi, A Chandramouli, A Grover. 2008. SUMO-conjugating enzyme (Sce) and FK506-binding protein (FKBP) encoding rice (*Oryza sativa* L.) genes: genome-wide analysis, expression studies and evidence for their involvement in abiotic stress response. *Molecular Genetics and Genomics* 279: 317-383.
 32. Singh A and Anil Grover. 2008. Genetic engineering for heat tolerance in plants. *Physiology and Molecular Biology of Plants* 155-166.
 33. Agarwal S, Kapoor A, Satya Lakshmi O and A Grover. 2007. Production and phenotypic analysis of rice transgenics with altered levels of pyruvate decarboxylase and alcohol dehydrogenase proteins. *Plant Physiology and Biochemistry* (Elsevier) 45: 637-646.
 34. Sahi C, Agarwal M, Singh A and A Grover. 2007. Molecular characterization of a novel isoform of rice (*Oryza sativa* L.) glycine rich -RNA binding protein and evidence for its involvement in high temperature stress response. *Plant Science* 173: 144-155.
 35. Batra G, Chauhan VS, Singh A, Sarkar NK and A Grover. 2007. Complexity of rice Hsp100 gene family: lessons from rice genome sequence data. *J. Biosciences* 32: 611-619.
 36. Sahi, C, A Singh, K Kumar, E Blumwald and A Grover. 2006. Salt stress response in rice: genetics, molecular biology and comparative genomics. *Functional and Integrative Genomics* 6: 263-284.
 37. Agarwal S and A Grover. 2006. Molecular biology, biotechnology and genomics of flooding associated low O₂ stress response in plants. *Critical Reviews in Plant Science* 25 (1): 1-21.
 38. Sahi C, A Singh, E Blumwald and A Grover. 2006. Beyond osmolytes and transporters: novel plant salt stress tolerance-related genes from transcriptional profiling data. *Minireview. Physiologia Plantarum* 127: 1-9.
 39. Agarwal S and A Grover. 2005. Isolation and transcription profiling of low O₂ stress associated cDNA clones from flooding stress tolerant FR13A rice genotype. *Annals of Botany* 96: 831-844.
 40. Grover A and D Pental. 2003. Breeding objectives and requirements for producing transgenic for the major field crops of India. *Current Science* 84: 310-320.
 41. Grover A, PK Aggarwal, A Kapoor, S Katiyar-Agarwal and M Agarwal. 2003. Production of abiotic stress tolerant transgenic crops: present accomplishments and future needs. *Current Science* 84: 355-367.
 42. Dubey H and A Grover. 2003. Respiratory pathway enzymes are differentially altered in flood tolerant and sensitive rice types during O₂ deprivation stress and post-stress recovery phase. *Plant Science* 164: 815-821.
 43. Dubey H and A Grover. 2003. Proteome maps of flood tolerant FR 13A and flood sensitive IR 54 rice types depicting proteins associated with deprivation stress and recovery regimes. *Current Science* 84: 83-89.
 44. Sahi C, M Agarwal, MK Reddy, SK Sopory, A Grover. 2003. Isolation and expression analysis of salt stress associated expressed sequence tags from contrasting rice cultivars using PCR-based subtraction method. *Theoretical and Applied Genetics* 106: 620-628.
 45. Katiyar_Agarwal S, M Agarwal and A Grover. 2003. Heat tolerant basmati rice engineered by overexpression of hsp101 gene. *Plant Molecular Biology* 51: 677-686.
 46. Agarwal Manu, Chandan Sahi, Surekha Katiyar-Agarwal, Sangeeta Agarwal, Todd Young, Daniel R Gallie, Vishva Mitra Sharma, K Ganesan and Anil Grover. 2003. Rice Hsp100 protein complements yeast hsp104 mutation by promoting disaggregation of protein granules and shows differential expression in indica and japonica rice types *Plant Molecular Biology* 51: 543-553.
 47. Agarwal M, S-Katiyar-Agarwal and A Grover. 2002. Plant Hsp100 proteins: structure, function and regulation. *Plant Science* 163: 397-405.
 48. Grover A and A Chandramouli. 2002. Abiotic stress tolerant transgenics in the days of genomics and proteomics. *Physiology and Molecular Biology of Plants* 8: 193-211.
 49. Grover A. (2002) Molecular biology of stress responses. *Cell Stress and Chaperones* 7: 1-5.
 50. Katiyar-Agarwal S, A Kapoor and A Grover. 2002. Binary cloning vectors for efficient genetic transformation of rice plants. *Current Science* 82: 873-876.
 51. Grover A, Kapoor, A, Katiyar-Agarwal S, Agarwal M, Sahi C, Jain P, Satyalakshmi O, Sangeeta A, Dubey H. 2001. Experimentation in biology of plant abiotic stress responses. *Proc Indian Natn Acad Sci.* B67: 189-214.

52. Dubey H and A Grover. 2001. Current initiatives in proteomics research: plant perspectives. *Current Science* 80: 262-269.
53. Grover A, A Kapoor, O Satya Lakshmi, S Agarwal, C Sahi, S Katiyar-Agarwal, M Agarwal and H Dubey. 2001. Understanding molecular alphabets of the plant abiotic stress responses. *Current Science* 80: 206-216.
54. Katiyar-Agarwal S, M Agarwal, D Gallie and A Grover. 2001. Search for the cellular functions of plant Hsp100/ Clp family proteins. *Critical Reviews in Plant Sciences* 20: 277-295.
55. Rahman M, A Grover, WJ Peacock, ES Dennis and M Ellis. 2001. Effects of manipulation of pyruvate decarboxylase and alcohol dehydrogenase levels on the submergence tolerance of rice. *Aust J Plant Physiology* 28: 1231-1241.
56. Agarwal M, Katiyar-Agarwal S, Sahi C, Gallie DR and Grover A. 2001. *Arabidopsis thaliana* Hsp100 protein: kith and kin. *Cell Stress and Chaperones* 6: 219-224.
57. Grover A. 2000. Ripe time for academia-industry partnership in production of abiotic stress tolerant crops. *Current Science* 79: 550-551.
58. Grover A, M Agarwal, S Katiyar-Agarwal, C Sahi and S Agarwal. 2000. Production of high temperature tolerant transgenic plants through manipulation of photosynthetic membrane lipids. *Current Science* 79: 557-559.
59. Grover A and D Minhas. 2000. Towards production of abiotic stress tolerant transgenic rice plants: issues, progress and future research needs. *Proc Indian Natn Acad Sci.* B66: 13-32.
60. Mohanty HK, S Mallik and A Grover. 2000. Prospects of improving flooding tolerance in lowland rice varieties by conventional breeding and genetic engineering. *Current Science* 78: 132-137.
61. Dennis ES, R Dolferus, M Ellis, M Rahman, Y Wu, FU Hoeren, A Grover, KP Ismond, AG Good, WJ Peacock. 2000. Molecular strategies for improving flooding tolerance in plants. *J Expt Bot (Special issue—Molecular physiology: engineering crops for hostile environments)* 51: 89-97.
62. Quimlo CA, LB Torrizo, TL Setter, M Ellis, A Grover, EM Abrigo, NP Oliva, ES Ella, AL Carpena, O Ito, WJ Peacock, E Dennis and SK Datta, 2000. Enhancement of submergence tolerance in transgenic rice plants overproducing pyruvate decarboxylase. *J Plant Physiol* 156: 516-521.
63. Katiyar-Agarwal A, M Agarwal and A Grover. 1999. Emerging trends in agricultural biotechnology research: use of abiotic stress-induced promoter to drive expression of a stress resistance gene in the transgenic system leads to high level stress tolerance associated with minimal negative effects on growth. *Current Science* 77: 1577-1579.
64. Grover A, C Sahi, N Sanan and A Grover. 1999. Taming abiotic stresses in plants through genetic engineering: current strategies and perspective. *Plant Science* 143: 101-111.
65. Minhas D and A Grover. 1999. Towards developing transgenic rice plants tolerant to flooding stress. *Proc Indian Natn Acad Sci* B65: 33-50.
66. Grover A. 1999. A novel approach for raising salt tolerant transgenic plants based on altering stress signalling through Ca⁺⁺/calmodulin-dependent protein phosphatase calcineurin. *Current Science* 76: 136-137.
67. Minhas D, MV Rajam and A Grover. 1999. Maintenance of callus growth during subculturing is a genotype dependent response in rice: mature seed- derived callus from IR 54 rice cultivar lacks culturability. *Current Science* 77: 1410-1413.
68. Rathee JS, H Dubey, D Minhas, N Sanan and A Grover. 1999. Morphogenic shift from root explant to callus formation in rice is associated with specific protein alterations. *J Plant Biology* 26: 59-63.
69. Minhas D and A Grover. 1999. Transcript levels of genes encoding various glycolytic and fermentation enzymes change in response to abiotic stresses. *Plant Science* 146: 41-51.
70. Pareek A, SL Singla and A Grover. 1999. Analysis of stress proteins at four different developmental stages in field-grown rice (cultivar Pusa 169) plants. *Current Science* 76: 81-86.
71. Grover A, A Pareek, SL Singla, D Minhas, S Katiyar, S Ghawana, H Dubey, M Agarwal, GU Rao, J Rathee and A Grover. 1998. Engineering crops for tolerance against abiotic stresses through gene manipulation. *Current Science* 75: 689-696.
72. Grover A, N Sanan and C Sahi. 1998. Genetic engineering for high-level tolerance to abiotic stresses through over-expression of transcription factor genes: The next frontier. *Current Science* 75: 178-179.
73. Pareek A, SL Singla and A Grover. 1998. Protein alterations associated with salinity, desiccation, high and low temperature stresses and abscisic acid application in seedlings of Pusa 169, a high-yielding rice (*Oryza sativa* L.) cultivar. *Current Science* 75: 1023-1035.
74. Pareek A, SL Singla and A Grover. 1998. Protein alterations associated with salinity, desiccation, high temperature and low temperature stresses and abscisic acid application in Lal nakanda, a drought tolerant rice cultivar. *Current Science* 75: 1170-1174.
75. Pareek A, SL Singla and A Grover. 1998. Evidence for accumulation of a 55 kDa stress-related protein in rice and several other plant genera. *Plant Science* 134: 191-197.
76. Singla SL, A Pareek, AK Kush and A Grover. 1998. Distribution patterns of the 104 kDa stress-associated protein of rice reveal its constitutive accumulation in seeds and disappearance from the just-emerged seedlings. *Plant Molecular Biology* 37: 911-919.
77. A Mukhopadhyaya, D Minhas and A Grover. 1997. Callusing from rice root explants: adventitious root formation precedes callus initiation response. *Current Science* 73: 465-469.
78. A Pareek, SL Singla and A Grover. 1997. Short-term salinity and high temperature stress-associated ultrastructural

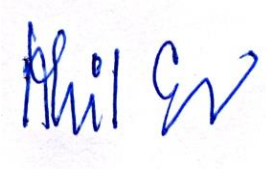
- alterations in young leaf cells of *Oryza sativa* L. *Annals of Botany* 80: 629-639.
79. A Pareek, SL Singla, AK Kush and A Grover. 1997. Distribution patterns of HSP90 proteins in rice. *Plant Science* 125: 221-230.
 80. Singla SL, A Pareek and A Grover. 1997. Yeast HSP 104 homologue rice HSP 110 is developmentally- and stress-regulated. *Plant Science* 125: 211-219.
 81. Pareek A, SL Singla and A Grover. 1998. Plant HSP 90 family with special reference to rice. *Journal of Biosciences* 23: 361-367.
 82. Singla SL, A Pareek and A Grover. 1998. Plant HSP 100 family with special reference to rice. *Journal of Biosciences* 23: 337-345.
 83. Hossain, MA, E Huq, A Grover, ES Dennis, WJ Peacock and TK Hodges. 1996. Characterization of pyruvate decarboxylase genes from rice. *Plant Molecular Biology* 31: 761-770.
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A handwritten signature in blue ink, appearing to read "Anil G", is located in the top left corner of the page.

(Signature of Faculty Member)

(Signature & Stamp
of Head of the Department)