




Faculty Profile of Prof. Sanjay Kapoor

Title	Professor.	First Name	SANJAY	Last Name	KAPOOR	
Designation	Professor					
Address	Department of Plant Molecular Biology University of Delhi South Campus					
Phone No	Office	+91 11 2415-7192				
	Residence					
	Mobile					
Email	kapoors@south.du.ac.in					
Web-Page	http://sklab.in http://www.dpmb.ac.in					
Educational Qualifications						
Degree	Institution				Year	
Ph.D.	Department of Botany, University of Delhi				1992	
PG	Department of Botany, University of Delhi				1986	
UG	SGTB Khalsa College, University of Delhi				1984	
Any other qualification	Diploma in Computer Software Application and Design				1986 (NIIT)	
Career Profile						
Functional Genomics of Reproductive Development in Rice:						
<p>The process of sexual reproduction in plants is one of the most important developmental event that not only is essential for propagation to next generation but also is important for human sustenance as plant seed/fruits resulting from in crop plants are used for human consumption. Three landmark events, (1) meiosis that marks the transition of sporophytic to gametophytic phase of development, (2) predetermined number of mitotic divisions giving rise to two sperm cells in pollen and a seven-celled embryosac in the ovule and (3) starch accumulation in pollen grains prior to anther dehiscence, determine the success and fidelity of sexual reproduction. In this project, we aim to generate knowledge on molecular aspects of regulation of reproductive development in rice and develop precision tools for manipulation of biotechnologically relevant traits.</p>						
Characterising the molecular-physiological basis of pollen abortion upon prolonged high temperature stress						
<p>Pollen development is a key heat-sensitive process in a variety of plant species, including mono- and dicots, and is pivotal for yield in many crops. The cause of lowered pollen viability under elevated temperature conditions has not yet been identified, but literature points at an important role for the tapetum and phytohormone signalling. In this project, we will combine phytohormone analyses and transcriptomics with modification of genetic backgrounds to establish in detail how the hormone, RNA-interference and anther-identity pathways in tomato and rice interact and are impacted by elevated temperature. Finally, we will address how the classical heat-shock-protein system interacts with the these pathways. Based on the results we will propose a molecular-physiological model for high</p>						

temperature-induced pollen defects. We expect the project to contribute genetic and chemical targets and tools for improving resilience of crops to heat stress. Since stress-induced male sterility is a widespread and seemingly conserved phenomenon in plants, the findings of this project might prove relevant to other systems.

Funding for this research comes from Department of Biotechnology (DBT), Department of Science and Technology (DST), Council for Scientific and Industrial Research (CSIR) and Delhi University Research Grant.

Administrative Assignments

Member of the Telephone/Networking Committee for South Campus
Member of the Security Committee of South Campus
Member Task Force on Re-engineering

Areas of Interest / Specialization

Molecular Analysis of Reproductive Development;
Functional Genomics
Understanding impact of Heat Stress on Pollen Development

Subjects Taught

Molecular Cell Biology
Photosynthesis
Prokaryotic Gene regulation
Structure and function of Eukaryotic Genomes

Research Guidance

List against each head (If applicable)

- | | |
|--|---|
| 1. Supervision of awarded Doctoral Thesis | 7 |
| 2. Supervision of Doctoral Thesis, under progress | 5 |
| 3. Supervision of awarded M.Phil dissertations | 1 |
| 4. Supervision of M.Phil dissertations, under progress | 0 |

Publications Profile

List against each head (If applicable) (as Illustrated with examples)

1. Books/Monographs (Authored/Edited) --
2. Research papers published in Refereed/Peer Reviewed Journals (55)
3. Research papers published in Academic Journals other than Refereed/Peer Reviewed Journals (13)
4. Other publications (Edited works, Book reviews, Festschrift volumes, etc.) 2 Patents; 5 Patents pending

Publications:

1. Ranjan R, Khurana R, Malik N, Badoni S, Parida SK, Kapoor S, Tyagi AK (2017) bHLH142 regulates various metabolic pathway-related genes to affect pollen development and anther dehiscence in rice. *Sci Rep* 7:43397. doi: 10.1038/srep43397
2. Singh S, Viridi AS, Jaswal R, Chawla M, Kapoor S, Mohapatra SB, Manoj N, Pareek A, Kumar S, Singh P (2017) A temperature-responsive gene in sorghum encodes a glycine-rich protein that interacts with calmodulin. *Biochimie* 137:115–123. doi: 10.1016/j.biochi.2017.03.010
3. Chawla M, Verma V, Kapoor M, Kapoor S (2016) A novel application of periodic acid–Schiff (PAS) staining and fluorescence imaging for analysing tapetum and microspore development. *Histochemistry and Cell Biology* 1–8. doi: 10.1007/s00418-016-148
4. Agarwal P, Parida SK, Raghuvanshi S, Kapoor S, Khurana P, Khurana JP, Tyagi AK. 2016. Rice Improvement Through Genome-Based Functional Analysis and Molecular Breeding in India. *Rice*

(New York, N.Y.) 9, 1–17.

5. Arya D, Kapoor S, Kapoor M. 2016. Physcomitrella patens DNA methyltransferase 2 is required for recovery from salt and osmotic stress. *FEBS Journal* 283, 556–570.
6. Kaur G, Singh S, Singh H, Chawla M, Dutta T, Kaur H, Bender K, Snedden WA, Kapoor S, Pareek A. 2015. Characterization of Peptidyl-Prolyl Cis-Trans Isomerase-and Calmodulin-Binding Activity of a Cytosolic Arabidopsis thaliana Cyclophilin AtCyp19-3. *PLoS ONE* 10, e0136692.
7. Research Highlight (2014). Protein clues into rice seed development gene. *NatureIndia* doi:10.1038/nindia.2014.107.
8. Nayar S, Kapoor M, Kapoor S (2014) Post-translational regulation of rice MADS29 function: homodimerization or binary interactions with other seed-expressed MADS proteins modulate its translocation into the nucleus. *Journal of Experimental Botany* 65:5339–5350. doi: 10.1093/jxb/eru296. Also cited as *Cell & molecular biology-Research Highlight, Nature India (Aug, 2014)*.
9. Dangwal M, Kapoor S, Kapoor M (2014) The PpCMT Chromomethylase Affects Cell Growth and Interacts with Homolog of LIKE HETEROCHROMATIN PROTEIN 1 in the Moss Physcomitrella patens. *The Plant Journal* 77 (4), 589-603
10. Kanwar P, Sanyal SK, Tokas I, Yadav AK, Pandey A, Kapoor S, Pandey GK (2014) Comprehensive structural, interaction and expression analysis of CBL and CIPK complement during abiotic stresses and development in rice. *Cell Calcium*.
11. Sharma M, Singh A, Shankar A, Pandey A, V Baranwal V, Kapoor S, Tyagi AK, Pandey GK (2014) Comprehensive Expression Analysis of Rice Armadillo Gene Family During Abiotic Stress and Development. *DNA Research*, dst056
12. Singh A, Kanwar P, Yadav AK, Mishra M, Jha SK, Baranwal V, Pandey A, Kapoor S, Tyagi AK, Pandey GK (2013) Genome-wide expressional and functional analysis of calcium transport elements during abiotic stress and development in rice. *FEBS J.* doi: 10.1111/febs.12656
13. Nayar, S., Sharma, R., Tyagi, A.K. and Kapoor, S. (2013). Functional delineation of rice MADS29 reveals its role in embryo and endosperm development by affecting hormone homeostasis. *Journal of Experimental Botany* 64 (14): 4239-4253 (doi:10.1093/jxb/ert231) Cover Page Article.
14. Dangwal, M., Malik, G., Kapoor, S., & Kapoor, M. (2013). De-novo methyltransferase, OsDRM2, interacts with the ATP-dependent RNA helicase, OsELF4A, in Rice. *Journal of Molecular Biology*, 1–37. doi:10.1016/j.jmb.2013.05.021
15. Singh, A., Kanwar, P., Pandey, A., Tyagi, A.K., Sopory, S.K., Kapoor, S. and Pandey, G.K. (2013). Comprehensive Genomic Analysis and Expression Profiling of Phospholipase C Gene Family during Abiotic Stresses and Development in Rice. *PloS one* 8 (4), e62494.
16. Shankar A, Singh A, Kanwar P, Srivastava AK, Pandey A, Suprasanna P, Kapoor S, Pandey GK (2013) Gene Expression Analysis of Rice Seedling under Potassium Deprivation Reveals Major Changes in Metabolism and Signaling Components. *PLoS ONE* 8: e70321
17. Mishra M, Kanwar P, Singh A, Pandey A, Kapoor S, Pandey GK (2013) Plant Omics: Genome-Wide Analysis of ABA Repressor1 (ABR1) Related Genes in Rice During Abiotic Stress and Development. *OMICS* 17: 439–450
18. Khurana R, Kathuria H, Mukhopadhyay A, Kapoor S, and Tyagi AK (2013). A 286 bp upstream regulatory region of a rice anther-specific gene, OSIPP3, confers pollen-specific expression in Arabidopsis. *Biotechnol. Letters* 35(3):455-462 doi:10.1007/s10529-012-1100-7)
19. Kumar S, Karan R, Kapoor S, Singh SP, Khare SK (2012). Screening and isolation of halophilic

bacteria producing industrially important enzymes. *Brazilian Journal of Microbiology* 43(4): 1595-1603.

20. Malik G, Dangwal M, Kapoor S, and Kapoor M (2012). Role of DNA methylation in growth and differentiation in *Physcomitrella patens* and characterization of cytosine DNA methyltransferases. *FEBS Journal* 279: 4081–4094.
21. Baranwal V, Mikkilineni V, Zehr-Barwale U, Tyagi AK and Kapoor S (2012) Heterosis: Emerging ideas about hybrid vigour. *Journal of Experimental Botany* 63(18):6309-6314 (doi: 10.1093/jxb/ers291). Opinion Article.
22. Khurana R, Kapoor S and Tyagi AK (2012) Anthology of anther/pollen-specific promoters and transcription factors. *Critical Reviews in Plant Sciences* 31 (5), 359-390.
23. Khurana R, Kapoor S and Tyagi AK (2012) Spatial and temporal activity of upstream regulatory regions of rice anther-specific genes in transgenic rice and *Arabidopsis*. *Transgenic Research* DOI 10.1007/s11248-012-9621-3.
24. Singh A, Pandey A, Baranwal V, Kapoor S, Pandey G (2012) Comprehensive expression analysis of rice phospholipase D gene family during abiotic stresses and development. *Plant Signal Behav* 7:847.
25. Kumar R, Sharma MK, Kapoor S, Tyagi AK, Sharma AK (2012) Transcriptome analysis of rin mutant fruit and in silico analysis of promoters of differentially regulated genes provides insight into LeMADS-RIN-regulated ethylene-dependent as well as ethylene-independent aspects of ripening in tomato. *Molecular Genetics Genomics*. doi: 10.1007/s00438-011-0671-7
26. Ray S, Kapoor S, Tyagi AK (2012) Analysis of transcriptional and upstream regulatory sequence activity of two environmental stress-inducible genes, NBS-Str1 and BLEC-Str8, of rice. *Transgenic Research* 21: 351–366
27. Sharma R, Agarwal P, Ray S, Deveshwar P, Sharma P, Sharma N, Nijhawan A, Jain M, Singh AK, Singh VP, Tyagi AK and Kapoor S (2012) Expression dynamics of metabolic and regulatory components across stages of panicle and seed development in indica rice. *Functional & Integrative Genomics* 12(2):229-248.
28. Singh A, Baranwal V, Shankar A, Kanwar P, Ranjan R, Yadav S, Pandey A, Kapoor S, Pandey GK (2012) Rice phospholipase A superfamily: organization, phylogenetic and expression analysis during abiotic stresses and development. *PLoS ONE* 7: e30947
29. Mathur S, Vyas S, Kapoor S and Tyagi AK (2011). The Mediator complex in plants: structure, phylogeny, and expression profiling of representative genes in a dicot (*Arabidopsis*) and a monocot (rice) during reproduction and abiotic stress. *Plant Physiol.* 157: 1609–1627.
30. Crismani W, Kapoor S, Able JA. (2011). Comparative Transcriptomics Reveals 129 Transcripts That Are Temporally Regulated during Anther Development and Meiotic Progression in Both Bread Wheat (*Triticum aestivum*) and Rice (*Oryza sativa*). *Int J Plant Genomics* 2011: 931898.
31. Deveshwar, P., Bovill, W.D., Sharma, R., Able, J.A., and Kapoor, S. (2011). Analysis of anther transcriptomes to identify genes contributing to meiosis and male gametophyte development in rice. *BMC Plant Biology* 11:78.
32. Ray, S., Dansana, P.K., Giri, J., Deveshwar, P., Arora, R., Agarwal, P., Khurana, J.P., Kapoor, S., and Tyagi, A.K. (2011). Modulation of transcription factor and metabolic pathway genes in response to water-deficit stress in rice. *Functional & Integrative Genomics* 11, 157-178.
33. Karan, R., Singh, S.P., Kapoor, S., and Khare, S.K. (2011). A novel organic solvent tolerant protease from a newly isolated *Geomicrobium* sp. EMB2 (MTCC 10310): production optimization by response surface methodology. *New Biotechnology* 28, 136-145.

34. Karan, R., Singh, R.K., Kapoor, S., and Khare, S. (2011). Gene Identification and Molecular Characterization of Solvent Stable Protease from A Moderately Haloalkaliphilic Bacterium, *Geomicrobium* sp. *EMB2. J Microbiol Biotechnol* 21, 129-135.
35. Agarwal, P., Kapoor, S., and Tyagi, A.K. (2011). Transcription factors regulating the progression of monocot and dicot seed development. *Bioessays* 33, 189-202.
36. Singh, A., Giri, J., Kapoor, S., Tyagi, A.K., and Pandey, G.K. (2010). Protein phosphatase complement in rice: Genome-wide identification and transcriptional analysis under abiotic stress conditions and reproductive development. *BMC Genomics* 11, 435.
37. Sharma, R., Kapoor, M., Tyagi, A.K., and Kapoor, S. (2010). Comparative transcript profiling of TCP family genes provide insight into gene functions and diversification in rice and *Arabidopsis*. *J Plant Mol Biol Biotechnol* 1, 24-38.
38. Raghuvanshi, S., Kapoor, M., Tyagi, S., Kapoor, S., Khurana, P., Khurana, J., and Tyagi, A. (2010). Rice genomics moves ahead. *Molecular Breeding* 26, 257-273.
39. Gaur, R., Grover, T., Sharma, R., Kapoor, S., and Khare, S.K. (2010). Purification and characterization of a solvent stable aminopeptidase from *Pseudomonas aeruginosa*: Cloning and analysis of aminopeptidase gene conferring solvent stability. *Process Biochemistry* 45, 757-764.
40. Sharma R, Mohan Singh RK, Malik G, Deveshwar P, Tyagi AK, Kapoor S, and Kapoor M (2009). Rice cytosine DNA methyltransferases - Gene expression profiling during reproductive development and abiotic stress. *FEBS Journal* 276, 6301-6311.
41. Bovill WD, Deveshwar P, Kapoor S, and Able JA (2009). Whole genome approaches to identify early meiotic gene candidates in cereals. *Functional and Integrative Genomics* 9, 219-229.
42. Vij, S., Giri, J., Dansana, P.K., Kapoor, S., and Tyagi, A.K. (2008). The receptor-like cytoplasmic kinase (OsRLCK) gene family in rice: organization, phylogenetic relationship, and expression during development and stress. *Molecular plant* 1, 732-750.
43. Kapoor, M., Arora, R., Lama, T., Nijhawan, A., Khurana, J.P., Tyagi, A.K., and Kapoor, S. (2008). Genome-wide identification, organization and phylogenetic analysis of Dicer-like, Argonaute and RNA-dependent RNA Polymerase gene families and their expression analysis during reproductive development and stress in rice. *BMC Genomics* 9.
44. Gupta, A., Ray, S., Kapoor, S., and Khare, S.K. (2008). Solvent-stable *Pseudomonas aeruginosa* PseA protease gene: Identification, molecular characterization, phylogenetic and bioinformatic analysis to study reasons for solvent stability. *Journal of Molecular Microbiology and Biotechnology* 15, 234-243.
45. Ray, S., Agarwal, P., Arora, R., Kapoor, S., and Tyagi, A.K. (2007). Expression analysis of calcium-dependent protein kinase gene family during reproductive development and abiotic stress conditions in rice (*Oryza sativa* L. ssp. *indica*). *Molecular Genetics and Genomics* 278, 493-505.
46. Jain, M., Nijhawan, A., Arora, R., Agarwal, P., Ray, S., Sharma, P., Kapoor, S., Tyagi, A.K., and Khurana, J.P. (2007). F-Box proteins in rice. Genome-wide analysis, classification, temporal and spatial gene expression during panicle and seed development, and regulation by light and abiotic stress. *Plant Physiology* 143, 1467-1483.
47. Arora, R., Agarwal, P., Ray, S., Singh, A.K., Singh, V.P., Tyagi, A.K., and Kapoor, S. (2007). MADS-box gene family in rice: Genome-wide identification, organization and expression profiling during reproductive development and stress. *BMC Genomics* 8.
48. Agarwal, P., Arora, R., Ray, S., Singh, A.K., Singh, V.P., Takatsuji, H., Kapoor, S., and Tyagi, A.K. (2007). Genome-wide identification of C2H2 zinc-finger gene family in rice and their phylogeny and expression analysis. *Plant Molecular Biology* 65, 467-485.

49. Kapoor, S., and Takatsuji, H. (2006). Silencing of an anther-specific zinc-finger gene, MEZ1, causes aberrant meiosis and pollen abortion in petunia. *Plant Molecular Biology* 61, 415-430. Cover Page Article.
50. Kapoor, S., Kobayashi, A., and Takatsuji, H. (2002). Silencing of the tapetum-specific zinc finger gene TAZ1 causes premature degeneration of tapetum and pollen abortion in *Petunia*. *Plant Cell* 14, 2353-2367.
51. Kapoor, S., and Sugiura, M. (1999). Identification of two essential sequence elements in the nonconsensus type II PatpB-290 plastid promoter by using plastid transcription extracts from cultured tobacco BY-2 cells. *Plant Cell* 11, 1799-1810.
52. Miyagi, T., Kapoor, S., Sugita, M., and Sugiura, M. (1998). Transcript analysis of the tobacco plastid operon rps2/atpl/H/F/A reveals the existence of a non-consensus type II (NCII) promoter upstream of the atpl coding sequence. *Molecular and General Genetics* 257, 299-307.
53. Kapoor, S., Suzuki, J.Y., and Sugiura, M. (1997). Identification and functional significance of a new class of non-consensus-type plastid promoters. *Plant Journal* 11, 327-337.
54. Kapoor, S., Maheshwari, S.C. and Tyagi, A.K. (1994). Developmental and light-dependent cues interact to establish steady-state levels of transcripts for photosynthesis related genes (psbA, psbD, psaA and rbcL) in rice (*Oryza saliva* L.). *Current Genetics* 25:362-366.
55. Kapoor, S., Wakasugi, T., Deno, H., and Sugiura, M. (1994). An atpE-specific promoter within the coding region of the atpB gene in tobacco chloroplast DNA. *Current Genetics* 26, 263-268.
56. Kapoor, S., Maheshwari, S.C., and Tyagi, A.K. (1993). Organ-specific expression of plastid-encoded genes in rice involves both quantitative and qualitative changes in mRNAs. *Plant and Cell Physiology* 34, 943-947.

Book Chapters

57. Agarwal P, Parida S, Kothari KS, Sharma G, Baranwal V, Kapoor S and Tyagi A (2012). Transcriptome resources for functional analysis and genetic enhancement of rice. In *Designer Rice*, EA Siddiq eds. in press.
58. Kapoor S, Khurana R, Baranwal V, Agarwal P, Ray S and Tyagi A (2011). Genome-wide Strategies for Genetic Enhancement of Rice. In *Genomics and Crop Improvement: Relevance and Reservations*, K. Muralidharan and EA Siddiq eds. PP 11-25.
59. Kapoor, S., and Kapoor, M. (2011). Epigenome and Abiotic Stress Tolerance in Plants. In *Omics and Plant Abiotic Stress Tolerance*, N. Tuteja, ed (Sharjah: Bentham Science Publishers Ltd.), pp. In Press.
60. Ray S, Dansana PK, Bhaskar A, Giri J, Kapoor S, Khurana JP, and Tyagi AK (2009). Emerging Trends in Functional Genomics for Stress Tolerance in Crop Plants. In *Plant Stress Physiology*; Hirt H ed. WILEY-VCH Verlag GmbH & Co., Weinheim, pp. 37-63.
61. Tyagi AK, Khurana JP, Khurana P, Kapoor S, Singh VP, Singh AK, Thakur JK, Gupta S, Anand S, Vij S, Jain M, Ray S, Agarwal P, Arora R, Sharma P, Mukherjee S, Nijhawan A, Giri J, Khurana R. (2006) Expression and functional analysis of rice genes involved in reproductive development and stress response. In *Rice Genetics V*, IRRI, Philippines.
62. Kapoor S., Sugita M. and Sugiura M. (2002). In vitro Characterization of Plastid NCII promoter elements By Using Plastid Transcription Extracts From Tobacco BY-2 Cultured Cells. In. *Molecular Insight in Plant Biology*; Nath P. et al. Eds. Oxford & IBH Publishing Co. New Delhi. pp 81-91.
63. Tyagi AK, Grover M, Chaudhury A, Kapoor S, Kelkar NY & Maheshwari SC. (1997) Influence of light and development on expression of genes encoding photosynthesis-related proteins. In: Tewari KK & Singhal GS (eds), *Plant Molecular Biology and Biotechnology* pp. 101-114, Narosa Pub. House, New Delhi.
64. Kapoor S. and Sugiura M. (1996) Expression and regulation of plastid genes. In *Photosynthesis: A Comprehensive Treatise*; Raghavendra A.S. ed. Cambridge Univ. Press, Cambridge UK. pp. 72-86.

65. Tyagi A.K., Grover M., Chaudhury A., Kapoor S., Kelkar N.Y., and Maheshwari S.C. (1995). Influence of light and development on expression of genes encoding photosynthesis-related proteins. In. *Plant Mol. Biol. and Biotech.*; Tewari K.K. and Singhal G.S. eds. Kluwer Acad. Pub. Dordrecht. pp. 101-114.
66. Tyagi A.K., Kelkar N.Y., Kapoor S. and Maheshwari S.C. (1993). The chloroplast genome: genetic potential and its expression. In *Photosynthesis: Photoreaction to Plant Productivity*; Abrol Y.P., Mohanty P. and Govindjee eds. Kluwer Acad. Pub. Dordrecht. pp. 3-47.
67. Tyagi AK, Kelkar NY, Kapoor S, Oelmuller R, Herrmann RG, Grover M, Kochhar A, Chaudhury A, Khurana JP & Maheshwari SC. (1993) Expression of genes encoding thylakoid membrane protein as influenced by light and development. In: Lodha S, Mehta SL, Ramagopal S & Srivastava GP (eds), *Advances in Plant Biotechnology and Biochemistry* pp. 1-7, ISAB, India.
68. Kapoor S., Maheshwari S.C. and Tyagi A.K. (1991). Cloning of chloroplast DNA and localization of the genes for thylakoid proteins in indica rice In. *Trends in Bioenergetics and Biotechnological processes*; Singhal G.S. and Ramasarna T. eds. Today and Tomorrow Pub. New Delhi pp. 66-73.
69. Tyagi A.K., Kelkar N.Y., Kapoor S. and Maheshwari S.C. (1988). Genes of the photosynthetic apparatus of higher plants—structure, expression and strategies for their engineering. In *Photosynthesis: Molecular Biology and Bioenergetics*; Singhal G.S., Barber J., Dilley, R.A., Govindjee, Haselkorn, R. and Mohanty, P. eds. Springer-Verlag, Berlin. pp. 3-20.

Patents

70. Method for lowering pollen fertility by using tapetal layer-specific zinc finger transcription factor gene',
 - a. Inventor; Hiroshi Takatsuji, Sanjay Kapoor, Akira Kobayashi.
 - b. Australlia patent, No. 779285, 2005.1.13,
 - c. Korea Patent No.455620, 2004.10.26.,
 - d. China Patent, No. CH0261275P, 2005.9.9.
71. Method of making sterile petunia plants by transformation with a nucleic acid encoding a zinc finger transcription factor'
 - a. Inventor; Hiroshi Takatsuji, Sanjay Kapoor, Akira Kobayashi.
 - b. Australlia patent, No. 779284, 2005.1.13,
 - c. Korea Patent No.455621, 2004.10.26.,
 - d. US Patent, No.6,989,473, 2006.1.24.
72. Kapoor Sanjay, Tyagi K. Akhilesh and Arora Rita (2008). Rice Nucleic Acid Sequences Associated With Panicle Development and Uses Thereof. Indian Patent Application no. 157/DEL/2007 (Pending)
73. Tyagi K. Akhilesh, Kapoor Sanjay and Agarwal Pinky (2008). Nucleic Acid Sequences Form Rice Involved in Seed Development and Uses Thereof. Indian Patent Application no. 160/DEL/2007 (Pending).
74. Tyagi K. Akhilesh, Kapoor Sanjay and Dhar Swatishmita (2011). Abiotic and Heavy Metal Stress-inducible BLEC-Str8 Promoter from Rice. Indian Patent Application no. 1403/DEL/2011 (Pending).
75. Kapoor Sanjay, Tyagi K. Akhilesh and Priyanka Deveshwar (2011). Tissue-specific promoter and uses thereof. India No. 1146/DEL/2011 (Pending)

Conference Organization/ Presentations (in the last three years)

List against each head (If applicable)

1. Organization of a Conference 1
2. Participation as Paper/Poster Presenter 6

Research Projects (Major Grants/Research Collaboration)

- 2012-2014 Role: Principle Investigator; A DST-JSPS Indo-Japanese collaborative project on “Elucidation of Mechanical Basis of Plant Gene Regulation for promotion of Plant Utilization. Indo-Japanese Joint Project between University of Delhi South Campus and Nagoya City University, Nagoya Japan.
- 2009 – 2012; Role: Co-Principle Investigator; Funding National Agriculture Innovation Project. BIOPROSPECTING OF GENES AND ALLELE MINING FOR ABIOTIC STRESS TOLERANCE
- 2009 – 2014; Role: Principle Investigator; Funding DBT. National Consortium for Functional Genomics of Rice (NCFGR): Phase II; Functional Analysis of Gene Regulatory Networks During Flower and Seed Development in Rice.
- 2008 – 2011; Role: Principle Investigator; Funding DBT. Screening of Biotechnologically Useful Enzymes in Halophiles/Haloalkaliphiles from Coastal Areas of Gujarat: Molecular and Functional Characterization for Industrial Applications. A collaborative Project Between UDSC, IIT Delhi and Saurashtra University.
- 2007 – 2012; Role: Co-Team Leader; Funding: DBT. Center of Excellence (DBT): Development of High Throughput Approaches to Understand Molecular Basis of Heterosis in Rice for Precision Breeding: A collaborative project between University of Delhi South Campus and Maharashtra Hybrid Seed Company Ltd.
- 2007 – 2011; Role: Principle Investigator; Funding DST. Control of Floral Organ Development by Methylome Profiling Using High Density Microarrays in Rice. A collaborative project between UDSC and GGS Indraprastha University.
- 2007 – 2010; Role: Principle Investigator; Funding: DST-DEST-Australia-India Strategic Research Fund. Meiosis in wheat and rice: are the interactions and regulation of this process conserved between other diverse eukaryote organisms? Indo-Australian Joint Project between University of Delhi South Campus and Adelaide University, South Australia.
- 2004-2009; Role: Principal Investigator; Funding: DBT. Identification and functional analysis of transcription factors and signal transduction components involved in the regulation of reproductive floral-organ development in rice.

Awards and Distinctions

1. Science and Technology Agency Japan -- Foreign Scientist (1997-1999)
2. JSPS (Japan society for the Promotion of Science) -- Post-doctoral fellowship (1995-1997).
3. Japanese Government (“Monbusho”—Ministry of Education and Culture) Fellowship (1992-94).
4. Member, Editorial board, Journal of Plant Biochemistry and Biotechnology (2010 ~)
5. Fellow of the National Academy of Sciences, India (December 7, 2013~)

Association With Professional Bodies

1. *Editing: Editorial board, Journal of Plant Biochemistry and Biotechnology (2010 ~)*
2. *Reviewing:*
3. *Advisory Committees and Boards*
4. *Memberships: Japanese Society for the promotion of Science (JSPS), Japan*

Other Activities

Vice Precedent: MOSAI, Monbusho Scholar Association of India (an Indo Japan professional and cultural ties promoting organization)

Web Master: Department of Plant Molecular Biology Website: www.dpmb.ac.in