

1. **Name of faculty:** Dr Sumita Kachhwaha
2. **Department:** Department of Botany
3. **Designation:** Associate Professor
4. **Age as on 01.01.2016:** 46 years & 6 months
5. **Educational Qualifications:** M.Sc, Ph.D
6. **Teaching Experience as on 01.01.2016:** 19 years
7. **Address (Local):** 10, Shiv Shakti Nagar ,King's Road, Jaipur-19
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10. **Details of Research Projects:**

S. No.	Title of project	Co-investigator if any	Funding Agency	Year of sanction	Year of completion	Funds received (in Lacs)
1	Biotechnological Studies in Barley (Principal Investigator)		UGC, New Delhi	2004-	2006	~Rs. 37,000/-
2	Collection characterization and conservation of <i>Withania coagulans</i> (Stocks) Dunal chemotypes/biotypes and their metabolomic comparison with <i>Withania somnifera</i> (L.) Dunal counterparts	Myself Co- P. I	CSIR, New Delhi	2007	-2011	~ Rs. 26 Lakhs
3	Bioinformatics Infrastructure Facility		DBT	2006	ongoing	Ongoing (25 L received so far)

11. List of Publications:

- Barupal, J. K., Saini, A., Chand, T., Meena, A., Beniwal, S., Suthar, J. R., Bhagri, N., Kothari, S. L., Kachhwaha, S. (2015), ExcellmiRDB for translational genomics: A curated online resource for extracellular microRNAs. *Omics Journal of Integrative Biology*, Volume 19, Number 1(I.F., 2.7)
- Pooja Sharma, S. L. Kothari, Sumita Kachhwaha (2015), Expression analysis of photosynthesis genes in *Dunaliella salina* grown at different NaCl concentrations. *Journal of applied biology and Biotechnology* . Volume 3 (06),015-021.
- Sankhala, A, Sharma,R, Yadav,R.S., Kashyap,D,Kothari,S.L and Kachhwaha,S.(2015) Biosynthesis and characterization of cadmium sulphide nanoparticles-An emphasis of zeta potential behavior due to capping. *Materials Chemistry and physics*,<http://dx.doi.org/10.1016/j.matchemphys.2015.12.017>.(I.F.,2.2)
- Bhatt,R, Asopa,P.P, Sihag,S, Sharma,R, Kachhwaha,S and Kothari,S.L .(2015).Comparative three way analysis of Biochemical responses in cereal and millet crops under salinity stress.*Journal of applied Biology and Biotechnology*.Volume 3 (06),022-028.
- Bardar,S.,Kothari, S.L and Sumita Kachhwaha (2015) Optimization of Factors Influencing *Agrobacterium* mediated Genetic Transformation in *Eclipta alba* (L.)Hassk. *Plant Tissue Cult. & Biotech.* 25(2): 155-164.
- Poonam Patel, Priti Agarwal, Sajjan Kanawaria, Sumita Kachhwaha and S. L. Kothari (2015) Plant-Based Synthesis of Silver Nanoparticles and Their Characterization. In: Manzer H. Siddiqui et al. (Eds) *Nanotechnology and Plant Sciences*. Springer, Switzerland.271-288.Book ID: 326454_1_En; Book ISBN: 978-3-319-14502-0
- Vyas S, Kachhwaha,S and .Kothari S L (2015). Comparative analysis of phenolic contents and total antioxidant capacity of *Moringa oleifera* Lam. *Pharmacognosy Journal*. Volume 7:1,44-51.
- Mathur Sujata and Kachhwaha S.(2015).Neem Tree: Amazing beauty components in skin and hair care.*Adv.Pharmacol.Toxicol*.Vol.16(3),31-43
- Jain P, Kachhwaha S and Kothari SL (2014). Chloroplast ultra structure, photosynthesis and enzyme activities in regenerated plants of *Stevia rebaudiana* (Bert.) Bertoni as influenced by copper sulphate in the medium. *Indian Journal of Experimental Biology* 52, 898-904 (I.F., 1.295)
- Dangi B, Khurana-Kaul V, Kothari SL and Kachhwaha S (2014). Micropropagation of *Terminalia bellerica* from nodal explants of mature tree and assessment of genetic fidelity using ISSR and RAPD markers. *Physiology and Molecular Biology of Plants* DOI 10.1007/s12298-014-0247-1
- Agarwal P, Bairwa VK, Kachhwaha S and Kothari SL (2014). Green synthesis of silver nanoparticles using callus extract of *Capsicum annuum* L. and their activity against microorganisms. *International Journal of Nanotechnology and Application* 4, 1-8.
- Jain P, Kachhwaha S and Kothari SL (2014). Biotechnology and metabolic engineering of *Stevia rebaudiana* (Bert.) Bertoni: Perspective and possibilities. *International Journal of Life Sciences Biotechnology and Pharma Research* 3, 15-37.

- Bardar,S. Khurana-Kaul,V. Kachhwaha,S and Kothari,SL.(2014)Nutrient optimization for improved in vitro Plant Regeneration in *Eclipta alba*(L.)Hassk. And Assessment of Genetic Fidelity using RAPD Analysis. *Plant Tissue cult.& Biotech.*24:2,223-234.
- Vyas S, Kachhwaha S and.Kothari S L (2014). Comparative analysis of the *in vitro* antioxidant activity and polyphenolic content of successive extracts of *Nyctanthes arbour-tristis* Linn. *International journal of pharmacy and pharmaceutical sciences.* Volume 6:11,373-376.
- Haq,S, Jain,R, Sharma,M, Kachhwaha,S and Kothari, S. L. (2014). Identification and Characterization of Microsatellites in Expressed Sequence Tags and Their Cross Transferability in Different Plants. *International Journal of Genomics* <http://dx.doi.org/10.1155/2014/863948>
- Goyal, P, Jain,R, Kachhwaha,S and Kothari, S. L. (2014) Assesment of genetic diversity in *Pithecellobium dulce* (Roxb.) Benth germplasm using RAPD and ISSR markers. *Trees* DOI 10.1007/s00468-014-1141-8(I.F.1.8)
- Agarwal,P, Patel,P, Kachhwaha, S and Kothari, S. L. (2014) Carbohydrates as Potent Nanosynthesizers: A comparative Account. *Journal of Bionanoscience* 8: 1–8 *Journal ISSN: 1557-7910 (Print); EISSN: 1557-7929 (Online).*
- Dangi B, Khurana-Kaul V, Kothari SL and Kachhwaha S (2014). Micropropagation of *Terminalia bellerica* from nodal explants of mature tree and assessment of genetic fidelity using ISSR and RAPD markers. *Physiology and Molecular Biology of Plants* DOI 10.1007/s12298-014-0247-1
- Agarwal P, Bairwa VK, Kachhwaha S and Kothari SL (2014). Green synthesis of silver nanoparticles using callus extract of *Capsicum annuum* L. and their activity against microorganisms. *International Journal of Nanotechnology and Application* 4, 1-8.
- Mehta A, Srivastava G, Kachhwaha S, Sharma M and Kothari SL (2013). Antimycobacterial activity of *Citrullus colocynthis* (L.) Schard. Against drug sensitive and drug resistant *Mycobacterium tuberculosis* and MOTT clinical isolates. *Journal of Ethnopharmacology* 149, 195-200 (I.F., 3.014)
- Verma KS, Kachhwaha S and Kothari SL (2013). *In vitro* plant regeneration of *Citrullus colocynthis* (L.) Schard. and assessment of genetic fidelity using ISSR and RAPD markers. *Indian Journal of Biotechnology* 12, 409-414. (I.F., 0.550)
- Modi P, Jain D, Kachhwaha S and Kothari SL (2013). Analysis of genetic diversity among *Tagetes patula* L. cultivars based on RAPD markers. *Indian Journal of Horticulture* 70, 549-554. (I.F., 0.125)
- Jain D, Rathore KS, Jain R, Singh H, Kachhwaha S and Kothari SL (2013). Phytofabrication of Iron oxide nanoparticles using *Calotropis gigantea* L. *Advanced Science Focus* 1, 318-321.
- Agarwal P, Mehta A, Kachhwaha S and Kothari SL (2013).Green synthesis of silver nanoparticles and their activity against *Mycobacterium tuberculosis*. *Advanced Science, Engineering and Medicine* 5, 709-714.
- Srivastava G, Jain R, Vyas N, Mehta A, Kachhwaha S and Kothari SL (2013). Antimicrobial activity of the Methanolic extract, fractions and isolated compounds from *Citrullus colosynthis* (L.) Schard. *International Journal of Pharma and Biosciences* 4, 825-833.

- Yadav T, Kachhwaha S and Kothari SL (2013). Efficient *in vitro* plant regeneration and generation of transgenic plants in barley (*Hordeum vulgare* L.) using particle bombardment. *Journal of Plant Biochemistry and Biotechnology* 22, 202-213. (I.F., 0.523)
- Yadav T, Kothari SL and Kachhwaha S (2013). Optimization of *Agrobacterium* mediated genetic transformation and regeneration of transgenic plants in Indian Cultivar of Barley (*Hordeum vulgare* L. cv. BL 2). *Proceedings of the National Academy of Sciences, India, Section B: Biological Sciences* 83, 255-264. (I.F., 0.019)
- Yadav SK, Khurana-Kaul V, Verma KS, Kachhwaha S and Kothari SL (2013). Assessment of diversity in *Solanum surattense* Burm f. using morphological and molecular markers and implication for its conservation. *National Academy Science Letters* 36, 541-549. (I.F., 0.211)
- Kumawat S, Kachhwaha S. and Kothari SL (2013). Micronutrient optimization in the basal medium improves *in vitro* plant regeneration in carnation (*Dianthus caryophyllus* L.) and Chinese pink (*Dianthus chinensis* L). *Propagation of Ornamental Plants* 13, 3-11 (I.F., 0.50)
- Dangi B, Kachhwaha S and Kothari SL (2012). Regeneration and *Agrobacterium*-mediated genetic transformation of *Terminalia bellerica* Roxb.: a multipurpose tree species. *In Vitro Cellular and Developmental Biology-Plant* 48, 304-312. (I.F., 1.497)
- Jagga-Chugh S, Kachhwaha S, Sharma M, Kothari-Chajer A, Kothari SL (2012). Optimization of factors influencing microprojectile bombardment-mediated genetic transformation of seed derived callus and regeneration of transgenic plants in *Eleusine coracana* (L.) Garten. *Plant Cell Tissue and Organ Culture* 109, 401-410. (I.F., 3.090)
- Jain D, Kachhwaha S, Jain R and Kothari SL (2012). Isolation and characterization of *cry* genes from indigenous strains of *Bacillus thuringiensis* taken from desert soils of Rajasthan. *Indian Journal of Biotechnology* 11, 491-494. (I.F., 0.550)
- Jain P, Kachhwaha S and Kothari SL (2012). Optimization of micronutrients results into highly improved *in vitro* plant regeneration, biomass and chlorophyll content in the micropropagated plants of *Stevia rebaudiana* (Bert.) Bertoni. *Indian Journal of Biotechnology* 11, 486-490. (I.F., 0.550)
- Goyal P, Kachhwaha S and Kothari SL (2012). Micropropagation of *Pithecellobium dulce* (Roxb.)Benth- a multipurpose leguminous tree and assessment of genetic fidelity of micropropagated plants using molecular markers. *Physiology and Molecular Biology of Plants* 18, 169-176.
- Khurana-Kaul V, Kachhwaha S and Kothari SL (2012). Characterization of genetic diversity in *Jatropha curcas* L. germplasm using RAPD and ISSR markers. *Indian Journal of Biotechnology* 11, 54-61. (I.F., 0.550)
- Jain R, Kachhwaha S and Kothari SL (2012). Phytochemistry, pharmacology, and biotechnology of *Withania somnifera* and *Withania coagulans*: A review. *Journal of Medicinal Plant Research* 6, 5388-5399.
- Bairwa VK, Kachhwaha S and Kothari SL (2012). Phloroglucinol mediated shoot bud elongation in *Capsicum annum*. *National Academy Science Letters* 35, 331-335. (I.F., 0.211)
- Dangi B, Jain R, Kachhwaha S and Kothari SL (2012). Assessment of Diversity in *Terminalia bellerica* Roxb. Using morphological, Phytochemical and molecular markers. *National Academy Science Letters* 35, 27-35. (I.F., 0.211)

- Sharma P, Agarwal V, Krishna Mohan M, Kachhwaha S and Kothari SL (2012). Isolation and characterization of *Dunaliella* species from Sambhar lake (India) and its phylogenetic position in the genus *Dunaliella* using 18s rDNA. National Academy Science Letters 35, 207-213. (I.F., 0.211)
- Goyal A and Kachhwaha S (2012). ZnO thin films preparation by spray pyrolysis and electrical characterization. Material Letters 68,354-356.(I.F.,2.48)
- Yadav T, Kachhwaha S and Kothari SL (2011). Evaluation of regeneration potential of mature embryo derived callus in Indian cultivars of Barley (*Hordeum vulgare* L.) Journal of Plant Biochemistry & Biotechnology 20, 166-172. (I.F., 0.523)
- Jain R, Sinha A, Jain D, Kachhwaha S and Kothari SL (2011). Adventitious shoot regeneration and *in vitro* biosynthesis of steroidal lactones in *Withania coagulans* (Stocks) Dunal. Plant Cell Tissue and Organ Culture 105, 135-140. (I.F., 3.090)
- Khan S, Tyagi P, Kachhwaha S and Kothari SL (2010). High frequency plant regeneration and detection of genetic variation among micropropagated plants of *Datura metal* L. Phytomorphology 60, 1-8.
- Jain D, Jain R, Kachhwaha S, Srivastava G and Kothari SL (2010) Novel microbial route to synthesize silver nanoparticles using spore crystal mixtures of *Bacillus thuringiensis*. Indian Journal of Experimental Biology 48, 1152-1156. (I.F., 1.295)
- Kothari SL, Joshi A, Kachhwaha S and Ochoa-Alejo N (2010). Chilli peppers – A review on tissue culture and transgenesis. Biotechnology Advances 28, 35-48. (I.F., 9.646)
- Khurana-Kaul V, Kachhwaha S and Kothari SL (2010). Direct shoot regeneration from leaf explants of *Jatropha curcus* L in response to TDZ and high copper levels in the medium. Biologia Plantarum 54, 369-372. (I.F., 1.974)
- Sinha A, Jain R, Kachhwaha S and Kothari SL (2010). Optimization of the level of micronutrient copper in the culture medium improves shoot regeneration in Indian Ginseng [*Withania somnifera* (L.) Dunal]. National Academy Science Letters-India 33, 11-16. (I.F., 0.211)
- Yadav SK, Kachhwaha S and Kothari SL (2010). Comparison of *in vitro* regeneration efficiency of leaf explants in response to different cytokinins and assessment of genetic uniformity of regenerated plants of *Solanum surattense* Burm.f. African Journal of Biotechnology 9, 8991-8997
- Jain D, Daima HK, Kachhwaha S and Kothari SL (2009). Synthesis of plant mediated silver nanoparticles using papaya fruit extract and evaluation of their antimicrobial activities. Digest Journal of Nanomaterials and Biostructures 4, 723-727. (I.F., 1.2)
- Jain P, Kachhwaha S and Kothari SL (2009). Improved micropropagation protocol and enhancement in biomass and chlorophyll content in *Stevia rebaudiana* (Bert) Bertoni by using high copper levels in the culture medium. Scientia Horticulturae 119, 315-319. (I.F., 1.527)
- Jain R, Sinha A, Kachhwaha S and Kothari SL (2009). Micropropagation of *Withania coagulans* (Stocks) Dunal: A critically endangered medicinal herb. Journal of Plant Biochemistry and Biotechnology 18, 249-252. (I.F., 0.523)
- Kothari-Chajer A., Sharma M., Kachhwaha S., and Kothari S. L. 2008. Micronutrient optimization results into highly improved *in vitro* plant regeneration in kodo (*Paspalum scrobiculatum* L.) and finger (*Eleusine coracana* (L.) Gaertn.) millets. Plant Cell Tissue Organ Culture. 94:105-112 (IF-2.12)

- Kothari,A., Sharma,M., Juniwal,P., Kachhwaha, S., Kothari, S.L and Chandra,N.2007.Recent Advances in Biotechnology of cereals and millet crops.In:Biotechnology in Plant Improvement,(editor-P.C.Trivedi), pp.336-368.
- Vishnoi,R.K., Kachhwaha,S and Kothari,S.L. 2000. Biotechnology of Barley.In:Plant Biotechnology-recent advances,(editor-P.C.Trivedi),pp.41-62.
- Kachhwaha,S., Varshney,A and Kothari,S.L.1997.Somatic embryogenesis and long term high plant regeneration from barley (*Hordeum vulgare* L.) using Picloram. Cereal Research Communication. 25:117-126. (IF-0.50)
- Kachhwaha, S.,Joshi,S., Sankhla,N.and Sankhla,D.1997.Micropropagation of Ziziphus cultivars via tissue culture. Proc.Plant Growth Reg.Soc.Amer.24:199-202.
- Sankhla,N., Upadhyaya,A., Mali,S., Kachhwaha,S., Dinesh,R.,Joshi,S and Sankhla,D.1997.Growth and antioxidant activity in *Ziziphus mauritiana* cv.*Tikri* seedlings under moisture stress. Proc. Plant Growth Reg. Soc. Amer.24:203-207.
- Sankhla,D., Sankhla,N., Upadhyaya,A., Kachhwaha,S., Mali,S., Dinesh,R and Joshi, S.1997.Effect of Uniconazole on growth and activities of active oxygen processing enzymes in *Ziziphus* seedlings. . Proc. Plant Growth Reg.Soc.Amer. 24:208-212.
- Kachhwaha,S and Kothari,S.L.1996. Plant regeneration from immature embryo explants of *Hordeum spontaneum* and *Hordeum vulgare*. Cereal Research Communication.24:27-32. (IF-0.50)
- Dinesh,R., Sankhla,N., Sankhla,D., Kachhwaha,S and Upadhyaya,A.1996. Effect of Thidiazuron on growth, antioxidants and Lipid peroxidation in chickpea seedlings. Proc. Plant Growth Reg.Soc.Amer.23:211-216.
- Sankhla,N., Kachhwaha,S., Mali,S., Dinesh,R.,Choudhary,R.,Mehra,N and Srivastava,H.P.1996. Effect of salt,paclobutrazol and Thidiazuron on *in vitro* growth. Proc.Plant Growth Reg.Soc.Amer.23: 152-158.
- Kachhwaha, S and Kothari, S.L.1994. Plant regeneration in barley through microtillering and multiple shoot regeneration. Current Science.67:116-118. (IF-0.8)
- Kachhwaha, S and Kothari, S.L.1994. Mode of plant regeneration from immature embryo cultures of *Hordeum vulgare* L. Acta Botanica Indica 22:232-235.

12. List of Conferences / Symposium/ Refresher Courses organized

- National workshop on Biotechnology and Bioinformatics, 25-26- Sept. 2008, at CCT, University of Rajasthan,Jaipur
- National workshop on Biological Sequence Analysis,9-10 Jan,2009,at CCT, University of Rajasthan, Jaipur
- National workshop on Introduction to Bioinformatics ,11-12 Jan,2009 at CCT, University of Rajasthan, Jaipur
- Workshop on Nanotechnology, 8-9th August 2009, at CCT, University of Rajasthan, Jaipur
- One day workshop on Introduction to Bioinformatics,19-21 Oct,2010 for M.Sc Students(Microbiology, Botany & Biotechnology) BIF, University of Rajasthan, Jaipur

- Two-day workshop on Proteomics and Genomics (Courtesy: Bio-Rad) for M.Tech, 7th and 8th semester students, 26-27 November, 2010 at CCT, University of Rajasthan, Jaipur
- One Day workshop on Bioinformatics (Resource person: Prof. Peter Myler, University of Washington, USA) for M.Tech students, 7 February, 2011. CCT, University of Rajasthan, Jaipur
- Two-day workshop on "Using R for statistical analysis of biological data", September 9th & 10th 2014. BIF (IPLS building), University of Rajasthan, Jaipur

13. List of Conferences / Symposium/ Refresher Courses Attended

- National Symposium on Medicinal Plants: Biodiversity Conservation, Export Potential and Intellectual Property Rights. Jaipur. March 28-29, 2003.
- National Symposium on Biotechnology for Human Welfare: The Commercial and Ethical Considerations. Jaipur. March 26-27, 2004.
- The National Academy of Sciences, India 74th Annual Session and National Symposium on Science and Technology for Desert Development. Jaipur. December 2-4, 2004.
- National Symposium on Biotechnology for Food, Health and Environmental Security. Jaipur. March 3-4, 2005.
- Conference on Resource Development and Marketing Issues in Rapeseed-Mustard. Jaipur. March 28-29, 2005.
- National Conference on Role of Plant Physiology and Biotechnology in Biodiversity Conservation and Agriculture Productivity and Annual Meeting of Society for Plant Physiology and Biochemistry. Jaipur. 24-26 February, 2006.
- National Symposium on Biotechnology for Sustainable Agriculture & Conservation of Biodiversity. Jaipur. March 24-25, 2006.
- International Conference on Agriculture for Food and Nutritional Security and Rural Growth. New Delhi. May 25-27, 2006.
- National Seminar on Biotechnology in Sustainable Agriculture and Environmental Management. Jaipur. November 7-8, 2008.
- National Seminar on Water Auditing. May 18th to 20th 2010. University of Rajasthan, Jaipur, 2010.
- National Conference & Workshop on "Recent Advances in Modern Communication Systems and Nanotechnology" NCMCN-2011. University of Rajasthan, Jaipur, Jan 06-08, 2011.

- Mentorship Workshop on ‘Bio-CARe’(Biotechnology Career advancement and Re-orientation Programme),organized by Biotech Consortium India Ltd.,New Delhi, organized at University of Pune, November 9,2011.
- National Symposium on “Impact of Plant Tissue culture on advances in Plant Biology” and PTCA Annual Meet ,Ahmedabad,19-21st January,2012
- AgTech Global Summit- 2012 at Aurangabad, 9-13 December, 2012
- National symposium on plant Tissue culture and Biotechnology for food and Nutritional Security and PTCA Annual Meet ,at CSIR-CFTRI, Mysore ,11-12 March,2013
- National Conference on plant Bioresource Management and Biotechnology, Department of Botany, University of Rajasthan, Jaipur. January 29-31,2014
- National Symposium on Advances in plant molecular biology & Biotechnology PTCA Annual Meet ,IICER, Pune.March 10-12, 2014
- All India conference of the Indian Botanical Society and National Symposium on “Emerging trends in plant sciences” Department of Botany, University of Rajasthan, Jaipur. October 26-28, 2015.

Orientation & Refreshers attended:

Name of the Course/ Summer School	Duration	Place	Sponsoring Agency
Orientation Course	27 days, 2002	ASC, Jaipur	UGC
Refresher Course in Botany	20 days, 2003	ASC, Jaipur	UGC
Refresher Course in Biotechnology	20 days, 2004	ASC, Jaipur	UGC

14. (a) National / International Collaborations with MoU (if any)

(b) Number of papers published where co-author is from another institute within the country-07

(c) Number of papers published where co-author is from another institute outside the country-02

15. Details of Ph. D. students supervised

16. Membership of technical societies / academic bodies/ National or international organizations (if any)

- Member, Indian Science Congress.
- Member, All India Botanical Society.
- Member, Society for Plant Biochemistry and biotechnology.
- Member, Institutional biosafety committee, U.O.R