

Curriculum-vitae Dr Sumya Pathak



Address for Correspondence

Dr Sumya Pathak
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Education

Ph.D. in Botany (2014) on thesis entitled “Elucidation of Papaverine biosynthesis pathway by comparative transcriptome sequencing of contrasting *Papaver somniferum L.* germplasm lines”. From Institute of Medical Sciences, Banaras Hindu University, Varanasi, India.

Work Area

My research interest revolves around the discipline of Science Technology and Innovation Studies to understand the social dynamics of technologies specifically the area of Indian traditional medicine. The major focus of my research is to develop a better understanding of interface between science, technology and society in order to drive the Technological Innovations towards the needs through effective mobilization of the resources as well as optimal utilization of innovation system building activities.

Currently I am working on innovation strategies to globalize traditional Indian system of medicine. framework for comparative strategies on legal regulations (with reference of China, EU and USA) and innovation on international market for TM, to propose solutions that can help facilitate the internationalization of TM of India and strengthening the patent regime for the future. Earlier I was involved in Secondary Metabolite Pathway Engineering of Medicinal Plant, Bioinformatics and Plant Tissue culture.

Awards and recognitions

- Selected for DST-Science technology and Innovation Senior Policy Fellow (2022)
- Selected for DST- Science technology and Innovation Post-Doctoral Fellow (2018)
- Selected for Bio Care Women Scientist (DST- INDIA) (2018)
- Awarded N-PDF (DST- SERB) (2015)
- Awarded DSK-PDF (UGC) (2014)
- Qualified CSIR SRF (2011)
- Contributed as a core team in formulating **India's 5th Science, Technology, and Innovation Policy with O/o Principal Science Advisor and DST New Delhi,**
- Worked as a **Member Secretary** in formulating UP state Science, Technology, and Innovation Policy.
- Contributed as core team member in formulating **MP state Science, Technology, and Innovation Policy.**

- Competed **STI Policy Training** Course 'Science, Technology and Innovation Policy for Turbulent Times' held at the **University of Sussex, Brighton, United Kingdom. (June 2019)**

- **Task force of United Nations - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)** in the area of local and indigenous knowledge.

- Worked on coordination of eight states (UP, MP, Bihar, Chhattisgarh, Jharkhand, Rajasthan, Delhi and Gujarat) as **a part of DST- Center State Coordination Secretariat in Ministry of Science and Technology, New Delhi.**

- Attended ISTIC'S (International Science, Technology and Innovation Centre for South-South Cooperation under the auspices of UNESCO) **4th Biennial International Conference on Women in Science, Technology and Innovation – "Empowering Women through Technology in Kuala Lumpur, Malaysia**

- Funding for the project "Globalization of Indian traditional medicine" from Transformative and Innovative policy consortium, **Science Policy Research Unit, University of Sussex, U.K. (meeting will be held in 4-5 November 2019, Valencia, EU)**

- Worked with **Ministry of AYUSH** for Mainstreaming the Traditional Medicine system and its policy Intervention and Globalization of Indian Traditional Medicine on policy perspective (2020- 2023)
- Selected for UP and NITI AYOOG **Aspirational District program** as UP CM fellow (2022)
- Contributed in Futuristic technologies in “**Vision 2047**”
- Contributed in making **SOP for Pooling** resources for facilitating drug research.
- Contributed in preparing **Strategy Document for NEP** and **Report on NCF** for ministerial representation.
- **Best Paper** in **International conference on Functional Biology and molecular interaction: Application in Health and Agriculture (FBMI-2017)** entitled “Pathway Engineering of Embelia Ribes: An vulnerable Medicinal Plant”.
- **Best Paper award** in **International conference of aromatic and medicinal plant, CIMAP (2010)** “On poster entitled in vitro regeneration by high frequency somatic embryos of *Papaver somniferum*”.
- **Best Paper award** in **International conference on Papaver, CIMAP (2010)** “On Poster entitled comparative transcriptome sequencing of *pap1* mutant and wild type parent under 454 sequencing platform”
- **Best paper presentation** in **International conference of efficiency and efficacy of ayurvedic formulations BHU, Varanasi (2011)**. On lecture entitled “Biosynthesis of Benzylisoquinoline alkaloids in *Papaver somniferum* L.cell cultures”.

List of Publication

- N. Singh, G Sharma, **S. Pathak**, R Trikha, A.S Dayama, M C Chaudhary (2022) Innovation Ecosystem for Research, Innovation and Entrepreneurship in India: Analysis of the role of Actors (**Policy Brief**); DST CPR, Indian Institute of Sciences, Bangalore.
- R Singh, P Dua and **S Pathak** Robust clinical trials in AYUSH systems: compelling necessity (2022); **Current science**, 0767
- **S Pathak**, R Singh, S Saraf COVID -19: An Opportunity to Revamp Pharmacovigilance System (2021); **RIS- Policy discussion paper 270** (Discussion Paper: # 270)

- **S. Pathak** and R. Singh. Digital Interventions to uplift AYUSH system (**April 2022**): **RIS, Policy Brief**, Journal of Traditional Medicine, **Vol: 1**
- **S Pathak**, AV Agarwal, VC Pandey (2020) Phytoremediation—a holistic approach for remediation of heavy metals and metalloids; **Bioremediation of Pollutants**, 3-16.
- P Agarwal, **S Pathak**, RS Kumar, YV Dhar, S Shukla, MH Asif, PK Trivedi (2020) Short-chain dehydrogenase/reductase, PsDeHase, from opium poppy: putative involvement in papaverine biosynthesis; **Plant Cell, Tissue and Organ Culture (PCTOC)** 143 (2), 431-440.
- P Agarwal, **S Pathak**, R S Kumar, YV Dhar, A Pandey, S Shukla, PK Trivedi (2019) 3'O-Methyltransferase, Ps3'OMT, from opium poppy: involvement in papaverine biosynthesis. **Plant Cell Reports** 38 (10), 1235-1248.
- **S Pathak**, AV Agarwal, P Agarwal, PK Trivedi (2019) Secondary Metabolite Pathways in Medicinal Plants: Approaches in Reconstruction and Analysis; **Molecular Approaches in Plant Biology and Environmental Challenges**, 339-364.
- Agarwal P*, **Pathak S***, Lakhwani D, Gupta P, Asif MH, Trivedi PK (2015) Comparative analysis of transcription factor gene families from *Papaver somniferum*: identification of regulatory factors involved in benzyloisoquinoline alkaloid biosynthesis. **Protoplasma**. DOI. [10.1007/s00709-015-0848-8](https://doi.org/10.1007/s00709-015-0848-8)

***Authors contributed equally.**

- Asif MH, Lakhwani D, **Pathak S**, Bhambhani S, Bag SK, Trivedi PK (2014) Genome-wide identification and expression analysis of the mitogen-activated protein kinase gene family from banana suggest involvement of specific members in different stages of fruit ripening. **Functional and Integrative Genomics**. March 2014, Volume 14, Issue 1, pp 161–175.
- M H Asif, D Lakhwani, **S Pathak**, P Gupta, S K Bag, P Nath, and Prabodh Kumar Trivedi (2014) Transcriptome analysis of ripe and unripe fruit tissue of banana identifies major metabolic networks involved in fruit ripening process. **BMC Plant biology**.14, 316
- **Pathak S**, Lakhwani D, Gupta P, Mishra BK, Shukla S, Asif MH, Trivedi PK (2013) Comparative transcriptome analysis using high papaverine mutant of *Papaver somniferum* reveals pathway and uncharacterized steps of papaverine biosynthesis. **PLoS ONE**, 8, e65622.
- Gupta P, Goel R, **Pathak S**, Srivastava A, Singh SP, Sangwan RS, Asif MH, Trivedi PK (2013) *De novo* transcriptome sequencing of *Withania somnifera* to identify genes involved in the biosynthesis of tissue-specific withanolides. **PLoS ONE**, 8, e62714.
- **Pathak S**, Mishra BK, Misra P, Misra P, Joshi VK, Shukla S, Trivedi PK (2012) High frequency somatic embryogenesis, regeneration and correlation of alkaloid biosynthesis with gene expression in *Papaver somniferum*. **Plant Growth Regulation**, 68, 17–25.
- Mishra BK, **Pathak S**, Sharma A, Trivedi PK, Shukla S (2010) Modulated gene expression in newly synthesized autotetraploid of *Papaver somniferum* L. **S A Journal of Botany**, 76, 447–452.