



Rajiv Kumar
Senior Scientist

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Education

Ph.D. (2008-2014)

Area of research : Plant molecular biology and proteomics
Thesis title : Study of dehydration-responsive phosphoproteome of nuclear fraction in chickpea (*Cicer arietinum* L.)
Supervisor : Dr. Niranjana Chakraborty
Institution : National Institute of Plant Genome Research, New Delhi, India

M.Sc. (2006-2008)

Subject : Biotechnology
Institution : School of Biotechnology, Devi Ahilya Vishwavidyalaya, Indore, India

B. Sc. (2001-2004)

Subject : Zoology (Hons.)
Institution : Pandit Ugam Pandey College, Motihari, Bihar, India

Research career:

8th Aug 2014-15th Dec 2015 : Post-Doctoral research, School of Life Sciences, Jawaharlal Nehru University, New Delhi, India
16th Dec 2015- 15th Dec 2019 : Scientist, CSIR- Institute of Himalayan Bioresource Technology, India
16th Dec 2019- Till date : Senior Scientist, CSIR-Institute of Himalayan Bioresource Technology, India

Area of research

Plant adaptation is an evolutionary process that increases survival and reproduction in newly encountered climatic conditions. Understanding the molecular mechanistic basis of adaptation to environmental stress has important implications in evolutionary ecology. The adaptation process underlies transcriptional, translational, metabolic and epigenetic control during the developmental process. Research in our lab is focusing on comprehensive mapping of transcriptome, proteome, metabolome and epigenome of medicinal plants that will be helpful for understanding the multilayered control of adaptation process.

Research Projects

1. Exploring the molecular mechanism of plant adaptation along an elevational gradient in *Picrorhiza kurroa* a high altitude medicinal plant through proteomics approach by ECR- SERB, DST: 2018-2021 (**Principal Investigator**).
2. Exploration of RBP-RNA interactions to reveal the post-transcriptional regulatory impact and development of related tools and resource server by DBT- IBSD: 2018-2021 (**CO-PI**)
3. Molecular mechanism underlying Apple scar skin viroid-whitefly interaction by CSIR-NCP: 2018-2020 (**CO-PI**).
4. Integrated Next Gen approaches in health, disease and environmental toxicity (INDEPTH) by CSIR: 2016-2017 (**Principal Investigator**)

Awards and Honor

1. Received SERB Early Career Research Award 2018
2. Awarded D.S Kothari Postdoctoral Fellowship (2014-2017)
3. Awarded DBT-RA (2014-2019)
4. Qualified for DBT-JRF (2008-2013)
5. Qualified NET-LS in 2008
6. Qualified GATE in Life Science (Percentile: 98.93%), in December 2007
7. Received DBT fellowship for two years (2006-2008) during M.Sc.
8. Qualified in JNU CEEB (2006)

Publications

Evaluating peptides of *Picrorhiza kurroa* and their inhibitory potential against ACE, DPP-IV, and oxidative stress. Shweta Thakur, Jyoti Chhimwal, Robin Joshi, Manglesh Kumari, Yogendra Padwad*, and **Rajiv Kumar***
Journal of Proteome Research, 2021

Insights from proteomics in kidney disease diagnosis and various in vitro and in vivo experimental models. Vikram Patial*, Garima Dadhich, **Rajiv Kumar***. **Animal Biotechnology for Livestock Production** Vol.2 2021 (Accepted).

Systemic acquired resistance specific proteome of *Arabidopsis thaliana*. **Rajiv Kumar**, Pragma Barua, Niranjana Chakraborty & Ashis Kumar Nandi. **Plant Cell Report**. 2020

Metabolic signatures provide novel insights to *Picrorhiza kurroa* adaptation along the altitude in Himalayan region. Manglesh Kumari, Robin Joshi & **Rajiv Kumar***. **Metabolomics**. 2020; 16:77

Elevated CO₂ and temperature influence key proteins and metabolites associated with photosynthesis, antioxidant and carbon metabolism in *Picrorhiza kurroa*. **Rajiv Kumar***, Robin Joshi, Manglesh Kumari, Reema Thakur, Dinesh Kumar*, Sanjay Kumar*. **Journal of Proteomics**. 2020; 219:103755.

Unveiling *Taenia solium* kinome profile and its potential for new therapeutic targets. Naina Arora, Anand Raj, Farhan Anjum, Rimantpreet kaur, Suraj Singh Rawat, **Rajiv Kumar**, Shweta Tripathi, Gagandeep Singh & Amit Prasad. **Expert Review of Proteomics**. 2020; 17:85-91.

Regulation of color transition in purple tea (*Camellia sinensis*). Manglesh Kumari, Shweta Thakur, Ajay Kumar, Robin Joshi, Prakash Kumar, Ravi Shankar, **Rajiv Kumar***. **Planta**. 2020; 251:35.

Neglected Agent Eminent Disease: Linking Human Helminthic Infection, Inflammation, and Malignancy. Naina Arora, Rimantpreet Kaur, Farhan Anjum, Shweta Tripathi, Amit Mishra, **Rajiv Kumar** and Amit Prasad. **Front. Cell. Infect. Microbiol**. 2019, <https://doi.org/10.3389/fcimb.2019.00402>.

Usnic acid modifies MRSA drug resistance through down-regulation of proteins involved in peptidoglycan and fatty acid biosynthesis. Sneha Sinha, Vivek Kumar Gupta, Parmanand Kumar1, **Rajiv Kumar**, Robin Joshi, Anirban Pal and Mahendra P. Darokar **FEBS Open Bio.** **2019**; 9:2025–2040.

Adaptive mechanisms of medicinal plants along altitude gradient: contribution of proteomics. **Kumar, R***. & Kumari, M. **Biologia Plantarum** **2018**; 62(4):630-640.

Nuclear phosphoproteome of developing chickpea (*Cicer arietinum* L.) and protein-Kinase interaction network. **Kumar R**, Kumar A, Subba P, Gayali S, Barua P, Chakraborty S, Chakraborty N. **J Proteomics.** **2014** 13; 105:58-73.

Comparative proteomics of dehydration response in the rice nucleus: new insights into the molecular basis of genotype-specific adaptation. Jaiswal DK, Ray D, Choudhary MK, Subba P, Kumar A, Verma J, **Kumar R**, Datta A, Chakraborty S, Chakraborty N. **Proteomics.** **2013**;13 (23-24):3478-97.

Characterization of the nuclear proteome of a dehydration-sensitive cultivar of chickpea and comparative proteomic analysis with a tolerant cultivar. Subba P, **Kumar R**, Gayali S, Shekhar S, Parveen S, Pandey A, Datta A, Chakraborty S, Chakraborty N. **Proteomics.** **2013**,12-13,1973-92.

Phosphoproteomic Dynamics of Chickpea (*Cicer arietinum* L.) Reveals Shared and Distinct Components of Dehydration Response. Subba P, Barua P, **Kumar R**, Datta A, Soni KK, Chakraborty S, Chakraborty N. **J Proteome Res.** **2013**;12(11):5025-47.

Analysis of the grass pea proteome and identification of stress-responsive proteins upon exposure to high salinity, low temperature, and abscisic acid treatment. Chattopadhyay A, Subba P, Pandey A, Bhushan D, **Kumar R**, Datta A, Chakraborty S, Chakraborty N. **Photochemistry.** **2011**,72,1293-307.

Referred Papers in Published Conference Proceedings

Metabolic signatures provide novel insights to *Picrorhiza kurroa* adaptation along the altitude in Himalayan region. Kumari M. Thakur. S, Joshi R. **Kumar R**: In Proteomic society, India held at ICAR-National Dairy Research Institute Karnal, Haryana, India on 02nd to 4th dec.2019. pp 60.

Plant responses and global significance: Elevated CO₂ and temperature effects on *Picrorhiza kurroa*. **Kumar R**, Thakur R, Joshi R, Kumar D, Kumar V. S, Kumar S: International conference of proteomics in health and disease held at school of life science, Bhubaneswar, on 30th November -2nd December 2017.

Lab Photo



Year 2016-17



Year 2018-19