

CURRICULUM VITAE

Harvesh Kumar Rana, Ph.D.
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EDUCATION

PhD in Biochemistry, Department of Biochemistry, University of Allahabad, India	August 2024
M.Sc. in Biochemistry, Department of Biochemistry, University of Allahabad, India	June 2016
B.Sc. in Chemistry, Zoology & Botany, University of Allahabad, India	June 2014

RESEARCH EXPERIENCE

Doctoral Researcher

Laboratory of Prof. A.K. Pandey, Department of Biochemistry,
University of Allahabad, Uttar Pradesh, India. April 2017 – June 2022

During my doctoral training, I investigated anti-tubercular drug-induced liver injury and its metabolic mechanisms in albino Wistar rats. A major focus of my research was evaluating morin hydrate as a metabolic antioxidant and hepatoprotective agent, particularly its role in mitigating hepatic damage. I employed mechanism-based biochemical and cellular assays along with preclinical models of hepatic injury to assess metabolic adaptation, oxidative stress, and survival outcomes, aiming to elucidate how metabolic interventions can prevent hepato-renal injury.

Post-Graduate Researcher

Laboratory of Prof. A.K. Pandey, Department of Biochemistry,
University of Allahabad, Uttar Pradesh, India. January 2015 – June 2016

“Antioxidant and hepatoprotective activity of *Callistemon lanceolatus* bark extract.”

AWARDS AND HONORS

Graduate Aptitude Test in Engineering (GATE), Indian Institute of Technology, Madras (IITM), Govt. of India	2018
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Council of Scientific & Industrial Research - National Eligibility Test,
(CSIR-NET) Govt. of India

2018

University Grant Commission-Combined Research Entrance Test
(UGC-CRET) -Fellowship, Govt. of India

2017-2021

PUBLICATIONS (Peer-Reviewed)

1. Singh, A. K., **Rana, H. K.**, Sharma, R., & Pandey, A. K. (2025). Chlorogenic acid, a dietary phenolic acid ameliorates hepatorenal injury in streptozotocin-induced diabetic rats through regulation of oxidative stress and inflammation. *Food Bioscience*, 66, 106244. <https://doi.org/10.1016/j.fbio.2025.106244>
2. **Rana, H. K.**, Singh, A. K., & Pandey, A. K. (2024). Therapeutic potential of morin hydrate against rifampicin induced hepato and renotoxicity in albino wistar rats: Modulation of organ function, oxidative stress and inflammatory response. *Indian Journal of Clinical Biochemistry*, 39(2), 197–206. <https://doi.org/10.1007/s12291-023-01145-0>
3. **Rana, H. K.**, Singh, A. K., Kumar, R., & Pandey, A. K. (2024). Antitubercular drugs: Possible role of natural products acting as antituberculosis medication in overcoming drug resistance and drug-induced hepatotoxicity. *Naunyn-Schmiedeberg's Archives of Pharmacology*, 397(3), 1251–1273. <https://doi.org/10.1007/s00210-023-02679-z>.
4. Singh, A. K., **Rana, H. K.**, Singh, V., Chand Yadav, T., Varadwaj, P., & Pandey, A. K. (2021). Evaluation of antidiabetic activity of dietary phenolic compound chlorogenic acid in streptozotocin induced diabetic rats: Molecular docking, molecular dynamics, in silico toxicity, in vitro and in vivo studies. *Computers in Biology and Medicine*, 134, 104462. <https://doi.org/10.1016/j.combiomed.2021.104462>.
5. Gupta, A., Kumar, R., Ganguly, R., Singh, A. K., **Rana, H. K.**, & Pandey, A. K. (2021). Antioxidant, anti-inflammatory and hepatoprotective activities of Terminalia bellirica and its bioactive component ellagic acid against diclofenac induced oxidative stress and hepatotoxicity. *Toxicology Reports*, 8, 44–52. <https://doi.org/10.1016/j.toxrep.2020.12.010>.
6. Singh, A. K., **Rana, H. K.**, Tshabalala, T., Kumar, R., Gupta, A., Ndhala, A. R., & Pandey, A. K. (2020). Phytochemical, nutraceutical and pharmacological attributes of a functional crop Moringa oleifera Lam: An overview. *South African Journal of Botany*, 129, 209–220. <https://doi.org/10.1016/j.sajb.2019.06.017>
7. Gupta, A., Singh, A. K., Kumar, R., Ganguly, R., **Rana, H. K.**, Pandey, P. K., Sethi, G., Bishayee, A., & Pandey, A. K. (2019). Corilagin in cancer: A critical evaluation of anticancer activities and molecular mechanisms. *Molecules*, 24(18), 3399. <https://doi.org/10.3390/molecules24183399>

8. Kumar Singh, A., Cabral, C., Kumar, R., Ganguly, R., **Kumar Rana, H.**, Gupta, A., Rosaria Lauro, M., Carbone, C., Reis, F., & Pandey, A. K. (2019). Beneficial effects of dietary polyphenols on gut microbiota and strategies to improve delivery efficiency. *Nutrients*, 11(9), 2216. <https://doi.org/10.3390/nu11092216>

Book Chapter

1. **Rana, H. K.**, Singh, A. K., Kumar, V., & Arya, S. (2025). Nanoadsorbents for removal of chemical contaminants. In A. K. Singh, Ajaya Kumar Singh, & Md. A. B. H. Susan (Eds), *Advances in Nanomaterials for Detection, Control, and Removal of Environmental Pollutants* (pp. 155–170). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-87409-3_6
2. **Rana, H. K.**, Singh, A. K., & Pandey, A. K. (2022). Antioxidants and infertility. In *Antioxidants Effects in Health* (pp. 741–754). Elsevier. <https://doi.org/10.1016/B978-0-12-819096-8.00058-6>
3. Singh, A. K., **Rana, H. K.**, & Pandey, A. K. (2022). The oxidative stress: Causes, free radicals, targets, mechanisms, affected organs, effects, indicators. In *Antioxidants Effects in Health* (pp. 33–42). Elsevier. <https://doi.org/10.1016/B978-0-12-819096-8.00012-4>
4. Abdolghaffari, A. H., Farzaei, M. H., Lashgari, N.-A., Roudsari, N. M., Haddadi, N.-S., Singh, A. K., **Rana, H. K.**, Pandey, A. K., & Momtaz, S. (2020). Dietary fiber and aging. In S. M. Nabavi, G. D'Onofrio, & S. F. Nabavi (Eds), *Nutrients and Nutraceuticals for Active & Healthy Ageing* (pp. 111–145). Springer Singapore. https://doi.org/10.1007/978-981-15-3552-9_6
5. Singh, A. K., **Rana, H. K.**, & Pandey, A. K. (2020). Analysis of chlorophylls. In *Recent Advances in Natural Products Analysis* (pp. 635–650). Elsevier. <https://doi.org/10.1016/B978-0-12-816455-6.00019-6>
6. Singh, A. K., **Rana, H. K.**, & Pandey, A. K. (2019). Fungal-derived natural product: Synthesis, function, and applications. In A. N. Yadav, S. Singh, S. Mishra, & A. Gupta (Eds), *Recent Advancement in White Biotechnology Through Fungi* (pp. 229–248). Springer International Publishing. https://doi.org/10.1007/978-3-030-14846-1_8
7. Singh, A. K., **Rana, H. K.**, Yadav, R. K., & Pandey, A. K. (2020). Dual role of microalgae: Phycoremediation coupled with biomass generation for biofuel production. In A. K. Upadhyay, R. Singh, & D. P. Singh (Eds), *Restoration of Wetland Ecosystem: A Trajectory Towards a Sustainable Environment* (pp. 161–178). Springer Singapore. https://doi.org/10.1007/978-981-13-7665-8_11

POSTER PRESENTATION

95th Annual Session and Symposium on “Healthy Brain, Mind and Cognition: From Computers to Clinics” Jointly organised by the National Academy of Sciences, India and IIT Guwahati. Presented a paper titled “Exploring morin hydrate’s role in combating Isoniazid-induced oxidative stress and inflammation in liver and kidney”. December 8-10, 2025

BioSangam 2020: An International Conference “Biotechnological Interventions for Societal Development” organised by the Department of Biotechnology, Motilal Nehru National Institute of Technology, Allahabad. February 21-23, 2020

89th Annual Session of NASI and Symposium on Science and Technology-based Entrepreneurship Development in collaboration with ICAR- NAARM, Rajendranagar, Hyderabad, India December 21-23, 2019

BioSangam: An International Conference on Innovation and Translational Dimensions: Food, Health and Environmental Biotechnology, organized by the Department of Biotechnology, Motilal Nehru National Institute of Technology Allahabad, India March 9-11, 2018

88th Annual Session of the Academy (NASI) held at Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot, Satna, MP India December 6-8, 2018

WORKSHOPS ATTENDED

Bioinformatics workshops on “Genomics, Personalized Medicine and Ethics (161018H01)” organized by Global Initiative of Academic Networks (GIAN) and Motilal Nehru National Institute of Technology Allahabad, India July 31-August 11, 2017

Bioinformatics workshops on “Modeling, Simulation, Performance Evaluation and Biological Safety for Medical Devices for Respiratory and Cardiovascular Assistance” organized by Global Initiative of Academic Networks (GIAN) and Motilal Nehru National Institute of Technology Allahabad, India March 22 – April 2, 2018

RESEARCH EXPERTISE/TRAINING OF TECHNIQUES

Animal Handling

Handling, feeding, and maintenance of mouse and rat colonies. Subcutaneous and intraperitoneal tumor implantation in BALB/c H-2d mice (Dalton's lymphoma, Ehrlich ascites carcinoma) with tumor monitoring. Therapeutic dosing via IV, IP, SC, IT, and oral routes; organ, tissue, and cell isolation; anesthesia.

Animal Behaviors

Hyperalgesia assessment in transgenic mouse (C3TA_g and HbSS/HbAA-BERK) models using mechanical, thermal, and musculoskeletal hypersensitivity measures; cognitive testing using Novel Object Recognition and Object Location Memory.

Immunology

Functional assays: cytokine bioassays, ELISA, Western blotting, immunofluorescence, oxygen and hydrogen peroxide assays, immunisation techniques for raising polyclonal antibodies in mice, immunoblotting, antigen–antibody interaction assays (precipitation and agglutination reactions), and ion-exchange chromatography for antibody purification.

Molecular Biology and Biochemistry

Isolation of DNA, RNA, and protein from cells; quantitative and qualitative analysis of biomolecules; protein estimation; PCR; gradient PCR; qPCR; molecular cloning; transformation; transfection; gene silencing by siRNA or shRNA; electrophoresis and chromatographic techniques; spectrofluorimetric methods; enzyme assays.

Bioinformatics

Molecular docking, homology modelling and RNA-Seq analysis,

TEACHING EXPERIENCE

Feroze Gandhi College, Raebareli affiliated with the
University of Lucknow, India
(Assistant Professor)

June 2022 – Pursuing

REFERENCE

Dr. Rita Rani, Ph.D.
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Department of Zoology
Feroze Gandhi College, Raebareli,
University of Lucknow, India, 229010
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Dr Abhay Kumar Pandey, PhD.
(PhD and M.Sc. Dissertation Supervisor)
Professor and Head
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Rana H.K.—Curriculum Vitae

Dr Shashank Kumar Ojha Ph.D.
(Collaborator)
Post-doc at Hebrew University of Jerusalem
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Dr. Amit Kumar Singh
(Collaborator)
Assisitant Professor and Head
Department of Botany
BMK Govt Girls College Balod
Affiliated to Durg University Chattisgarh.
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