

Rakesh Kumar Mishra

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Brief

A confident, motivated and passionate researcher with experience and special interest in exploring drug delivery systems for therapeutic applications. In my PhD research work I have successfully formulated nanostructured lipid carriers (NLCs) and nano micelles which modified the physicochemical properties of drugs like celecoxib and budesonide. These delivery systems were able to enhanced therapeutic efficacy of these model drugs significantly. Furthermore, these nanoformulations were assessed *in-vivo* using dextran sodium sulphate (DSS)-induced colitis in Swiss Albino mice models. I have performed various *in-vivo* and *in-vitro* experiments to assess the safety and pharmacology of prepared formulations. After completion of the study efficacy of administered formulations were evidenced by various biochemical parameters (estimations of cytokines and enzymes) and histological studies (H&E, AB-NR, HID-AB, Toluidine blue and immunohistochemical estimations of COX-2 and iNOS). I possess good written and verbal communication skills and commendable interpersonal skills.

Professional Competence

- Dynamic light scattering (DLS Zetasizer Nano ZSP; Model- ZEN5600)
- UV-Vis (UV-2600, Shimadzu)
- FTIR (Agilent Cary 600 series FT-IR)
- Fluorescence spectrometer (Infinite M. Plex. Tecan)
- Scanning electron microscope (JEOL, JSM IT-300)
- Cytation 5
- Software knowledge: Origin 8.5, Graph pad prism and Chemdraw
- Cell culture techniques and experimental animal handling

Areas of Interest

- Formulation and development of drug delivery systems and assess their efficacy against *in-vitro* as well as *in-vivo* models.
- Synthesis and conjugation of biocompatible materials for drug delivery applications.
- Exploring the pharmacology of inflammatory disease like ulcerative colitis and cancer mechanisms.

Educational Qualifications

Ph.D.; 2018-2022 : **Biocompatible nanocarrier-mediated drug delivery for the management of disease severity of experimental colitis**

Supervisor: Dr. Rehan Khan
Institute of Nanoscience & Technology (INST)
and Indian Institute of Science Education and
Research (IISER), Mohali, Punjab, India.

- M. Pharm.; 2013-2015** : **77.50 %** (Pharmacology), Babasaheb Bhimrao Ambedkar University, Lucknow, India
- B. Pharm.; 2009-2013** : **78.54 %** (Pharmaceutical Sciences), Uttar Pradesh Technical University, Lucknow, India

List of Publications

Research Articles

1. **Mishra RK**, Ahmad A, Kanika, Kumar A, Vyawahare A, Sakla R, Nadeem A, Siddiqui N, Raza SS, Khan R. Caffeic Acid-Conjugated Budesonide-Loaded Nanomicelle Attenuates Inflammation in Experimental Colitis. *Molecular Pharmaceutics*. 2022 Dec 6.
2. **Mishra RK**, Selim A, Gowri V, Ahmad A, Nadeem A, Siddiqui N, Raza SS, Jayamurugan G, Khan R. Thiol-Functionalized Cellulose-Grafted Copper Oxide Nanoparticles for the Therapy of Experimental Colitis in Swiss Albino Mice. *ACS Biomaterials Science & Engineering*. 2022 Apr 22;8(5):2088-95.
3. Prakash R, **Mishra RK**, Ahmad A, Khan MA, Khan R, Raza SS. Sivelestat-loaded nanostructured lipid carriers modulate oxidative and inflammatory stress in human dental pulp and mesenchymal stem cells subjected to oxygen-glucose deprivation. *Materials Science and Engineering: C*. 2021 Jan 1; 120:111700.
4. **Mishra RK**, Ahmad A, Kumar A, Vyawahare A, Raza SS, Khan R. Lipid-based nanocarrier-mediated targeted delivery of celecoxib attenuate severity of ulcerative colitis. *Materials Science and Engineering: C*. 2020 Nov 1; 116:111103.
5. **Mishra RK**, Kumar A, Ali Aneesh, Kanika, Raza SS, Khan R. Cortisone loaded stearyl ascorbic acid based nanostructured lipid carrier alleviate inflammatory changes in DSS induced colitis. (**Manuscript under review**)
6. **Mishra RK**, Sammi SR, Rawat JK, Roy S, Singh M, Gautam S, Yadav RK, Devi U, Ansari MN, Saeedan AS, Saraf SA. Palonosetron attenuates 1, 2-dimethyl hydrazine induced preneoplastic colon damage through downregulating acetylcholinesterase expression and up-regulating synaptic acetylcholine concentration. *RSC advances*. 2016;6(46):40527-38.

7. Khan MM, Khanam N, Uddin M, **Mishra RK**, Khan R. Nanotized kinetin enhances essential oil yield and active constituents of mint via improvement in physiological attributes. *Chemosphere*. 2022 Feb 1; 288:132447.
8. Dar AH, Gowri V, **Mishra RK**, Khan R, Jayamurugan G. Nanotechnology-Assisted, Single-Chromophore-Based White-Light-Emitting Organic Materials with Bioimaging Properties. *Langmuir*. 2021 Dec 29;38(1):430-8.
9. Ahmad A, Ansari MM, **Mishra RK**, Kumar A, Vyawahare A, Verma RK, Raza SS, Khan R. Enteric-coated gelatin nanoparticles mediated oral delivery of 5-aminosalicylic acid alleviates severity of DSS-induced ulcerative colitis. *Materials Science and Engineering: C*. 2021 Feb 1; 119:111582.
10. Ahmad A, Ansari MM, Kumar A, Vyawahare A, **Mishra RK**, Jayamurugan G, Raza SS, Khan R. Comparative acute intravenous toxicity study of triple polymer-layered magnetic nanoparticles with bare magnetic nanoparticles in Swiss albino mice. *Nanotoxicology*. 2020 Nov 25;14(10):1362-80.
11. Ansari MM, Ahmad A, **Mishra RK**, Raza SS, Khan R. Zinc gluconate-loaded chitosan nanoparticles reduce severity of collagen-induced arthritis in Wistar rats. *ACS Biomaterials Science & Engineering*. 2019 May 27;5(7):3380-97.
12. Sinha P, Srivastava N, Rai VK, **Mishra RK**, Ajaya kumar PV, Yadav NP. A novel approach for dermal controlled release of salicylic acid for improved anti-inflammatory action: Combination of hydrophilic-lipophilic balance and response surface methodology. *Journal of Drug Delivery Science and Technology*. 2019 Aug 1; 52:870-84.
13. Ahmad A, Fauzia E, Kumar M, Mishra RK, Kumar A, Khan MA, Raza SS, Khan R. Gelatin-coated polycaprolactone nanoparticle-mediated naringenin delivery rescue human mesenchymal stem cells from oxygen glucose deprivation-induced inflammatory stress. *ACS Biomaterials Science & Engineering*. 2018 Dec 7;5(2):683-95.

Review Articles

1. **Mishra RK**, Ahmad A, Vyawahare A, Alam P, Khan TH, Khan R. Biological effects of formation of protein corona onto nanoparticles. *International Journal of Biological Macromolecules*. 2021 Apr 1; 175:1-8.
2. **Mishra RK**, Ahmad A, Vyawahare A, Kumar A, Khan R. Understanding the monoclonal antibody involvement in targeting the activation of tumor suppressor genes. *Current Topics in Medicinal Chemistry*. 2020 Aug 1;20(20):1810-23.
3. Ahmad A, **Mishra RK**, Vyawahare A, Kumar A, Rehman MU, Qamar W, Khan AQ, Khan R. Thymoquinone (2-Isopropyl-5-methyl-1, 4-benzoquinone) as a chemopreventive/anticancer agent: Chemistry and biological effects. *Saudi Pharmaceutical Journal*. 2019 Dec 1;27(8):1113-26.

4. Ahmad A, Khan F, **Mishra RK**, Khan R. Precision cancer nanotherapy: evolving role of multifunctional nanoparticles for cancer active targeting. *Journal of medicinal chemistry*. 2019 Jul 24;62(23):10475-96.

Book Chapters

1. Ahmad A, Imran M, Kumar A, **Mishra RK**, Vyawahare A, Khan AQ, Raza SS, Khan R. Black seeds of *Nigella sativa*: A remedy for advanced cancer therapeutics with special reference to nanotechnology. In *Black Seeds (Nigella Sativa) 2022* Jan 1 (pp. 253-294). Elsevier.

2. Ali A, Yangchan J, Ahmad A, Kumar A, **Mishra RK**, Vyawahare A, Akhter R, Ashraf GM, Shakil S, Khan R. A Mechanistic Perspective on Chemopreventive and Therapeutic Potential of Phytochemicals in Honey. In *Therapeutic Applications of Honey and its Phytochemicals 2020* (pp. 113-140). Springer, Singapore.

3. Rehman MU, Ahmad SB, Shah A, Kashani B, Ahmad A, **Mishra RK**, Khan R, Rashid SM, Ali R, Rasool S. An overview of the pharmacological properties and potential applications of lavender and cumin. *The Global Floriculture Industry*. 2020 Nov 17:83-115.

Achievements

- Qualified GPAT 2014 (**AIR 158**) and GPAT 2016.
- Overall topper of B. Pharm (batch 2013) from Saroj Institute of Technology & Management, Lucknow.
- Registered Pharmacist (Uttar Pradesh, Pharmacy Council of India)

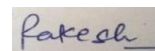
Conferences

- Presented a poster in annual meeting of chemical biology unit "Lipid based nanoformulation for the management of colitis" 24th – 25th September, 2021 at Institute of Nano Science and Technology, Mohali
- Attended two days symposium on "Recent Exciting Developments in MAPs" 22nd – 23rd February, 2017 at CSIR- Central Institute of Medicinal and Aromatic Plants, Lucknow
- Attended two days symposium on "Translating MAPs Research for Mankind" 28th – 29th November, 2015 at CSIR- Central Institute of Medicinal and Aromatic Plants, Lucknow
- Attended a National Conference on "Novel Tools and Treatment Approaches in Health Care System" 3rd March, 2015 at faculty of pharmacy, Integral University, Lucknow
- Presented a poster in International Pharmaceutical Conference- 2015 on "Nanoformulation and Translational Research: Small Getting Bigger" 2-3rd February, 2015 at Babasaheb Bhimrao Ambedkar University, Lucknow
- Attended a National Conference on "Lead Development and Drug Designing: Emerging Opportunities" 26th September, 2014 at United Institute of Pharmacy, Allahabad

- Attended National Seminar on "Emerging Trends in Pharmaceutical Research and All India Pharma Student`s Conclave" 16-17th March, 2013 at Indian Institute of Technology, Banaras Hindu University, Varanasi
- Presented a Poster in National Seminar on "Digital Health Management" 14th March, 2013 at Azad Institute of Pharmacy, Lucknow
- Presented a Poster in International Conference on "Targeting of Bioactive Concepts and Application" 10th February, 2013 at Advance Institute of Pharmacy, Kanpur

Declaration

I hereby declare that the above information is true to the best of my Knowledge.



Rakesh Kumar Mishra