

**Dr. Ruby Bansal, PhD****DOB:** 2<sup>nd</sup> June 1986**Email:** [rubybansal02@gmail.com](mailto:rubbybansal02@gmail.com)**Mob:** +91 9953293299**Career Objective**

Looking for a competitive and innovative organization where I can contribute to realize higher goals with the skills and knowledge I have, while also learning new things to enhance my own abilities.

**Academic Qualifications**

**Ph.D in Bioscience** from CSIR-Institute of Genomics and Integrative Biology/ AcSIR **2015**

Thesis Title: “Designing and Development of Polymeric Vectors for Biomedical Application”

This work was carried out with the Supervision of Dr. Pradeep Kumar & Dr. Kailash C Gupta

We have synthesized the polymer based effective nucleic acid delivery system with a potential to carry the gene at the target site with the maximum cell viability and transfection efficiency. Further, we have also evaluated their efficacy *in vitro* in various cell lines as well as *in vivo*.

**M.Sc., Organic Chemistry** from University of Delhi / Ramjas College, with **66.4%** **2007-09**

**B.Sc., Chemistry (Hons.)** from University of Delhi / Rajdhani College, with **69.0%** **2004-07**

**Professional Experience**

- **Research Associate** at Translational Health Science & Technology Institute April **2022-Present**  
To setup the in-vitro and in vivo model of non-alcoholic fatty liver disease (NAFLD) and test the small modulators and Ayush herbal extracts for their efficacy to mitigate the hallmark of disease.
- **Research Associate** at National Assessment & Accreditation Council **2021**  
Working in Department of Science & Technology supported National project, GATI. Worked on framework development for advancing Gender Equity in Science & Technology in Higher Education Institutions. Development of Survey instruments, Data Analysis and Preparation of Reports.
- A year of experience as **Product Researcher** in International Market Support Group- Mettler Toledo India Private limited, Mumbai **2019-20**  
Worked with various liquid handling product by running lab experiments to create unique profile. Learning of enduser's applications & workflows thereby suggesting solutions to improve manufacturing and advancement of products.
- **Three years** of research experience as **Postdoctoral Fellow** in Dept. of Chemical Engineering, Indian Institute of Technology Delhi **2016-19**  
Thermodynamic study of aggregated protein with metal ions using Isothermal Titration Calorimeter. Protein-protein interaction study was also studied using Quartz Crystal Microbalance. In addition, modification of silica surface to inhibit non-specific adsorption of proteins have been carried out.
- **10 months** as **Postdoctoral Fellow** in Centre for Biomedical Engineering, Indian Institute of Technology Delhi **2015-16**  
Worked on synthesis of biocompatible polymer containing disulfide linkages for paclitaxel delivery.
- **Research Associate** in CSIR-Institute of Genomics and Integrative Biology **2009-12**

**Instrumental and Characterization Techniques**

Hands on experience with characterization techniques like DLS, Zetasizer, Analytical HPLC, Gas Chromatography, DSC, TGA, IR as well as UV-Vis spectroscopy, Fluorescence Spectrometer, Isothermal titration calorimeter, Goniometer, Karl Fischer, Quartz Crystal Microbalance, Confocal

microscope, Lyophilizer, & Atomic Adsorption spectroscopy.

Purification/separation techniques: Preparative HPLC, Size exclusive gel-filtration Chromatography, Ion-exchange and Affinity Chromatography as well as Thin Layer Chromatography

Also worked extensively with Agarose-gel & SDS-PAGE Electrophoresis, Fluorescence activated cell sorting as well as proficient in handling cultures like Mammalian & Bacterial Cell Culture and FACS.

**Analyzing knowledge** for NMR, Mass Spectra, Circular Dichroism, TEM, AFM, SEM and XRD

## Organic Synthesis & Pharmacological Expertise

- Working experience of running experiments with microbial culture in ISO Grade 8 laboratories.
- Carried out multi-step synthesis of different organic compounds at lab scale.
- Worked on *in vivo* model for toxicity and gene expression studies
- Very much familiar with of various techniques required to work in an organic research laboratory
- Cell culture experiments and animal Handling along with Sacrificing and dissection of animals
- Route of administration (intra-peritoneal, intravenous & subcutaneous) of drug in mice
- RNA isolation from mice tissues
- Quantified protein expression using luciferase activity assays
- Experiments on cells i.e., ELISA, MTT, Internalization study, SDS-PAGE, Transfection etc

## Key Courses

Oxidation and reduction of functional groups, Common reagents (organic, inorganic and organometallic) in organic synthesis, Chemistry of natural products, Medicinal Chemistry, Selective organic transformations, Characterization of organic compounds by IR, UV, MS, and NMR.

## Soft Skills

Worked with various softwares used in liquid handling instruments such as Calibry, Lab X and EasyDirect Pipette Asset Management.

Sound knowledge of Chemdraw Ultra, MathType, MATLAB, Origin 9.1 and X'pert highscore.

Extensively worked with MS Office and comfortable with other similar packages like LiberOffice etc. Platform: Linux, Windows, macOS.

## Other Skills

Proficiency in English as well as Hindi communication and comprehension

Ability to work independently as well as ready to take crucial task in team collaborations

Quick learner with teaching aptitude.

## AWARDS & ACHIEVEMENTS

- National Post-Doctoral Fellowship, sponsored by Dept. of Science and Technology (2016)
- Awarded with CSIR Travel grant to present my research work at 29<sup>th</sup> Southern Biomedical Engineering Conference, Miami – Florida (2013)
- Best presentation award, at Nanocon Pune, 2014
- Senior Research Fellowship from CSIR for the period of 2012-2014
- Consistent and outstanding academic records with first class throughout my education

## References

**Prof. Sudip Kumar Pattanayek**

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**Dr. Pradeep Kumar**

Institute of Genomics and Integrative Biology

Mobile No.: 8527764994

Email Address: [pkumar@igib.in](mailto:pkumar@igib.in)**Dr. Kailash C. Gupta**

Institute of Genomics and Integrative Biology

Mobile No.: 9628106106

Email: [kcgupta9@gmail.com](mailto:kcgupta9@gmail.com)**CONFERENCES & WORKSHOPS**

1. Participated in Faculty training program on “*Pedagogical training for effective online teaching and learning*” organised by Deen Dayal Upadhyaya college (University of Delhi) and KTHM college, Nashik under Internal quality assurance cell & DBT star college program from 3-10 August, 2020.
2. Attended *International E-workshop on Principles and Applications of Analytical instruments for analysis of Organic/Inorganic molecules* from 25-29 August, 2020 organized by Department of Chemistry & Department of Botany, Govt. R.R.M.P.G. College, Surajpur and Department of Chemistry, Govt. Shivnath Sciences College, Rajnandgaon (C.G.), India.
3. Presented paper in “Bioprocessing India 2017” at IIT Guwahati, 9-11 December, 2017.
4. Paper presentation at *International Conference on Advances in Polymer Science and Technology* held at Radisson Blue, organized by IIT Delhi, 23-25 November, 2017.
5. Presented paper in “Industry Day 2017” Symposia at IIT Delhi, September 23, 2017.
6. Participated in “International Conference on Biomaterials, Biodiagnostics, Tissue Engineering, Drug Delivery and Regenerative Medicine” in IIT Delhi, April 15-17, 2016.
7. Oral presentation at *5th International Conference on Stem Cells & Cancer (ICSCC-2014): Proliferation, Differentiation, & Apoptosis* organized at JNU Convention Centre, New Delhi, 8-10 November, 2014.
8. Delivered an oral presentation at 3<sup>rd</sup> International Conference on Nanotechnology-Smart Materials Composites, Applications and New Inventions (NANOCON 014), Pune, India, 14-15 October, 2014.
9. Participated in *1<sup>st</sup> International Conference on Emerging Trends of Nanotechnology in Drug Discovery* during 26-27 May, 2014 at Department of Biochemistry, Delhi University South Campus.
10. Oral presentation “29<sup>th</sup> Southern Biomedical Engineering Conference” (SBEC), Miami, Florida, 3-5 May 2013.
11. Participated in one day workshop on *Laboratory Animal welfare and alternatives models*, organized by CSIR-Institute of Genomics and Integrative Biology, July 6, 2012.
12. Participated in International symposium on the safe use of nanomaterials and workshop on *Nanomaterial Safety: Status, Procedures, policy and Ethical Concerns* (SUN-2011) organized by, Indian Institute of Toxicology Research at Lucknow India, February 1-3, 2011.
13. Attended DU-NERI (AU) Workshop on Atmospheric Science and Climate Change, organized by Department of Chemistry, University of Delhi, (27<sup>th</sup>-28<sup>th</sup> Feb, 2009).

**Journal Publications**

1. **Ruby Bansal**, Sudip K Pattanayek, Rohit Bansal, Anurag S Rathore, “A correlation of thermodynamic parameters with size of copper-chelated albumin aggregates”, *Colloid and Polymer Science*, 299, (2021), 1945-1953.
2. Rajender Jena, Dushyant K Garg, Mohan Murali V Achary, Jasdeep Singh, Rachana Tomar, Lipsa Choudhury, **Ruby Bansal**, Bishwajit Kundu, “Application of a protein domain as chaperone for enhancing biological activity and stability of other proteins”, *Journal of Biotechnology*, Vol. 310 (2020), 68-79.
3. **Ruby Bansal**, Brashket Seth, Shashikant Tiwari, Sadaf Jahan, Manisha Kumari, Aditya Bhushan Pant, Rajnish Kumar Chaturvedi, Pradeep Kumar, Kailash Chand Gupta, "Hexadecylated linear PEI

self-assembled nanostructures as efficient vector for neuronal gene delivery", *Drug Delivery And Translational Research*, Vol. 8(5) (2018), 1436-1449

4. **Ruby Bansal**, Rajiv Pathak, Bipul Kumar, Hemant K Gautam, Pradeep Kumar, "Enhanced antimicrobial activity of amphiphilic cationic polymers against a broad range of bacterial strains and skin microbes", *Colloid and Polymer Science*, Vol. 295(7) (2017), 1177-1185
5. **Ruby Bansal**, Pradeep Kumar, "Engineered polymeric amphiphiles self-assembling into nanostructures and acting as efficient gene and drug carriers", *Journal of Biomaterials Applications*, Vol. 32(1) (2017), 40-53.
6. **Ruby Bansal**, Pallavi Kiran, Pradeep Kumar, "Synthesis, characterization and evaluation of diglycidyl-1,2-cyclohexanedicarboxylate cross-linked polyethylenimine nanoparticles as efficient carriers of DNA", *New Journal of Chemistry*, Vol 40(6) (2016), 5044-5052.
7. Soma Patnaik, Priyanka Bhatnagar, **Ruby Bansal**, Joyita Sarkar, Ashok Kumar, Pradeep Kumar, Kailash C. Gupta, " Modified Polysaccharides as Carriers for Biomolecules", *Pharmaceutical Nanotechnology*, Vol. 3(4) (2015), 261-287.
8. **Ruby Bansal**, K C Gupta, P. Kumar, " Biodegradable and versatile polyethylenimine derivatives efficiently transfer DNA and siRNA into mammalian cells", *Colloids and Surfaces, B: Biointerfaces*, Vol 135 (2015), 661–668.
9. **Ruby Bansal**, Shweta Tayal, K. C. Gupta, P. Kumar, "Bioreducible polyethylenimine nanoparticles for the efficient delivery of nucleic acids", *Organic and Biomolecular Chemistry*, Vol .13(10)(2015), 3128-3135.
10. R. Goyal, **Ruby Bansal**, R.P. Gandhi, K.C. Gupta, "Copolymers of Covalently Crosslinked Linear and Branched Polyethylenimines as Efficient Nucleic Acid Carriers", *Journal of Biomedical Nanotechnology*, Vol 10(11) (2014), 3269-3279.
11. **Ruby Bansal**, A. K. Singh, R. P. Gandhi, A. B. Pant, P. Kumar, K. C. Gupta, " Galactomannan-PEI based non-viral vectors for targeted delivery of plasmid to macrophages and hepatocytes", *European Journal of Pharmaceutics and Biopharmaceutics*, Vol 87(3) (2014), 461-71.
12. **Ruby Bansal**, M. Singh, K.C. Gupta, P. Kumar, "Oligoamine-tethered low generation polyamidoamine dendrimers as potential nucleic acid carriers", *Biomaterial Science*, Vol 2(9) (2014), 1275-1286.
13. **Ruby Bansal**, Rajiv Pathak, Diksha Jha, Pradeep Kumar, Hemant K. Gautam, "Enhanced Antimicrobial Activity of Amine-Phosphonium (N-P) Hybrid Polymers Against Gram-Negative and Gram-Positive Bacteria", *International Journal of Polymeric Materials and Polymeric Biomaterial*, Vol 64(2) (2014) 84-89.
14. **Ruby Bansal**, S.K. Tripathi, K.C. Gupta, P. Kumar, "Lipophilic and cationic triphenylphosphonium grafted linear polyethylenimine polymers for efficient gene delivery to mammalian cells", *Journal of Material Chemistry*, Vol 22(48) (2012), 25427-25436.
15. R Goyal, **Ruby Bansal**, S Tyagi, Y Shukla, P Kumar, K C Gupta, " 1,4-Butanediol diglycidyl ether (BDE)-crosslinked PEI-*g*-imidazole nanoparticles as nucleic acid-carriers *in vitro* and *in vivo* ", *Molecular Biosystems*, Vol 7(6) (2011) 2055-65.
16. **Ruby Bansal**, S K Tripathi, KC Gupta and P Kumar, "N-Butyltriphenylphosphonium bromide –linear PEI polymers mediated efficient gene transfection", *IEEE Explore* Vol 10 (2013), 45-46.