



## RAM LAL ANAND COLLEGE (University of Delhi)

Benito Juarez Road, New Delhi-110021

### Faculty Details



Name and Designation	<b>RAKESH KUMAR GUPTA PRINCIPAL- PROFESSOR</b>	Photograph
Address	<b>Ram Lal Anand College (University of Delhi) 5, Benito Juarez Road, New Delhi - 110021 <a href="https://rlacollege.edu.in">https://rlacollege.edu.in</a></b>	
Phone No Office Mobile	<b>011-24112557</b>	
Email	<b>Rgupta1965@yahoo.com</b>	
<b>Educational Qualifications</b>		
Degree	Institution	Year
<b>Post Doctorate Research Fellow</b>	<b>Center for Environmental Biotechnology and Department of Microbiology, University of Tennessee, Knoxville, TN, USA</b>	<b>1999-2002</b>
<b>Ph.D Microbiology</b>	<b>NATIONAL DAIRY RESEARCH INSTITUTE (ICAR), KARNAL, HARYANA</b>	<b>1991</b>
<b>M.Sc Microbiology</b>	<b>NATIONAL DAIRY RESEARCH INSTITUTE (ICAR), KARNAL, HARYANA</b>	<b>1987</b>
<b>Career Profile</b>		
<ul style="list-style-type: none"><li>• Lecturer – 1991-2000: Department of Microbiology, Ram Lal Anand College, University of Delhi</li><li>• Reader – 2000-2006: Department of Microbiology, Ram Lal Anand College, University of Delhi</li><li>• Associate Professor – 2006-2016: Department of Microbiology, Ram Lal Anand College, University of Delhi</li><li>• PRINCIPAL (Officiating) – 01.12.2016 to 18.03.2018 : RAM LAL ANAND COLLEGE, UNIVERSITY OF DELHI</li><li>• <b>Principal-Professor – Since 19.03.2018: RAM LAL ANAND COLLEGE, UNIVERSITY OF DELHI</b></li></ul>		
<b>Administrative Assignments (Recent)</b>		
<ul style="list-style-type: none"><li>• Member, Academic Committee, IMTech-CSIR, Chandigarh</li><li>• Academic Council Member – 2019-2021, University of Delhi</li><li>• Member Standing Committee on Academic Matters of Academic Council, University of Delhi 2021.</li><li>• UGC Member of Curriculum Development Committee for B.Sc (H) Microbiology syllabus under CBCS: 2014-15</li></ul>		
<b>Areas of Interest / Specialization</b>		
Molecular Biology and Recombinant DNA Technology Applied Microbiology, Environmental Metagenomics		
<b>Research Projects:</b> 10 with funding of 2.6 Crores from DST, ICMR, DBT, DU and ICSSR; 09 projects completed; 01 projects ongoing)		

**Ongoing:**

- Sustainable livelihood enhancement of SC communities in Chainpura Tehsil of Niwai, Rajasthan: PI - Dr Prerna Diwan, **Co-PIs: Prof R K Gupta**, Prof Sanjay Kumar, Dr Nidhi Yadav, Mr Siddharth Gupta, INR 69,75,678/-, Two Years, Funded by Department of Science and Technology (DST), Govt of India.

**Completed:**

- Assessment and Monitoring of Depth of Anesthesia using Explainable AI (Principal Investigator: Dr. Neeraj Kumar Sharma **Co - Investigators: Prof. R K Gupta**, Prof. Sanjeev Sharma), INR 18.50 Lacs, 1.5 Years (2022-2024). Funded by ICMR, Government of India.
- Resistome metagenomic profiling of bioaerosols in metro network in Delhi- NCR, (**Principal Investigator: Prof R K Gupta**, Co-investigators: Dr Sunila, Dr Prerna Diwan), INR 56 Lacs, 3 years (2021-2024). Funded by ICMR, Government of India.
- Targeting biofilm formation by inhibiting Cysteine biosynthesis pathway enzymes in ESKAPE pathogens with natural products (**Principal Investigator: Prof. R K Gupta**, Co-investigators: Dr Vibha Gupta, Dr Prerna Diwan), INR 45 Lacs, 3 years (2021-2024). Funded by ICMR, Government of India.
- Alterations in oral microbiome of Betel nut chewing population of North Eastern India and its Correlation with Oral Cancers: Prospecting Microbial Consortium for Therapeutic Effect (Principal Investigator: Dr Prerna Diwan; **Co-investigators: Prof R K Gupta**, Dr James Wahlang, INR 36 Lacs, 3 years (2019-2022). Funded by ICMR, Government of India.
- Communicating the science behind the phenomenon of antibiotic resistance to promote social awareness (Principal Investigator: Dr Prerna Diwan; **Co-investigators: Dr R K Gupta**), INR 5 Lacs, 2 years (2019-2021), IMPRESS- ICSSR, Government of India.
- Betel Nut Chewing Induced Genotoxic Changes–Evaluation and Awareness Study in Young Population of North Eastern State of India (Principal Investigator: Dr Prerna Diwan; **Co-investigator: Dr R K Gupta**), INR 8.00 Lacs, one Year (2018-19). Funded by Department of Biotechnology, Government of India.
- Delhi University Innovation project for Colleges entitled “Dissemination of Antibiotic Resistance among Airborne Bacteria and its Public Health Implications” for the year 2015-16. INR 6 Lacs.
- Delhi University Innovation project for Colleges entitled “Potable water in Delhi and NCR – Assessment of quality, resources and remediation” for the year 2013-15. INR 5 Lacs.
- Delhi University Innovation project for Colleges entitled “Delineation of Groundwater Potential and Potable Quality in and around South Campus (University of Delhi) Ridge Area” for the year 2012-2013 in association with Geology Department. INR 10 Lacs.

**International Patents:** 2 (US Patents Granted) + 3 (International Patent Publications)

**US Patents Granted: Two**

1) Lux Expression in Eukaryotic cell. US Patent Number - 7300792, Date of Issue – 11/27/2007: Gupta Rakesh K, Patterson Stacey S, Saylor Gary S, Ripp Steven.

2) Destabilized Bioluminescent Proteins. US Patent Number – 7250284, Date of Issue – 07/31/2007 Allen

Michael S, Rakesh Gupta, Gary Saylor

### US Patent Publication: One

Compositions and methods for detecting estrogenic agents in a sample. US Patent Application 20060008837, Date of Publication – 12/07/2006, Sanseverino John, Layton Alice, Gupta Rakesh, Saylor Gary, Ripp Steven, Patterson Stacey

### International Patent Publications: Two

1) Novel Plant Glycine and Histidine-Rich Metal-Binding protein family and uses thereof. Pub Number – WO/2005/021577, Date of publication – 10/03/2005, Mullin Beth C, Gupta Rakesh Kumar, Dobrista Svetlana V.

2) Modified Luciferase Nucleic Acids and Methods of Use, Pub Number – WO/2004/042010, Date of Publication – 21/05/2004, Patterson Stacey, Gupta Rakesh, Saylor Gary, Dionisi Hebe.

### Indian Patent Applied: 1

A Method for Extracting Metagenomic DNA from Bioaerosols, Application Number – 202411010372, Date 11/12/2024, Shashi Prabha Kumari, Mansi Podia, Sunila Hooda, Prerna Diwan and Rakesh Kumar Gupta.

**Publications:** Research Publications: >50; Book/e- chapters - 08; H-Index - 14; Citations – 937; Total Impact Factor (TR) – >90.0 as on January 2025.

### Research Publications:

- Kumari, S. P., Podia, M., Hooda, S., Diwan, P., & **Gupta, R. K.** (2024). An efficient method for isolating bacterial DNA from bioaerosols for metagenomics. *Aerosol Science and Technology*, 1–13. <https://doi.org/10.1080/02786826.2024.2410037>. Impact Factor – 2.8
- Swagata Karmakar, Paromita Mukherjee, Vandana Mishra, **Rakesh Kumar Gupta**, Rohit Kumar, Pankaj Srivastava, Radhey Shyam Sharma (2024). Microhabitat influences on phage-bacteria dynamics in an abandoned mine for ecorestoration, *Journal of Environmental Management*, 370, 122659. Impact Factor – 8.0. <https://doi.org/10.1016/j.jenvman.2024.122659>.
- Prerna Yadav, Shashi Prabha Kumari, Sunila Hooda, **Rakesh Kumar Gupta**, Prerna Diwan (2024). Comparative assessment of microbiome and resistome of influent and effluent of sewage treatment plant and common effluent treatment plant located in Delhi, India using shotgun approach. *Journal of Environmental Management*, 369, 122342. Impact Factor – 8.0. <https://doi.org/10.1016/j.jenvman.2024.122342>.
- Neeraj Kumar Sharma, Shakeena Shahid, Subodh Kumar, Sanjeev Sharma, Naveen Kumar, Tanya Gupta, **Rakesh Kumar Gupta** (2024). "XAI-VSDoA: An Explainable AI-Based Scheme Using Vital Signs to Assess Depth of Anesthesia," *IEEE Access*, 12, 119185-119206. Impact Factor – 3.557. <https://doi.org/10.1109/ACCESS.2024.3449704>.
- Mody Deepansh, Joshi Priyanka, Antil Monika, **Gupta K. Rakesh**, Gupta Vibha (2024). Insights into Kinases of ESKAPE Pathogens for Therapeutic Interventions. *Cardiovascular & Hematological Agents in Medicinal Chemistry*; 22 (3): e230124225995. Scopus Listed. <https://doi.org/10.2174/0118715257267497231128093529>
- Neeraj Kumar Sharma, Sakeena Shahid, Subodh Kumar, Sanjeev Sharma, **Rakesh Kumar**

**Gupta**, and Naveen Kumar. (2024). Predicting Depth of Anesthesia using EEG Signals and Deep Convolution Network. In Proceedings of the Third International Conference on AI-ML Systems (AIMLSystems '23). Association for Computing Machinery (ACM), New York, NY, USA, Article 7, 1–8. <https://doi.org/10.1145/3639856.3639863>

- Mohan, Lalit,; Anand, Shaubhik,; Mittal, Muskan,; Goyal, Keshav,; Akanksha,; Dixit, Aman,; **Gupta, Rakesh**,; Jain, Rita,; Diwan, Perna (2023). Cross-sectional study: knowledge assessment of youth regarding the global public health threat of antibiotic resistance. *Journal of Public Health*. 1-10. <https://doi.org/10.1007/s10389-023-02179-7>. **Impact Factor: 1.8**
- Diwan, P.; Nirwan, M.; Bahuguna, M.; Kumari, S.P.; Wahlang, J.; **Gupta, R.K.** (2023). Evaluating Alterations of the Oral Microbiome and Its Link to Oral Cancer among Betel Quid Chewers: Prospecting Reversal through Probiotic Intervention. *Pathogens*, 12, 996. **Impact Factor: 3.7**. <https://doi.org/10.3390/pathogens12080996>.
- Bahuguna M, Hooda S, Mohan L, **Gupta RK**, Diwan P (2023). Identifying oral microbiome alterations in adult betel quid chewing population of Delhi, India. *PLoS ONE* 18(1): e0278221. <https://doi.org/10.1371/journal.pone.0278221>. **Impact Factor: 3.752**
- Kundu, A., Antil, M., Rana, S., Diwan, P., **Gupta, R.K.**, & Gupta, V (2022). Surveillance of two Noida drains for assessing the presence of carbapenem-resistant ESKAPE bacteria. *International Journal of Health Sciences*, 1658-7774 <https://doi.org/10.53730/ijhs.v6nS1.8615>.
- Dwivedi V, **Gupta RK**, Gupta A, Chaudhary VK, Gupta S, Gupta V. (2022). Repurposing Novel Antagonists to p7 Viroprotein of HCV Using *in silico* Approach. *Letters in drug design and discovery*; 19. <https://dx.doi.org/10.2174/1570180819666220124112150>. **Impact Factor: 1.15**.
- Snigdha, S., Bajwa, T., Anand, S., Mohan L., Goyal, K., Mittal, M., Gupta, K.R., Wahlang, J. **Gupta, R. K.** and Diwan, P. (2021). A Cross-sectional Study on Prevalence of Betel nut Chewing Among the Youth of Meghalaya, North East Region of India: Development of Multifaceted Prevention Strategy: Prevalence of Betel Nut Chewing Among the Youth of Meghalaya” *Asian Pacific Journal of Health Sciences*, 8(3), 185-190. ISSN 2350-0964; E-ISSN 2349-0659 (UGC care listed).
- Deval H, Katoch K, Chauhan DS, Tyagi AK, **Gupta RK**, Kamal R, Kumar A, Yadav VS, Katoch VM and T. Hussain (2016), TlyA protein of *Mycobacterium leprae*: a probable bio-marker of active infection, *Leprosy Review*, Vol. 87 (4). **Impact Factor: 0.537**.
- Kaur J., Kaur S., Dashora V., Chaudhary Y., Nijhawan P., Saini S., Dabas M., Sharma K., Aggarwal R., Gupta V., Singh R., Pande P., Sharma SK., John S., **Gupta RK**. (2015) Microbiological and Physico-Chemical Quality of Groundwater at a Resettlement Colony, Madanpur Khadar in Delhi, India. *DU Journal of Undergraduate Research and Innovation*: 1 (3), 26-38.
- Puri RV, Singh N, **Gupta RK**, Tyagi AK (2013) Endonuclease IV Is the Major Apurinic/Apyrimidinic Endonuclease in *Mycobacterium tuberculosis* and Is Important for Protection against Oxidative Damage. *PLoS ONE* 8(8): e71535. **Impact Factor: 3.752**
- Khare G., Gupta V., Nangpal P., **Gupta R.K.**, Sauter N.K. and Tyagi A.K. (2011). Ferritin Structure from *Mycobacterium tuberculosis*: Comparative Study with Homologues identifies Extended C-terminus involved in Ferroxidase Activity. *PLoS One*, 4(6):e18570. **Impact Factor: 3.752**
- Gupta V<sup>#</sup>, **Gupta R.K<sup>#</sup>**, Khare G., Salunke D.M., Suroliya, A., Tyagi, A.K. (2010) Structural ordering of disorderd ligand binding loops of biotin protein ligase into active confirmation as a consequence of dehydration. *PLoS One*, 5(2): e9222. # These authors contributed equally to this work. **Impact Factor: 3.752**
- Khare G., Gupta V., **Gupta R.K.**, Gupta R, Bhat R., Tyagi, A.K. (2009) Dissecting the Role of Critical Residues and Substrate Preference of a Fatty Acyl-CoA Synthetase (FadD13) of *Mycobacterium tuberculosis*. *PLoS One*, 4(12): e8387. **Impact Factor: 3.752**
- Gupta V., **Gupta R.K.**, Khare G., Salunke D.M. and Tyagi A.K. (2009). Crystal Structure of Bfr A from *Mycobacterium tuberculosis*: Incorporation of Selenomethionine Results in Cleavage and Demetallation of Haem. *PLoS ONE* 4(11): e8028. **Impact Factor: 3.752**

- Gupta V., **Gupta R.K.**, Khare G., Surolia A., Salunke D.M. and Tyagi A.K. (2008). Crystallization and preliminary X-ray crystallographic analysis of biotin acetyl CoA (BirA) from *Mycobacterium tuberculosis*. **Acta Crystallogr Sect F Struct Biol Cryst Commun**. 2008 Jun 1; 64 (Pt 6): 524-7. **Impact Factor: 1.004**
- Gupta V., **Gupta R.K.**, Khare G., Salunke D.M. and Tyagi A.K. (2008). Cloning, expression, purification, crystallization and preliminary X-ray crystallographic analysis of bacterioferritin A from *Mycobacterium tuberculosis*. **Acta Crystallogr Sect F Struct Biol Cryst Commun**. 2008 May 1; 64 (Pt 5): 398-401. **Impact Factor: 1.004**
- Sanseverino J., **Gupta R.K.**, Layton A.C., Patterson S.S., Ripp S.A., Saidak L., Simpson M.L., Schultz T.W., Sayler G.S. (2005). Use of *Saccharomyces cerevisiae* BLYES expressing bacterial bioluminescence for rapid, sensitive detection of estrogenic compounds. **Appl Environ Microbiol.** ; 71(8): 4455-60. **Impact Factor: 5.005**
- Patterson S.S., Dionisi H.M., **Gupta R.K.**, Sayler G.S. (2005). Codon optimization of bacterial luciferase (lux) for expression in mammalian cells. **J Ind Microbiol Biotechnol.**; 32(3):115-23. **Impact Factor: 4.258**
- **Gupta, R. K.**, S. S. Patterson, S. Ripp, A. C. Layton, and G. S. Sayler. (2004). A yeast reporter strain expressing bacterial bioluminescence for rapid sensitive detection of estrogenic compounds, p. 283-291. In M. S. Reddy and S. Khanna (ed.), **Biotechnological Approaches for Sustainable Development**, Allied Publishers, New Delhi, India.
- Patterson S.S., Dionisi H.M., **Gupta R.K.**, Ripp S.A. and Sayler G.S. (2004). Expression and stabilization of bacterial luciferase in mammalian cells. **Proc. Of The International Society of Optical Imaging (SPIE)**; 5325: 115-121, **Optical Diagnostics and sensing IV**: Gerard L. Cote, Alexander V. Priezhev, (eds.). **Impact Factor: 0.59**
- **Gupta, R.K.**, S.S. Patterson, S. Ripp, G.S. Sayler. (2003). Expression of the *Photobacterium luminescens* lux genes (luxA, B, C, D, and E) in *Saccharomyces cerevisiae*. **FEMS Yeast Research**, 4: 305-313. **Impact Factor: 2.796**
- Cherian, S., **Gupta R.K.**, Mullin B.C., and Thundat T, (2003). Detection of heavy metal ions using protein-functionalized microcantilever sensors. **Biosensors and Bioelectronics**; 19(5): 411-514. **Impact Factor: 10.618**
- **Gupta R.K.**, Dobrista S., Stiles C.A., Essington M.E., Liu Z., Chen C., Serpersu E.H., Mullin B.C. (2002). Metallothioneins: A new class of plant metal binding proteins. **J Protein Chemistry**, 21(8), 529-536. **Impact Factor: 2.371**
- Maillet C., **Gupta R.K.**, Schell M.G., Brewton R.G., Murphy C.L., Wall J.S., Mullin B.C. (2001). Enhanced capture of small Histidine-containing polypeptides on membranes in the presence of ZnCl<sub>2</sub>. **Biotechniques**: 30 (6) 1224-1230. **Impact Factor: 1.993**
- **Gupta R.K.**, Grover S., Batish V.K. (1993). Co-transformation of lactococci producing 2.0 Mdal and erythromycin resistant pGB301 plasmids to *Lactococcus lactis* subsp. *lactis* protoplasts. **Current Microbiology**, 27, 211-218. **Impact Factor: 2.118**
- **Gupta R.K.**, Batish, V.K. (1992). Protoplast induced curing of bacteriocin plasmid in *L.lactis* subsp. *lactis* 484. **J. Applied Bacteriology**, 73, 337-341. **Impact Factor: 3.772**
- **Gupta RK**, Batish VK. (1992). Lytic response of *L. lactis* subsp. *lactis* 484 to muralytic enzymes. **Enzyme and Microbial Technology**, 14,156-160. **Impact Factor: 3.493**
- **Gupta R.K.**, Batish V.K. (1992). Genetic evidence for plasmid encoded lactococci production in *L. lactis* subsp. *lactis* 484. **Current Microbiology**, 24, 231-238. **Impact Factor: 2.118**

#### Books and Book chapters:

- Podia, Mansi, Yadav, Prerna, Hooda, Sunila, Diwan, Prerna, **Gupta, Rakesh** (2023). Microbial

Weathering of Rocks in Natural Habitat: Genetic Basis and Omics-Based Exploration. In Singh VB, Madhav S, Pant PC, Shekhar R (Eds). Weathering and Erosion Processes in the Natural Environment, PP 265-302, Wiley, ISBN: 978-1-394-15735-8: 10.1002/9781394157365.ch11.

- Diwan P. **Gupta, R. K.** (2021). Substantial Thrust to Indian Rural Economy through Village Dairy Cooperatives as Envisaged by Gandhi. In Devendra Kumar (Eds.) Self-Reliant India: A Gandhian Perspective, pp. 80-96, Shivalik Prakashan, Delhi India, ISBN 978-93-87195-86-8.
- **Gupta, R. K.**, Diwan P. (2020). The Gandhian way of Life: An Impeccable solution to World Environmental Concerns. In Devendra Kumar (Eds.) Gandhi Across the Boundaries, pp: 52-62, Shivalik Prakashan, Delhi India, ISBN 978-81-945562-1-3.
- Mohan, L., Goyal, K., Anand, S., Mittal, M., Snigdha, S., Bajwa, T., Gupta, K. R., **Gupta, R. K.** and Diwan, P. (2020). Foldscope: A New Age Exploratory Educational Tool. In A. D. Sharma (Ed.). Foldscope and its Applications (pp. 188-193). New Delhi: National Press Associates. ISBN 978-93-85835-68-1.
- **Gupta RK.** 2015. Microscopic Techniques to Identify & characterize bacteria -II, Virtual Learning Environment, ILLI, University of Delhi
- **Gupta RK.** 2015. Microscopic Techniques to Identify & characterize bacteria -I, Virtual Learning Environment, ILLI, University of Delhi
- **Gupta RK.** 2014. Application of Microorganisms in Food and Dairy Industry, Virtual Learning Environment, ILLI, University of Delhi
- **Gupta RK.** 2013. Nutritive Value of Foods and Fermentation Technology in Food Science. 'Science & Life' Foundation Course FYUP published by Delhi University. Publishers - University Press.
- **Gupta RK.** 2007. Food Preservation. E-Book on Food and Industrial Microbiology Published by NISCAIR, New Delhi. <http://hdl.handle.net/123456789/305>.

#### Awards and Distinctions

- United Nations Development Program (UNDP) Fellowship from 1984-1987
- National Dairy Research Institute Fellowship from 1987-1991
- Life time achievement award for Skill India Initiatives by NICER on 12<sup>th</sup> March, 2017 at the Skill and Vocational Education Summit 2017, held at the India International Centre
- Life Time Achievement Award in Education on 5<sup>th</sup> September 2023 by Ramanujan College, CA Parivaar and Indian Accounting Association, NCR Chapter.

#### Association With Professional Bodies

- Association of Microbiologists of India – Life Member
- Biotechnology Research Society of India – Life Member
- Probiotic Society of India – Life Member

#### ADMISSION and CAREER GUIDANCE ON DD NATIONAL:

- Invited in "Good Evening India" Delhi "Admissions in Delhi University - Dos and Don'ts live telecast programme 4.30-5.30 pm on DD National for guiding aspirants seeking admissions in the University of Delhi in the years 2017, 2018, 2019.
- DD Morning Show "Education and Career Development" – 18<sup>th</sup> September 2023
- DD Morning Show "Admissions in University of Delhi" – 2<sup>nd</sup> September 2024