RAM LAL ANAND COLLEGE (University of Delhi)

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Faculty Details

Name and Designation	**RAKESH KUMAR GUPTA** **PRINCIPAL- PROFESSOR**	Photograph
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Educational Qualifications

Degree	Institution	Year
Post Doctorate Research Fellow	**Center for Environmental Biotechnology and Department of Microbiology, University of Tennessee, Knoxville, TN, USA**	**1999-2002**
Ph.D	**NATIONAL DAIRY RESEARCH INSTITUTE (ICAR), KARNAL, HARYANA**	**1991**
M.Sc	**NATIONAL DAIRY RESEARCH INSTITUTE (ICAR), KARNAL, HARYANA**	**1987**

Career Profile

- Lecturer – 1991-2000: Department of Microbiology, Ram Lal Anand College, University of Delhi
- Reader – 2000-2006: Department of Microbiology, Ram Lal Anand College, University of Delhi
- Associate Professor – 2006-2016: Department of Microbiology, Ram Lal Anand College, University of Delhi
- **PRINCIPAL-PROFESSOR – SINCE 2016: RAM LAL ANAND COLLEGE, UNIVERSITY OF DELHI**

Administrative Assignments (Recent)

- Academic Council Member – 2019-2021, University of Delhi
- Member Standing Committee on Academic Matters of Academic Council, University of Delhi 2021.
- UGC Member of Curriculum Development Committee for B.Sc (H) Microbiology syllabus under CBCS: 2014-15

Areas of Interest / Specialization

Molecular Biology and Recombinant DNA Technology
Applied Microbiology, Environmental Microbiome

Research Projects

Ongoing

- 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.

- Targeting biofilm formation by inhibiting Cysteine biosynthesis pathway enzymes in ESKAPE pathogens with natural products (**Principal Investigator: Dr R K Gupta**, Co-investigators: Dr Vibha Gupta, Dr Prerna Diwan), INR 45 Lacs, 3 years (2021-2024). Funded by ICMR, Government of India.
- Resistome metagenomic profiling of bioaerosols in metro network in Delhi- NCR, (**Principal Investigator: Dr R K Gupta**, Co-investigators: Dr Sunila, Dr Prerna Diwan), INR 56 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: Dr R K Gupta**, Dr James Wahlang), INR 36 Lacs, 3 years (2019-2022). Funded by ICMR, Government of India.

Completed

- 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.

US Patents Granted

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

2) Destabilized Bioluminescent Proteins. US Patent Number – 7250284, Date of Issue – 07/31/2007 Allen Michael S, Rakesh Gupta, Gary Sayler

US Patents Published Application

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, Sayler Gary, Ripp Steven, Patterson Stacey

International Patent Publications

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, Sayler Gary, Dionisi Hebe.

Research Publications:

- Dwivedi V, **Gupta RK**, Gupta A, Chaudhary VK, Gupta S, Gupta V. (2022). Repurposing Novel Antagonists to p7 Viroporin of HCV Using *in silico* Approach. *Letters in drug design and discovery*; 19. https://dx.doi.org/10.2174/1570180819666220124112150.
- 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).**
- 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.
- 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
- Gupta V[#], **Gupta R.K[#]**., Khare G., Salunke D.M., Surolia, 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
- 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.
- 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.
- 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.
- 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.
- 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.

- 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.
- **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. Priezzhev, (eds.)
- **Gupta, R.K.,** S.S. Patterson, S. Ripp, G.S. Sayler. (2003). Expression of the *Photorhabdus luminescens* lux genes (luxA, B, C, D, and E) in *Saccharomyces cerevisiae*. ***FEMS Yeast Research***, 4: 305-313.
- 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.
- **Gupta R.K.**, Dobrista S., Stiles C.A., Essington M.E., Liu Z., Chen C., Serpersu E.H., Mullin B.C. (2002). Metallohistins: A new class of plant metal binding proteins. ***J Protein Chemistry***, 21(8), 529-536.
- 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 ZnCl2. ***Biotechniques***: 30 (6) 1224-1230.
- Prasad DN, **Gupta RK**. (1995). Occurrence of infectious hepatitis in food. *Everyman's Science*, XXX, 107-110.
- **Gupta R.K**. (1994). Induction of plasmid loss in *Lactococcus lactis* under acidic environments. *Microbiologie-Aliments-Nutrition*, 12, 31-36.
- **Gupta R.K**, Grover S., Batish V.K. (1993). Co-transformation of lactococcin producing 2.0 Mdal and erythromycin resistant pGB301 plasmids to *Lactococcus lactis* subsp.*lactis* protoplasts. ***Current Microbiology***, 27, 211-218.
- **Gupta R.K.**, Grover S., Batish, V.K. (1993). Anti-listerial activity of lactic acid bacteria isolated from buffalo market milk. *Cultured Dairy Products J*., 28, 21-25.
- **Gupta RK**, Goyal NK. (1993). Antimicrobial potentials of lactococci-A review. *Microbiologie-Aliments-Nutrition*, 11, 477-490.
- **Gupta R.K**. (1993). Diverse nature of antibacterial factors produced by lactococcal isolates. *Microbiologie-Aliments-Nutrition*, 11, 383-389.
- **Gupta R.K**, Batish, V.K. (1992). Protoplast induced curing of bacteriocin plasmid in *L.lactis* subsp. l*actis* 484. ***J. Applied Bacteriology***, 73, 337-341.
- **Gupta R.K.**, Batish V.K. (1992). Over expression and inactivation of bac genes in *L. lactis* subsp. *cremoris* 134 by mutagenesis. *Microbiologie-Aliments-Nutrition*, 10, 161-165.
- **Gupta RK**, Batish VK. (1992). Lytic response of *L. lactis* subsp. l*actis* 484 to muralytic enzymes. ***Enzyme and Microbial Technology***, 14,156-160.
- **Gupta R.K**, Batish V.K. (1992). Genetic evidence for plasmid encoded lactococcin production in *L. lactis* subsp*. lactis* 484. ***Current Microbiology***, 24, 231-238.
- **Gupta R.K**, Batish V.K. (1990). Screening lactic streptococci for antibacterial activity, plasmid profiles and biochemical performance*. Microbiologie-Aliments-Nutrition*, 8, 45-52.
- Prasad DN, **Gupta RK**. (1990). *Listeria monocytogenes* in dairy products- An overview. *Microbiologie-Aliments-Nutrition*. 8, 383-405.

- **Gupta RK,** Prasad DN. (1990). *Shigella* and its virulent factors. *Everyman's Science*, XXV, 60-77.
- **Gupta R.K**., Batish V.K. (1990). Optimising conditions for protoplast formation and regeneration from a wild bacteriocin producing lactococci. Brief Communications of the XXIII International Dairy Congress, Montreal, October 8-12, 1990, Vol. II. International Dairy Federation.
- **Gupta R.K**, Prasad D.N. (1989). Nisin in the preservation of stirred yoghurt under non-refrigerated storage. *Microbiologie-Aliments-Nutrition*, 7, 123-129.
- **Gupta R.K**, Prasad D.N. (1989). Incorporation of nisin in stirred yoghurt. III. Quantitative estimation of residual nisin. *Cultured Dairy Products J*., 24, 11.
- **Gupta RK**, Prasad DN. (1989). Antibiotic activity of nisin in food preservation-A review. *Microbiologie-Aliments-Nutrition*, 7, 199-208.
- **Gupta R.K**, Prasad D.N. (1989). Incorporation of nisin in stirred yoghurt. II. Effect on biochemical activities during storage. *Cultured Dairy Products J*., 24, 9-10.
- **Gupta RK**, Prasad DN. 1989. Use of nisin in dairy industry. *Indian Dairyman*, 229-233.
- **Gupta R.K**, Prasad D.N. (1988). Incorporation of nisin in stirred yoghurt. I. Effect on lactic and non-lactic organisms during storage. *Cultured Dairy Products J*., 23, 17-18.

Books and Book chapters:

- 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, ILLL, University of Delhi
- **Gupta RK.** 2015. Microscopic Techniques to Identify & characterize bacteria -I, Virtual Learning Environment, ILLL, University of Delhi
- **Gupta RK.** 2014. Application of Microorganisms in Food and Dairy Industry, Virtual Learning Environment, ILLL, 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 the recommendations of International Association of Educators for World Peace –NGO Affiliate of United Nations: ECOSOC, UNDPI) on 12th March, 2017 at the Skill and Vocational Education Summit 2017, held at the India International Centre

Association With Professional Bodies

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