

Rekha Kumari, Ph.D.

RESEARCH INTEREST: Molecular Biotechnology, Metagenomics, and Bioinformatics.
Contact No. +91 9582347742, Molecular Biotechnology and Bioinformatics Laboratory
Email: rekha.kumari@mirandahouse.ac.in

EDUCATION

S. No.	Degree Earned	University attended	College attended	Date received
1	M.Sc. Bioinformatics	University of Edinburgh, UK	College of Science and Engineering	Nov, 2012
2	Ph.D. Molecular Biology and Biotechnology	University of Delhi	Department of Zoology, Faculty of Science	Feb, 2003
3	M.Sc. Zoology Sp: Cell and Molecular Biology	University of Delhi	Hans Raj College	May, 1997
4	B.Sc. (Hons.) Zoology	University of Delhi	Hans Raj College	May, 1994

PROFESSIONAL POSITIONS HELD

- **Assistant Professor:** Dept. of Zoology, Miranda House, University of Delhi, Delhi, India (July 2002 onwards)
- **Teacher-in-Charge:** Dept. of Zoology, Miranda House, (July, 2013 to April, 2015).
- **Dy. Coordinator, Central Evaluation Centre,** at Miranda House, for Delhi University Examinations (May, 2014 to July, 2014).
- **Dy. Coordinator, Semester end Theory Examination and School of Open Learning Annual Examinations,** at Miranda House, for Delhi University Examinations (May, 2018 to June, 2018).
- **Visiting Scientist:** Helmholtz Centre for Environmental Research (UFZ), Leipzig, **Germany** (April - July 2013)
- **BOYSCAST Fellow:** Dept. of Microbiologie Fondamentale, Univ. of Lausanne, Lausanne, **Switzerland** (May 2009- April 2010).
- **Visiting Scientist** (part-time): Institute of Genomics and Integrative Biology, Delhi, **India** (Feb 2007-March 2009)

PROFESSIONAL HONORS, AWARDS AND FELLOWSHIPS

- **Invited talk** on, “*Role of Gut Bacterial Bacteriocins to Combat Obesity By Regulating Lipogenesis*” at 7th Annual International Conference of the Indian Network of Soil Contaminated Research (INSCR 2022) on “**MODULATING THE ENVIRONMENT WITH MICROBES**” organized from November 7th -11th November, 2022 in online mode.
- **Invited talk** on, “*Bacteriocins At Work: Role of Gut Bacteriome In Obesity Management* at 5th International Conference on **Nutraceuticals and Chronic Diseases (INCD-2022)** on “**Pharmaceuticals and Nutraceuticals for Cancer and Other Chronic Diseases**” from October 7th -9th, 2022 held at University of Delhi as part of University’s Centenary and Department of Zoology’s 75th year celebrations.
- **Invited faculty oral presentation** on, “*Structural changes in tnaA, gadB and tdc genes of human gut bacteria lead to variations in neurotransmitter levels during depression*” at the 6th Annual International Conference of Indian Network for Soil Contamination Research (INSCR) organized from 15th- 18th November, 2021 in online mode.

- **Invited Lecture** on “*Reporter Gene Technology: Exploring potential for Cancer Immunotherapy*”, School of Medicine, Meharry Medical College, Nashville, USA (June, 2019).
- **Invited faculty oral presentation**, “*Reporter Gene Technology and Biosensing: A boon in Environmental Pollution Management*” at INSCR International Conference 2017 on “Role of Microbe-Plant-Animal Interactions in Human Health” from September 26-28th 2017 held at University of Delhi, Delhi India.
- **Teaching Excellence Award for Innovation**: Univ. of Delhi 93rd Foundation Day (1st May, 2015) Project MH-203 for UG students.
- **Visiting Scientist** under **INSA-DFG Bilateral Exchange Programme** at Helmholtz Centre for Environmental Research (UFZ), Leipzig, **Germany**; Project Title: “*Fungal hyphae translocation of Pesticides*” (April – July, 2013).
- **International Fellowship** under **Faculty Training Program (FTP)** to pursue *M.Sc. Bioinformatics* at University of Edinburgh, **UK** (Sep 2011– Aug 2012).
- **Boyscast fellowship** from **Dept. of Science and Technology (Govt. of India)** for research work at Dept. of Microbiologie Fondamentale (DMF), University of Lausanne, **Switzerland**; Topic: “*Construction of Microbial Biosensors*” (May 2009-Apr 2010).
- **Invited Lecture** at University of Hamburg, Hamburg, **Germany** on “*Biosensing and Reporter Gene Technology: A Boon in Environmental Pollution Management*” (March, 2010).
- **Visiting Scholar** under **DST-DAAD Personnel Exchange Program** at the Dept of Genetics, University of Kaiserslautern, **Germany**; Topic: “*Development of cloning vectors for A.mediterranei for genetic engineering of Rifamycin biosynthetic gene cluster*” (June-Aug, 2001).

MEMBERSHIP OF PROFESSIONAL BODIES

- Life member: Association of Microbiologists of India (AMI); Member organising committee for conferences and workshops.
- Life member: International Network for Soil Contamination and Research (INSCR); Member organising committee for international conferences and workshops 2017, 2020 and 2022.
- Member, American Society of Microbiologists (ASM), since 2013.

TEACHING AND RELATED ACTIVITIES

A. Teaching the following papers in the Dept of Zoology, Miranda House, in accordance with the Delhi University syllabi (current scheme-Choice Based Credit System, CBCS) applicable from 2015-16) (http://du.ac.in/du/uploads/Syllabus_2015/B.Sc.%20Hons.%20Zoology.pdf)

(http://du.ac.in/du/uploads/Syllabus_2015/BSc-Prog-Life-Science-Botany-Chemistry-Zoology.PDF)

- Cell and Molecular Biology (2003-to date) B.Sc.Hons. Zoology
- Biotechnology: (2007-to date) B.Sc. (Hons.) Zoology /B.Sc. Life Science
- Biodiversity: Chordates and their Comparative Anatomy (2002-2007, 2014-16) B.Sc. (Hons.) Zoology
- Genetics and Genomics, Biochemistry. (2005-07) B.Sc. (Hons.) Zoology
- Bioinformatics (2014-15) B.Sc. (Hons.) Zoology

B. My academic responsibilities have included:

- Member, Admissions Committee in Miranda House (2010-12, 2014-17)
- Paper-setting and evaluation for Delhi University theory examinations
- Delhi University UG Curriculum Revision for which I am functioning as –
- (i) **Coordinator** of Committee for paper on **Animal Biotechnology** (DSE) B.Sc.

(Life Sciences Programme) 2019.

(ii) **Member** of Committee paper on **Animal Biotechnology** (DSE) B.Sc (Hons) Zoology, 2019.

C. Coordinator for teaching of **Environmental Sciences (EVS)** paper to 1st year students of Miranda House. Guest faculty appointments and ensuring smooth conduct of classes.

D. Add-on Courses: Have **introduced two** Add-on Courses in Miranda House. They are:

1. **Medical Biotechnology** (in 2008).

2. **Bioinformatics: *in silico* medicine** (in 2014)

I have been coordinating the structuring and conduct of these on-going courses since their inception. The courses are self-financed and open to all UG students from Delhi University and private Universities. The course details can be accessed at:

<http://mirandahouse.ac.in/academics/courses/addon/medicalbiotechnology.php>

<http://mirandahouse.ac.in/academics/courses/addon/bioinformatics.php>

Nearly 200 students have been trained so far and they are now working in various research labs in India and abroad.

E. Resource person for **Bridge Courses** in Zoology at Miranda House.

OTHER SERVICES TO STUDENTS AND HOME INSTITUTION

- **Coordinator for *Science Setu*:** This is a DBT program to bridge the gap between UG and research students. The aim is to motivate UG students to take science as a career. Talks by eminent scientists, and interactive workshops on contemporary science topics are organized.
- **Teacher Adviser for *Evolvere*:** This is the society of Dept of Zoology which organizes seminars, annual departmental fest, outstation excursions, publishing of the departmental magazine, etc.
- **DBT Star College Scheme:** Departmental coordinator for the project in Zoology. Organized workshop, up-gradation of UG labs, summer projects.
- **Student Excursions:** Facilitate/ coordinator for organization of students excursions to various biotechnology institutes (IGIB, NIL, TERI university, AIIMS etc.), industry (Panacea Biotec Ltd) visits for their project reports and participation in many student outreach activities.

RESEARCH & REVIEW ARTICLES (Peer Reviewed)

1. **Kumari, R***. Singhvi, N, Sharma P, Choudhary, C, Shakya, R (2023). "Virtual screening of gut microbiome bacteriocins as potential inhibitors of stearyl-CoA desaturase 1 to regulate adipocyte differentiation and thermogenesis to combat obesity" *J Biomol Struct Dyn*. 1-11. doi: 10.1080/07391102.2023.2167121 Epub. PMID: 36644882. **IF: 5.235**
2. **Kumari, R*.,** Yadav Y., Misra R., Das U., Das U., Adhikari P.M., Dubey G.P. (2022). Emerging frontiers of antibiotics use and their impacts on the human gut microbiome, *Microbiological Research*, Volume 263, 2022, 127127, ISSN 0944-5013, <https://doi.org/10.1016/j.micres.2022.127127>. **IF: 5.47**
3. Sharma P, **Kumari R***, Yadav M, Lal R. (2022). Evaluation of TiO₂ Nanoparticles Physicochemical Parameters Associated with their Antimicrobial Applications. *Indian J Microbiol*. 2022 Sep; 62(3): 338-350. [https://doi: 10.1007/s12088-022-01018-9](https://doi.org/10.1007/s12088-022-01018-9) Epub. Apr 18. **IF: 2.46.**
4. Sharma, M., Pathak, M., Ojha, H., **Kumari, R.**, Sharma, N., Roy, B. and Jain, G. (2016). Green synthesis, characterization and antibacterial activity of Silver Nanoparticles. *Green Chemistry and Technology Letters*, 2(2), 103-109. Citations: **2**
5. **Kumari, R.**, Pathak, M., Sharma, M., Pandey, A., Majumdar, I., Payal, and Khare, A. (2016). Design of affordable Water Purification Devices using Green and Ecofriendly Silver

Nanoparticles. **Young Scientists Conclave, India International Science Festival**, CSIR-NPL, Delhi, SYNTH_3. Published in Proceedings/of the conference.

6. Dwivedi, V., Kumari, K., Gupta, S.K., **Kumari, R.**, Tripathi, C., Lata, P., Niharika, N., Singh, A.K., Kumar, R., Nigam, A., Garg, N., Lal, R. (2015). *Thermus parvatiensis* RLT sp. nov., Isolated from a Hot Water Spring located in the Himalayan Ranges at Manikaran, India. ***Indian Journal of Microbiology***, 55(4), 357–365. Citations: **14; IF: 2.46**
7. **Kumari, R.**, Tecon, R., Beggah, S., Butler, R., Arey J.S. and van der Meer, JR. (2011). Development of Bioreporter Assays for the Detection of Long Chain Alkanes Based on the Marine Bacterium *Alcanivorax borkumensis* strain SK2. ***Environmental Microbiology***. 13(10), 2808-19. Citations: **24, IF: 5.491**
8. Gupta, S.K., **Kumari, R.**, Prakash, O., and Lal, R. (2008). *Pseudomonas panipatensis* sp. nov., isolated from an oil-contaminated site. ***Int.J.Syst.Evol.Microbiol.*** 58(6), 1339-45. Citations: **44, IF: 2.747**
9. Sharma, P., Raina, V., **Kumari, R.**, Malhotra, S., Dogra, C., Kumari, H., Kohler, H.P., Buser, H.R., Holliger, C., Lal, R. (2006). Haloalkane dehalogenase LinB is responsible for beta- and delta-hexachlorocyclohexane transformation in *Sphingobium indicum* B90. ***Applied Environmental Microbiology***, 72(9), 5720-7. Citations: **84; IF: 5.005**
10. Lal, R., Sharma, P., Kumari, H., Kumar, M., Kumari, K., Gupta, S.K., Malhotra, S., **Kumari, R.** (2006). Metagenomics: You are what your Bacteria eat! (Research News) ***Indian Journal of Microbiology***, 46, 414. Citations: **2; IF: 2.46**
11. Dhingra, G., **Kumari, R.**, Subudhi, S. Suar, M., Bala, S., Raina, V, Lal, S., Cullum, J., Lal, R. (2003). Development of cloning vectors and transformation methods for *Amycolatopsis*. ***Journal of Industrial Microbiology and Biotechnology***, 30, 195-204. Citations: **15; IF: 4.58**
12. **Kumari, R.**, Subudhi, S. Suar, M., Dhingra, G., Raina, V., Dogra, C., Lal, S., Van der Meer, J.R., Lal, R. (2002). Cloning and characterization of *lin* genes responsible for the degradation of hexachlorocyclohexane isomers in *Sphingomonas paucimobilis* B90 (Indian strain). ***Applied Environmental Microbiology***, 68, 6021-6028. Citations: **186, IF: 5.005**
13. Lal, R., **Kumari, R.** Kaur, H., Khanna, R., Dhingra, N., Tuteja, D. (2000). Regulation of type I PKS gene clusters and their manipulations. ***Trends in Biotechnology***, 18, 264-274. Citations: **36; IF: 19.536**

* Corresponding author

BOOKS/CHAPTERS

1. Kumari, R. *et al.* (2004) Chapter No. 7 Cell Biology in “Molecular Biology - A text book for M.Sc. students” Ed Das, H.K., Wiley Dream tech India (P) Ltd. India.
2. Kumari, R., (2007) Cancer in “Cell and Molecular Biology”. New Delhi, India, E-book by NISCAIR, Govt. of India.

RESEARCH PROJECTS UNDERTAKEN

- Role of gut bacterial metabolite (bacteriocins) in combating obesity through virtual screening as inhibitors of SCD 1.
- Identification and Characterization of Extremophiles from Jakrem Hot Spring, Meghalaya. 2 (IoE Grant No.: Ref. No./IoE/2021/12/FRP, Dated: 29-10-21, Amount 3L)
- Metagenomic characterization of microbial diversity from pesticide contaminated soils. (Summer Students Projects at Miranda House under DBT Star College Scheme, 2016).
- Design of Affordable Water Purification devices using Green and Ecofriendly Silver Nanoparticles. (DU Innovation projects, MH 306, Grant received 6,00,000)
- Development of bioreporter assays for the detection of long chain alkanes based on the marine bacterium *Alcanivorax borkumensis* strain SK2. (**BOYSCAST, DST 2009-10**).

- Development of an experimental test system for the visualization of mycelial translocated PAH and potential metabolites. (**INSA-DAAD, 2013**).
- To study the efficacy of natural dyes in dyeing and imparting antimicrobial properties to different textile materials (**DU Innovation Projects, 2013**).
- Design of affordable water purification devices using green and ecofriendly silver nanoparticles. (**DU Innovation Projects, 2015**).
- Development of cloning vectors for *A. mediterranei* for genetic engineering of Rifamycin biosynthetic gene cluster. (**DST-DAAD, 2001**)

ORAL PRESENTATIONS / POSTERS / SEMINARS/CONFERENCES ATTENDED

1. **Kumari, R.**, Presented a paper on “Reporter Gene Technology and Biosensing: A Boon in Environmental Pollution Management” at the **INSCR International Conference on Role of Microbe-Plant-Animal Interactions in Human Health**, University of Delhi, India, Sep 26-28, 2017.
2. Jain, R. and **Kumari, R.**, “Study of differentially-expressed genes (DEGs) in Argyrin A, an anti-proliferative drug-treated samples of intestinal adenomatous polyps, using an integrated bioinformatics analysis” at the **INSCR International Conference on Role of Microbe-Plant-Animal Interactions in Human Health**, University of Delhi, India, Sep 26-28, 2017. (**Best Poster Award**)
3. **Kumari, R.**, “Natural Dyeing of Textiles using Plant Extracts: Dyeing potential and Antimicrobial Properties”: **Oral presentation** at Maitreyi College, University of Delhi, India, Feb 25, 2015.
4. **Kumari, R.**, “Efficacy of Natural Dyes in Dyeing and Imparting Antimicrobial Properties to Different Textile Materials: Industrial Applications of Natural Dyes”: **Oral Presentation in Anterdwani**, Cluster Innovation Center, University of Delhi, India, Feb 20- 22, 2015.
5. **Kumari, R.**, “Development of Sustainable and Eco-friendly Processes for Natural Dyeing of Textiles using Plants Extracts”: **Oral Presentation** at AOC-5 GSC, North India Section of The Royal Society of Chemistry (London), Green Chemistry Network Centre (New Delhi) and The Energy and Resources Institute, Delhi, India, March 15-17, 2015.
6. **Kumari, R.**, and Van der Meer, J.R., “Tetradecane inducible *Alcanivorax borkumensis* tagged with gfp”: **Poster Presentation** in 5th Swiss Molecular Microbiology Meeting, “SWIMM 2010”, Gwattzentrum, Switzerland, March 24-26, 2010.
7. Beggah, S., Moreno-Forero, S.K., **Kumari R.**, Van der Meer, J.R., “Transcriptome analysis in response to water stress in the bacterium *Arthrobacter chlorophenolicus* strain A6T”: **Poster Presentation** in 5th Swiss Molecular Microbiology Meeting, “SWIMM 2010”, Gwattzentrum, Switzerland, March 24-26, 2010.
8. **Kumari, R.**, Gupta, S.K., Lal, R.. Isolation and partial characterization of Himachal Pradesh, India”: **Poster Presentation** at the 46th Annual Conference of Association of Microbiologists of India, “**Micro-Biotech-2005**”, held at Osmania University, Hyderabad, India, Dec 8-10, 2005.

Conferences/ Workshops organized/Consultations (Selected):

1. **E-content reviewer** for Biotechnology, Molecular Biology, Biomedical Sciences and Bioinformatics for UG at **Consortium for Educational Communication (CEC, UGC)**, an Inter University Centre of the University Grants Commission on Electronic Media, India, May 2017-onwards.
2. **Member**, local organizing committee for 5th International Conference on **Nutraceuticals and Chronic Diseases (INCD-2022)** on “**Pharmaceuticals and Nutraceuticals for Cancer and Other Chronic Diseases**” from October 7th -9th, 2022 held at University of Delhi as part of University’s Centenary and Department of Zoology’s 75th year celebrations.
3. **Organizing secretary** for 7th Annual International Conference of the Indian Network of Soil Contaminated Research (INSCR 2022) on “**MODULATING THE ENVIRONMENT WITH MICROBES**” organized from November 7th -11th November 2022 in online mode.

4. **Coordinator:** One-day undergraduate workshop on “Understanding our Environment: Human Interference”, DBT Star College Scheme, Miranda House, University of Delhi, Delhi, Aug 18, 2017.
5. **Joint Coordinator:** “*Indo-Dutch Collaborative Program*”, Jan 27 - Feb 4, 2017.
6. **Member:** Organizing committee for IBSD Miranda House Centre Launch and Northeast Fest 2017.
7. **Coordinator** two days workshop “*Bioinformatics and Biostatistics: An Introduction*” for UG teachers of Delhi University, Feb 24-25, 2016.
8. **Convener:** Panel discussion on “*Voices for Cancer: ‘Your’ role in Prevention*” in collaboration with NSS, Welcome Trust, DBT, PHFI & RTI International, Feb 17, 2015.
9. **Co-Convener:** One-day Workshop on *Natural Dyeing of Textiles* supported by Innovation Project MH-203, March 13, 2015.
10. **Member:** Organizing committee for one day workshop on *Flow Cytometry* for faculty, research scholars and post-graduation students, DBT Star College Scheme, March 20, 2015.
11. **Coordinator:** *NASI Award Lectures*, organized at Miranda House, 16th Sep, 2014.
12. **Coordinator:** *Inspiration Talks on Smoking and Lung Cancer*” organized under the DBT Visitors Programme, Oct 27, 2014.
13. **Convener:** Workshop on *Techniques in Biotechnology* for B.Sc. (H) Zoology and B.Sc. LS Teachers, funded by ILL, University of Delhi, Jan 9-13, 2013.

Association with COMMUNITY SERVICES

1. **Convener, MH Vatavaran**, the environment society of Miranda House. Coordinating activities for organic composting, paper recycling plant, water harvesting/storage, energy conservation etc. in the college premises. Student activities and MH souvenir shop.
2. Founder member of **Center for Environmental Sustainability and Disaster management (CESDM)** at MH. Organization of various workshops, internships, lecture etc. as mandated under the centre activities.
3. **NSS (National Service Scheme) Miranda House Unit:** Presently working as NSS Program Officer in Miranda House 2019-2021; have also been associated with NSS during 2003-2007.
Some of the activities were:
 - Visit **Orphanages** to teach mentally challenged students.
 - Conducted **Cleanliness drive** in collaboration with MH *Vatavaran*, on 11 Sep, 2018 under *Swachh Parisar Abhiyan*; also organized a seminar on eco-friendly disposable bags.
 - Organized seminar on *TFI Fellowship and opportunities in Education Sector* in collaboration with **Teach for India Foundation** on Oct 5, 2018.
 - Organized a seminar and **awareness program** on *Polycystic Ovarian Syndrome* in collaboration with NULIFE Hospital, on Jan 15, 2019.
 - Organized a workshop on **Self Defence Training** “*Fight Like A Girl*”, Feb 5-9, 2019.
 - Organized NSS Annual Fest 2019 *Satya* on March 13, 2019; it included various inter-college cultural and academic activities as well as a panel discussion on *Women’s Empowerment*.
2. **EOC (Equal Opportunity Cell, Miranda House) Member 2015-17**
 - Remedial classes for English, mathematics and other subjects if required
 - Helping financially through different fellowships to needy students.
3. **AOGIN (Asia Oceania research Organization on Genital Infections and Neoplasia – India):** Organized one day workshop on “**Women Health and Cancer Awareness Workshop**” and “**Women Health and Cancer Screening Camp**” on April 7, 2017.

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92.4+

23.7+

31.2+

20.7

168