Manish Kumar, PhD.

Senior Lecturer, Microbiology, Texas State University,
601, University Dr. San Marcos -TX-78666. Email m_k135@txstate.edu: Phone +1-512-245-8968

1. Educational qualifications

Degree	Year	Field of Study	University
Ph. D.	2005	Microbiology	Dr. RML Avadh University Faizabad, India
M. Sc.	1998	Microbiology	M.D.S. University Ajmer, India
B. Sc.	1996	Chemistry, Botany. Zoology	M.D.S. University Ajmer, India

2. University experience

- Senior lecturer, Texas State University, San Marcos-Texas. 2014 – till date
- Postdoctoral fellow, University of Texas at Arlington, Texas. 2012-2014.
- Postdoctoral research associate, University of Florida, Gainesville. 2008-2012.
- DBT-Post doctoral fellow, Indian Institute of Science, Bangalore. 2005- 2008.

3. Awards and fellowships

- Fellowship Recipient: Post-doctoral fellowship, Department of Biotechnology (DBT)/Government of India. 2005 - 2010
- Award Recipient: (SBRI- USA, Bursaries award, International Symposium on New Frontiers in Tuberculosis Research. 2006
- Award Recipient: Dr. R.S. RANA memorial award, 44th Annual Conference of Association of Microbiologists of India (AMI). 2003

4. Research interests:

Antibiotics resistance and regulation of biofilms formation in bacteria. Identification of novel drug target in *Clostridioides difficile*. Bioremediation of pollutants and waste water treatment.

5. Curriculum development and Teaching achievements

- Designed, developed and taught **four new courses** to expands the curriculum of Microbiology at Texas State University. These courses alleviated the bottleneck for the microbiology curriculum and provided new pathways and marketable skills to our students at Texas State.

  a. Bacterial Genetics (Bio-4448/5448,), New Course, Taught: 2016 onwards. Laboratory component of 1 credit hour was added in 2018.
  b. Microbial Biotechnology (Bio-4376/5376), New Course, Taught: 2016 onwards.

c. Microbial Biotechnology Lab (Bio-4176/5176) New course, Texas State University. Taught: 2018 onwards.
d. Introduction to Biotechnology (Bio-3376), New course. Taught: 2019 onwards

- Taught 14 different undergraduate/ graduate level Biology, Microbiology and Cell & molecular biology courses.
- Serving as Committee member on Biology Field of Study (FOS) Advisory Committee, at Texas Higher Education Coordinating Board. The committee is tasked with identifying courses to recommend for inclusion in the new Texas Transfer Framework for Biology. (2017-till date).

6. Publications

A. **Research publications** (*corresponding author)

Thornhill SG‡, Kianarsi S‡, Packard CA‡, **Kumar M**, Lewis KA, and McLean RJC. (2023) Anaerobic growth alters *Chromobacterium violaceum* quorum and motility inhibition by cobalt (II) chloride. Applied and Environmental Microbiology, (in preparation). (‡joint first authors)

Pujara DS, Kim S, Nam JC, Mayorga J, Elmore I, **Kumar M**, Koiwa H, and Kang HG (2021) Imaging-based resistance assay using enhanced luminescence-tagged *Pseudomonas syringae* reveals a complex epigenetic network in plant defense signaling pathways" *Mol. Plant-Microbe Interactions* 34(9):990-1000.

Sapkota M, Marreddy KRR, Wu X, **Kumar M** and Hurdle J (2020). The early-stage peptidoglycan biosynthesis Mur enzymes are antibacterial and antisporulation drug targets for recurrent *Clostridioides difficile* infection. *Anaerobe* 61:102129**.**

Thornhill S and **Kumar M*** (2018) Biological filters and their use in potable water filtration systems in spaceflight conditions *Life Sciences in Space Research*. 17:40-43.

Thornhill S, **Kumar M**, Vega L and McLean R (2017) Cadmium ion inhibition of quorum signaling in *Chromobacterium violaceum*. *Microbiol.* 163:1429-35. This paper was selected as Editor's choice.

Kumar, M., Adhikari, S., Hurdle, J. G. (2014). The action of nitroheterocyclic drugs against *Clostridium difficile*. *Int. J. Antimicrobial Agents, 44*(314).

Shen, L., Maddox, M. M., S., Bruhn, D. F., **Kumar, M**., Lee, R. E., Hurdle, J. G., Lee, R. E., Sun, D. (2013). "Syntheses and evaluation of macrocyclic engelhardione analogs as antitubercular and antibacterial agents". *J. Antibiotics, 66*, 319-325.

Bharati, B. K., Sharma, I. M., Kasetty, S., **Kumar, M**., Mukherjee, R., Chatterji, D. (2012). A full length bifunctional protein involved in c-di-GMP turnover is required for long term survival in *Mycobacterium smegmatis*. *Microbiol, 158*, 1415-1427.

Kumar, M., Gupta, S. K., Garg, S. K., Kumar, A. (2006). Biodegradation of hexachlorocyclohexane-isomers in contaminated soils. *Soil Biol. Biochem, 38*, 2318-2327.

Choudhary, P., **Kumar, M**., Khangarot, B. S., Kumar, A. (2006). Degradation and detoxification of HCH isomers by *Pseudomonas aeruginosa ITRC-5. International Biodeterioration & Biodegradation* (vol. 57, pp. 107-113).

Jain, V., **Kumar, M**., Chatterji, D. (2006). ppGpp: Stringent Response and Survival. J. *Microbiol* 44, 1-10.

Kumar, M., Chaudhary, P., Dwivedi, M., Kumar, R., Paul, D., Jain, R. K., Garg, S. K., Kumar, A. (2005). Enhanced biodegradation of beta- and delta-hexachlorocyclohexane in the presence of alpha- and gamma-isomers in contaminated soils. *Env Sci Tech* (vol. 39, pp. 4005-4011).

B. Book chapters (* corresponding author)

Osbon Y and **Kumar M*** (2019) Biocatalysis and Strategies for Enzyme Improvement. In Mohammed Khalid (ed) Biophysical Chemistry -Advance Applications. DOI: 10.5772/intechopen.85018.

McLellan J. and **Kumar M*** (2019) Feasibility of using bacterial-microalgal consortium for the bioremediation of organic pesticides: Application constraints and prospects. In Sanjay Gupta and Faizal Bux (ed) Application of Microalgae in Wastewater Treatment: Domestic and Industrial Wastewater Treatment. Springer Nature, Switzerland (Volume 1), pp341-362.

Letry KA, Castro ED, Gupta SK and **Kumar M*** (2019) Industrial waste water based algal biorefineries: Application constraints and future prospects. In Sanjay Gupta and Faizal Bux (ed) Application of Microalgae in Wastewater Treatment: Domestic and Industrial Wastewater Treatment. Springer Nature, Switzerland (Volume 2), pp-371-392.

McLellan J, Thornhill SG, Shelton S, and **Kumar M*** (2018) Keratin-Based Biofilms, Hydrogels, and Biofibers. In Swati Sharma and Ashok Kumar (ed.) Keratin as a protein Biopolymer. Springer Nature, Switzerland. Chapter-7, pp 187-200

Chabukdhara M, Gupta SK, Ansari FA, Bajhaiya AK, **Kumar M** (2017) Bioremediation of organic xenobiotics from wastewater: a review In Microbial Biodegradation of Xenobiotic Compounds, Science Publisher (CRC Press), Boca Raton, FL. pp 111-134.

Gupta SK, Roy S, Chabukdhara M, Hussain J, **Kumar M** (2017) Risk of metal contamination in agriculture crops by reuse of wastewater: An Ecological and Human health risk perspectives. In Rajeev P Singh, Alan Kolok, Shannon L. Bartelt-Hunt (ed.) Water Conservation, Recycling and Reuse: Issues and Challenges, Springer international.

C. Posters/Oral Presentation at Professional Meetings: (*corresponding author)

Joseph Ball, Sangchul Hwang, Ranjit Gurav, **Manish Kumar**, In-Hyouk Song, Chang Ji (2023). Biodegradation of Trichloroethylene (TCE) using sediment microbes, and impact of climate change on microbial degradation performance at DOE TXST Symposium, Nov 17.

Widmer J, **Kumar M,** Spinler J and McLean RJC (2020). The Effect of *Debaryomyces hansenii* on *Clostridium difficile* Sporulation. ASM Texas branch Meeting. Nov 5-7, Virtual.

McLellan J, Julia Widmer, and **Kumar M*** (2018). Induction of *C. difficile* Sporulation by Next Generation Probiotics. Oral presentation at 2nd Antimicrobial Resistance and Gut Health Symposium, Houston June 15th. Presenting author (JM).

Faulkner M and **Kumar M*** (2018). Development of CRISPR-Cas Nickase tool for genetic manipulation in *Clostridium difficile***.** Poster presented at American Society of Microbiology (ASM) Texas branch. Spring meeting March 23. New Braunfels, TX.

Castro E, McLellan J, Faulkner M and **Kumar M*** (2017). Development of *in-vitro* assay for screening of peptide deformylase inhibitors against *Clostridium difficile*. Annual Biomedical Research Conference for Minority Students (ABRCMS), Nov 1-4. Phoenix, AZ. Presenting author (EC) received Travel Award for attending the conference.

Kumar, M.*, Lewis, T., Hurdle, J. G.,(2016). Expression and purification of two peptide deformylase from *C. difficile* in *E. coli* for in vitro assays. Poster presented at American Society of Microbiology (ASM) Texas branch. fall meeting, University of Texas, Dallas, Richardson, TX, United States. (November 10-12).

Kumar, M., (2014). In vitro perspectives on *Clostridium difficile*. Invited talk at The *Clostridium difficile* Gulf Coast Collaborative conference, Houston, TX, United States. (June 21).

Kumar, M., (2012) "Regulation of β-1,6-N-acetyl-D-glucosamine synthesis and biofilm formation in *Escherichia coli* by c-di-GMP," Oral presentation at Genomic Biology Group seminar University of Texas, Arlington, TX. (November 2012).

Kumar, M., Chatterji, D., (2008) "SBRI-GID Infectious disease workshop," Hyderabad, India. (January).

Kumar, M., Bharati, B. K., Chatterji, D.,(2006). Role of c di-GMP in biofilm formation of *Mycobacterium smegmatis*. Poster presented at International Symposium on New Frontiers in Tuberculosis Research, International Centre for Genetic Engineering and Biotechnology, New Delhi, India. (December).

Kumar, M., Choudhary, P., S. K., Kumar, A., (2003) "Biodegradation and detoxification of an industrial muck consisting of hexachlorocyclohexane (HCH) isomers. Poster presented at 44th annual conference of Association of Microbiologists of India (AMI), ," Dharwar, India. (November).

Kumar, M., Kumar, A.,(2003) "Flasks to Field' Studies on the Biodegradation of Chlorinated Pesticide Hexachlorocyclohexane, Oral presentation at "International symposium on molecular toxicology and environmental health, Industrial Toxicology Research Centre, Lucknow, India. (November).

Kumar, M., Kumar, A., Soil- Elixir of Life" (2003). Microbial degradation of an industrial muck consisting of hexachlorocyclohexane (HCH) isomers, Poster presentation at National conference of Indian Network of Soil Contamination research (INSCR), " Thapar Institute. (February).

Kumar, M., Singh, A. K., Manickam, N., Kumar, A., (2002). Microbial degradation of an industrial muck consisting of hexachlorocyclohexane (HCH) isomers. Poster

presented at A mini symposium by Indo-Swiss Collaboration in Biotechnology (ISCB), “Utilization of Microbes for Development of Bioremediation Technologies," Delhi University, New Delhi, India. (December).

Kumar, M., Awasthi, N., Kumar, A., (2002). Bioremediation of hexachlorocyclohexane and endosulfan contaminated soils by isolated bacterial cells. Poster presented at First National conference of Indian Network of Soil Contamination research (INSCR) on “Soil Contamination and Bio-diversity, Industrial Toxicology Research Centre, Lucknow, India. (February).

7. Research mentorship:

- Co-advisor Master's Thesis, An Evaluation of an Enriched Taxa of Aerobic Bacterial Communities Capable of Biodegrading TCE Under Different Effects of pH and Temperature. Started Fall-2023. Student: Joseph Ball
- Supervisor / Co-Chair, Master's Thesis, "The Effect of *Debaryomyces hansenii* on *Clostridioides difficile* Sporulation", Status: Completed. (September 2019 - July 15, 2021). Biology, Texas State University. Student: Julia Widmer, Graduate, MS.
- Committee member on seven Master’s Thesis committees (2016-2023).
- Research mentor for three undergraduate researcher for three years in SURE program. The STEM Undergraduate Summer Research Experience (SURE) Program provides a holistic approach to undergraduate summer student research to increase student success at Texas State University (TXST), a Hispanic-serving institution.
- Mentored twelve undergraduate students for their research projects.
- Generated $7000 in research funding in form of Undergraduate Research Fellowships (URF) and Francis Rose fellowship, awarded to five of my undergraduate research students working under my direct supervision (2018-2021).

8. Teaching Professional Development Activities

- Attended International Learning Assistant Conference (ILAC) held at Colorado in October, 27-29, 2023.
- Participated in Biology course transformation project to redesign and transform the Functional biology (Bio-1330) course (May-Aug2023).
- Participated in Faculty Student STEM Community project to redesign the course (Bio-1330). Summer and Fall-2021.
- Attended One-week long Summer STEM teaching workshop for COSY Faculty to “Strengthen your pedagogical expertise and learn about student’s experiences” at Texas State University, May 18-22, 2020.
- Attended ‘Quality Matters Workshop’ on How to design online course. Texas State University, San Marcos, TX Aug 22, 2019.
- Completed semester long “Advance of Online Course Design and Development," Texas State University, San Marcos, TX. (January 4, 2016 - May 6, 2016).
- Foundations of Online Course Design and Development course," Texas State University San Marcos, TX. (May 2015).

9. Service

A. Institutional

- Committee member of the hiring committee for Microbiology cluster hire for assistant/associate professor molecular microbiology position. (2023).
- Invited Panelist to facilitate the discussion "How to Teach Online and Still Have a Life". (2017-2021, 3-4 times a year). This discussion is the part of Foundation/Advance course for faculties to develop and teach online courses offered by Texas State University.
- Judge for poster presentations "WISE conference" at Texas State university, 2018 & 2019.
- Judge annual Undergraduate Research poster competition, Texas State University. 2019 & 2020.
- Invited panelist on Active learning and hybrid course development for Health and Human Performance (HHP) department faculty. Nov 22. 2019.
- Invited panelist on National Distance Learning Week webinar series: Student Misconduct in Online Courses Nov-09, 2018.
- Panel chair (Biology) at the 10th Annual International Research Conference for Graduate Students held at Texas State University. Nov. 13-14, 2018.
- Served as Undergraduate Marshal, Commencement Ceremony. (December 16, 2016).
- Poster Respondent, in 6th, 7th and 8th International Research Conference for Graduate Students at Texas State Univ. (2014-16).
- Representative faculty, Commencement ceremony. (August 12, 2016).
- Volunteered to assist the Department of Housing and Residential Life with move-in. Friday, August 14, 2015, from 10:30 am – Noon.
- Judge, Annual Biology Students Colloquium for presentation at Texas State University Biology Colloquium. (2016, 2019, 2020, 2023).
- Judge, Annual Biology Students Colloquium for presentation and poster sessions at Texas State University. (April 17, 2015).

B. Professional

- Judge for oral and poster presentation for Annual Biomedical Research Conference for Minority Students (ABRCMS) held in Anaheim , California (2022). Selected for Judge Travel award of $1000.
- Session chair and host : American Society of Microbiology (Texas Branch), Virtual meeting organized by Texas State University, San Marcos TX, United States. (November 4-5, 2021).
- Reviewer for poster abstract for Annual Biomedical Research Conference (for Minority Students (ABRCMS). (2022, 2019 & 2015)
- PhD Thesis examiner/evaluator "Elucidating The Involvement Of Multiple Drug Resistant, High Biofilm Forming Staphylococcus aureus In Bacterial Pneumonia Among HIV Patients In Eastern U.P' Submitted to Dr. APJ Kalam Technical University, India (2019).
- Grant Reviewer: Phi Sigma grant program, UT Arlington, TX. (2019, 2014 -2016). I have reviewed 3-grant proposal every semester (up to $3000 each grant).

- Session chair (medical microbiology), American Society of Microbiology (Texas Branch), Richardson, TX, United States. (November 11, 2016).
- Judge at the Science fair, Texas preparatory school San Marcos -TX. (January 28, 2015).
- Books reviewed: Reviewed total of three book proposals, two for Elsevier and one for Springer publishing company
  1. Pilot Scale Microalgae Cultivation, Techno-Economic Challenges and Prospects (2021)
  2. Recent trends in solid waste management: Waste management (2021) .
  3. Phytoremediation Potential of Bioenergy Plants" Bioenergy: A sustainable approach for a cleaner environment (2015) published by Springer nature.
- Reviewer for scientific journals: Reviewed manuscripts for the following Journals (2015-2023)
  American Chemical Society Journals Chemosphere, Industrial & Engineering Chemistry Research. Sustainable Chemistry & Engineering, Pharmaceutical, Water, Antibiotics, Journal of Cleaner production, Sustainability, Energies, International Journal of Molecular Science, Marine drug, Antibiotic, Toxic , IJERPH, JFuel, Environmental Science & Pollution Research, Asian Journal of Medical Science, Infectious Diseases in Obstetrics and Gynecology. Current Issues in Molecular Biology, Microoragnisms. Frontier in immunology. BMC Complementary Medicine and Therapies.

10. Organization Memberships and leadership

- Member, American Society of Microbiology (ASM). (2014 –2019, 2021, 23).
- Vice president, Microcenoes' alumni association of microbiologist of MDS University, Ajmer, India (2004).
- Member, The Nu Biophysical Society, Molecular Biophysics Unit, Bangalore. (2005 - 2008).
- Member Association of Microbiologists of India (AMI). (2003).
- Vice president, student union of Government Bangur P.G. College, Pali-(Rajasthan) India. (1995 - 1996).

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