

# Scientist Profile

**Name:** Dr. Vijay M Kumbar  
**Designation:** Assistant Professor Grade-I  
**Qualification:** M.Sc., Ph.D. (Bio-Technology)  
**Specialization:**  
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## Academic and Research Experience: 16 Years

1. **Assistant Professor Grade-I**, KLEs Dr. Prabhakar Kore Basic Science Research Center, Belagavi. 03/11/2025 to till date
2. **Research Scientist Grade-I**, KLEs Dr. Prabhakar Kore Basic Science Research Center, Belagavi. 10/01/2021 to 02/11/2025.
3. **Scientific Research Officer**, Central Research Laboratory, Maratha Mandal Dental college, Belagavi, 2021-2022.
4. **Research Assistant Grade-II**, KLEs Dr. Prabhakar Kore Basic Science Research Center, Belagavi. 10/01/2013 to 14/02/2017.
5. **Research Assistant Grade-I**, KLEs Dr. Prabhakar Kore Hospital Belagavi, 05/05/2010 to 09/01/2013.

## Research Focus

- **Exosome-derived ceramic composites from Human dental pulp stem cells (HDPSCs):** Functionalization, fabrication, and optimization of HDPSC-derived exosomes integrated into ceramic-based biomaterials for applications in bone tissue engineering, regenerative medicine, and implantable biomedical devices.
- **Exosome-based wound healing applications:** Development and optimization of **wound healing platforms** utilizing HDPSC-derived exosomes, aimed at enhancing tissue regeneration, modulating inflammation, and promoting scar-free healing in various clinical settings.
- **Exosome-based biomarkers for diagnosis and prognosis:** Investigating the potential of exosomes as non-invasive, information-rich carriers for the early detection and prognosis of head and neck cancers, with an emphasis on identifying specific protein and nucleic acid-based biomarkers.

- **Advanced exosome-based drug delivery systems:** Designing targeted drug delivery systems using engineered exosomes for precise delivery of therapeutic agents to **cancer stem cells** and **tumor microenvironments**, aiming to improve drug bioavailability, specificity, and reduce systemic toxicity.
- **Head and neck cancer, oral cancer, oral microbiology:** Molecular biology, medical microbiology, infectious diseases, antimicrobial resistance, biofilm biology, host-pathogen interactions, bacterial infections, antibiofilm therapeutics, microbial genomics, computational biology, and translational approaches for improving antibiotic efficacy.
- **Role of oral microbiomes in head and neck cancer:** Exploring the complex interactions between **oral microbial communities** and **carcinogenesis in head and neck cancer**, with the goal of identifying microbial markers and elucidating mechanisms driving disease initiation and progression.
- **Natural compounds targeting harmful oral bacteria:** Screening and evaluating the **antibacterial activity of natural phytochemicals** against pathogenic oral bacteria associated with cancer development, aiming to develop preventive or adjunctive therapies for oral and oropharyngeal cancers.

### **Achievements / Awards:**

1. **Best Young Scientist**, KLE Academy of Higher Education and Research, Belagavi, Karnataka, 2025.
2. **Best Paper award of Odontology** (Official Journal of the Society of the Nippon Dental University), Springer, 2024.

**Publications:** 120

**Patents:** 3

**Book Chapters:** 3

### **Conferences**

- Conferences Attended: 4
- Papers Presented: 4

**Ph.D. Students:** 4

**PG Students:** 6