

**Dr Shivangi Yadav**  
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Department of Zoology  
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## EDUCATION

**Secondary School Examination Percentage:** 72.33%, 2009 (Board of High School and Intermediate Education, Uttar Pradesh)

**Senior Secondary in Biology Percentage:** 79.00%, 2011 (Board of High School and Intermediate Education, Uttar Pradesh)

**Bachelor of Science in Zoology and Chemistry Percentage:** 76.00%, (Gold Medalist) July 2012 to May 2014 (Bundelkhand University, Jhansi, India)

**Masters of Science in Zoology Percentage:** 77.33, July 2014 to June 2016 (University of Lucknow, Lucknow, India)

**Doctor of Philosophy in Zoology:** November 2020

**Qualified UPHESC Examination:** May 2022

**Joining as Assistant Professor:** S. N. Sen B.V. P.G. College, Kanpur (27/05/2022 till date)

**Thesis:** A Study on *Klebsiella pneumoniae* in reference to biofilm formation and drug resistance.

## AWARDS AND HONOURS

**Junior Research Fellowship** by Council of Scientific & Industrial Research, Govt. of India, December 2016

**Senior Research Fellowship** by Council of Scientific & Industrial Research, Govt. of India, July 2017-November 2020

## BOOK PUBLISHED:

Ecology, Ethology, Environmental Science and wild life (B.Sc. Third year Semester VI)- 2024

## PRESENTATIONS:

1. Poster presentation, 60<sup>th</sup> Annual conference of the association of Microbiologists of India & International symposium on microbial technologies in sustainable development of energy, environment, agriculture and health, "Classification of multidrug resistant *Klebsiella pneumoniae* in based on biofilm forming capacity and elucidation of its biofilm chemistry, 15<sup>th</sup>-18<sup>th</sup> November 2019, Central University of Haryana, Mahendergarh-123031, Haryana, India

2. Paper presentation, 12<sup>th</sup> National conference of Indian Academy of Tropical Parasitology, “Evolution in Parasitology: Addressing New Challenges”, titled, “Resistance profile of *Klebsiella pneumoniae* isolated from patients with amoebic liver abscesses”, 7<sup>th</sup>-9<sup>th</sup> September 2018, Institute of Medical Sciences, Banaras Hindu University, Varanasi-221005, India

## PUBLICATIONS:

1. Singh AK, Yadav S, Chauhan BS, Nandy N, Singh R, Neogi K, Roy JK, Srikrishna S, Singh RK, Prakash P. Classification of Clinical Isolates of *Klebsiella pneumoniae* Based on Their *in vitro* Biofilm Forming Capabilities and Elucidation of the Biofilm Matrix Chemistry With Special Reference to the Protein Content. *Front Microbiol.* 2019 Apr 4;10:669. doi: 10.3389/fmicb.2019.00669. PMID: 31019496; PMCID: PMC6458294.
2. Yadav S, Singh AK, Agrahari AK, Singh AS, Gupta MK, Tiwari VK, Prakash P. Making of Water Soluble Curcumin to Potentiate Conventional Antimicrobials by Inducing Apoptosis-like Phenomena among Drug-Resistant Bacteria. *Sci Rep.* 2020 Aug 5. doi: doi.org/10.1038/s41598-020-70921-2.
3. Yadav S, Singh AK, Agrahari AK, Pandey AK, Gupta MK, Chakravorty D, Tiwari VK, Prakash P. Galactose-Clicked Curcumin-Mediated Reversal of Meropenem Resistance among *Klebsiella pneumoniae* by Targeting Its Carbapenemases and the AcrAB-TolC Efflux System. *Antibiotics.* 2021; 10(4):388. <https://doi.org/10.3390/antibiotics10040388>. (Invited Paper)
4. Singh AK, Yadav S, Sharma K, Firdaus Z, Aditi P, Neogi K, Bansal M, Gupta MK, Shanker A, Singh RK, Prakash P. Quantum curcumin mediated inhibition of gingipains and mixed-biofilm of *Porphyromonas gingivalis* causing chronic periodontitis. *RSC Adv.* 2018 Dec 31. DOI: 10.1039/c8ra08435a.
5. Singh AK, Mishra H, Firdaus Z, Yadav S, et al. MoS<sub>2</sub>-Modified Curcumin Nanostructures: The Novel Theranostic Hybrid Having Potent Antibacterial and Antibiofilm Activities against Multidrug-Resistant Hypervirulent *Klebsiella pneumoniae*. *Chem Res Toxicol.* 2019;32(8):1599-1618 (In equal contribution)
6. Maurya VK, Singh AK, Singh RP, Yadav S, Kumar K, Prakash P, Prasad LB. Synthesis and evaluation of Zn (II) dithiocarbamate complexes as potential antibacterial, antibiofilm, and antitumor agents. *Journal of Coordination Chemistry.* 2019; 72(19-21), 3338-58.

7. Kumar A, Singh AK, Singh AS, **Yadav S**, Prakash P, Tiwari VK. Click inspired synthesis of ptert-butyl calix[4]arene tethered benzotriazolyl dendrimers and their evaluation as anti-bacterial and anti-biofilm agents. *New J. Chem.*, 2020, **44**, 19300-19313. doi: **10.1039/D0NJ02591G**

#### **Papers in Review/Revision or just accepted:**

1. Maurya VK, Singh AK, **Yadav S**, Singh RP, Kumar K, Prakash P, Prasad LB. Synthesis, and Characterization of Ni(II) Dithiocarbamate Complexes as Potential Antibacterial, Antibiofilm Agents acting on the cell membrane. *RSC MedChemComm* (**In Review**)
2. Pratap CB, Singh AK, Singh S, **Yadav S**, Prakash P, Nath G. Irritable Bowel Disease: Gut microbiota, Dysbiosis and Beyond. *World Journal of Gastroenterology* (**In Review**)
3. **Yadav S**, Singh AK, Chakravorty D, Gupta MK. Water soluble curcumin subverts  $\beta$ -lactam resistance and attenuates virulence among Methicillin-Resistant *Staphylococcus aureus* in animal infection model. (**Manuscript under preparation**) (**In equal contribution**)

#### **RESEARCH EXPERIENCE**

Institute of Medical Sciences, Banaras Hindu University, Varanasi, **Junior Research Fellow, Council of Scientific & Industrial Research, Govt. of India, March 2017-June 2019**

Institute of Medical Sciences, Banaras Hindu University, Varanasi, **Senior Research Fellow, Council of Scientific & Industrial Research, Govt. of India, July 2019- November 2020**

Supervisor: Dr. Pradyot Prakash, Professor, Department of Microbiology, IMS, BHU

- Coordinated and designed research experiments regarding biofilm quantification and classification of bacterial isolates under the supervision of Dr. Pradyot Prakash
- Streamlined processes to maximize productivity during critical phases of projects related to Curcumin.
- Perform research on biofilm formation (both for diagnostic and therapeutic) among clinical isolates of pathogenic bacteria especially, *Staphylococcus aureus* and *Klebsiella pneumoniae*. The work mainly include establishment of refined method for optimum biofilm formation as well as quantification, establishment of matrix chemistry assay for selective quantitation of various biofilm matrix components like proteins, sugars, extra polymeric nucleic acids (eDNA), uronic acid and total acetyl content. Further Confocal Laser Scanning Microscopic

(CLSM) evaluation of chemical contents of biofilm matrix, FTIR and NMR Spectroscopy along with proteomic analysis of biofilm matrix and metal homeostasis especially iron, calcium and zinc in bacterial biofilms *vis a vis* planktonic mode and their possible role in immune evasion is also performed.

- To synthesize and fabricate newer antimicrobial agents utilizing the nano and quantum approach.

### **TECHNIQUES UTILIZED DURING RESIDENCY:**

- Performed and analyzed data using tools like:
  - Transmission Electron Microscopy (including HR-TEM)
  - Atomic Force Microscopy (AFM)
  - Zeta potential analyzer
  - Raman Spectroscope
  - Nuclear Magnetic Resonance (NMR) spectroscopy
  - Fourier Transform Infrared Spectroscope including attenuated total reflectance (FTIR-ATR)
  - UV-Vis Spectroscope
  - Fluorescence spectroscope
  - Electron spray ionization mass spectroscope (ESI-MS)
  - High resolution mass spectroscopy (HR-MS)
  - Liquid chromatography mass spectroscope (LC-MS)
  - High performance liquid chromatography (HPLC)
  - Real Time/ Normal PCR
  - SDS-PAGE
  - Circular dichroism (CD)
  - Phase contrast microscopy
  - Confocal Laser Scanning microscopy (CLSM)
  - Isothermal calorimetry (ITC)
  - Single crystal X-ray diffraction performance and analysis (XRD)
  - Immunohistochemistry utilizing Charles Foster strain rats
  - In addition, well trained in synthetic sugar chemistry utilizing “CLICK” i.e. 1, 3-cyclo addition methodology