

CURRICULUM VITAE

Sristy Shikha

Ph.D.

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Language: Hindi, English

OBJECTIVE:

To enhance my working capacities, professional skills and to serve my organization and nation in best possible way with sheer determination and commitment.

PROFESSIONAL EXPERIENCE

Research fellow from Aug 2012 to Aug 2018, CSIR-Institute of Microbial Technology, Chandigarh, India

EDUCATION

Ph.D. Biotechnology (2012-2018)

Affiliation: CSIR-Institute of Microbial Technology, Chandigarh, India (Under Jawaharlal Nehru University, New Delhi, India)

Thesis Title: Studies on Biomolecules Immobilized to Nanoparticles for Bio-applications

Thesis Supervisor: Dr. Mani Shankar Bhattacharyya, Senior Scientist.

ACADEMIC PROFILE

- 2012 to 2018: Doctorate of Philosophy (Ph.D.) from CSIR-Institute of Microbial Technology, affiliated to Jawaharlal Nehru University, New Delhi, India
- 2011-2012: Junior Research Fellow at School of Life Science, Jawaharlal Nehru University, New Delhi
- 2008-2010: Master of Science (M. Sc.) in Marine Biotechnology from CAS in Marine Biology, Annamalai University (CGPA: **8.4/10**)
- 2004-2008: Bachelor of Science (B. Sc. Hons) in Zoology from Magadh University (**65.4%**)
- 2002-2004: XIIth in Science (**75.4%**) from Jawahar Navodaya Vidyalaya, Rewar, Nawada
- 2002: Xth (**78.2%**) from Jawahar Navodaya Vidyalaya, Rewar, Nawada

M.Sc Dissertation: "Innate immune response of Asian Dwarf Catfish *Mystus vittatus* infected with *Aeromonas hydrophilla*"

AWARDS & HONORS

- Awarded with **Best poster Award** at international conference on 'nanomedicine and nanotechnology in health care' held in Melbourne, Australia on 23-24 Nov 2017
- Awarded with Indian Council of Medical Research (ICMR) **International Travel Grant** to attend conference nanomedicine and nanotechnology in health care' held in Melbourne, Australia on 23-24 Nov 2017
- 2014-2017: Senior Research Fellow, Indian Council of Medical research (ICMR), Government of India.
- 2012-2014: Junior Research Fellow, Indian Council of Medical research (ICMR), Government of India.
- 2011: GATE in Life Sciences, **All India Rank 307**, Ministry of Human Resources, Government of India.
- 2011: Junior Research Fellowship, (**All India Rank UGC-53**, Council for Scientific and Industrial Research (CSIR), Government of India.

- Awarded with **ICMR JRF-Fellowship** (awarded only to top 120 students Indian students)
- Project entitled “Isolation and characterization of neutrophil like cell from marine catfish” was selected as **student project** by **TNSCST sponsored by DBT**.
- Secured **All India Rank 191** in CEEB-2008 conducted by JNU sponsored by DBT for admission to the M.Sc. course in Biotechnology
- Awarded with **scholarship for a period of two years (2008-10)** by the Department of Biotechnology, Govt. of India, New Delhi during M.Sc biotechnology at Annamalai University

PEER- REVIEWED JOURNALS PUBLISHED

- **Sristy Shikha**, Saumya Ray Chaudhuri, Mani Shankar Bhattacharyya; Facile one pot greener synthesis of sophorolipid capped gold nanoparticles and its antimicrobial activity having special efficacy against Gram Negative *Vibrio cholera*; Scientific Reports, 10,1463(2020) doi: 10.1038/s41598-019-57399-3, *Impact Factor 4.12*
- **Sristy Shikha**, Krishan Gopal Thakur and Mani Shankar Bhattacharyya; Facile Fabrication of Lipase to Amine Functionalized gold Nanoparticles to Enhance Stability and Activity (RscAdvances, 2017) *Impact Factor 3.1*
- Geeta Gahlawat, **Sristy Shikha**, Baldev Singh Chaddha, Saumya Ray Chaudhuri, Shanmugam Mayilraj, and Anirban Roy Choudhury; Microbial glycolipoprotein-capped silver nanoparticles as emerging antibacterial agents against cholera; Microb Cell Fact. 2016; 15: 25. doi: 10.1186/s12934-016-0422-x, *Impact Factor 4.17*
- **Sristy Shikha**, Vinit Kumar, Ankita Jain, Saumya Ray Chaudhuri, Deepak Dutta, Mani Shankar Bhattacharyya; Elucidation of mechanism of action of AuNPs-SL in *Vibrio cholerae*., (manuscript under preparation)

TRAINING ATTENDED

- A training program on “Different immunological techniques used in visceral leishmaniasis” for 45 days under the guidance of Dr. Sanjiva Bimal at Rajendra Memorial Research Institute of Medical Sciences (ICMR) Agamkuan, Patna, Bihar.
- A training program of 21 days under the guidance of Dr. Mithilesh Kumar on the “Cancer Cell” at Patna Medical College, Patna, Bihar.

CONFERENCES ATTENDED

- Presented poster at international conference “**17th International conference and exhibition on nanomedicine and nanotechnology in health care**” held in Melbourne, Australia on 23-24 Nov 2017
- Presented poster at international conference “**IMTechCon-2017**” held at CSIR-Institute of Microbial Technology, Chandigarh on 4-6 Oct 2017
- An International Conference on “**Bioprocessing India (BPI-2016)**” at Center of Innovative and Applied Bioprocessing (CIAB) Mohali, in 2016
- Attended 2nd **Bio-Club Meet CRIKC** (Chandigarh Region Innovation & Knowledge Cluster) held on April-16, 2015 at IMTECH
- Participated in an International Conference “**NanoSciTech-2014**” organized by Punjab University, Chandigarh in 2015
- Participated in a National symposium on **Biocomputing-2009**, organized by Annamalai University, Chidambaram, in 2009

STRENGTHS:

- Young and energetic with responsibility towards allocated duties
- Versatile and rapid learner according to most recent developments
- Enthusiastic to implement emerging techniques in modern Teaching
- Ability to implement several innovative thoughts
- Ability to motivate the people and to lead a group of resources

EXPERTIZED SKILLS:

Molecular Biology and Biochemistry

Genomic DNA isolation, Polymerase Chain Reaction (PCR), Primer design, Molecular cloning, SDS-PAGE, Western blotting, Real-time quantitative PCR, Agarose gel electrophoresis, DNA/RNA isolation/purification, Plasmid sub-cloning,

Microbiology

Antimicrobial activity by agar diffusion assay, Microdilution assay, XTT assay, SEM & TEM sample preparation and analysis, Membrane Potential measurement, ROS measurement, Live Dead Cell Measurement through FACS, Confocal Microscopy,

Nanotechnology

DLS and Zeta Measurement, TGA, FTIR, XRD, Nanoparticles synthesis from various materials, Nanoparticles fabrication using methods,

Biochemistry

Enzyme Kinetics and dynamics, Stability measurement of enzymes under different Conditions, Enzyme Immobilization through various techniques.

Research Summary

The aim of my Ph.D. work was based on synthesis of various types of nanoparticles and develops their applications. For this, in first objective, I have immobilise lipase on amine functionalized gold nanoparticles (AuNPs-NH₂) to attain enhanced activity and stability. I described confirmation of conjugation (AuNP-NH₂-lipase) that was determined by various techniques such as agarose gel electrophoresis, zeta measurement, FTIR-spectroscopy and TEM. Further, catalytic parameters (V_{max} , $K_{M,app}$, K_{cat} , and $K_{cat}/K_{M,app}$) have been studied to establish activity enhancement upon immobilization. The data also suggested that, AuNP-NH₂-lipase has desirable improved parameters such as temperature and storage stability. The thermodynamic parameters for the kinetics of deactivation (ΔH°_D , ΔS°_D and ΔG°_D) of the AuNP- NH₂-lipase and free lipase demonstrated better stability of the conjugate. I further confirmed the minor structural rearrangement in the enzyme upon conjugation by CD and fluorescence spectroscopic studies.

In second part of work, I synthesized water-soluble gold nanoparticles using sophorolipid (AuNPs-SL) that was characterized by UV-Visible spectroscopy, DLS, zeta potential measurement and TEM. I have analyzed antibacterial activity of the nanoparticles against Gram-positive *Staphylococcus aureus* and Gram-negative *Vibrio Cholerae* using XTT assay, Growth kinetics assay, TEM and SEM. In this study, SEM analysis revealed morphological changes induced by AuNPs-SL such as disruption of cell wall and cell membrane, leakage of intracellular fluid to the surroundings. The efficacy of AuNPs-SL was also investigated against the least metabolically active state of cell i.e., non dividing cells and biofilm of *S. aureus* and *V. cholerae* through XTT assay that also implied its potency for antimicrobial activity. I checked the synergy of AuNPs-SL with different antibiotics using checker board assay. The possible mechanism of action of AuNPs-SL was analyzed by LDH assay that indicated the inhibition of enzyme activity leads the killing of

microbes. These results suggested the possible use of AuNPs-SL as an antimicrobial therapy in the field of nanomedicine.

Since I found interesting results in the earlier chapter therefore I wanted to elucidate the mechanism of action of AuNPs-SL nanoparticles in Gram-negative *Vibrio Cholerae* as a last part of PhD thesis work. In this, stress mediated ROS generation, its consequences effects, i.e., oxidative stress were studied. For this, I measured ROS generation, membrane potential alteration, ATP depletion and extent of DNA damage. These studies were also correlated with the Real time-qPCR with selected genes responsible for above mentioned effects.

REFERENCES:

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DECLARATION

I hereby declare that all the statements, which mentioned above are true, complete and correct to the best of my knowledge and belief.

(Sristy Shikha)