

Dr. Ashwini Chauhan, Ph.D.

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Google scholar profile

<https://scholar.google.co.in/citations?user=bAoGugoAAAAJ&hl=en>

Linkedin Profile

<https://www.linkedin.com/in/ashwini-chauhan-b6297923/>

FUNDINGS

1. UGC-FRP STARTUP 2019-2022 Rs.10 Lakhs

Central Venous Catheter (CVC) associated bacterial biofilm infections: Novel Antibiotic Lock Therapy (ALT) using adjuvants

2. DST/Nanomission 2020-2024 Rs. 89.9 Lakhs

In vivo Central Venous Catheters associated biofilm infections: surface treatment using nanomaterials (NMs) to decrease the thrombotic and infection risks.

3. ICMR 2021-2024 Rs. 56.6 Lakhs

Devising Multi-Characteristic Surface Coatings for Central Venous Catheters to prevent biofilm colonization and associated infections

4. SERB-CRG 2022 - 2024 Rs. 29 Lakhs

*Bacteriophages and their products for controlling the biofilms of drug resistant *Klebsiella pneumoniae**

PROFESSIONAL EXPERIENCE

| From | To | Position | Organization |
|-------------|------------|---------------------|--|
| 11/08/2023 | Present | Associate Professor | University of Delhi South Campus, N. Delhi |
| 12/2017 | 10/08/2023 | Assistant Professor | Tripura University (A central University) |
| 08/2016 | 12/2017 | Associate Professor | NIIT University, Neemrana |

Dr. Ashwini Chauhan, Ph.D.

| | | | |
|---------|----------|--|---|
| 02/2015 | 02/2016 | Chargé de Recherche | Bioaster, Lyon |
| 06/2015 | 02/2015 | Chargé de Recherche | Institute Pasteur, Paris/Sanofi Pasteur, Lyon |
| 06/2012 | 05/ 2014 | Assistant de Recherche | Institute Pasteur, Paris/Sanofi Pasteur, Lyon |
| 10/2008 | 05/2012 | Postdoctoral Researcher | Institute Pasteur, Paris |
| 11/2007 | 08/2008 | Postdoctoral Research Associate | University of Rochester Medical Center, NY, USA |
| 03/2007 | 10/2007 | Postdoctoral Research Associate | University Of Texas Health Science Center, Tyler, TX USA |
| 10/2003 | 02/2007 | Visiting Scientist/PhD Candidate | University Of Texas Health Science Center, Tyler, TX USA |
| 04/2002 | 05/2003 | Junior Research Fellow (CSIR NET JRF) | CSIR-Institute of Integrative Genomics and Biology, Delhi |
| 01/2001 | 03/2002 | Junior Research Fellow (CSIR-Project Fellow) | Gurukul Kangri Vishwavidyalya, Haridwar |
| 06/1998 | 11/1999 | Research Chemist | Ranbaxy Research Ltd., Delhi |

EDUCATION/TRAINING

| From | To | Qualification | Subject | Organisation | Supervisor |
|-------------|-----------|----------------------|----------------|--|--|
| 05/2004 | 05/2007 | PhD | Microbiology | University of Kalyani, West Bengal, India/ Work Place: Health Center at Tyler, University of Texas, USA | Prof. S. Mukherjee (University of Kalyani) / Prof. M. Rajagopalan (University of Texas Health Center at Tyler) |
| 08/1995 | 11/1997 | MSc | Microbiology | Gurukul Kangri Vishwavidyalya, Haridwar | Prof. D.K. Maheshwari |
| 08/1992 | 07/1995 | BSc | Biology | Gurukul Kangri Vishwavidyalya, Haridwar | NA |

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

- **Since 2005:** American Society for Microbiology (ASM), contributing member

PUBLICATIONS

Research Articles

Under Preparation/ Submitted

1. Thermally stable, highly crystalline Cellulose Nanofibrils isolated from novel Lignocellulosic biomass of *G. Tiliifolia* plant barks by a facile mild organic acid hydrolysis. Authors: Rini Thresia Varghese, Reeba Mary Cherian, Tijo Antony, Hanieh Kargarzadeh *, Akshit Malhotra, **Ashwini Chauhan**, Cintil Jose Chirayil *, Sabu Thomas. (Submitted to MDPI-Polymers) **Under Revision**
2. Non-cytotoxic, highly functionalized cellulose nanocrystals with high crystallinity and thermal stability derived from a novel agromass of *Elettaria cardamomum*, using a soft and benign mild oxalic acid hydrolysis. REEBA MARY CHERIAN, Rini Thresia Varghese; Tijo Antony; Akshit Malhotra; Hanieh Kargarzadeh; Suchitra Rajput Chauhan; Ashwini Chauhan; Cintil Jose Chirayil; Sabu Thomas (Submitted to International Journal of Biological Macromolecules) **Under Revision**
3. **Ashwini CHAUHAN***, B. Rokbi and S. Ruiz. UV inactivation of *S. aureus* biofilms for immunization studies.
4. Ankurita bhowmik, Varun Venkatakrisnan, J.M. GHIGO, C. Beloin and **Ashwini CHAUHAN***. *In vivo* antibiofilm activity of N-acetyl cysteine against *S. aureus* in combination with cefazolin.
5. Ankurita Bhowmik, J.M. GHIGO, C. Beloin and **Ashwini Chauhan***. *In vivo* comparative study of heparin and glycerol as anti-coagulating agent and preventive lock solution

6. Akshit Malhotra, Giovanni Mutton, Vincent Semetey and **Ashwini Chauhan***. Coatings for Central Venous Catheters: a comprehensive review.

Published (Total Impact Factor > 250)

1. Malhotra A, Chauhan SR, Rahaman M, Tripathi R, Khanuja M, **Chauhan A**. Phyto-assisted synthesis of zinc oxide nanoparticles for developing antibiofilm surface coatings on central venous catheters. **Front Chem**. 2023 Mar 23;11:1138333. doi: 10.3389/fchem.2023.1138333
2. Successfully treating biofilms of extensively drug resistant *Klebsiella pneumoniae* isolates from hospital patients with N-Acetyl Cysteine. Ankurita Bhowmik, Sambuddha Chakraborty, Anusha Rohit and **Ashwini Chauhan**. bioRxiv
3. F. Stressmann, E. Couvé-Deacon, D. Chainier, **Ashwini Chauhan**, A. Wessel, S. DurandFontanier, M.-C. Escande, I. Kriegel, B. François, M.-C. Ploy, C Beloin, J.-M. Ghigo, Comparative Analysis of Bacterial Community Composition and Structure in Clinically Symptomatic and Asymptomatic Central Venous Catheter., mSphere 2017 Sep 27;2(5). pii: e00146-17. (1)
4. **Ashwini Chauhan**, J.M. Ghigo and C. Beloin. Study of in vivo catheter biofilm infections using pediatric central venous catheter implanted in rat. Nature protocols 2016 Mar; 11(3): 525- 541 (7)
5. Chalabaev, S. **Chauhan Ashwini**, Novikov, A., Iyer, P. Beloin, C. Carroff, M. and J.M. Ghigo. Biofilms formed by Gram-negative bacterial pathogens undergo lipid A palmitoylation increasing their in vivo survival. mBio 2014 Aug 19;5(4):e01116-14. (27)
6. D. Lebeaux, **Ashwini Chauhan**, S. Létoffé, F. Fischer, H. Reuse, C. Beloin and J. M. Ghigo. pH-mediated potentiation of aminoglycosides kills bacterial persisters and eradicates in vivo biofilms. The Journal of Infectious diseases 2014 Nov(1); 210(9):1357-66 (41)
7. **Ashwini Chauhan**, Bernardin, A.; Mussard, W.; Kriegel, I.; Esteve, M. Ghigo, J.M.; Beloin, C. and V. Semetey. In vivo inhibition of bacterial biofilm development on totally implantable venous catheters by biomimetic glycocalyx-like polymers. The Journal of Infectious diseases. 2014 Nov 1;210(9):1347-56 (21)
8. **Chauhan Ashwini**, Sakamoto C, Ghigo J-M, Beloin C (2013) Did I Pick the Right Colony? Pitfalls in the Study of Regulation of the Phase Variable Antigen 43 Adhesin. PLoS ONE 8(9): e73568. (19)
9. **Chauhan, Ashwini** ; D. Lebeaux, J.M. Ghigo, C. Beloin. Full and broad-spectrum eradication of catheter-associated biofilms using gentamicin-EDTA antibiotic lock therapy. Antimicrobial Agents and Chemotherapy, 2012 Dec; 56 (12):6310-8. (63).
10. M. Kiran, **Chauhan Ashwini**, E. Maloney, R. Dziedzic, S. K. Mukherjee, M. Madiraju and M. Rajagopalan. Mycobacterium tuberculosis ftsH expression in response to stress and viability. Tuberculosis. 2009, 89(suppl1) S70-73 (17).
11. M. Kiran, E. Maloney, H. Lofton, **Ashwini Chauhan**, R. Jensen, R. Dziedzic, M. V.V.S. Madiraju and M. Rajagopalan. Mycobacterium tuberculosis FtsZ expression and minimal promoter activity. Tuberculosis, 2009 Dec;89 Suppl 1:S60-4 (9)
12. **Chauhan, Ashwini**, H. Lofton, E. Maloney, J. Moore, M. Fol, M. V.V. S. Madiraju and M. Rajagopalan. Interference of Mycobacterium tuberculosis cell division by Rv2719c, a cell wall hydrolase. Molecular Microbiology. 2006, 62(1); 132-147. (92)
13. M. Fol, **Ashwini Chauhan**, N. K. Nair, E. Maloney, M. Moomey, C. jagannath, M. V. V. S. Madiraju and M. Rajagopalan. Modulation of Mycobacterium tuberculosis proliferation by MtrA, an essential two-component response regulator. Molecular Microbiology. 2006, 60(3); 643-657. (116)
14. **Chauhan, Ashwini**; M. V V S Madiraju, M. Fol, H. Lofton, E. Maloney, R. Reynolds, M. Rajagopalan. Mycobacterium tuberculosis cells growing in macrophages are filamentous and deficient in FtsZ rings. Journal of Bacteriology. 2006 March; 188:1856-65. (137)
15. M. Rajagopalan, E. Maloney, J. Dziadek, M. Poplawska, H. Lofton, **Ashwini Chauhan**, M. V V S Madiraju. Genetic evidence that mycobacterial FtsZ and FtsW proteins interact, and co localize to the division site in Mycobacterium smegmatis. FEMS Microbiol Lett. 2005 Sep 1;250:9-17. (37)

16. M. Rajagopalan, M. A L Atkinson, H. Lofton, **Ashwini Chauhan**, M. V Madiraju Mutations in the GTP-binding and synergy loop domains of Mycobacterium tuberculosis ftsZ compromise its function in vitro and in vivo. *Biochem Biophys Res Commun.* 2005 Jun 17;331:1171. (25)
17. V. C. Kalia, **Ashwini Chauhan**, G. Bhattacharyya & Rashmi. Genomic databases yield novel bioplastic producers. *Nature Biotechnology* 2003, 21, 845 - 846 (63).
18. **Chauhan, Ashwini**; S. Bhatia and D.K. Maheshwari. A preliminary study on decolorization of triphenyl methane dyes by *Coriolus hirsutus*. *Journal of Indian Botanical Society* (2000) 295-297. (0)

Reviews

19. Sambuddha Chakraborty & **Ashwini Chauhan** (2023) Fighting the flu: a brief review on anti-influenza agents, *Biotechnology and Genetic Engineering Reviews*, DOI: [10.1080/02648725.2023.2191081](https://doi.org/10.1080/02648725.2023.2191081).
20. Bhowmik, Ankurita, Phatchada Chunchavacharatorn, Sharanya Bhargav, Akshit Malhotra, Akalya Sendrayakannan, Prashant S. Kharkar, Nilesh Prakash Nirmal, and Ashwini Chauhan. 2022. "Human Milk Oligosaccharides as Potential Antibiofilm Agents: A Review" *Nutrients* 14, no. 23: 5112. <https://doi.org/10.3390/nu14235112>
21. BP Singh, S Ghosh, **A Chauhan**. Development, dynamics and control of antimicrobial-resistant bacterial biofilms: a review. *Environmental Chemistry Letters*, 1-11 (2021)
22. Lebeaux, D. Fernández-Hidalgo, N. **Chauhan, Ashwini**, Lee, S. Ghigo, J.M. Almirante, B. and C. Beloin (2013) Management of totally implantable venous access port-related infections: challenges and perspectives. *Lancet Infect Dis.* 2014 Feb; 14(2):146-59 (78).
23. D. Lebeaux, **Chauhan, Ashwini**, O. Rendueles and C. Beloin. From in vitro to in vivo Models of Bacterial Biofilm-Related Infections. *Pathogens* 2013, 2(2), 288-356 (174).
24. Kalia, V. C.; Lal, S.; Ghai, R.; Mandal, M.; **Chauhan, Ashwini**. Mining genomic databases to identify novel hydrogen producers *Trends in Biotechnology*. 2003 Vol. 21 (4). (65) **Book Chapter(s)** Kalia VC, Lal S, Rashmi, Chauhan Ashwini, Bhattacharyya G. In silico reconstitution of novel routes for microbial plastic *Microbial Factories: Biofuels, Waste Treatment: volume 2* Springer Ltd. 2015. pp 299-315 Online ISBN 978-81-322-2595-9

Book Chapters

1. Tripathi, R., Malhotra, A., **Chauhan, A.**, Chauhan, S.R. (2023). Biopolymers: Building Blocks for the Synthesis of Advanced Materials. In: Thomas, S., AR, A., Jose Chirayil, C., Thomas, B. (eds) *Handbook of Biopolymers*. Springer, Singapore. https://doi.org/10.1007/978-981-16-6603-2_49-1
2. Sambuddha Chakraborty, **Ashwini Chauhan**, Chapter 11 - Anti-influenza agents, *Viral Infections and Antiviral Therapies*, Academic Press, 2023, Pages 211-239, ISBN 9780323918145, <https://doi.org/10.1016/B978-0-323-91814-5.00006-4>.
3. Ankurita Bhowmik, Sangita Jana, Arunima Bhattacharjee, Tushar Kanti Dutta, **Ashwini Chauhan**, Chapter 9 - *Escherichia coli* biofilms, In *Developments in Applied Microbiology and Biotechnology, Application of Biofilms in Applied Microbiology*, Academic Press, 2022, Pages 153-171, ISBN 9780323905138, <https://doi.org/10.1016/B978-0-323-90513-8.00008-X.T>
4. Bhowmik A., Malhotra A., Jana S., **Chauhan A.** (2021) Biofilm Formation and Pathogenesis. In: Nag M., Lahiri D. (eds) *Analytical Methodologies for Biofilm Research*. Springer Protocols Handbooks. Springer, New York, NY. https://doi.org/10.1007/978-1-0716-1378-8_1
5. Brij Pal Singh, Sougata Ghosh, **Ashwini Chauhan**. Control of Bacterial Biofilms for Mitigating Antimicrobial Resistance. Accepted, springers Ltd. 2020
6. Kalia VC, Lal S, Rashmi, **Chauhan Ashwini**, Bhattacharyya G. In silico reconstitution of novel routes for microbial plastic *Microbial Factories: Biofuels, Waste Treatment: volume 2* Springer Ltd. 2015. pp 299-315 Online ISBN 978-81-322-2595-9

PROGRESSIONAL DEVELOPMENT OF MY CAREER

Assistant Professor - Department of Microbiology, Tripura University **Dec 2017 - Present**

Research Focus and Responsibilities:

Teaching M.Sc. students

In charge, Departmental Journal Club

Training and mentoring M.Sc. students (1yr research project;)

Research focus: Understanding Biofilms using animals, Biofilm-immune system interactions. Anti-biofilm strategies.

Associate Professor - Area of Biotechnology and Bioinformatics, NIIT University **August 2016- Dec 2017**

Research Focus and Responsibilities:

Teaching B.Tech students

Member of Academic council and communication workshop

Research focus: Understanding Biofilms using animals, Biofilm-immune system interactions. Anti-biofilm strategies.

Training and mentoring B.Tech students (15 months research project; 4 students)

Key Achievements:

Mentored Mr. Harshit Jindal, Class 12th 2017-18 to represent his school at India's Largest pre-college National Science Fair (Intel-IRIS 2017). He won GOLD MEDAL and represented Team India at Intel-ISEF 2018 (USA).

Lab student Ms. Yagika Kaushik won Second prize for Poster presentation at ETAMS 2018

Chargé de Recherche – R & NCS (Discovery) Sanofi Pasteur / Institute Pasteur / Bioaster, France
Oct 2013 – 2016

Research Focus and Responsibilities:

Anti-biofilm strategies (Vaccines and Drug Targets: Discovery and Preclinical) Carrying out experimental designs, data analysis and presentations.

Managing and training a team of 7-8 scientists. Interdisciplinary collaborations

Writing scientific reports and papers for journals based on observations and experiments.

Key Achievements:

Preclinical demonstration of potential of UV inactivated *S. aureus* whole cells obtained from *in vivo* biofilms as vaccine candidate against Staphylococcus infections using clinically relevant *in vivo* central venous catheter model.

Demonstrated the role of specific immune cells in central venous implant associated *S. aureus* biofilm colonization and infections using a preclinical animal model.

Preclinical evaluation of *S. aureus* anti-persister molecules in collaboration with chemists.

Postdoctoral Researcher - Genetics of Biofilms Unit, Institute Pasteur, France **Oct 2008 – Oct 2013**

Research Focus and Responsibilities:

Creation and management of original R&D project: Medical device associated complications (infections and thrombosis) and associated mechanisms. Development of preclinical animal

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model to study biofilm mechanisms and anti-biofilm strategies.

Animal study protocol development and approval.

Responsible for the scientific communication, oral/written, at international level Training PhD students and technicians.

Stock and budget management

Key Achievements:

Developed a clinically relevant animal model to screen anti-biofilm compounds and anti-biofilm vaccines. Technology transferred to Sanofi Pasteur, France.

Successfully conducted pre-clinical evaluation of novel approaches to treat persist bacterial cells grown on medical devices — currently under clinical trial in Hospital Neckar (in collaboration with Dr. David Lebeaux)

Evaluated the preventive efficacy of methylcellulose coatings on commercial central venous catheter using implant animal model in collaboration with Institute Curie, Paris, France.

Postdoctoral Researcher, Dept. of Pulmonary Research, University of Rochester Medical Centre, NY, USA **Nov 2007 – Aug 2008**

Research Focus and Responsibilities:

Creation and management of original R&D project: *Investigating the role of oxidative stress and Nrf2 in regulation of innate immune response and pathogenesis of major obstructive lung diseases such as COPD and Asthma.*

Visiting Scientist / PhD Candidate Biomedical Research Centre, UTHCT, Tyler, TX, USA **Oct 2003 – Oct 2007**

Research Focus and Responsibilities:

Creation and management projects: *Conducting studies on cell division of Mycobacterium tuberculosis using molecular and biochemical approaches*

Responsible for the scientific communication, oral/written, at international level

Representing the team in national & international medical/scientific conferences Training & supervision of technical & scientific personnel

Key Achievements:

Constructed and characterized an FtsZ-gfp fusion protein strain to study the *Mycobacterium tuberculosis* FtsZ (important drug target) inhibitors developed by collaborators at SRI, Alabama, USA.

Demonstrated that ChiZ (Rv2719) is a hydrolase that inhibits FtsZ in *Mycobacterium tuberculosis* using molecular and biochemical techniques. Work carried out in BSL3 laboratory

Showed FtsH is a protease that degrades the cell division protein ftsZ in *Mycobacterium tuberculosis*. Obtained PhD degree.

SCIENTIFIC MEETINGS

2021

1. Antibacterial Efficacy of ZnO NMs against *S. aureus*. Virtual Conference on emerging Trends in Applied Sciences, ETAS 2021 2021-10-28

2. Treating Multidrug resistant *Klebsiella pneumoniae* biofilms with weak Protic acids: An Alternative to antibiotics. Virtual Conference on emerging Trends in Applied Sciences, ETAS 2021 2021-10-28
3. Central Venous Catheter Associated Biofilm infections: Eradication Strategies. NBIC-IBS online Webinar. 2021-09-12

2020

1. Central Venous Catheter associated-biofilm infections: Eradication Strategies. NBIC and India Biofilms Society Symposia. **(Oral Talk)**
2. **Surface modifications of Central Venous Catheters to inhibit bacterial biofilm infections.** National Conference on Emerging Trends in Applied Materials Science and Surface Engineering-2, BML Munjal University, Gurgaon, India. **(Invited Speaker)**.
3. Biosafe $Ni_{1-x}Zn_xFe_2O_4$ ($x = 0, 0.5$ and 1) nanoparticle based gas sensors for diagnosis of medically relevant biofilms. National Conference on Emerging Trends in Applied Materials Science and Surface Engineering-2, BML Munjal University, Gurgaon, India. **(Poster Presentation)**
4. Treatment of sewage water from different sites in Agartala using ZnO nanoparticles. National Conference on Emerging Trends in Applied Materials Science and Surface Engineering-2, BML Munjal University, Gurgaon, India. **(Poster Presentation)**

2019

1. Evaluation Of Anti-Biofilm Efficacy Of ZnO-Nano Rods (ZnO-NRs). Nano-India/DST 2019. Kottayam, Kerala. **(Poster Presentation)**

2018

1. Anti-biofilm efficacy of N-acetyl Cystiene (NAC) is pH-dependent. 8th ASM-Biofilm Conference 2018, Washington DC *(Poster Presentation)*
2. Surface Modifications to prevent biofilm associated infections on medical devices. National Conference on Emerging Trends in Applied Materials Science and Surface Engineering, BML Munjal University, Gurgaon, India. **(Invited Speaker)**.
3. Antibiofilm Activity of ZnO nanoparticles. National Conference on Emerging Trends in Applied Materials Science and Surface Engineering, BML Munjal University, Gurgaon, India. **(Poster Presentation)**
4. Biosafety evaluation of $Ni_{1-x}Zn_xFe_2O_4$ ($x = 0, 0.5$ and 1) nanoparticle gas sensors. National Conference on Emerging Trends in Applied Materials Science and Surface Engineering, BML Munjal University, Gurgaon, India. **(Poster Presentation)**

2014

International conference. ICAAC. Washington DC, USA **(Attended)**

2014

ASM -Biofilms 7. Chicago, USA **(Attended)**

2013

1. Fighting catheter-associated biofilms by antibiotic locks and surface treatment. The Stevens Conference: The 2nd conference on Bacteria-Materials interactions. NJ, USA **(Oral Presentation)**

2012

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1. Eradication of in vivo catheter-associated biofilm infection using gentamicin-EDTA lock therapy. 6th ASM-Biofilms meeting, Miami, USA (**Poster Presentation**)

2011

1. Modelling of controlled biofilm infection-using rats with totally implantable Port access intravenous cathéter. 21st ECCMID and 27th ICC, Milan Italy (**Oral Presentation**)
2. In vivo modelling of Biofilm infection using Totally Implantable Port-Access intravenous catheters. Journées Départementales, Saint Malo, France (**Oral Presentation**)
3. Modeling of controlled long-term biofilm infection-using rats with totally implantable Port access intravenous catheter. Gordon Research Conferences, Boston, USA (**Poster Presentation**)

2010

1. Development of in vivo rat model of controlled biofilm infection. Aères Evaluation, Institut Pasteur, Paris France (**Oral Presentation**)
2. Development of in vivo rat model of controlled biofilm infection in implantable portaccess intravenous catheters. Biofilm 4 International Conference, Winchester UK (**Poster Presentation**)
3. Development of in vivo rat model of controlled biofilm infection in implantable PortAccess Intravenous Catheter. Journées Départementales, Paris, France (**Poster Presentation**)

2009

1. Nrf2 inhibits Lipopolysaccharide-induced IL6 secretion in RAW macrophage cell line. American Thoracic Society 2009 International Conference, May 15-20 2009 San Diego, California; 04/2009 (**Poster Presentation**)

2006

1. Characterization of a cell division inhibitor from Mycobacterium tuberculosis. International Conference, American Society of Microbiology, Florida, USA (**Poster Presentation**)
2. Modulation of Mycobacterium tuberculosis proliferation by MtrA, a two-component response regulator. International Conference, American Society of Microbiology, Florida, USA (**Poster Presentation**)
3. Cell division inhibition in Mycobacterium tuberculosis. International Conference, American Society of Microbiology, Florida, USA (**Poster Presentation**)

2005

1. Mycobacterium tuberculosis FtsZ: Promoter analysis and visualization of FtsZ-GFP structures in M. tuberculosis. International Conference, American Society of Microbiology, Atlanta, USA (**Poster Presentation**)
2. Genetic evidence that mycobacterial FtsZ and FtsW proteins interact, and colocalize to the division site. Keystone Tuberculosis Meeting, Whistler, Canada. (**Poster Presentation**)

2001

1. Studies on degradation of Tri-phenyl methane dyes by Fungus: Coriolus hirsutus. All India Association of Botany, Hyderabad, India (**Oral Presentation**)