

Karishma S Kaushik, M.B.B.S., M.D., Ph.D.

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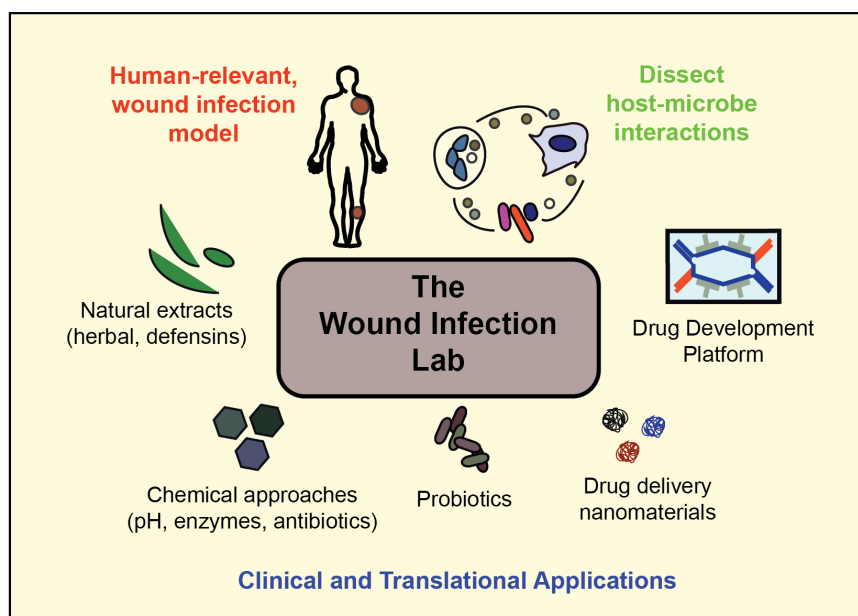
EDUCATION AND WORK EXPERIENCE

- 2018-till date **Assistant Professor**
Ramalingaswami Re-entry Fellow, DBT
Institute of Bioinformatics and Biotechnology
Savitribai Phule Pune University, Pune, India
- 2016-2018 **Assistant Professor of Instruction**
Biology Instructional Office (BIO)
University of Texas at Austin, USA
- 2010-2015 **Ph.D., Molecular Genetics and Microbiology**
Department of Molecular Biosciences
University of Texas at Austin, USA
- 2005-2008 **M.D., Clinical Microbiology**
Armed Forces Medical College, University of Pune, India
- 1999-2005 **M.B.B.S.**
Maharashtra University of Health Sciences

RESEARCH GROUP – The Wound Infection Lab

Lab Webpage: <https://www.karishmakaushiklab.com/>

The Wound Infection Lab studies the complex chronic wound infection microenvironment, to enable precision based and personalized therapeutic approaches.



CURRENT RESEARCH AREAS

1. Developing human-relevant, *in vitro*, biomimetic models of chronic wound infections for clinical and translational applications

Using a combination of bioengineering, microengineering, microscopy, cell and microbial culture, our research focuses on recapitulating the key elements of the chronic wound infection state in an *in vitro* platform. This platform will provide insights into the dynamic wound infection microenvironment and will be leveraged to develop diagnostic and therapeutic approaches for chronic wound infections.

This project is funded by the **Ramalingaswami Re-entry Fellowship**, Department of Biotechnology, Government of India (**INR:1,03,60,000**) for 5 years.

2. Dissecting host-microbial dynamics in chronic wound infection microenvironment, with special reference to immune cell function

Using an *in vitro*, biomimetic model of the chronic wound-bed capillary interface, our research will employ advanced NGS-based transcriptomics to study immune cell (such as neutrophils and macrophages) signaling and expression, under selective and precise conditions of the chronic wound infection state. This will provide invaluable insights into immune cell functioning and potential therapeutics in the chronic wound infection state.

3. Long-term characterization of microbial populations from patients with chronic wound infection states

We are starting a research project that focuses on long-term phenotypic, metagenomic and molecular characterization of microbial populations from patients with chronic wound infections.

4. Phenotypic and genotypic characterization of bacterial and host cellular behavior in an artificial chronic wound exudate fluid

We aim to use LC-MS approaches to study the composition of chronic wound infection exudates, and will develop an artificial wound exudate fluid to enable the realistic study of bacterial and host cellular behavior in this environment.

CURRENT LAB MEMBERS:

Research Assistants – Snehal Kadam, Vandana M

Masters' Students – Rutuja Ugale, Utkarsha Tikhole (University of Pune), Devyani Bhide (Garware College)

Undergraduates – Janhavi Lele, Shivani S, Pratiksha M, Savani Nadkarni, Ayushi K, Anushree Kelkar (Garware College), Saptarshi Sai, Aditi Shahane (Pune College of Pharmacy), Jay Panchpor (MIT College of Engineering), Niharika Jadeja (UC Berkeley)

Dr. Anuradha Bandgar – Ayurveda practitioner, Pune (formerly with Seth Tarachand Ramnath Hospital, Pune)

FELLOWSHIPS

- 2016 ASM-LINK Undergraduate Faculty Research Initiative (UFRI) Fellowship (**\$2000**), American Society for Microbiology (ASM) to attend ASM Microbe 2017, New Orleans.
- 2015 Microbiology Summer Merit Award (**\$7564**), University of Texas at Austin, USA
- 2014 Graduate School Continuing Fellowship (**\$1000**), University of Texas at Austin
- 2010 Graduate School Recruitment Fellowship (**\$28,000**), University of Texas at Austin
- 2008 Young Science Scholar (**INR: 50,000**), Ranbaxy Science Foundation, India
- 2008 Senior Research Fellowship (**INR: 100,000**), Indian Council of Medical Research
- 2005 Thesis Development Scholarship (**INR: 25,000**), Indian Council of Medical Research

AWARDS

- 2017 European Society for Clinical Microbiology and Infectious Diseases (ESCMID) Observership, May 10-24, 2017, Rigshospitalet, Copenhagen, Denmark (**€1700**)
- 2016 Registration and Travel Award, Gordon Research Conference on Drug Resistance, June 12th-16th, University of New England, Biddeford, Maine, USA (**\$1505**)
- 2015 Early-Career Faculty Travel Award, American Society for Microbiology Conference for Undergraduate Educators' (ASMCUE), May 28th-31st, 2015, Austin, USA (**\$750**)
- 2014 Best Poster Award (Second Place), Procter & Gamble Poster Competition, University of Texas at Austin (**\$500**)
- 2014 Outstanding Teaching Award, Biology Instructional Office, UT Austin (**\$1000**)
- 2012/14 Professional Development Award, University of Texas at Austin (**\$1000 each year**)
- 2014 Charlie Guantt Award (Best Oral Presentation), American Society for Microbiology, Texas Branch Spring Meeting, New Braunfels, USA (**\$100**)
- 2013 Best Poster (Life Sciences), College of Science Research Conference, University of Texas at San Antonio, USA
- 2006 Domestic Training Award, 1-week training with Japanese International Co-operative Agency, Government of Japan & National Institute of Cholera and Enteric Diseases, Kolkata, India (**INR: 50,000**)
- 2006 Junior Best Paper Gold Medal, Indian Association of Medical Microbiologists', 30th National Conference, Nagpur, India
- 2004 Best Medical Student (University Gold Medal), Maharashtra University of Health Sciences, India

PUBLICATIONS

1. **Kaushik K.** Defining the path of a physician-scientist (2019). *Nature Medicine* 25, 867.
2. Kadam S, Shai S, Shahane A, **Kaushik K** (2019). Recent advances in non-conventional antimicrobial approaches for chronic wound biofilms: Have we found the 'chink in the armor'? *Biomedicines* 7(2), 35.
3. Franco-Duarte R, Černáková L, Kadam S, **Kaushik K**, et al (2019). Advances in chemical and biological methods to identify microorganisms – from past to present. *Microorganisms* 7(5), 130.
4. **Kaushik K**, Kadam S (2018). Abandon or Administer? Moving Beyond Oversimplified Approaches and Developing Strategies that Target the Composite Infected Wound Microecosystem. Letter to the Editor. *Wounds* 31(1).
5. Hutchison J, **Kaushik K**, Lilleholm T, Bakhtiari L, Gordon VD (2018). Increased production of the extracellular polysaccharide Psl can give a growth advantage to *Pseudomonas aeruginosa* in low-iron conditions (under review).
6. **Kaushik K**, Stolhandske J, Shindell O, Smyth H, Gordon VD (2016). Tobramycin and Bicarbonate synergize to kill planktonic *Pseudomonas aeruginosa*, but antagonize to promote biofilm survival. *npj Biofilms and Microbiomes* 2: 16006.
7. **Kaushik K**, Ratnayeke N, Katira P, Gordon VD (2015). The spatial profiles and metabolic capabilities of microbial populations impact the growth of antibiotic-resistant mutants. *J R Soc Interface* 12: 20150018.
8. **Kaushik K**, Kessel A, Ratnayeke N, Gordon VD (2015). A low-cost, hands-on module to characterize antimicrobial compounds using an interdisciplinary, biophysical approach. *PLOS Biol* 13(1): e1002044.
9. Hutchison J, Rodesney C, **Kaushik K**, Le H, Hurwitz D, Irie Y, Gordon VD (2014). Single-cell control of initial spatial structure in biofilm development using laser trapping. *Langmuir* 30: 4522-4530.
10. **Kaushik K**, Kapila K, Chumber SK (2013). Photo Quiz: Lady in Red. *J Clin Microbiol* 51: 3915.
11. **Kaushik K**, Kapila K, Praharaj AK (2011). Shooting Up: The interface of microbial infections and drug abuse. *J Med Microbiol* 60: 408-422.
12. **Kaushik K**, Kapila K (2009). Women in Medical Microbiology: Reflections on contributions. *Indian J Med Microbiol* 27: 285-288.
13. **Kaushik K**, Kapila K (2009). Laboratory microbiology to clinical microbiology: Are we ready for the transition? *Indian J Med Microbiol* 27: 378-379.
14. **Kaushik K**, Lahiri KK, Chumber SK, et al (2008). Molecular characterization of clinical varicella-zoster strains from India and differentiation from the Oka vaccine strain. *Jpn J Infect Dis* 61: 65-67.

15. **Kaushik K**, Lahiri KK, Kumar S, et al (2008). Differentiation of wild-type varicella- zoster strains from India and the Oka vaccine strain using a VZV ORF-62 based PCR-RFLP Technique. *Braz J Infect Dis* 12: 313-315.
16. **Kaushik K**, Kumar S, Kapila K, et al (2007). Tuberculous brain abscess in a patient with HIV infection. *Indian J Tuberc* 54: 196-198.
17. Chumber SK, **Kaushik K**, Savy S (2007). Bacteriological profile of street foods in Pune. *Indian J Pub Health* 51.

Front-cover Illustrations

Kaushik K, Kapila K, Chumber SK (2013). *J Clin Microbiol* 51.

Kaushik K, Kapila K (2009). *J Med Microbiol* 58(7).

Kaushik K, Kapila K (2008). *J Med Microbiol* 57(4).

CONFERENCES / WORKSHOPS

1. Young Investigators' Meeting, IndiaBioscience, Guwahati, Assam, March 6th-10th, 2019.
2. 10th Ramalingaswami Conclave, Central Brain Research Institute, Haryana, April 28th-May 1st, 2019.
3. CURATOR Cell Culture Workshop, Chest Research Foundation, Pune, Sept 7-8th, 2018.
4. Poster Presentation, Gordon Research Conference on Drug Resistance, University of New England, Biddeford, Maine, USA, June 12th-16th, 2016.
5. Poster Presentation, ASM Microbe, Boston, USA, June 16th-20th, 2016.
6. Microbrew (Oral) Presentation, American Society for Microbiology Conference for Undergraduate Educators' (ASMCUE), Austin, May 30, 2015.
7. Poster Presentation, ASM Texas Branch Spring Meeting, New Braunfels, USA, April 4, 2014.
8. Kaushik K, Ratnayeke N, Katira P, Gordon VD. Poster Presentation, ASM Annual Meeting, Boston, USA, May 20, 2014
9. Kaushik K, Ratnayeke N, Katira P, Gordon VD. Poster Presentation, College of Science Research Conference, University of Texas San Antonio, October 18, 2013.
10. Kaushik K, Hutchison E, Gordon VD. Poster Presentation, ASM Annual Meeting, San Francisco, USA, June 18, 2012.
11. Kaushik K, Lahiri KK, Kapila K. Poster Presentation, Asia-Pacific Congress of Medical Virology, New Delhi, India, November, 2007
12. Kaushik K, Lahiri KK, Kapila K. Oral Presentation, Indian Association of Medical Microbiologists', 30th National Conference, Nagpur, India, October 2007.

TEACHING EXPERIENCE

Assistant Professor of Instruction, University of Texas at Austin

Spring 2016 - Spring 2018

General Microbiology Lab (BIO226L)

Teaching Assistant, University of Texas at Austin

Spring 2015 Public Health Bacteriology Lab (BIO361L)

Fall 2014 Introduction to Genetics (BIO315H)

Summer 2014 Human Infectious Diseases (BIO361)

Spring 2014 Public Health Bacteriology Lab (BIO361L)

Fall 2013 Introduction to Genetics (BIO315H)

Summer 2013 Advanced Genetics (BIO344)

Spring 2012 General Microbiology (BIO326R)

Fall 2011 Molecules to Organisms (BIO301L)

MENTORING EXPERIENCE

2011-2016 Research mentor for undergraduates - Thomas Lilleholm, Parth Patel, Jake Stolhandske, Ashley Kessel, Nalin Ratnayake, Ellen Hutchison, and Amber Doyle, and graduate student – Layla Bakhtiari, Departments of Physics and Biomedical Engineering, Vernita Gordon laboratory, University of Texas at Austin.

2013-2014 Undergraduate research mentor for Vanessa Neutzler, McNair's Scholars' Program, St. Edward's University, Austin.

2011 High-school mentor for Archana Jeeji, Alice in Wonderland Program, Department of Physics, University of Texas at Austin.

2008 Graduate student mentor for Soumya Savy (M.Sc.) and Harleen Kaur (M.Ed.), Armed Forces Medical College, Pune, India

INVITED TALKS AND SEMINAR PRESENTATIONS

1. Chronic Wound Infections. M.E.S. Abasaheb Garware College, Pune, July 2018.
2. Molecular Microbiology for the undergraduate student. UT Austin, March 2018.
3. Spanning the divide from Clinical Microbiology to Basic Microbiology. Bharati Vidyapeeth Medical College, Pune, India, November 2016.
4. Overcoming antibiotic resistance in microbial populations: an interdisciplinary perspective. CSIR-Institute for Genomics and Integrative Biology, New Delhi, India, November 2015.

5. Overcoming antibiotic resistance in microbial populations: an interdisciplinary perspective. Indian Council of Medical Research, New Delhi, India, November 2015.
6. A low-cost, hands-on module to characterize antimicrobial compounds using an interdisciplinary, biophysical approach. Texas ASM Spring Meeting, USA, March 2015.
7. The Role of Aggregates in *Pseudomonas aeruginosa* Biofilm Formation. Seminar, Center for Non Linear Dynamics, University of Texas at Austin, March 2016.
8. A biophysical approach to novel therapeutic strategies: Evaluating the potential of tobramycin and bicarbonate in combination against *Pseudomonas aeruginosa*. Seminar, Center for Non Linear Dynamics, University of Texas at Austin, April 2015.
9. The impact of microbial population structure on antibiotic resistance. Seminar, Center for Non Linear Dynamics, University of Texas at Austin, April 2014.
10. The effect of population structure on the survival and growth of antibiotic-resistant mutants of *Pseudomonas aeruginosa*. Seminar, Center for Non Linear Dynamics, University of Texas at Austin, April 2013.
11. The role of spatial structure in the evolution of antibiotic resistance. Seminar, Center for Non Linear Dynamics, University of Texas at Austin, February 2013.

SCIENCE OUTREACH AND COMMUNITY SERVICE

1. Antibiotic Resistance for the general public. The LOFT Forum, Pune, December 2017.
2. Invited Speaker, 'Present your Ph.D. thesis to a 12-year old', Thinkery Museum, Austin as part of University of Texas at Austin Science Outreach Program, February 2016.
3. Science Demonstrator, Alice in Wonderland Program, Department of Physics, University of Texas at Austin, 2013 and 2015.
4. Assistant instructor at the Hands-On Research School in Complex Systems, International Centre for Theoretical Physics, Trieste, Italy, June 30th – July 12th 2014.
5. Judge, Annual Science Fair (3rd -5th grade), UT Elementary School, Austin, January 2014.
6. Panelist, "Preparing for graduate school", McNair's Scholars Program for minority undergraduates, St. Edward's University, Austin, November 2013.
7. Host, talk show on "HIV/AIDS awareness among Indian youth", BBC India, World AIDS Day, December 1st, 2004.

POPULAR SCIENCE ARTICLES

1. Kadam S, Kaushik K. Tweet, Post, Share, Like: How is social media shaping Indian science? IndiaBioscience, June 2019. (<https://indiabioscience.org/columns/indian-scenario/tweet-post-share-like-how-is-social-media-shaping-indian-science>)
2. Kaushik K. Turning Dreams to Reality. A Young Scientists' 'Return to India' journey. IndiaBioscience, December 2018. (<https://indiabioscience.org/columns/journey-of-a-yi/dreams-to-reality-a-young-scientists-return-to-india>)
3. Kaushik K. From India to the US, and maybe back again: the journey of a physician-scientist. BioMed Central Blog Network, July 2015 (<http://blogs.biomedcentral.com/on-medicine/2015/07/23/india-us-maybe-back-journey-physician-scientist/>).
4. Kaushik K. Journey of a physician-scientist: The professional full circle. BioMed Central Blog Network, Jan 2016 (<http://blogs.biomedcentral.com/on-medicine/2016/01/19/journey-physician-scientist-professional-full-circle/>).

PROFESSIONAL SOCIETIES AND AFFILIATIONS

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| 2006-Present | Life member, Indian Association of Medical Microbiologists' (IAMM) |
| 2008-Present | Member, American Society for Microbiology (ASM) |
| 2016-Present | Young Member, European Society for Clinical Microbiology and Infectious Diseases (ESCMID) |
| 2014-Present | Ad-hoc reviewer: Journal of Clinical Microbiology (ASM), PLoS One, Journal of Cystic Fibrosis, Antimicrobial Agents and Chemotherapy |