

Department of Biological Sciences
University of Texas at El Paso
Texas, USA

PROFESSIONAL POSITIONS

2020- Assistant Professor, University of Texas at El Paso (UTEP), Texas, USA
2017-2019 Adjunct Assistant Professor, City University of New York, New York, USA.
2016-2019 Associate (Faculty), Albert Einstein College of Medicine, New York, USA.
2012-2015 Research Fellow, Howard Hughes Medical Institute & Albert Einstein College of Medicine, New York, USA.
2009-2011 Associate Research Scientist, Section of Microbial Pathogenesis, Yale University, School of Medicine, New Haven, CT
2006-2008 Postdoctoral Fellow, Section of Microbial Pathogenesis, Yale University, School of Medicine, New Haven, CT
1999-2005 Ph.D., Institute of Microbial Technology (CSIR), Jawaharlal Nehru University, New Delhi, India

RESEARCH INTERESTS

Bacterial Pathogenesis (*Mycobacterium tuberculosis (Mtb)*) and Vaccines.
Host-pathogen interactions.
Tuberculosis Drug Discovery.

FUNDING/ HONORS/ AWARDS

- Rising STAR award from University of Texas (2020)
- Invited Keystone speaker at EBVC-2020 conference 2020, India.
- Invited speaker and travel award for a World Vaccine and Immunotherapy Congress West Coast 2019, San Francisco.
- Invited speaker at collaborative meeting between University of Texas at El Paso and Texas Tech University at El Paso (2019).
- Invited speaker at University of Texas at El Paso (2018).
- Human Challenge grant from Bill and Melinda gates foundation 2017-2019.
- Invited speaker and travel award for international conference on Vaccine, San Diego, Nov 28-30 (2018)
- William R. Jacobs Jr. award for active participation in research in the Department of Microbiology and immunology, Albert Einstein college of Medicine (2018)
- Reviewer for Journal of Archives of Microbiology (2018-present), Journal of Acquired Immune Deficiency Syndromes (2012- Present), Journal of cellular and Molecular medicine (2018-present), PNAS (2018-present).
- Member of editorial board for Insights in chest diseases (2017-) and Current trends in Vaccines and Vaccinology (2017-)
- Associate Editor for International journal for Vaccines and Vaccination (2017-present).
- Primary peer reviewer for Medical Research Council (MRC) funding (2017)
- Invited speaker at City University New York, Lehman College, Biological sciences research seminar (2017).
- Travel award for 3rd annual CTVD meeting 21-23 June 2017.
- Invited speaker for Microbial Pathogenesis conference, Toronto, Canada 2017.

- Invited speaker at Institute of Microbial Technology, a top ranking CSIR Institute, Chandigarh, India, (2015).
- Council of Scientific and Industrial Research predoctoral fellowship, India (2002-2005).
- Council of Scientific and Industrial Research predoctoral fellowship, India (1999-2001).
- Academic excellence fellowship by Government of India for undergraduate and Masters education (1996-1998).
- University Academic excellence award for outstanding performance in Masters, GNDU, India (1998).
- University Academic excellence award for outstanding performance in undergraduate, GNDU, India (1994-1996).

RESEARCH EXPERIENCE

2020- **Tenure-track** Assistant Professor, UTEP.

Roles and Responsibilities:

- Supervise undergraduate, graduate students and postdoctoral fellows.
- Manage lab projects
- Grant writing and submissions.

Research: TB chemotherapy, Vaccines and host-pathogen interactions

- Drug discovery against *Mtb* by targeting arginine biosynthesis.
- New potential Vaccines against *Mtb* alone or in combination with BCG
- Cancer immunotherapy

2012- 2019 **Associate (Faculty)**, Albert Einstein College of Medicine.

Advisor: Dr. W.R. Jacobs Jr. (National Academy of Sciences Member)

Roles and Responsibilities:

- Initiate, develop and manage multi organizational TB projects
- Represent AECOM vaccine group at vaccine meetings and conferences.
- Edit and provide Critiques for several federal or private grants.
- Writing RO1 and R21 NIH grants. In first attempt RO1 got reviewed.
- Mentor postdoctoral fellows, graduate, undergraduate and high school students.

Research: TB chemotherapy, Vaccines and host-pathogen interactions

- Generation of null deletion mutant sets with barcodes to shorten chemotherapy by Identification of novel potential drug targets essential for *in vivo* survival of *Mtb* and other Nontuberculous mycobacteria. Understanding of the mechanisms of sterilization of *Mtb* by above discovered pathways/genes.
- Generation of null deletion mutants to generate potential new vaccine candidates
- Identification of novel mycobacterial factors involved in virulence and evasion of host immune responses to design effective vaccines and host directed therapies.
- Utilization of attenuated recombinant mycobacterial vectors to express antigens to generate AIDS and Malaria vaccines.

2005- 2011 **Postdoctoral fellow and Research Associate Scientist**, Howard Hughes Medical Institute, Yale University. Advisor: Dr. J.D. MacMicking

Research and Roles: "Understanding of IFN- γ inducible innate immune mechanisms against intracellular Pathogens", a step towards host directed therapy against *Mtb* and other intracellular pathogens.

- Investigation of the mechanism of Immunity related GTPases in regulating host defense

processes involved in the control of vacuolar pathogens like *Mycobacterium tuberculosis* (*Mtb*), *Listeria* and *Salmonella*.

- Dissection of role of Immunity related GTPases in antigen presentation by a novel pathway involving organelle “lipid bodies”.
- Initiated, developed and managed projects.

1999-2005 **Ph.D. fellow**, Institute of Microbial Technology, Council Of Scientific & Industrial Research (CSIR) & Jawaharlal Nehru University, New Delhi, India. Advisor: Dr. Pradip K. Chakraborti

Research: “Molecular and biochemical characterization of Mycobacterial virulence factor “Nucleoside Diphosphate Kinase (mNdk)”

- Elucidated the molecular and biochemical properties of mNdk
- Structure-function analysis and Genetic studies to elucidate the effect of mutations on the functionality of mNdk by disruption of Ndk in *Pseudomonas aeruginosa* and complementation using mNdk and its mutants.
- Functional dissection to study role of mNdk in virulence of *M.tb* by its disruption in mycobacteria and assessment of its effect on macrophages.

PUBLICATIONS

1. **Tiwari S***, Dutt T *et al.*, BCG-Prime and Boost with Esx-5 secretion system deletion mutant leads to better protection against clinical strains of Mycobacterium tuberculosis, 2020 (manuscript Submitted in *Vaccine*, * co-corresponding author)
2. **Tiwari S***, Casey R, Hingley-Wilson S, Jacobs WR Jr. ^{*} (2019). Inject and infect; how *mycobacterium tuberculosis* utilizes its major virulence-associated type VII secretion system ESX-1, *Microbiology spectrum*, 7(3):1-14. (^{*}**Corresponding authors**)
3. **Tiwari S***, Chen B, Chen M, Vilcheze C, Weinrick B, Malek A, Berney M, Vitor M, Thomas S, Hartman T, Blundell T, and Jacobs WR Jr. ^{*} (2018). Arginine-deprivation-induced oxidative damage sterilizes *Mycobacterium tuberculosis*. *PNAS*, 115 (39): 9779-9784. (^{*}**Corresponding authors**)
 - **This article is highlighted as Commentary in PNAS.** Mizrahi V, Warner DF. 2018. Death of Mycobacterium tuberculosis by l-arginine starvation. *PNAS* 115(39): 9658-9660
4. Zolla V, Nizamutdinova IT, Scharf B, Clement CC, Maejima D, Akl T, Nagai T, Luciani P, Leroux JC, Halin C, Stukes S, **Tiwari S**, Casadevall A, Jacobs WR Jr., Entenberg D., Zawieja D., Condeelis J., Fooksman D.R., Gashev A.A. and Santambrogio L. (2015). Aging-related anatomical and biochemical changes in lymphatic collectors impair lymph drainage, fluid homeostasis and pathogen transport. *Aging Cell*. 14(4): 582-94.
5. Vilchèze C, Molle V, Carrère-Kremer S, Leiba J, Mourey L, Shenai S, Baronian G, Tufariello J, Hartman T, Veyron-Churlet R, Trivelli X, **Tiwari S**, Weinrick B, Alland D, Guérardel Y, Jacobs WR Jr., Kremer L. (2014). Phosphorylation of KasB Regulates Virulence and Acid-Fastness in Mycobacterium tuberculosis. *PLoS Pathogens*. 10(5): e1004115
6. Junqueira-Kipnis AP, Oliveira FM, Trentini MM, **Tiwari S**, Chen B, Resende DP, Bruna D, S Silva, Chen M, Tesfa L, Jacobs WR Jr., Kipnis A (2013). Prime–Boost with Mycobacterium smegmatis Recombinant Vaccine Improves Protection in Mice Infected with Mycobacterium tuberculosis. *PLoS One*, 8(11): e78639.
7. Kim BH, Shenoy AR, Kumar P, **Tiwari S** and MacMicking JD (2010) IFN- γ -inducible Gbps confer cell-autonomous immunity to bacterial pathogens. *Science*. 332 (6030): 717-21.
This article is highlighted in:

- Olive Leavy. Innate immunity: GBPs coordinate vesicular trafficking for host defense. 2011. *Nature Reviews Immunology*. 11(6): 372-3.
 - *The Scientist Magazine* “Proteins on the prowl, Defensive proteins kill bacteria invading mouse cells by delivering deadly sacs of antimicrobial chemicals”.
 - *MedicalXpress*:<http://medicalxpress.com/news/2011-05-key-weapons-immune-arsenal.html>
8. Bougnères L[§], Helft J[§], **Tiwari S**[§], Vargas P, Chang BH, Chan L, Campisi L, Lauvau G, Hugues S, Kumar P, Kamphorst AO, Dumenil AM, Nussenzweig M, MacMicking JD, Amigorena S, Guermonprez P (2009). A role for lipid bodies in the cross-presentation of phagocytosed antigens by MHC class I in dendritic cells. *Immunity*. 31(2): 232-44.
§Authors contributed equally to this work.
 - *This article was highlighted in the IMMUNITY PREVIEWS.*
 - Michel Desjardins. (2009). The Good Fat: A Link between Lipid Bodies and Antigen Cross-presentation. *Immunity*. 31(2): 176-178.
 9. **Tiwari S**, Choi HP, Matsuzawa T, Pypaert M, MacMicking JD (2009). Targeting of the GTPase Irgm1 to the phagosomal membrane via PtdIns(3,4)P(2) and PtdIns(3,4,5)P(3) promotes immunity to mycobacteria. *Nature Immunology*. 10: 907-17.
 - *This article is highlighted in NEWS AND VIEWS in Nature Immunology.* Kuijl C & Neefjes J (2009). New insight into the everlasting host-pathogen arms race. *Nature Immunology*. 10(8): 808-809.
 10. **Tiwari S**, Macmicking JD (2008). Bacterial phagosome acidification within IFN-gamma-activated macrophages: role of host p47 immunity-related GTPases IRGs), *Methods in Molecular Biology*. 445: 407-15.
 11. Shenoy AR, Kim BH, Choi HP, Matsuzawa T, **Tiwari S**, MacMicking JD (2007). Emerging themes in IFN-gamma-induced macrophage immunity by the p47 and p65 GTPase families. *Immunobiology*. 212: 771-84.
 12. **Tiwari S**, Kishan KV, Chakrabarti T, Chakraborti PK (2004). Amino acid residues involved in autophosphorylation and phosphotransfer activities are distinct in nucleoside diphosphate kinase from *Mycobacterium tuberculosis*. *J. Biol. Chem.* 279: 43595-603.

PATENT

“Double auxotrophic Mycobacterium and uses thereof” (Provisional patent application No. 62/764, 696 Filed, USA, Albert Einstein College of Medicine, 2018). Inventors Jacobs WR Jr. and **Tiwari S**.

MENTORING, SUPERVISION AND TEACHING EXPERIENCE

- 2020- (Spring) Assistant Professor, UTEP, El Paso, Dept. of Biological Sciences. “**Advanced Topics in Molecular Biochemistry**” course for the graduate students.
- 2020- Assistant professor, UTEP, Mentoring graduate students and postdoctoral fellows (undergraduate students: Austre Y. Schiaffino Bustamante, Luisa Dominguez; graduate students: Stephanie Kehl, Abraham Villa Mundo; Postdoctoral fellow: Chenoa Arico and Tugba Mehmetoglu), UTEP.
- 2018-19 (Spring) Instructor, **Clinical Microbiology/Infectious diseases** Lab course, Albert Einstein College of Medicine, Dept. of Medicine/Infectious Diseases.
- 2017-19 (Spring) Adjunct Professor, CUNY Lehman College, New York, Dept. of Biology. “**Immunology**” course for the undergraduate students
- 2018 Mentor, Albert Einstein college of Medicine, Dept. of Microbiology and

- Immunology. Undergraduate student, Yunia Alvarez and master's student Robin Khan, CUNY, Lehman College.
- 2017 Mentor, Albert Einstein college of Medicine, Dept. of Microbiology and Immunology. Undergraduate STEM program student: Marie Mazzeo (presented poster at Einstein (2017), as well as will present poster at Emerging researchers National (ERN) conference in STEM, 2018 and received first place.
- 2016 Research Consultant, Albert Einstein College of Medicine, Dept. of Microbiology and Immunology. Oren Mayer, Ph.D. student.
- 2015 (Summer) Mentor, Albert Einstein college of Medicine, Dept. of Microbiology and Immunology. High school student: Dan Vozza.
- 2014 (Fall) Assistant Instructor, Albert Einstein College of Medicine, Dept. of Microbiology and Immunology. "Microbes" course for the M.D., Ph.D. students.
- 2014 (Summer) Mentor, Albert Einstein college of Medicine, Dept. of Microbiology and Immunology. High school students: Karen Giraldo & Humira Ferdush. Karen presented poster at INTEL ISEF (2014).
- 2013 (Summer) Mentor, Albert Einstein college of Medicine, Dept. of Microbiology and Immunology. High school students: Karen Giraldo.
- 2012 (Spring) Mentor, Albert Einstein college of Medicine, Dept. of Microbiology and Immunology. Lara Kleinfelter, Ph.D. Student.
- 2010 Research Consultant, Yale University, Section of Microbial Pathogenesis. Clinton Bradfield, Ph.D. Student.
- 2008 Research Consultant, Yale University, Section of Microbial Pathogenesis. Undergraduate Student, H. Kassa
- 1999 Teaching trainee Lecturer, High school class. G.H.G.H College of Education, India.

PROFESSIONAL DEVELOPMENT AND SERVICES

- Organizer of Infectious diseases journal club in the department of Biological sciences at University of Texas at El Paso 2020.
- Introduction to Molecular Modeling in Drug Discovery: Online Course 2020.
- Selected by National Research Mentoring Network (NRMN) for grant writing workshop 2019-2020.
- Serving as Moderator, for work-in-progress talks at Department of Microbiology and Immunology, Albert Einstein College of Medicine (2017-2019)
- Passed Course "Design and conduct of Clinical research" offered at Albert Einstein College of Medicine, Winter-spring 2019.
- Served as member of the Logistic committee for organization of the conference "Many host of the mycobacteria", Albert Einstein College of Medicine, 4-6 march, 2019.
- Serving as Adhoc postdoc Senator at Albert Einstein College of Medicine, 2015-19.
- Representative for women networking group at Albert Einstein College of Medicine, 2018-19.
- Attended talk "Developing a good Research Question: A Critical step in the research process" at Bronx, at Albert Einstein College of Medicine, 2018
- Finished "iRIS 101 training initial Submissions to the IRB" at Albert Einstein College of Medicine.
- Participated in the workshop "The Joy of Teaching" hosted at Albert Einstein College of Medicine, 2018.
- Participated in Grant writing workshop at Albert Einstein College of Medicine, 2018.
- Attended NIH grant writing workshop at Columbia University, NY, 2017.
- Attended "how to talk the talk: Presenting to diverse audiences" course at Albert Einstein

- College of Medicine, 2016.
- Completed “Fundamentals of course design and teaching course” at Albert Einstein college of Medicine, spring 2015.
 - Supervised and managed Confocal Microscopy facility at Department of microbial pathogenesis, Yale University 2007-2010.
 - Lab management at Dr. J.D MacMicking lab, Yale University (2005-2009).
 - Guided and tutored “Biology Course” to various undergraduate students as a volunteer service to community, India.
 - Bachelors in education (B. Ed), Professional Degree for teaching in schools, 1999.

ADDITIONAL PRESENTATIONS, OUTREACH AND VOLUNTEERING ACTIVITIES

- Attended Keystone symposia on Tissue Organoids as models, Vancouver, BC, Jan19-22, 2020.
- Bill Gates foundation meeting, CTVD-2020.
- Presented poster at Keystone Symposia, Banff, Canada, 17-22 Jan 2019.
- Presented poster at 5th global forum on TB vaccines, India, 20-23 Feb 2018.
- Presented poster at 3rd annual CTVD meeting, Seattle, 21-23 June 2017.
- 2016 World TB Day Conference at Columbia University, 2016.
- Developing Functional Assays for TB Vaccine R&D: An Aeras / NIAID Workshop, Maryland, 2016.
- World TB Day Symposium: Countdown to 2015, New York academy of Sciences, 2014.
- Fourth Annual New England TB Symposium, Broad Institute, Cambridge, MA, 2010
- Presented Poster at Annual Microbiology Retreat, West brook, CT, 2007-2010.
- Presented Poster at Keystone symposia on Molecular and Cellular Biology, Tuberculosis: From Lab Research to Field Trails (C6), Vancouver, BC, 2007
- Presented Poster at Annual Microbiology Retreat, West brook, CT, 2006
- Presented Poster at ‘Satellite symposium on the Regulation of the gene expression’, IICB, Kolkata, 2003

MEMBERSHIPS

The New York Academy of Sciences, 2011-present
American Society of Cell Biology, 2006-present
American Society of Microbiology, 2009-present