

CURRICULUM VITAE

Simran Banga

Assistant Professor, Department of Biology,
Western Kentucky University,
KTH 3021, 1906 College Heights Blvd. #11080
Bowling Green, KY 42101
Phone (O): (270) 745-4748
E-mail: simran.banga@wku.edu

EDUCATION

Ph.D. (2009) Molecular Biology & Microbiology, Purdue University, West Lafayette, IN, USA
M.S. (1992) Microbiology, University of Bombay, Mumbai, India.
B.S. (1990) Microbiology & Chemistry, University of Bombay, Mumbai, India.

EMPLOYMENT

Assistant Professor, Department of Biology, Western Kentucky University 2016
Assistant Professor of Biology, School of Natural Science & Mathematics, Indiana University East, Richmond, IN 2013- 2016
Postdoctoral Research Scholar, Department of Microbiology, University of Iowa, Iowa City, IA 2011- 2013
Postdoctoral Research Associate, Department of Biological Sciences, Purdue University, West Lafayette, IN 2009 - 2011
Graduate Research Assistant, Department of Biological Sciences, Purdue University, West Lafayette, IN 2004 - May 2009
Graduate Teaching Assistant, Department of Biological Sciences, Purdue University, West Lafayette, IN 2003 – 2008
Lecturer, Department of Microbiology, S.I.E.S College of Arts, Science & Commerce, Bombay, India 1996-2003

TEACHING

Current Teaching (Jan 2016-current)

- BIOL 328 Immunology Spring 2016, Spring 2017, Spring 2018, Spring 2019, Spring 2020
- BIOL 226 Honors Microbial Biology and Diversity Fall 2017, Fall 2018, Fall 2019
- BIOL 226 Microbial Biology and Diversity Fall 2016, Fall 2017, Fall 2018, Fall 2019
- BIOL 227 Microbial Biology and Diversity Laboratory Fall 2016, Fall 2017, Fall 2018, Fall 2019
- BIOL 207 General Microbiology Summer 2017, Summer 2018, Summer 2020
- BIOL 121C Biological Concepts Laboratory: Cell, Metabolism and Genetics lab Coordinator Fall 2016, Spring 2017, Fall 2017
- BIOL 675 Special Topics: Epigenetics Spring 2019

Assistant Professor of Biology (Aug 2013-Dec 2015)

School of Natural Science & Mathematics, Indiana University East, Richmond, IN

- BIOL-L 211 Molecular biology Spring 2014, Fall 2014
- BIOL-L 213 Molecular biology Laboratory Spring 2014, Fall 2014
- BIOL-L 321 Principles of Immunology Spring 2015
- MICR-J 200 Microbiology & Immunology Fall 2014, Spring 2015, Fall 2015
- BIOL-L 391 Special topics in Biology: Proteins & Enzymes Spring 2014
- BIOL-L 391 Special topics in Biology: Exercise Physiology Fall 2014
- BIOL-L 102 Introduction to Biological Sciences Fall 2013, Spring 2014, Fall 2014, Spring 2015, Fall 2015

Graduate Teaching Assistant (Aug 2003 – Dec 2008)

Department of Biological Sciences, Purdue University, West Lafayette, IN

- BIOL 301 Human Anatomy and Physiology Fall 2003, Fall 2004 & Fall 2005
- BIOL 302 Human Anatomy and Physiology Spring 2004 & Spring 2005
- BIOL 501 Protein Expression & Purification Fall 2007 & Fall 2008

PUBLICATIONS

Belekov E, Kholikov K, Cooper L, **Banga S**, and Er AO. Improved Antimicrobial Properties of Methylene Blue Attached to Silver Nanoparticles. Photodiagnosis and Photodynamic Therapy (*Submitted*)

Banga S, Coursen JD, Portugal S, Tran TM, Hancox L, Ongoiba A, Traore B, Doumbo OK, Huang CY, Harty JT and Crompton PD. Impact of acute malaria on pre-existing antibodies to viral and vaccine antigens in mice and humans. *PLOS One*, (2015) 10(4): e0125090

Weber MM, Chen C, Rowin K, Mertens K, Galvan G, Zhi H, Dealing CM, Roman VA, **Banga S**, Tan Y, Luo ZQ and Samuel JE. Identification of *C. burnetii* type IV secretion substrates required for intracellular replication and Coxiella-containing vacuole formation. *Journal of Bacteriology* (2013) 195 (17): 3914-3924

Zhu W, **Banga S**, Tan Y, Zheng C, Stephenson R, Gately J and Luo ZQ. Comprehensive identification of protein substrates of the Dot/Icm type IV transporter of *Legionella pneumophila*. *PLOS One*, (2011) 6(3): e17638

Fontana MF, **Banga S**, Barry KC, Shen X, Tan Y, Luo ZQ and Vance RE. Secreted bacterial effectors that inhibit host protein synthesis are critical for induction of the innate immune response to virulent *Legionella pneumophila*. *PLoS Pathogens* (2011) 7(2):e1001289

Chen C,* **Banga S**,* Mertens K,* Weber MM, Gorbaslieva I, Tan Y, Luo ZQ and Samuel JE. Large-scale identification and translocation of Type IV secretin substrates by *Coxiella burnetii*. *PNAS* (2010) 107(50): 21755-21760

Authors Contributed Equally.

Xu L, Shen X, Bryan A, **Banga S**, Swanson MS and Luo ZQ. Inhibition of Host Vacuolar H⁺-ATPase Activity by a *Legionella pneumophila* effector. *PLoS Pathogens* (2010) 6(3): e1000822

Shen X, * **Banga S**, * Liu Y, Xu L, Gao P, Shamovsky I, Nudler E and Luo ZQ. Targeting eEF1A by a *Legionella pneumophila* effector leads to inhibition of protein synthesis and induction of host stress response. *Cell Microbiol.* (2009) 11: 911-926

Authors Contributed Equally.

Liu Y, Gao P, **Banga S** and Luo ZQ. An *in vivo* gene deletion system for determining temporal requirement of bacterial virulence factors. *PNAS* (2008) 105: 9385-9390

Banga S, Gao P, Shen X, Fiscus V, Zong WX, Chen L and Luo ZQ. *Legionella pneumophila* inhibits macrophage apoptosis by targeting pro-death members of the Bcl2 protein family. *Proc. Natl. Acad. Sci. USA* (2007) 104: 5121-5126

AWARDS AND HONORS

- KBRIN-IDeA Award, 2020-21, sponsored by the Kentucky Biomedical Research Infrastructure Network.
- FUSE – Faculty Undergraduate Student Engagement Award, Spring 2019, Western Kentucky University.
- KBRIN-IDeA Award, 2018-20, sponsored by the Kentucky Biomedical Research Infrastructure Network.
- Early Investigator award, 2017, Office of Sponsored Programs, WKU, 2017.
- First Time Grant Awardee award from the Office of Sponsored Programs, WKU, 2017.
- RCAP award, 2017 Western Kentucky University
- EPSCoR Research Startup Support, 2016
- EPSCoR Research Enhancement Grant, 2016
- KBRIN start-up award 2016, Western Kentucky University
- Faculty Research Fellowship, Summer 2015, Indiana University East
- Midwest Microbial Pathogenesis Conference Abstract Award Oct 2011, Ann Arbor, MI
- Purdue Pre-Tenure Fellowship 2010
- H. E. Umbarger Outstanding Graduate Student in Research (*Honorable Mention*) 2008
- Department of Biological Sciences, Purdue University. IN
- Purdue University Summar Research Fellowship 2004

PRESENTATIONS

*Denotes Student authors/presenters

Poster Presentations

- Gearner, C.* and **Banga, S** Characterization of *Legionella pneumophila* effectors that localize into the host cell nucleus during an infection. Southeast regional IDeA conference 2019, Louisville, Kentucky, Nov, 2019
- Pfirman, K., Singh, A., McElroy, D., **Banga, S.**, Kazimuddin, M., Joyce, M., Stork, J., Chaney, D., Jones, P. and Donley, T. Periodontal Disease influencing Acute Coronary Syndrome. 5th Research Symposium, Western Kentucky Heart & Lung Research foundation & Educational Trust, Bowling Green, KY, September 2019.
- Gearner, C.* and **Banga, S.** Potential Use of Essential Oils as an Alternative Treatment for Bacterial and Fungal Skin Infections. 49th Annual Student Research Conference, Western Kentucky University, 2019.
- Hodge, B.*, Emani, C. and **Banga, S.** Legionella Proteins as a Molecular Evolution Model for Legionnaires Disease. 49th Annual Student Research Conference, Western Kentucky University, 2019.
- Vaughan, J.* and **Banga, S.** Antibiotic Resistance of Bacteria Isolated from Soils. 48th Student Research Conference, Western Kentucky University, 2018
- Brown, E.* and **Banga, S.** Isolation Of Viruses Infecting Free Living Protozoa From Water. 48th Student Research Conference, Western Kentucky University, 2018
- Harper, S*., Dobrokhotov, V., **Banga, S.** and Novikov, I. Comparison of Bacterial Count and Sensor Response Using Metal Oxide Sensors. 48th Student Research Conference, Western Kentucky University, 2018
- Loomis, D.*, Harper, S.*, Dobrokhotov, V. and **Banga, S.** Metal Oxide Semiconductors and Their Application for Spoiled Meat Detection. 48th Student Research Conference, Western Kentucky University, 2018
- **Banga, S.**, Tan, T. and Luo, Z.Q. Host nucleus targeting of *Legionella pneumophila* Dot/Icm effectors. 18th Midwest Microbial Pathogenesis Conference, 2011 Ann Arbor, MI
- **Banga, S.**, Tan, T. and Luo, Z.Q. Characterization of a group of Legionella effectors that target to the nucleus of host cell. ASM Conference 2010, San Diego, CA.
- Shen, X., **Banga, S.** and Luo, Z. Q. Inhibition of Protein biosynthesis by SidI in *Legionella pneumophila* infected macrophages. 2007 Biological Sciences Retreat, Purdue University, IN.

Oral Presentations

- **Banga, S.** Hijacking Cells: An Internal Terrorist Crisis. Science Café Talk, Bowling Green, KY, Feb 25, 2019
- **Banga, S.** Spatial Organization and Dynamics of Host and Bacterial Protein Interactions during *Legionella* Infection. 2nd Global Summit and Expo on Proteomics, Dallas, TX, Nov 2018
- Gearner, C.* and **Banga, S.** Potential Use of Essential oils as Alternative Treatment for Bacterial Skin Infections. Kentucky Academy of Science Conference, Nov 2018.
- **Banga, S.** Characterization of *Legionella pneumophila* effectors that localize into the host cell nucleus during an infection. KBRIN External Advisory Committee Meeting, Lexington, KY Oct 2018

- **Banga, S.** Host cell modulations by *Legionella pneumophila*. Department of Biology, Western Kentucky University, 2015
- **Banga, S.** B cell response in malaria infected mice. Department of Microbiology & immunology, University of Iowa 2013
- **Banga, S.** *Legionella pneumophila* induced host cellular response. Department of Microbiology & immunology, University of Iowa 2011
- **Banga, S.** Inhibition of Protein biosynthesis in *Legionella pneumophila* infected macrophages. Department of Biological Sciences, Purdue University 2009
- **Banga, S.** Manipulation of host cell functions by *Legionella pneumophila*. Biological Sciences Retreat 2006, Purdue University, IN

CONFERENCES/WORKSHOPS

- ASM Virtual Conference for Undergraduate Educators (ASMCUE) July 2020.
- Southeast regional IDeA conference 2019, Louisville, Kentucky, Nov 6-8, 2019
- Five Year Scholarly/Creative Plan Workshop, Potter and Ogden Colleges, WKU, May 2019.
- ACUE (Association of College and University Educators) Professional Development Course on Teaching, CITL Western Kentucky University, Feb 2019 – Dec 2019
- International conference on proteomics; 2nd Global Summit and Expo on Proteomics, Dallas, TX, Nov 2018.
- Kentucky Academy of Science conference/meeting, Bowling Green, KY, Nov 2018.
- Grant Administration workshop organized by Office of Sponsored Program. WKU, Aug 2018
- Big Genomic Data Training Course for Professors, Farmington, Connecticut. May 21st-25th, 2018.
- ASM KY-TN Branch Conference at Tennessee Technological University, TN on Nov 10-11, 2017.
- ASM Conference for Undergraduate Educators (ASMCUE), Denver, CO July 2017
- NSF Grants Conference organized by EPSCoR at the University of Louisville, Louisville, KY June 2017
- Professional Learning Community Series: Strengthening Classroom Teaching, Western Kentucky University, Spring 2017
- NSF Professional Learning Community workshops, Office of Research and Creative Activity, WKU Fall 2017
- NIH R15 professional development workshops, Office of Research and Creative Activity, WKU Spring 2017
- NIH R15 grant workshop organized by KBRIN at University of Louisville, Louisville, KY November 2016
- Beginning a Research Program in the Natural Sciences Institute organized by Council on Undergraduate Research (CUR), Arlington, VA November 18- 20, 2016.
- Lilly International Conference, College and University Teaching and Learning, Bethesda, MD. May 2015
- Keystone symposia conference Malaria, New Orleans, LA. Jan. 2013

- 18th Annual Midwest Microbial Pathogenesis, University of Michigan, Ann Arbor, MI. Oct 2011
- 17th Annual Midwest Microbial Pathogenesis, Washington University, St. Louis. MO. Sep 2010
- ASM (American Society of Microbiology) Conference, San Diego, CA. May 2010
- 16th Annual Midwest Microbial Pathogenesis, Purdue University, IN. Sep. 2009
- 15th Annual Midwest Microbial Pathogenesis, University of Wisconsin, Madison, WI. Sep 2008
- 14th Annual Midwest Microbial Pathogenesis, Northwestern University, Chicago, IL. Oct 2007
- LEGIONELLA 2005, 6th International Conference on *Legionella*, Chicago, IL. Oct 2005

SCIENTIFIC/COMMUNITY ACTIVITIES

- Member of WISE (Women in Science and Engineering) advisory committee, Western Kentucky University, 2016 -current
- Member Student Research Council, Western Kentucky University, 2016 - current
- Reviewer RCAP awards - 2018, 2019; FUSE awards - Fall 2018, Spring 2019, Fall 2019
- Event Supervisor, Disease Detective, Science Olympiad 2017, 2018
- Judge for WKU Student Research Conference 2016, 2017, 2018, 2019
- Judge for Microbiology Poster Presentations at Kentucky Academy of Science, Nov 2018
- Judge for ASM KY-TN Branch Conference at Tennessee Technological University, 2017
- Editorial Board member of GSR Journals of Immunology, 2016-current
- Journal Reviewer for PLoS One, PLoS Pathogens, Journal of Microbiology and Biology Education (JMBE)
- Advisor, WISE Living and Learning Community, Ogden College, Western Kentucky University 2017-2018
- Curriculum development for B.S. degree program in microbiology, Indiana University East, Richmond, IN
- Judge for Undergraduate Research Symposium, Purdue University, West Lafayette 2009-2011
- Judge for Lafayette regional science and engineering fair, West Lafayette, 2008-2011
- Postdoctoral and Research Scientist Advisory Committee representative, Department of Biological Sciences, Purdue University, IN 2010- 2011
- Council Member of Purdue Post-Doctoral Association, Purdue University, IN 2009- 2011

PROFESSIONAL MEMBERSHIP

- American Society for Microbiology (2004 – current)
- The American Association of Immunologists (2011-current)
- Kentucky Academy of Science (2016 –current)
- Sigma Xi (2016 – current)
- American Society for Microbiology, KY-TN branch (2017 – current)