Curriculum Vitae

Education:

Postdoctoral Training: 03/2000 - 02/2002. Microbiology, Public Health Research Institute, New York, NY.
Ph.D.: 02/2000: Molecular Mycology and Plant Physiology, Biology Department, University of Tuebingen, Tuebingen, Germany.

Positions and Honors:

Assistant Professor: 07/2013 - Present. Medicine, Public Health Research Institute, New Jersey Medical School, Rutgers, The State University of New Jersey, Newark, NJ.
Assistant Professor: 11/2007 - 06/2013. Medicine, Public Health Research Institute, New Jersey Medical School, University of Medicine and Dentistry of New Jersey, Newark, NJ.
Research Associate: 03/2002 - 10/2007. Microbiology, Public Health Research Institute, Newark, NJ.
Visiting Scholar: 01/1996 - 12/1996. Biology Department, University of Wuerzburg, Wuerzburg, Germany.

Young Investigator Award: 2006, Theobald Smith Society, New Jersey Branch of American Society for Microbiology.
Fellowship Award: 1996, The Ministry of Education, P.R. China.

Research Support:

Active project:

1R01 AI127844-01A1 NIH/NIAID
Role: Principal investigator (contact PI)
06/06/2017 – 05/31/2022
The Warburg effect and host immune response in tuberculosis
The program characterizes the metabolic determinants of specific immune cell functions in association with infection outcome and investigates metabolic modulation by the pathogen as mechanisms of TB pathogenesis
$3,428,223

Finished Projects:

New Jersey Health Foundation (NJHF) and PHRI Inspiration Fund
Role: Principal investigator
01/01/2015 – 12/31/2016
Immunometabolism in tuberculosis
The goal of the study is to characterize the correlation between the Warburg effect state of host immune cells and their specific functions in *Mycobacterium tuberculosis*-infected lungs
$70,000

RAI090328A NIH/NIAID
Role: Principal investigator
06/01/2011 – 05/31/2014
Triacylglycerol metabolism and *M. tuberculosis* virulence
The goal of the project is to study the roles of triacylglycerol for *M. tuberculosis* persistence and during reactivation from dormancy.
$437,250

FP7-223681
European Union
Role: Coinvestigator (PI: Cirillo)
01/01/09 - 12/31/2013
TB PAN-NET - Pan-European network for the study and clinical management of drug resistant Tuberculosis
The goal of the program is to characterize the mechanisms of *M. tuberculosis* drug resistance and stress response.

RAI083855Z NIH/NIAID
Role: Principal investigator
06/06/2009 – 05/31/2012
Dissection of *M. tuberculosis* metabolic and regulatory pathways to persistence
The goal of the project is to study the central metabolic and regulatory pathways during *M. tuberculosis* persistence.
$437,250

5P30AI027742-17 (Subaward No. 98-0576)
Center for Aids Research (CFAR) at New York University
Role: Co-investigator
05/01/2007 – 04/30/2008
Metabolic shift of *M. tuberculosis* during infection and its regulation
$50,000

Publications (research papers):
https://www.ncbi.nlm.nih.gov/sites/myncbi/1peOF6ih3dC53/bibliography/48109852/public/?sort=date&direction=descending

1. Du P, Sohaskey,CD, **Shi L**. **2016** Transcriptional and physiological changes during *Mycobacterium tuberculosis* reactivation from non-replicating persistence ***Front Microbiol***. 7:1346. DOI:10.3389/fmicb.2016.01346 (corresponding author).
2. Giffin MM, **Shi L**, Gennaro ML, Sohaskey CD. **2016**. Role of alanine dehydrogenase of *Mycobacterium tuberculosis* during recovery from hypoxic nonreplicating persistence. ***PLoS One***. 11(5):e0155522. DOI: 10.1371/journal.pone.0155522. eCollection 2016. PMCID: PMC4874671.
3. **Shi L**, Eugenin EA, Subbian S. **2016**. Immunometabolism in tuberculosis ***Front Immunol.*** 7:150. DOI: 10.3389/fimmu.2016.00150. eCollection. PMCID: PMC4838633 (review; corresponding author).
4. **Shi L**, Salamon H, Eugenin EA, Pine R, Cooper A, Gennaro ML. **2015**. Infection with *Mycobacterium tuberculosis* induces the Warburg effect in mouse lungs. ***Sci Rep.***

10;5:18176. DOI: 10.1038/srep18176. PMCID: PMC4674750 (corresponding author).

5. Salamon H, Bruiners N, Lakehal K, **Shi L**, Ravi J, Yamaguchi KD, Pine R and Gennaro ML. **2014** Cutting edge: Vitamin D regulates lipid metabolism in *Mycobacterium tuberculosis* infection. ***J Immunol.*** 193(1):30-4. DOI: 10.4049/jimmunol.1400736. PMCID: PMC4073889.

6. Datta P, **Shi L**, Bibi N, Balázsi G, and Gennaro ML. **2011**. Regulation of central metabolism genes of *Mycobacterium tuberculosis* by parallel feed-forward loops controlled by sigma factor E (σ(E)). ***J Bacteriol.*** 193(5):1154-60.

7. **Shi L**, Sohaskey CD, Pfeiffer C, Datta P, Parks M, McFadden J, North RJ, and Gennaro ML. **2010**. Carbon flux rerouting during *Mycobacterium tuberculosis* growth arrest. ***Mol Microbiol.*** 78(5):1199-215.

8. Hussain S, Malik M, **Shi L**, Gennaro ML, and Drlica K. **2009**. In vitro model of mycobacterial Growth arrest using nitric oxide with limited air. ***Antimicrob Agents Chemother.*** 53(1):157-61.

9. **Shi L**, Sohaskey CD, North RJ, and Gennaro ML. **2008**. Transcriptional characterization of the antioxidant response of *Mycobacterium tuberculosis* in vivo and during adaptation to hypoxia *in vitro*. ***Tuberculosis*** (Edinb). 88(1):1-6.

10. Balázsi G, Heath AP, **Shi L**, and Gennaro ML. **2008**. The temporal response of the *Mycobacterium tuberculosis* gene regulatory network during growth arrest. ***Mol Syst Biol.*** 4:225.

11. Singh A, Singh Y, Pine R, **Shi L**, Chandra R, and Drlica K. 2006. Protein kinase I of *Mycobacterium tuberculosis*: cellular localization and expression during infection of macrophage-like cells. ***Tuberculosis*** (Edinb). 86(1):28-33.

12. **Shi L**, Sohaskey CD, Kana BD, North RJ, Dawes S, Mizrahi V, and Gennaro ML. **2005**. Changes in energy metabolism of *Mycobacterium tuberculosis* in mouse lung and under *in vitro* Conditions affecting aerobic respiration. ***Proc Natl Acad Sci U S A***. 102(43):15629-34.

13. Davidow A, Kanaujia GV, **Shi L**, Kaviar J, Guo X, Sung N, Kaplan G, Menzies D, and Gennaro ML. **2005**. Antibody profiles characteristic of *Mycobacterium tuberculosis* infection state. ***Infect Immun.*** 73(10):6846-51.

14. **Shi L**, North RJ, and Gennaro ML. **2004.** Effect of growth state on transcription levels of genes encoding major secreted antigens of *Mycobacterium tuberculosis* in the mouse lung. ***Infect Immun.*** 72(4):2420-4.

15. **Shi L**, Jung YJ, Tyagi S, Gennaro ML, and North RJ. **2003**. Expression of Th1-mediated immunity in mouse lungs induces an *Mycobacterium tuberculosis* transcription pattern characteristic of nonreplicating persistence. ***Proc Natl Acad Sci U S A***. 100(1):241-6.

16. **Shi L**, Guttenberger M, Kottke I, Hampp R. **2002**. The effect of drought on mycorrhizas of beech (*Fagus sylvatica L.*): changes in community structure, and the content of carbohydrates and nitrogen storage bodies of the fungi. ***Mycorrhiza***. 12(6):303-11. PubMed PMID: 12466918 DOI: 10.1007/s00572-002-0197-2.

17: Loewe A, Einig W, **Shi L**, Dizengremel P, Hampp R. **2000** Mycorrhiza formation and elevated CO2 both increase the capacity for sucrose synthesis in source leaves of spruce and aspen. ***New Phytologist.*** 145:565-574. DOI: 10.1046/j.1469-8137.2000.00598.x.

18: Wiese C, **Shi L**, Heber U. **1998**. Oxygen reduction in the Mehler reaction is insufficient to

protect photosystems I and II of leaves against photoinactivation. ***Physiologia Plantarum***. 102(3):437- 446. DOI: 10.1034/j.1399-3054.1998.1020312.x.

Presentations in Conference:

1. **Shi L**. **2017** The Warburg effect in tuberculosis ***The Third National Conference on Actinomycetes*** Chongqing, China (Invited speaker).
2. **Shi L**. **2017** Immunometabolism in tuberculosis Institute of Pathogen Biology, ***Chinese Academy of Medical Sciences***, Beijing, China (invited speaker seminar).
3. **Shi L**. Salamon H, Eugenin EA, Pine R, Cooper A, Gennaro ML. **2015** Immunometabolism in tuberculosis. ***ASM International Conferences on Tuberculosis: Host Response in Tuberculosis*** Santa Fe, NM.
4. Salamon H, **Shi L**, Yamaguchi KD, Pine R, and Gennaro ML. **2013** Pathway analysis suggests diverse molecular mechanisms with diagnostic potential biomarkers for tuberculosis. ***New Questions, New Tools*** Chantilly, VA.
5. **Shi L**, Salamon H, Yamaguchi KD, Cooper A, Pine R, and Gennaro ML. **2013** Global transcriptomics reveal mechanisms underlying metabolic and immunological remodeling of the mouse lung during *Mycobacterium tuberculosis* infection. ***ASM International Conferences on Tuberculosis: Understanding the Enemy*** Whistler, Canada.
6. **Shi L.** Sohaskey CD, Datta P, and Bibi N. **2013** Triacylglycerol metabolism and *Mycobacterium tuberculosis* physiology. ***ASM International Conferences on Tuberculosis: Understanding the Enemy*** Whistler, Canada.
7. **Shi L. 2010** Adaptation of *Mycobacterium tuberculosis* carbon metabolism during infection. ***TB Day Symposium*** Newark, NJ (Invited Speaker).
8. **Shi L**, Sohaskey CD, North RJ, and Gennaro ML. **2008** Adaptation of *Mycobacterium tuberculosis* carbon metabolism during infection - as a rule or an exception. ***ASM General Conference*** Boston, MA.
9. **Shi L**, Sohaskey CD, North RJ, and Gennaro ML. **2007** Metabolic adaptation of *Mycobacterium tuberculosis* to host adaptive immunity. ***ASM International Conference on Integrating Metabolism and Genetics*** Montreal, Canada.
10. **Shi L**, Kana BD, Sohaskey CD, North RJ, Mizrahi V, and Gennaro ML. **2005** The transition to chronic infection in mouse lung and hypoxia-induced bacterial growth arrest *in vitro* are accompanied by a shift in the respiratory pathways of *Mycobacterium tuberculosis*. ***ASM International Conferences on Tuberculosis: Integrating the Host and Pathogen Biology*** Whistler, Canada (Travel Scholarship Recipient)**.**
11. **Shi L**, North RJ, and Gennaro ML. **2003** Changes of gene expression program of *Mycobacterium tuberculosis* in response to host immunity in the lung of aerosol-infected mice. ***ASM International Conferences on Tuberculosis: Integrating the Host and Pathogen Biology*** Taos, NM.
12. **Shi L. 2002** Changes of *Mycobacterium tuberculosis* gene expression in association with expression of host immunity in the lungs of mice infected via the respiratory route. ***The Fourth Annual NYC/Regional Tuberculosis Conference*** Newark, NJ (Invited Speaker).
13. **Shi L** and Gennaro ML. **2001** Expression of genes encoding the antigen 85 complex in the

Lungs of mice infected with *Mycobacterium tuberculosis*. ***ASM International Conferences on Tuberculosis: Molecular and Cellular Aspects of Tuberculosis Research in the Post Genomic Era*** Taos, NM.