BIOGRAPHICAL SKETCH

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NAME: Li, Jun

eRA COMMONS USER NAME (credential, e.g., agency login): junlix

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Nanjing University, Nanjing, China	B.S.	07/1991	Biochemistry
Shanghai Institute of Biochemistry, Chinese Academy of Sciences, Shanghai, China	M.S.	07/1994	Molecular Biology
Oklahoma State University, Stillwater, OK	M.S.	12/2000	Computer Sciences
Oklahoma State University, Stillwater, OK	Ph.D.	12/1999	Vet. Biomed Sciences
University of Minnesota	Postdoctoral	08/2010	Genomics, Vector Biology

A. Personal Statement

My research interest focuses on the interaction between mosquitoes and parasites. I have been trained in biochemistry (BS, Ph.D.), molecular biology (MS), computer science (MS), and vector biology (Postdoc). I have knowledge, skills and experience to do mosquito-malaria interaction using computational, molecular biological, and biochemical approaches. My working experience at malaria endemic areas is also valuable for my research. I have published nearly 20 papers, and have lead and participated NIH funded projects. I have successfully constructed a fully functional infection system with parasites, mice, mosquitoes, and patients, which allow me to investigate *parasite* transmission to mosquitoes. My education, experience and leadership have prepared me very well to conduct the proposed research.

B. Positions and Honors

Positions and Employment

1991-1994 Research Assistant, SIBCB, Chinese Academy of Sciences, Shanghai, China
1994-1995 Assistant Researcher, National Center for Gene Research, Shanghai, China
1995-1996 Assistant Researcher, SIPP, Chinese Academy of Sciences, Shanghai, China
1996-1999 Research Assistant, Oklahoma State University, Stillwater, Oklahoma.
2000-2003 Software Engineer, Aptix Corp, San Jose, California
2003-2004 Research Associate, University of Minnesota, Twin Cities, Minnesota
2004-2010 Senior Research Associate, University of Minnesota, Twin Cities, Minnesota
2010-2016 Assistant Professor, University of Oklahoma, Norman, Oklahoma
2016-present Associate Professor, Florida International University, Miami, Florida

Other Experience and Professional Memberships

2009-2010 Visiting Scientist, International Centre of Insect Physiology and Ecology, Nairobi, Kenya
2003 Member of American Society Tropical Medicine and Hygiene

2010 Member of Entomology Society of America
2014 Member of American Society of Biochemistry and Molecular Biology

Honors

1987 Recipient of the State Best High School Student Honor from Jiangsu Province, China
1993 Excellence in graduate research from the Director of Shanghai Institute of Biochemistry, Chinese Academy of Sciences
1999 Recipient of the Joe Mack Mason Memorial Scholarship for Excellence in Research from Oklahoma State University.
2015 Recipient of US National Science Foundation CAREER award

Contribution to Science (* indicate senior corresponding author)

1. I started to conduct biochemistry and molecular biology research in 1991. At that time, scientists tried to express medical related human proteins in *E. coli*. However, most *E. coli* expressed proteins forms inclusion bodies and they are insoluble in saline buffer. My contribution is establishing an *E. coli* expression system that secreted heterologous proteins to resolve the protein solubility problem. Several heterologous proteins were successfully expressed into medium.
    a. **Li, J**. and Li, B.L.*, 1995. High-level excretion of heterologous proteins from *E. coli* directed by Protein-A signal peptide. Chinese J. of Biochemistry and Biophysics. 27(6): 617-24. High Profile Chinese Journal.
2. In 1996, I came to the US to pursue my Ph.D. and did research on a gram-negative bacterial pathogen *Mannheimia haemolytica* (previous called *Pasteurella haemolytica*) that causes cattle shipping fever. My contribution is finding the role of lipopolysaccharide on bacterial-secreted exotoxin (leukotoxin) and discovery of the species-specific receptor of leukotoxin for the first time.
    a. **Li J.**, Clinkenbeard K.D.*, Ritchey J.W., 1999. Bovine CD18 identified as a species specific receptor for *Pasteurella haemolytica* leukotoxin. Vet Microbiol. 15;67(2):91-7. Impact Factor: 3.1.
    b. **Li J.**, Clinkenbeard K.D.*, 1999. Lipopolysaccharide complexes with *Pasteurella haemolytica* leukotoxin. Infect Immun. 67(6):2920-7. Impact Factor: 4.1.
3. From 2000-2003, I took a software engineer position in industry. In 2003, I resumed my research at the University Minnesota to study the relationship between mosquitoes and malaria. My major contribution at this period includes designing our customized oligo-chip, involving in discovery of a mosquito genetic locus and several proteins related *Plasmodium* transmission. I also reannotated the whole *An. gambiae* genome.
    a. Vernick, K.*, Oduol F., Lazzaro, B.P., Glazebrook, J., Xu J., Riehle M., and **Li, J.,** 2005. Molecular genetics of mosquito resistance to malaria parasites. Curr Top Microbiol Immunol. 295:383-415. Impact Factor: 4.0.
    b. Korochkina S., Barrean C., Field E., Pradel G., Natarajan R., **Li J.**, Frevert U., Vernick K.*, 2006. A mosquito-specific protein family includes candidate receptors for malaria sporozoite invasion of salivary glands. Cellular Microbiology. 8(1):163-175. Impact Factor: 4.8.
    c. Riehle, M., Markianos, K., Niare, O., Xu, J., **Li, J.,** Toure A., Podiougou, B., Oduol, F., Diawara, S., Diallo M., Coulibaly, B., Ouatara, A., Kruglyak, L., Traore, S., Vernick K.*, 2006. Natural Malaria Infection in Anopheles gambiae Is Regulated by a Single Genomic Control Region. Science 312:577-9. Impact Factor: 31.5.
    d. **Li, J.**, Riehle, M., Zhang, Y., Xu, J., Oduol, F., Gomez, S.M., Eiglmeier, K., Ueberheide, B., Shabanowitz, J., Hunt, D.F., Ribeiro, J.M.C., and Vernick, K.D.* 2006. *Anopheles gambiae* genome reannotation through synthesis of *ab initio* and comparative gene prediction algorithms. Genome Biology. 7:R24. Impact Factor: 10.5.
4. In 2010, I became an assistant professor. I developed a novel algorithm to analyze genomes and discovered a key gene *FREP1*. Moreover, I analyzed the molecular mechanism of FREP1, and found it involving *Plasmodium* transmission to *An. gambiae* mosquitoes. Currently, we are investigating this pathway, and developing a transmission-blocking vaccine against FREP1. Notably, the results are promising for vaccine development. I also developed a high-throughput platform for novel drugs targeting FREP1, and found a compound orlandin that can block malaria transmission. The approaches and

products are conceptually innovative. Since very few mosquito proteins have been identified to be suitable for transmission blocking vaccine, further investigating FREP1 will have substantial effects on malaria control.

a. **Li, J**.*, Ribeiro, J.M.C., Yan, G. 2010. Allelic Gene Structure Variations in Anopheles gambiae Mosquitoes. PLoS ONE 5(5): e10699. Impact Factor: 3.5.
b. **Li, J.***, Wang, X., Zhang, G., Githure, J.I., Yan, G., James, A.A. 2013. Mining *Anopheles gambiae* Mosquito Genome for Resistance Genetic Variations Against *Plasmodium falciparum* Parasites. PNAS 110(5):20675-20680. Impact Factor: 9.8.
c. Zhang, G., Niu, G., Franca, C.M., Dong, Y., Wang, X., Butler, N.S., Dimopoulos, G., **Li, J**.*, 2015. *Anopheles* midgut FREP1 mediates *Plasmodium* invasion. J. Biol. Chem. 290(27):16490-16501. Impact Factor: 4.6.
d. Wang, H., Afrane, Y.A., Yan, G., and **Li, J**.*, 2015. Genome-wide detection of SNPs and LD map construction reveal reproductive segregation and insecticide selective sweeps in wild *A. gambiae* from western Kenya. BioMed Research International. 2015:238139. Impact Factor: 2.8.
e. Niu, G., Wang, B., Zhang, G., King, J.B., Cichewicz, R.H., **Li, J.*** 2015. Targeting FREP1 to block malaria transmission using fungal metabolites. Nature Scientific Reports. 14694. Impact Factor: 5.6.

My publications related to this project can be found at NCBI
http://www.ncbi.nlm.nih.gov/pubmed/?term=Jun%20Li%20and%20malaria%20and%20(Oklahoma%20or%20Minnesota).

D. Research Support

Pending

1. NIH 1R01AI125657-01 $2.67M
   Title: "Fungal metabolites block malaria transmission".
   Short Description: This project will use combinational approaches of genomics and organic chemistry to find target genes and bioactive compounds to block malaria transmission.
   Role: PI

2. NIH 1R01AI127787-01 $1.79M
   Title: "FREP1 as a universal malaria transmission-blocking vaccine target"
   Short Description: This project aims to investigate mosquito FREP1 protein as a vaccine antigen to block all species of Plasmodium parasites in all species of malaria vectors.
   Role: PI

Active

1. NIH 1R21AI115178-01A1 May 1, 2015-April 30, 2017 $424K
Title: Targeting Mosquito FREP1 Protein for Malaria Control
Short description: The project aims to evaluate FREP1 and its binding partners as antigens of malaria transmission blocking vaccines.
Role: PI

2. NSF CAREER AWARD 1453287 June 1, 2015-May 30, 2020 $783K
Title: "Genetic and Molecular Mechanisms of Parasite Infection in Insects".
Short description: The goal is to investigate the molecular mechanisms of parasite invasion pathways in insects.
Role: PI

Completed Research Support

NIH/NIAID 1R56 AI081829-01A1 08/20/09-07/31/11 $365K
Title: "Gene Structure Variations and Malaria Resistance".

Short description: The goal of this project is to determine the genetic variations that cause malaria resistance in vector *Anopheles gambiae*, which will help to develop novel vector control methods for malaria epidemic prevention.

Role: Original PI, then subcontractor after moving from UMN to OU.

OCAST, HR13-055 Sept 1, 2013-August 31, 2016 $135K
Title: "Genomics analysis of *Anopheles gambiae* mosquitoes to *Plasmodium falciparum* parasite Infection".
Short description: The goal is analyzing the *A. gambiae* genome to find the genes and alleles that are responsible for defense against malaria in mosquitoes from malaria endemic areas in Kenya.
Role: PI

NIH/HSC, 8P20GM103447 June 1, 2014-Oct 31, 2016 $76K
Title: "Memory T cell-mediated protecting against malaria"
Short description: The goal is to understand the role of a receptor on T cell surface for malaria infection.
Role: subcontractor. PI: Darrin Akins