

BIOGRAPHICAL SKETCH

NAME Zhengli Shi	POSITION TITLE Co-Investigator
eRA COMMONS USER NAME (credential, e.g., agency login) (b) (6)	

EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE	MM/YY	FIELD OF STUDY
Department of Biology, Wuhan University, China	BS	1987	Genetics
Wuhan Inst. Virol., Chinese Acad. Sci., China	MS	1990	Virology
University Montpellier II, Montpellier, France	Ph.D.	2000	Virology

A. Personal Statement

I have been working on the discovery and characterization of novel viruses from bats and other wildlife since 2004. This included the discovery that Chinese horseshoe bats are the natural reservoir of SARSr-CoVs and the likely origin of SARS-CoV. My group then isolated SARSr-CoVs from bats sharing high homology with human SARS-CoV and demonstrated their interspecies transmission risk, largely confirming bats as the source of SARs. My lab has carried out systematic studies on the epidemiology, genetic evolution, interspecies infection mechanism and pathogenesis of a series of bat-borne emerging viruses including SARSr-CoV, MERS-CoV, EBOV and others. This work has involved collaboration on all other scientists on this R01 renewal proposal, in particular Drs. Daszak and Linfa Wang, who I have collaborated with since 2003, publishing 2 papers in *Nature* and one in *Science* together on our bat-virus work, as well as dozens of others. Recently, this collaborative team discovered that an outbreak of fatal Swine Acute Diarrhea Syndrome in southern China that killed more than 24,000 piglets was caused by spillover of bat HKU2-related coronaviruses. In this proposed work, my group will be responsible for CoV testing in bat samples, serological testing in human samples, and virus characterization work such as cell entry analysis and receptor identification.

B. Positions and Honors.**Positions and Employment**

1990 - 93	Research assistant, Wuhan Institute of Virology, Chinese Academy of Sciences, China
1993 - 95	Research scientist, Wuhan Institute of Virology, Chinese Academy of Sciences, China
2000 -	Senior Scientist, Wuhan Institute of Virology, Chinese Academy of Sciences, Wuhan, China

Other Experience and Professional Memberships

2011 -	Director, Center for Emerging Infectious Diseases, Wuhan Inst. Virology, Chinese Acad. Sci.
2013 -	Director, BSL-3 laboratory at Wuhan Institute of Virology, Chinese Acad. Sci.
2014 -	Director, Committee of Biosafety, Wuhan Institute of Virology, Chinese Acad. Sci.
2014 -	Director, CAS Key Laboratory of Special Pathogens and Biosafety
2015 -	Vice Director, BSL-4 laboratory, Wuhan Institute of Virology, Chinese Acad. Sci.
2016 - 18	Associate Editor of <i>Virology Journal</i>
2017 - 19	Editorial Board of <i>Virology</i>
2017-2019	Editor in Chief, <i>Virologica Sinica</i>

Honors

- 2003 Natural Science Award (the Second Prize) of Hubei Province, China.
- 2004 Outstanding supervisor of graduate student of Hubei Province, China.
- 2006 Outstanding scientist of the Chinese Academy of Sciences.
- 2006 Outstanding Research Article on Natural Science (the First Prize), Hubei Province, China
- 2014 Young and Middle-aged Scholar with Distinguished Contribution in Hubei Province, China
- 2014 Outstanding Research Article on Natural Science (the Grand Prize), Hubei Province, China
- 2016 Palm Knight Medal for Education, Government of the Republic of France
- 2017 Natural Science Award (the First Prize) of Hubei Province, China.

C. Selected peer-reviewed publications most relevant to the current application

* = Co-corresponding or first author

Li W*, Shi Z*, Yu M, Ren W, Smith C, Epstein HJ, Wang H, Crameri G, Hu Z, Zhang H, Zhang J, Mceachern J, Field H, Daszak P, Eaton TB, Zhang S, Wang LF (2005). Bats are natural reservoirs of SARS-like coronaviruses. **Science**, 310: 676-679.

Ren W, Qu X, Li W, Han Z, Yu M, Zhang S, Wang LF, Deng H, Shi Z (2008) Difference in receptor usage between SARS coronavirus and SARS-like coronavirus of bat origin. **Journal of Virology** 82(4): 1899–1907.

Yuan J, Hon CC, Li Y, Wang D, Xu G, Zhang H, Zhou P, Poon LM, Lam TT, Leung FC. Shi Z (2010). Intra-species Diversity of SARS-Like Coronaviruses (CoVs) in *Rhinolophus sinicus* and Its Implications on the Origin of SARS-CoVs in human. **Journal of General Virology**, 91(4):1058-1062.

Ge XY, Li JL, Yang X-L, Chmura AA, Zhu G, Epstein JH, Mazet JK, Hu B, Zhang W, Peng C, Zhang YJ, Luo CM, Tan B, Wang N, Zhu Y, Crameri G, Zhang SY, Wang LF, Daszak P*, Shi Z* (2013). Isolation and characterization of a bat SARS-like Coronavirus that uses the ACE2 receptor. **Nature** 503: 535-538.

Menachery VD, Yount BL, Debbink K, Agnihothram S, Gralinski LE, Plante JA, Graham RL, Scobey T, Ge XY, Donaldson EF, Randell SH, Lanzavecchia A, Marasco WA, Shi Z*, Baric RS* (2015). A SARS-like cluster of circulating bat coronaviruses shows potential for human emergence. **Nature Medicine**, 21:1508-1513.

Yang XL, Hu B, Wang B, Wang MN, Zhang Q, Zhang W, Wu LJ, Ge XY, Zhang YZ, Daszak P, Wang LF*, Shi Z* (2016). Isolation and Characterization of a Novel Bat Coronavirus Closely Related to the Direct Progenitor of Severe Acute Respiratory Syndrome Coronavirus. **Journal of Virology**, 90: 3253-3256.

Zeng L, Ge X, Peng C, Yang X, Tan B, Gao Y, Chen J, Chmura AA, Daszak P*, Shi Z* (2016) Bat Severe Acute Respiratory Syndrome-Like Coronavirus WIV1 Encodes an Extra Accessory Protein, ORFX, Involved in Modulation of the Host Immune Response. **Journal of Virology**, 90(14): 6573–6582.

Hu B, Zeng LP, Yang XL, Ge XY, Zhang W, Li B, Xie JZ, Shen XR, Zhang YZ, Wang N, Luo DS, Zheng XS, Wang MN, Daszak P, Wang LF, Cui J*, Shi Z* (2017). Discovery of A Rich Gene Pool of Bat SARS-related Coronaviruses Provides New Insights into the Origin of SARS Coronavirus. **PLOS Pathogens**, 13(11): e1006698.

Zhou P, Fan H, Lan T, Yang XL, Shi WF, Zhang W, Zhu Y, Zhang YW, Xie QM, Mani S, Zheng XS, Li B, Li JM, Guo H, Pei GQ, An XP, Chen JW, Zhou L, Mai KJ, Wu ZX, Li D, Anderson D, Zhang LB, Li SY, Mi ZQ, He TT, Cong F, Guo PJ, Huang R, Luo Y, Liu XL, Chen J, Huang Y, Sun Q, Zhang XLL, Wang YY, Xing SZ, Chen YS, Sun Y, Li J, Daszak P, Wang LF, Shi Z, Tong YG, Ma JY (2018) Fatal swine acute diarrhea syndrome caused by an HKU-2 related coronavirus of bat origin. **Nature**, 556: 255-258.

Luo CM, Wang N, Yang XL, Liu HZ, Zhang W, Li B, Hu B, Peng C, Geng QB, Zhu G, Li F*, Shi Z* (2018). Discovery of Novel Bat Coronaviruses in South China That Use the Same Receptor as Middle East Respiratory Syndrome Coronavirus. **Journal of Virology**, 92 (13): e00116-18.

Additional recent publications of importance to the field (in chronological order)

Ge X, Li Y, Yang X, Zhang H, Zhou P, Zhang Y, Shi Z (2012). Metagenomic analysis of viruses from bat fecal samples reveals many novel viruses in insectivorous bats in china. **Journal of Virology**, 86, 4620-4630.

Yuan J, Zhang Y, Li J, Zhang Y, Wang LF*, Shi Z* (2012). Serological evidence of ebolavirus infection in bats, China. **Virology Journal**, 9: 236.

Yang XL, Zhang YZ, Jiang RD, Guo H, Zhang W, Li B, Wang N, Wang L, Waruhiu C, Zhou JH, Li SY, Daszak P, Wang LF*, Shi Z* (2017). Genetically Diverse Filoviruses in *Rousettus* and *Eonycteris* spp. Bats, China, 2009 and 2015. **Emerging Infectious Diseases**, 23(3):482-486.

Zeng LP, Ge XY, Peng C, Tai WB, Jiang SB, Du LY*, Shi Z* (2017). Cross-neutralization of SARS coronavirus-specific antibodies against bat SARS-like coronaviruses. **Science China Life Sciences**, 60(12):1399-1402.

Wang N, Li SY, Yang XL, Huang, HM, Zhang YJ, Guo H, Luo CM, Miller M, Zhu G, Chmura AA, Hagan E, Zhou JH, Zhang YZ, Wang LF, Daszak P*, Shi Z* (2018). Serological Evidence of Bat SARS-Related Coronavirus Infection in Humans, China. **Virologica Sinica**, 33(1):104-107.

D. Research Support

Ongoing Research Support

(b) (4)

Geographical distribution and genetic variation of pathogens in Africa

Role: PI

31770175 National Natural Science Foundation of China

01/01/2018-12/31/2021

Evolution mechanism of the adaption of bat SARS-related coronaviruses to host receptor molecules and the risk of interspecies infection

Role: PI

(b) (4)

Genetic evolution and transmission mechanism of important bat-borne viruses

Role: PI

R01 AI110964

Daszak (PI)

06/01/14-05/31/19

Understanding Risk of Bat Coronaviruses

The goal of this study is to analyze the risk of coronavirus spillover from bats to humans in Southern China

Role: Co-Investigator

Emerging Pandemic Threat Program, USAID Mazet (PI)

10/01/14-09/30/19

PREDICT 2

The goal of this project is to create and implement a global virus surveillance system in animals and humans and analyze spillover risk.

Role: China Country Coordinator

Completed Research Support

(b) (4)

Metagenomic analysis of bat intestinal viruses

Role: PI

(b) (4)

Mechanism of interspecies transmission of zoonotic viruses

Role: Co-PI

(b) (4)

Genetic diversity, identification and pathogenesis of bat viruses

(b) (4)