

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME	POSITION/TITLE
Zhang, Yun-Zhi	Chief Physician, Professor
eRA COMMON USER NAME (credential, e.g., agency.jpain)	
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)	
INSTITUTION AND LOCATION	DEGREE
School of Life Sciences Kunming Medical University	M.D. 2005 Medicine
Wuhan Institute of Virology, Chinese Academy of Sciences	2010 Virology

A. Personal Statement My career in public health is focused on zoonotic and emerging infectious diseases, including hantaviruses, henipaviruses and coronaviruses. As head of infectious disease surveillance at Yunnan CDC, I am particularly interested in the risk of new zoonotic pathogens emerging through the wildlife trade, which Yunnan is on the front line of in China. I have collaborated with Wuhan Institute of Virology (Zhenli Shi) and Earth Health Alliance (Peter Daszak, Jon Epstein and Kevin Oliver) and have conducted extensive surveillance in Myanmar, Laos and Vietnam. This has led to the discovery of numerous CoVs in mammals, including bats, and including the recent finding of a bat SL-CoV that uses ACE2 as its entry receptor in vitro, and our capacity to do extensive surveillance of wildlife and people in Yunnan. I believe that this project will generate valuable information on the ecology and evolution of CoVs and their potential for future zoonotic spillover.

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

2003-6	Deputy chief physician, Public Health Branch of the Chinese Medical Association Youth Committee
2006-9	Head of infectious disease surveillance, Yunnan Center for Disease Control, People's Republic of China.
2009-Present	Head of Infectious Disease Surveillance, Yunnan Institute of Prevention and Control, Peoples' Republic of China.

C. Field Experience and Professional memberships

2002-2004	Participant, international Field Epidemiology Training Program (FETP)
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C. Selected Peer-reviewed Publications**Most relevant to the grant**

- Li, Y., Wang, J.M., Hickey, A.C., Zhang, Y.Z., Li, Y., Wu, Y., Zhang, H., Broder, C.C., Wang, L.F. & Shi, Z. (2008). Antibodies to Nipah virus in bats, China. *Emerging Infectious Diseases* 14(12):1974-1976.

e) Supplies: Annual costs for laboratory reagents (20k) (20k x 2.5k = 5k); testing costs (30k); expendable equipment costs (5k) are requested in Y1-Y5.

f) Travel: Round-trip airfare to Boston for PI/Co-investigator (Dr. Shi) for attending PD/PI meetings each year in Y1-Y5: \$1,800. Dr. Shi has discretionary funds to supplement travel expenditures. We also request \$2,400 to cover in-country transportation costs of supplies and samples.

g) Participant support costs: N/A

Other direct costs: We request annual support costs for telephone (\$180), Printing (\$144), Conference Calls (\$504), and local shipping charges (\$172) for Dr. Shi's laboratory and Mr. Li in Y1-Y5.

i) Indirect Costs. All administrative costs are charged directly.

H. Other direct costs: We request \$74,000 in equipment for the laboratory including bat catching equipment, syringes, tubes, and reagents, and 2 liquid nitrogen dry shippers at \$3,000 each. We also request \$5,000 per year for shipping in years 2-5. We also request \$4,000 in years 3 and 4 for lab reagents to complete molecular genetics tests.

Other expenses for publishing and communications, including travel from referring facilities will be covered by EcoHealth Alliance.

I. Indirect Costs

We are requesting indirect costs for the consortium/contractual agreement on all applicable direct costs. Indirect is taken equally on the first \$25,000 for each consortium/contractual agreement. As there are 2 (one to Wuhan Institute of Virology and the other to East China Normal University) consortium/contractual agreements, indirect on consortium/contractual agreements is \$100,000. In Y2-Y5 no indirect is taken on consortium/contractual agreements.

RESEARCH & RELATED BUDGET - SECTION C, D, & E, BUDGET PERIOD 1

* ORGANIZATIONAL DUNS: 5290274740000

* Budget Type: Project Subaward/Consortium

Enter Name of Organization: Woman Institute of Biology

* Start Date: 10-01-2012

* End Date: 09-30-2014

Budget Period

C. Equipment		* Funds Requested (\$)
List items and dollar amount for each item exceeding \$5,000		
Equipment Item		
Total funds requested for all equipment listed in the attached file		
Additional Equipment:	File Name:	

D. Travel	Funds Requested (\$)
1. Domestic Travel Costs (Incl. Canada, Mexico, and U.S. Per Sessions)	2,060.00
2. Foreign Travel Costs	
Total Travel Cost	2,060.00

E. Participant/Trainee Support Costs	Funds Requested (\$)
1. Tuition/Fees/Health Insurance	
2. Stipend	
3. Travel	
4. Other:	
Number of Participant/Trainee Support Costs	

RESF

RESEARCH & RELATED BUDGET - SECTION 1, BUDGET REQUEST

* ORGANIZATION: **WUHAN INSTITUTE OF VIROLOGY** DUNS: 529027473, 20500

* Budget Period: 1

Enter name of Organization: **Wuhan Institute of Virology**

* Start Date: 10-01-2013

* End Date: 09-30-2014

Budget Period: 1

F. Other Direct Costs	Funds Requested (\$)
1. Materials and Supplies	95,737.00
2. Publication Costs	
3. Consultant Services	
4. ADP/Computer Services	
5. Travel	
6. Equipment or Purchases (Excludes Rental/User Fees)	
7. Alterations and Renovations	
Total Other Direct Costs	

G. Direct Costs	Funds Requested (\$)
Total Direct Costs (A-G)	

H. Indirect Costs	Funds Requested (\$)
Indirect Cost Type	Indirect
1. Wuhan Institute of Virology	
Total Indirect Costs	9,814.00

Cognizant Federal Agency: **NIH**
(Agency Name, DC Name, and POC Phone Number)

I. Total Direct and Indirect Costs	Funds Requested (\$)
Total Direct and Indirect Institutional Costs (G+H)	122,595.00

J. Fee	Funds Requested (\$)

K. * Budget Justification

File Name: 1212-WIV-NIAID-COV-BUDGET JUSTIFICATION.pdf Mime Type: application/pdf

JUSTIFICATION

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RESEARCH & RELATED Budget (F-K) (Funds Requested)

RESEARCH & RELATED BUDGET - SECTION C, D, & E, BUDGET PERIOD 2

* ORGANIZATIONAL DUNS: 5290274740000

* Budget Type: Project Subaward/Consortium

Enter Name of Organization:

* Start Date: 10-01-2014

* End Date: 09-30-2015

Budget Period: 2

C. Equipment		* Funds Requested (\$)
List items and dollar amount for each item exceeding \$5,000		
Equipment Item		
Total funds requested for all equipment listed in the attached file		
Additional Equipment:	File Name:	Amount:

D. Travel	Funds Requested (\$)
1. Domestic Travel Costs (Incl. Canada, Mexico, and U.S. Per Sessions)	2,060.00
2. Foreign Travel Costs	
Total Travel Cost	2,060.00

E. Participant/Trainee Support Costs	Funds Requested (\$)
1. Tuition/Fees/Health Insurance	
2. Stipend	
3. Travel	
4. Support	
5. Other:	
Number of Participant/Trainee Support Costs	

RESF

RESEARCH & RELATED BUDGET QUESTIONS, BUDGET PLAN

* Budget Type:

Enter name of Organization: Wuhan Institute of Virology

* Start Date: 10-01-2014

* End Date: 09-30-2015

Budget Period: 2

F. Other Direct Costs

Funds Requested (\$)

1. Material Costs	
2. Publication Costs	
3. Consultant Services	
4. ADP/Computer Center Services	
5. Travel	
6. Equipment	
7. Alterations and Renovations	
Total Other Direct Costs	100,756.00

G. Direct Costs

Funds Requested (\$)

Total Direct Costs (A thru F) 1,028,718.00

Indirect	
1. Wuhan Institute of Virology	
Total Indirect Costs	10,297.00

(Agency Name, POC Name, and POC Phone Number)

I. Total Direct and Indirect Costs

Funds Requested (\$)

Total Direct and Indirect Institutional Costs (G + H) 1,039,015.00

J. Fee

Funds Requested (\$)

K. * Budget Justification

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RESEARCH & I

RESEARCH & RELATED BUDGET - SECTION C, D, & E, BUDGET PERIOD 3

* ORGANIZATIONAL DUNS: 5290274740000

* Budget Type: Project Subaward/Consortium

Enter Name of Organization: Woman Institute of Virology

* Start Date: 10-01-2015

* End Date: 09-30-2016

Budget Period: 3

C. Equipment		* Funds Requested (\$)
List items and dollar amount for each item exceeding \$5,000		
Equipment Item		
Total funds requested for all equipment listed in the attached file		
Additional Equipment:	File Name:	

D. Travel	Funds Requested (\$)
1. Domestic Travel Costs (Incl. Canada, Mexico, and U.S. Per Sessions)	2,060.00
2. Foreign Travel Costs	
Total Travel Cost	2,060.00

E. Participant/Trainee Support Costs	Funds Requested (\$)
1. Tuition/Fees/Health Insurance	
2. Stipend	
3. Travel	
4. Support	
5. Other:	
Number of Participant/Trainee Support Costs	

RESF

RESEARCH & RELATED BUDGET

* ORGANIZATIONAL DUNS: 5290274740000

* Budget Type: Project Subaward/Consortium

Enter name of Organization: Wuhan Institute of Virology

* Start Date: 10-01-2015

* End Date: 09-30-2016 Budget Period: 26.0

F. Other Direct Costs	
1. Materials and Supplies	110,070.00
2. Publication Costs	
3. Consultant Services	
4. ADP/Computer Services	
5. Travel	
6. Equipment	
7. Alterations and Renovations	
Total Other Direct Costs 110,070.00	

G. Direct Costs	Funds Requested
Total Direct Costs (A + F)	110,070.00

H. Indirect Costs	Indirect Cost Type	Indirect Cost Rate	Indirect Cost Base (\$)	Fund
1. Wuhan institute of Virology F&A Rate		8.00%	8,805.60	
Total Indirect Costs				8,805.60

Organizational Agency:
(Agency Name, POC Name, and POC Phone Number)

I. Total Direct and Indirect Costs	Funds Requested
Total Direct and indirect institutional costs (G + H)	118,875.60

J. Fee	Funds Requested (\$)

K. * Budget Justification	File Name: 125... GOV BUDGET	Mime Type: application/pdf
JUSTIFICATION		
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RESEARCH & RELATED Budget (F-I)

RESEARCH & RELATED BUDGET - SECTION C, D, & E, BUDGET PERIOD 4

* ORGANIZATIONAL DUNS: 5290274740000

* Budget Type: Project Subaward/Consortium

Enter Name of Organization: Woman Institute of Virology

* Start Date: 10-01-2016

* End Date: 09-30-2017

Budget Period: 4

C. Equipment		* Funds Requested (\$)
List items and dollar amount for each item exceeding \$5,000		
Equipment Item		
Total funds requested for all equipment listed in the attached file		
Additional Equipment:	File Name:	Amount:

D. Travel	Funds Requested (\$)
1. Domestic Travel Costs (Incl. Canada, Mexico, and U.S. Per Sessions)	2,060.00
2. Foreign Travel Costs	
Total Travel Cost	2,060.00

E. Participant/Trainee Support Costs	Funds Requested (\$)
1. Tuition/Fees/Health Insurance	
2. Stipend	
3. Travel	
4. Support	
5. Other:	
Number of Participant/Trainee Support Costs	

RESF

RESEARCH & RELATED BUDGET QUESTIONS, BUDGET PLAN

* Budget Type:

Enter name of Organization: Wuhan Institute of Virology

* Start Date: 10-01-2016

* End Date: 09-30-2017

Estimate Period: 4 4

F. Other Direct Costs

Funds Requested (\$)

1. Material Costs	
2. Publication Costs	
3. Consultant Services	
4. ADP/Computer Center Services	
5. Travel	
6. Equipment	
7. Alterations and Renovations	
Total Other Direct Costs	119,373.00

G. Direct Costs

Funds Requested (\$)

Total Direct Costs (A thru F) 1,149,339.00

H. Indirect Costs

Indirect

1. Wuhan Institute of Virology	
Total Indirect Costs	11,707.00

Consultant Federal Agency (Agency Name, UIC, Name, and POC Phone Number)

I. Total Direct and Indirect Costs

Funds Requested (\$)

Total Direct and Indirect Institutional Costs (G + H) 1,161,046.00

J. Fee

Funds Requested (\$)

K. * Budget Justification

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RESEARCH & I

RESEARCH & RELATED BUDGET - SECTION C, D, & E, BUDGET PERIOD 5

* ORGANIZATIONAL DUNS: 5290274740000

* Budget Type: Project Subaward/Consortium

Enter Name of Organization: Woman Institute of Biology

* Start Date: 10-01-2017

* End Date: 09-30-2018

Budget Period: 5

C. Equipment		* Funds Requested (\$)
List items and dollar amount for each item exceeding \$5,000		
Equipment Item		
Total funds requested for all equipment listed in the attached file		
Additional Equipment:	File Name:	

D. Travel	Funds Requested (\$)
1. Domestic Travel Costs (Incl. Canada, Mexico, and U.S. Per Sessions)	2,060.00
2. Foreign Travel Costs	
Total Travel Cost	2,060.00

E. Participant/Trainee Support Costs	Funds Requested (\$)
1. Tuition/Fees/Health Insurance	
2. Stipend	
3. Travel	
4. Support	
5. Other:	
Number of Participant/Trainee Support Costs	

RESF

RESEARCH & RELATED BUDGET QUESTIONS, BUDGET PERIOD

* Budget Type:

Enter name of Organization: Wuhan Institute of Virology

* Start Date: 10-01-2017

* End Date: 09-30-2018

Budget Period: 5

F. Other Direct Costs

Funds Requested (\$)

1. Material Costs	
2. Publication Costs	
3. Consultant Services	
4. ADP/Computer Center Services	
5. Travel	
6. Equipment	
7. Alterations and Renovations	
Total Other Direct Costs	119,373.00

G. Direct Costs

Funds Requested (\$)

Total Direct Costs (A thru F) 1,149,333.00

Indirect	
1. Wuhan Institute of Virology	
Total Indirect Costs	11,767.00

Agency (Agency Name, Agency ID, Name, and POC Phone Number)

I. Total Direct and Indirect Costs

Funds Requested (\$)

Total Direct and Indirect Institutional Costs (G + H) 1,161,100.00

J. Fee

Funds Requested (\$)

K. * Budget Justification

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RESEARCH & I

RES

Totals (\$)

Section A, Senior/Key Personnel 79,325.00

Section B, Other Personnel

Total Number of Other

Total Salary, Wages and Fringe

Section C, Equipment

Section D, Travel

10,300.00

1. Domestic

10,300

2. Foreign

Section E,

1. Tuition/F

2.

3. Travel

4.

6. Number of Participants/Fellows

554,612.00

Section F,

1. Materials

554,612.00

2. Publication Costs

3. Con

4. ADP/Computer Services

5. Subawards/Consortium/Con

6. Equipment or Facility Rental/User Fees

7. Alterations and Renovations

8. Other 1

9. Other 2

10. Other

Section G, Direct Costs (A thru F)

694,422.00

Sub

Section H, Indirect Costs (Total Direc

Laboratory Supplies

We request support for *in vitro* infection experiments using pseudoviruses carrying the spike proteins (wild type or mutants) or live viruses in cell lines of interest origins, binding affinity assays between the spike proteins (wild type or mutants) and different cellular receptor molecules, and

In Year 1, \$65,300 is requested: Lipofectamine 2000 transfection reagent at a cost of \$2,428; cell lines from bats and other mammals including primates and humans at a cost of \$971; *in vitro* infection experiments require GIBCO Fetal Bovine Serum (\$5,002), GIBCO antibiotic antimycotic (\$563), GIBCO medium (\$2,914) as well as \$19,426 for Corning Cell culture; receptor-mutant pseudovirus binding assays require Luciferase assay system E1500 (\$858), pseudovirus package (\$5,713) and sequencing (\$22,662). \$8,094 is required for protein expression from the binding affinity assays.

In Year 2, \$70,385 is requested: Lipofectamine 2000 transfection reagent at a cost of \$2,428; cell lines from bats and other mammals including primates and humans at a cost of \$971 – sufficient cell lines requirement will decrease in Years 3-5; increased number of *in vitro* infection experiments will require slightly more funding for GIBCO Fetal Bovine Serum (\$4,047) as well as GIBCO antibiotic antimycotic (\$563), GIBCO medium (\$2,914) as well as \$19,426 for Corning Cell culture; receptor-mutant pseudovirus binding assays require Luciferase assay system E1500 (\$858), pseudovirus package requirements will be approximately double from Y1 (\$5,799), and sequencing (\$22,662), 713, is required for protein expression from the increased Year 2 number of binding affinity assays at a slightly higher cost than year one as well.

In Years 3, 4 and 5, \$65,300 is requested per year: Lipofectamine 2000 transfection reagent at a cost of \$2,428; cell lines from bats and other mammals including primates and humans at a cost of \$971 – sufficient cell lines requirement will decrease in Years 3-5; increased number of *in vitro* infection experiments will require slightly more funding for GIBCO Fetal Bovine Serum (\$5,026 per year) as well as GIBCO antibiotic antimycotic (\$563 per year), GIBCO medium (\$2,914 per year) as well as \$19,426 per year for Corning Cell culture; receptor-mutant pseudovirus binding assays require Luciferase assay system E1500 (\$858 per year), pseudovirus package requirements will be \$6,799 per year. Sequencing (\$22,662) will also be required. Protein expression from binding affinity assays; in only years 3, 4, and 5 humanized *in vivo* experimental animals will be raised at an annual cost of \$4,857 per year.

H. Indirect Costs

We are requesting an extremely indirect cost of 8% on all direct costs.

RESEARCH & RELATED BUDGET - SECTION C, D, & E, BUDGET PERIOD 1

ORGANIZATIONAL DUNS: 3209454950000

* Budget Type: Project Subaward/Consortium

Enter name of organization: East China Normal University

* Start Date: 10-01-2013 * End Date: 09-30-2014 Budget Period: 1

C. Equipment Description

List items and dollar amount for each item **not exceeding \$5,000**

Equipment Item

* Funds Requested (\$)

Total funds requested for all equipment listed in the attached file

Additional Equipment:

File Name:

File Type:

D. Travel

Funds Requested (\$)

- 1. Domestic Travel Costs (U.S., Canada, Mexico, possessions)
- 2. Foreign Travel Costs

Total Travel Cost 2,700.00

E. Participant/Trainee Support Costs

Funds Requested (\$)

- 1. Tuition/Fees/Health Insurance
- 2. Stipends
- 3. Travel
- 4. Student Support
- 5. Other:

Number of Participants

RESEARCH & RELATED BUDGET (C-E) (Funds Requested)

RESEARCH & RELATED BUDGET - SECTION C, D, & E, BUDGET PERIOD 2

ORGANIZATIONAL DUNS: 3209454950000

* Budget Type: Project Subaward/Consortium

Enter name of organization: East China Normal University

* Start Date: 10-01-2014 * End Date: 09-30-2015

Budget Print?

C. Equipment Description

List items and dollar amount for each item **not exceeding \$5,000**

Equipment Item

* Funds Requested (\$)

Total funds requested for all equipment listed in the attached file

Additional Equipment:

File Name:

File Type:

D. Travel

Funds Requested (\$)

- 1. Domestic Travel Costs (U.S., Canada, Mexico, possessions)
- 2. Foreign Travel Costs

Total Travel Cost

2,700.00

E. Participant/Trainee Support Costs

Funds Requested (\$)

- 1. Tuition/Fees/Health Insurance
- 2. Stipends
- 3. Travel
- 4. Student Support
- 5. Other:

Number of Participants

RESEARCH & RELATED BUDGET (C-E) (Funds Req

RESEARCH & RELATED BUDGET - SECTION C, D, & E, BUDGET PERIOD 3

ORGANIZATIONAL DUNS: 3209454950000

* Budget Type: Project Subaward/Consortium

Enter name of Organization: East China Normal University

* Start Date: 10-01-2015 * End Date: 09-30-2016 Budget Period: 3

C. Equipment Description

List items and dollar amount for each item **not exceeding \$5,000**

Equipment Item

* Funds Requested (\$)

Total funds requested for all equipment listed in the attached file

Additional Equipment:

File Name:

File Type:

D. Travel

Funds Requested (\$)

- 1. Domestic Travel Costs (U.S., Canada, Mexico, possessions)
- 2. Foreign Travel Costs

Total Travel Cost 2,700.00

E. Participant/Trainee Support Costs

Funds Requested (\$)

- 1. Tuition/Fees/Health Insurance
- 2. Stipends
- 3. Travel
- 4. Student Support
- 5. Other:

Number of Participants

RESEARCH & RELATED BUDGET (C-E) (Funds Req