Program Director/Principal Investigator (Last, First, Middle): Daszak, Peter

Targeted/Planned Enrollment Table

This report format should NOT be used for data collection from study participants.

Study Title: The ecology of bat coronaviruses and the risk of future coronavirus emergence.

Total Planned Enrollment: 2460**

TARGETED/PLANNED ENROLLMENT: Number of Subjects			
Ethnic Category	**Females**	**Males**	**Total**
Hispanic or Latino	,0	0	0
Not Hispanic or Latino	1,230	1,230	2,460
Ethnic Category: Total of All Subjects *	1,230	1,230	2,460
Racial Categories			
American Indian/Alaska Native	0	0	0
Asian	1,230	1,230	2,460
Native Hawaiian or Other Pacific Islander	0	0	0
Black or African American	0	0	0
White	0	0	0
Racial Categories: Total of All Subjects *	1,230	1,230	2,460

* The "Ethnic Category: Total of All Subjects" must be equal to the "Racial Categories: Total of All Subjects."

(** all study subjects will be enrolled at foreign sites in China)

INCLUSION OF CHILDREN:

Inclusion of Children: Children will not be included in this study. Children do not normally work in wildlife markets, and are not normally involved in the wildlife trade in China.

VERTEBRATE ANIMALS:

1. Detailed description of animal use.
All work with vertebrate animals will be conducted in China.
Capture and sampling techniques for all wild animals described in this study have been previously approved by UC Davis IACUC (Mazet and Epstein; UC Davis 15898; current).

Experimental work using humanized mice will be conducted at the Center for Animal Experiment Biosafety 3 lab of Wuhan University at the School of Medicine in Wuhan, China. The Center is AAALAC accredited and has both an Institutional Biosafety Committee and an Institutional Animal Care and Use Committee. Animals will be housed in a BSL-3 facility and will be under the care of a full-time veterinarian. We will submit our protocols for IACUC approval should this proposal be funded. Conditions for animal use are described below.

Note: The majority of wild animals captured and sampled will be done using non-destructive, techniques. In a small number of instances (~ 2 bats per species), where intestine and lung tissue is required to establish cell lines, animals will be humanely euthanized and a necropsy performed according to accepted protocols (see euthanasia section)

Bat capture. Free-ranging bats will be captured using either a mist net or harp trap. The net system is manned by two people during the entire capture period, and bats are removed from the net as soon as they become entangled to minimize stress and prevent injury. In the Co-PI's (Dr. Epstein) experience, a maximum of 20-30 bats can be safely held and processed by a team of three people per trapping period. Duration of trapping will depend on the capture rate. Bats are placed into a pillowcase or small cloth bag and hung from a branch or post until samples are collected. Bats are held for a maximum of six hours.

Wild rodent capture. Free-ranging rodents will be captured through pit traps and box traps; captive rodents, including resident free-ranging wild rats/rodents in markets, will be manually captured or captured through traps. Traps will be checked a minimum of once daily in the morning. If adverse weather (extreme heat, rain) is expected or researchers are working in areas where predation is common, traps will be checked more frequently, and closed during the adverse weather. Handling of rodents will involve morphometric measurements. Captive and wild rodent sampling procedures (including anesthesia if necessary), will involve manual restraint, venipuncture, mucosal swabs, fecal, urine, and external parasite collection. Following capture, small animals will be restrained with a fine mesh bag to minimize entanglement, taking precautions to ensure the animals are not traumatized by the hoop of the net or through net removal. Larger rodents will be restrained for sampling in specialized squeeze-cages, allowing adjustments appropriate to the size of the animal. Squeeze-cages consist of a wooden frame with a plasticized wire bottom and a Plexiglas shield used to press the animal, while ensuring visible communication between the field veterinarian and the animal. Once squeezed, a rod is inserted to keep the plastic shield in place. The box is then inverted, allowing sampling to be conducted through the open wire bottom and abdomen of the animal when the animal is safely immobilized. Anesthesia for small rodents will be conducted using plastic tubes, with the animals transferred directly from the traps to the tubes containing a cotton swab soaked in ether, isoflurane, or methoxyflurane for anesthetic induction. For larger rodents, chemical restraint and anesthesia (ketamine alone, or ketamine combined with xylazine) will be applied either through the squeeze cages by syringe if applicable.

Laboratory mice. Lab mice will be sourced commercially by the Wuhan Center for Animal Experiment at Wuhan University.

Sample Collection. Bats will be manually restrained during sampling.
Bats: Depending on the species and size of bat, swabs will be taken from the oropharynx, urogenital tract, and rectum. Fresh feces will be collected if available, in which case a rectal swab will not be collected. Blood will be collected from fruit bats either from the cephalic vein or from the radial artery or vein using a 25 gauge needle and 1cc syringe. Blood will be collected from bats weighing less than 100g according to published techniques (*126*).

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Rodents: Rodents will be anesthetized prior to sampling.
Once anesthetized a small blood sample will be collected using a capillary tube placed into the retro-orbital sinus. Only trained technicians will perform retro-orbital bleeding and it will only be performed on anesthetized rodents. Femoral or jugular venipuncture may be used for larger rodents (e.g. rats). In all rodents, blood volumes of no more than 1% of body weight will be withdrawn. (example 0.2 ml blood from a 20 gram rodent).

Civets and other small mammals: Anesthesia will be used to restrain small free ranging mammals according to published protocols. Animals will be monitored continuously while recovering from anesthesia. Animals that are sampled in the marketplace, and that may potentially be consumed, will not be anesthetized. Manual restraint will be used and blood will be drawn from the femoral artery or saphenous vein.

Laboratory Mice. Humanized mice will be bred at the University of Wuhan. Mice will be inoculated with a specific dose (e.g. $1x10^6$ TCID50) of virus through different routes (intranasally and intraperitoneally). Mouse body temperature will be monitored with implanted temperature sensing microchips (LifeChip Bio-thermo, Destron Fearing), and mice will be weighed daily. Animals will be observed daily for clinical signs of illness. Moribund mice will be euthanized, according to AVMA recommendations. Live animals will be euthanized at three weeks post-inoculation and organs harvested. We will collect sera on days 10, 15 and 21 to test for neutralizing antibodies against bat CoVs. We will collect nasal washes, oral swabs, and rectal swabs, and urine every two days. These are minimally invasive procedures, and will be performed by experienced lab technicians under the supervision of a full-time veterinarian.

2. Justify use of animals, choice of species, numbers to be used. Species and number used in study:
The purpose of this study is to conduct multi-regional surveillance in large populations of animals to detect coronaviruses that may pose a risk to the health of both humans and animals. The experimental work is designed to understand the ability of bat coronaviruses to bind to human receptors. Because we don't have prevalence estimates for novel strains of coronaviruses, we assume a conservative estimate of 10% prevalence. SARS-like coronaviruses have been found in between 10% and 38% of bats studied (*4, 25*). A 10% in wild populations of bats would require a sample of 30 individuals per species in order to ensure detection of an infected individual with 95% confidence. **Wild bats**: We will sample 30 individuals from 30 different species in each province in China (2 per species euthanized for organ tissue); representing but not limited to the following families: *Rhinolophidae, Hipposideridae, Vespertillionidae, Mollossidae,* and *Pteropodidae*, all of which are present in Southern China and potentially in the wildlife markets. **Bats in wet markets:** We will opportunistically sample a wide variety of insectivorous and frugivorous bats according to what is present in markets. In addition to bats, we will sample civets, raccoon dogs, rats, bandicoots, bamboo rats, and other rodents present in the markets that may act as intermediate hosts. Numbers of animals sampled from markets will be limited to animal availability. In every situation, sampling of wildlife will be conducted in the most humane manner while minimizing the impacts on individual animals and their wild populations. In cases where feces are collected for testing, non-invasive techniques will be used. In all instances, the fewest number of animals will be sampled that will provide valid information and statistical inference for the pathogen and disease of interest and every effort will be made to minimize stress and discomfort for the animal.

A small number of bats (maximum 2 per species) representing each of the species in this study may be euthanized in order to collect lung and intestinal tissue required for characterizing coronavirus receptors. Voucher specimens may also be collected at the discretion of the team leader for the accurate identification of species using molecular methodology.

Humanized mice for experimental infection for Specific Aim 3: In order to understand whether bat coronaviruses that utilize receptors found in people have the potential to infect people, we will use Swiss albino mice (standard breed at Wuhan University) that have been genetically modified to have human receptors. We'll infect them with cultured bat coronaviruses and determine which organs become infected and whether these mice are capable of shedding infectious virus. Humanized mice will be genetically modified to carry human ACE2 or DPP4 gene will be used to evaluate pathogenesis of CoVs. We cannot anticipate exactly how many viruses we will find that are candidates for experimental models, however we estimate that we will use
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four adult mice (2 male, 2 female) per virus and that we will identify approximately 20 viruses that will be used for mouse infection experiments. This will require a total of 80 mice over the study period.

3. Provide information on veterinary care. For wild caught animals, **t**here is no specific veterinary care that is appropriate, nor will clinical veterinary facilities be available. Animals that are injured during the capture or sampling process will be assessed by an experienced team leader, and if the animal is determined to be unlikely to survive if released, it shall be euthanized humanely (see euthanasia section). Animals will be released within hours of capture. In the markets, animals will be sampled using manual restraint or anesthesia. Animals will be returned to vendors after sampling, or, if wild caught in the markets (e.g. rodents), they will be released in the area outside the marketplace.

Laboratory mice will be housed in the BSL-3 small animal facility Center for Animal Experiment at Wuhan University. Experimental animals will be regularly monitored by experienced staff and a supervising veterinarian. The animal facility operates 24 hours a day and has full-time veterinarians on staff. All animals will be provided with food and water ad libitum and will otherwise receive standard care.

4. Procedures for ensuring animal comfort, lack of distress, pain, or injury: Animals will not be held longer than 6 hours. Co-PIs, Drs. Epstein and Olival have extensive experience in capture, anesthesia, and sampling wildlife, including bats. In our experience, bats and rodents tolerate the described procedure well. Mist nets will be attended continuously during capture periods, and bats will be extracted from the net as soon as they become entangled. This will minimize stress and injury from entanglement. Bats will be placed individually in cotton bags and hung from tree branches while awaiting processing and during recovery. The bags are sufficiently porous as to allow for ventilation and are designed for bat capture. The enclosed environment seems to calm the bats, as they do not struggle once inside, but they hang quietly. Animals will be monitored by a veterinarian or experienced field team member during all stages of capture, processing, and release. Animals will be kept in a cool place while in the pillowcases. Rodent traps will be set overnight and all traps will be checked in the morning while it still cool outside. Rodents will be kept in a cool, shaded environment during sampling and will be released within 10 hours of capture.

The procedures used in this experiment (blood draw, nasal, oral, and rectal swabs) are minimally invasive, however, mice that show signs of morbidity post-infection will be examined and euthanized according to AVMA standards (see below).

5. Euthanasia: In the event of injury to an animal that results in pain and suffering, and reasonable veterinary care is unavailable, the animal will be euthanized by a veterinarian or trained field team member using ketamine injected intramuscularly 37.5mg/kg and sodium pentobarbital injected intravenously at a dose of 1.0ml per 5kg injected intravenously. This protocol is in accordance with the AVMA euthanasia report (2007). Any animal that is euthanized using a chemical agent will be disposed such that it will not be permitted to enter the food supply either through markets or hunting.

SELECT AGENT RESEARCH/BIOHAZARDS. No select agent research as of 5/25/12

SARS-CoV caused outbreaks with significant case fatality rates, and there are no vaccines available for this agent. SARS-CoV is classified as a BSL-3 agent. The work proposed in this application will involve two aspects: field work and laboratory work. Fieldwork involves the highest risk of exposure to SARS or other CoVs, while working in caves with high bat density overhead and the potential for fecal dust to be inhaled. There is also some risk of exposure to pathogens or physical injury while handling bats, civets, rodents or other animals, their blood samples or their excreta. The Co-PI is a veterinarian with extensive experience working with wildlife species and high-biosecurity pathogens (Nipah virus, ebolavirus, SARS), and great care will be taken in the field to limit the risk of accidental exposure to known or unknown animal pathogens. We have strict procedures for handling bats and working with samples from them as they are secured in the field and transported to the lab. Field team members handling animals will be trained to utilize personal protective equipment and practice proper environmental disinfection techniques. This includes wearing coveralls or dedicated clothing, nitrile gloves, eye protection, and a P95 or P100 respirator. All field clothing and equipment will be disinfected using Virkon disinfectant. All biological waste from field surveys will be disposed of in the appropriate container (sharps box or an autoclave bag) and will be autoclaved at local hospitals or university labs. All personnel will be vaccinated against rabies and have a neutralizing antibody titer, in accordance with WHO and CDC recommendations. Field teams will carry rabies boosters in the field and will receive a booster in the event of a potential rabies exposure.

Field safety protocol: Our procedures to deal with bites, needle-sticks etc. are as follows: The wound is washed thoroughly with soap and water to clean away dirt and debris, then vigorously scrubbed with a sterile gauze bandage and benzalkonium chloride for 5 minutes. If bleeding, pressure is applied with a sterile bandage for until bleeding has stopped. If the wound continues to bleed, medical attention at the nearest hospital is sought. The bat from which the bite or exposure originated is identified, and the samples collected from it labeled on the data sheet that these were involved in an exposure. Our procedures require that the person potentially exposed reports to a major hospital within 24 hours to have wound examined and receive a rabies booster (as per WHO/CDC protocols). The laboratory work is lower risk, as samples placed in lysis buffer will be non-infectious. Samples placed in viral transport medium and frozen will be stored at ultra-low temperatures (-86C) until viral isolation is required. Serum will be heat inactivated (56C for 30 min) prior to testing.

Lab biosafety: Wuhan Institute of Virology and the Wuhan University Center for Animal Experiment BSL-3 lab have an Internal Biosafety Committee and are accredited BSL-2 and BSL 3 laboratories. All experimental work using infectious material will be conducted under appropriate biosafety standards. Disposal of hazardous materials will be conducted according to the institutional biosafety regulations.

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CONSORTIUM/CONTRACTUAL ARRANGEMENTS:

Consortium/Contractual Arrangements

This project is a multi-institutional collaboration led by EcoHealth Alliance, New York (Daszak, PI), which will subcontract funds to two institutions: the East China Normal Univerisity (Dr S. Zhang) and the Wuhan Institute of Virology (Dr. Z. Shi), which are both foreign institutions. Dr. Daszak has over 15 years previous experience managing collaborative projects including two R01s on Nipah virus ecology that involved 5 separate foreign institutions, a 5-year NSF/NIH Ecology of Infectious Disease award on West Nile virus which involved multiple subcontractees, an R01 on bat viral discovery that involves multiple international contracts, and a multi-million dollar p.a. contract from USAID that involves 12 international partners. The applicant organization (EcoHealth Alliance) is justified in taking the lead on this project because it specializes in understanding the ecological, and virological processes underlying zoonotic disease emergence. Dr Daszak has conducted significant preliminary work on this issue including 10-years of research on the ecological and related factors of the emergence of SARS and 11-years of work in China. The subcontractees will work on specific issues and areas in which they have proven expertise. These areas are: human and animal field sampling (East China Normal University, Dr. Zhang) and viral discovery, pathogenesis as well as sample storage and shipping (Wuhan Institute of Virology, Dr. Shi). Dr Daszak has launched and co-directed a joint institute in China with Dr Zhang, and has been involved in contractual arrangements with ECNU for 8 years. Drs Shi, Zhang, and Daszak have collaborated together since 2002 and have been involved in running joint conferences, and shipping samples into and out of China.

SCDC
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Dr. Peter Daszak
President
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Dear Dr. Daszak,

I am writing in response to a request for collaboration on an upcoming NIAID funded R01 entitled "Understanding the risk of bat coronavirus emergence." The Shanghai CDC has a high interest in working with EcoHealth Alliance and its scientists in identifying and preventing the transmission of bat coronaviruses to human populations.

The Shanghai CDC recognizes the mutual benefits to be gained through research cooperation and a successful partnership with EcoHealth Alliance in the field of identification and prevention of zoonotic disease transmission. It is vital to not only identify the diseases themselves, but also identify high-risk human populations and the actions that put them at risk for infection along with evaluating approaches to intervention and disease management.

Understanding and preventing exposure and transmission of zoonotic diseases from wildlife to humans remains a high priority for prevention of pandemics. In our discussion with EcoHealth Alliance, we have agreed to participate in activities that will strengthen the ability of China and other countries in the region to respond to the outbreak of epidemic diseases, particularly those of animal origin. To assist in this study, we will provide participating laboratories in China with human epidemiological information, both new and archived, to support research in bat coronaviruses.

We at the Shanghai CDC look forward to our collaboration with the EcoHealth Alliance team and working further on this worthwhile study.

Sincerely

Fan Wu, M.D.
Director General
Shanghai Municipal Center for Disease Control and Prevention

WUHAN INSTITUTE OF VIROLOGY
The CHINESE ACADEMY OF SCIENCES

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May 23, 2013

To whom it may concern:

On behalf our Institute, I am very pleased to express my strong support for Dr. Zhengli Shi for applying for the R01 entitled "Understanding the Risk of Bat Coronavirus Emergence" under the project managed by Peter Daszak, president of EcoHealth Alliance. Dr. Shi has extensive expertise in viral pathogen discovery. Since 2004, Dr. Shi's laboratory has discovered a variety of genetically diverse bat viruses including bat SARS-like coronavirus, bat adenovirus, and adeno-associated viruses. She has established a worldwide collaborative-group of leading experts on viral pathogens and ecology covering identification of emerging viruses, epidemiology on bat-borne viruses including Hendra and Nipah virus and SARS-coronavirus. Her work with Dr. Peter Daszak led to the discovery of bat SARS-like coronavirus in 2005.

Our Institute would provide all necessary support to Dr. Shi for accomplish the project if it is approved.

Sincerely yours,

Dr. Xinwen Chen
Director, Wuhan Institute of Virology
Chinese Academy of Sciences
Xiao Hong Shan, No. 44
Wuhan 430071 China
(b) (6)

UNC
SCHOOL OF PUBLIC HEALTH
DEPARTMENT
OF EPIDEMIOLOGY

5/31/2013

Dr. Peter Daszak
President
EcoHealth Alliance
460 W 34th St. 17th Floor
New York, NY 10001
USA

Dear Dr. Daszak,

I am writing in response to a request for collaboration on an upcoming NIAID R01 grant entitled "Understanding the risk of bat coronavirus emergence." I agree that studies are definitely needed to identify the key risk factors and develop strategies that prevent the transmission of bat coronaviruses to human populations. Understanding and preventing exposure and transmission of zoonotic diseases from wildlife to humans remains a high priority for prevention of pandemics.

Our laboratory has developed a variety of animal models for understanding human coronavirus pathogenesis in vivo. We have developed transgenic mouse models in the C57BL/6 mice, expressing hACE2 in ciliated cells from the FOXJ1 promoter. Unlike other epithelial cell promoters (e.g., K18, hACE2 expression from FOXJ1 should be specific to the airway epithelium. FOXJ1 (hepatocyte nuclear factor-3/forkhead homologue 4; HFH-4) is a member of the forkhead/winged helix family of transcription factors whose expression is tightly restricted to cells possessing motile cilia or flagella. Inoculation of these mice with wild type SARS-CoV resulted in lethal respiratory tract infections characterized by high virus titers (>10^8 PFU/day 4), hemorrhage, severe pneumonia and acute respiratory distress syndrome between days 2-7 post infection (Fig 1). We also have aged and immunosenescent models that are highly vulnerable to synthetically reconstructed strains of SARS-CoV from early in the epidemic. This letter states my willingness to collaborate with your group to evaluate the in vivo pathogenesis of interesting bat and animal SARS-like coronaviruses.

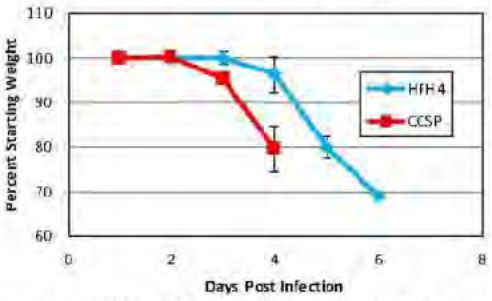

Figure 1. FOXJ1 ACE2 Transgenic Mice are Highly Susceptible to wildtype SARS-CoV Infection. Two different lines were infected with wildtype SARS-virus and clinical disease evaluated at different times postinfection.

It was a pleasure talking with you the other day. I believe your proposal asks fundamentally important questions in the evolution of new human coronaviruses from bats, contributes

dramatically to our understanding of coronavirus variation in natural populations, and provides key insights into the ecology of new emerging infectious diseases. Let me know if I can be of any additional assistance.

Sincerely,

Ralph S. Baric, Professor
Department of Epidemiology
Department of Microbiology and Immunology
Ph: (b) (6)
Email: (b) (6)

云南省地方病防治所
YUNNAN INSTITUTE OF ENDEMIC DISEASES CONTROL AND PREVENTION (YIEDC)

Dr. Peter Daszak
President
EcoHealth Alliance
460 W 34th St. 17th Floor
New York, NY 10001
USA

Dear Dr. Daszak,

I am writing in response to a request for collaboration on an upcoming NIAID funded R01 entitled " Understanding the risk of bat coronavirus emergence." The Yunnan Institute of Endemic Diseases Control and Prevention (EDC) has a high interest in working with EcoHealth Alliance and its scientists in identifying and preventing the transmission of bat coronaviruses to human populations.

The Yunnan EDC recognizes the mutual benefits to be gained through research cooperation and a successful partnership with EcoHealth Alliance, and long term colleague ZhengLi Shi, in the field of identification and prevention of zoonotic disease transmission. It is vital to not only identify the diseases themselves, but also identify high-risk human populations and the actions that put them at risk for infection along with evaluating approaches to intervention and disease management.

Understanding and preventing exposure and transmission of zoonotic diseases from wildlife to humans remains a high priority for prevention of pandemics. In our discussion with EcoHealth Alliance, we have agreed to participate in activities that will strengthen the ability of China and other countries in the region to respond to the outbreak of epidemic diseases, particularly those of animal origin. To assist in this study, we will provide participating laboratories in China with human samples, both new and archived, and support research in bat coronaviruses.

We at the Yunnan EDC look forward to our collaboration with the EcoHealth Alliance team and working further on this worthwhile study.

Sincerely,

Zhang Yunzhi
Yunnan Institute of Endemic Diseases Control and Prevention
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广东省疾病预防控制中心
Guangdong Provincial Center for Disease Control and Prevention

Dr. Peter Daszak
President
EcoHealth Alliance
460 W 34th St. 17th Floor
New York, NY 10001
USA

Dear Dr. Daszak,

I am writing in response to a request for collaboration on an upcoming NIAID funded R01 entitled " Understanding the risk of bat coronavirus emergence." The Guangdong CDC has a high interest in working with EcoHealth Alliance and its scientists in identifying and preventing the transmission of bat coronaviruses to human populations.

The Guangdong CDC recognizes the mutual benefits to be gained through research cooperation and a successful partnership with EcoHealth Alliance in the field of identification and prevention of zoonotic disease transmission. This partnership will continue a successful five year relationship between the Guangdong CDC and EcoHealth Alliance. It is vital to not only identify the diseases themselves, but also identify high-risk human populations and the actions that put them at risk for infection along with evaluating approaches to intervention and disease management.

Understanding and preventing exposure and transmission of zoonotic diseases from wildlife to humans remains a high priority for prevention of pandemics. In our discussion with EcoHealth Alliance, we have agreed to participate in activities that will strengthen the ability of China and other countries in the region to respond to the outbreak of epidemic diseases, particularly those of animal origin. To assist in this study, we will provide participating laboratories in China with human samples, both new and archived, and support research in bat coronaviruses.

We at the Guangdong CDC look forward to our collaboration with the EcoHealth Alliance team and working further on this worthwhile study.

Sincerely,

Ke Changwen

Ke Changwen

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華東師範大學
科学与技术跨学科高等研究院
Institutes for Advanced Interdisciplinary Research, ECNU

25 May 2013

Dr. Peter Daszak
President
EcoHealth Alliance
460 W 34th St. 17th Floor
New York, NY 10001
USA

Dear Dr. Daszak,

As Dean of Institutes for Advanced Interdisciplinary Research, I am delighted at the prospect of our continued collaboration on the NIAID funded R01 "Understanding the Risk of Bat Coronavirus Emergence."

Since 2005, our organizations have collaborated via our School of Life Science. We have a joint-MOU as well. I have enjoyed our close working relationship with EcoHealth Alliance especially on issues related to emerging infectious diseases and health.

Our collaborations include past and current research projects in Guangzhou, Guangxi, Yunnan, Hainan, and Shanghai as well as capacity building, training, and over 20 joint publications including Science papers, which have led to increased understanding of the ecology of disease dynamics and garnered invaluable data towards predicting and preventing zoonotic disease emergence. My field and laboratory teams based in Beijing, Shanghai, Guangxi, and Guangzhou are ideally positioned to conduct both research and surveillance as we work towards reducing the risk of zoonosis in China.

In our discussion with EcoHealth Alliance, I have agreed to participate in activities that will strengthen the ability of China and other countries in the region to respond to the outbreak of epidemic diseases – particularly those of animal origin.

I look forward to our continued collaboration and the results of this exciting and timely project.

Sincerely,

Zhang Shu-Yi

Dr. Zhang Shu-Yi
Dean of Institutes for Advanced Interdisciplinary Research
East China Normal University
B319, Science Building, 3663, North Zhongshan Road,
Shanghai 200062 China
(b) (6)

RESOURCE SHARING PLAN:

Data Sharing Plan*:* Sequence data will be made publicly available via GenBank, and shared when requested by other scientists, as soon as a publication is in press. Viral isolates will remain at the Wuhan Institute of Virology initially. Isolates, reagents and any other products, should they be developed, will be made available to other NIH-funded researchers via applicable Wuhan Institute of Virology and EcoHealth Alliance Material Transfer Agreements and/or licensing agreements.

Sharing Model Organisms*:* We do not anticipate the development of any model organisms from this study. Should any be developed, they will be made available to other NIH-funded researchers via applicable Wuhan Institute of Virology and EcoHealth Alliance Material Transfer Agreements and/or licensing agreements.
Genome Wide Association Studies (GWAS): N/A

PHS 398 Checklist

OMB Number: 0925-0001

1. Application Type:

From SF 424 (R&R) Cover Page. The responses provided on the R&R cover page are repeated here for your reference, as you answer the questions that are specific to the PHS398.

* Type of Application:

☒ New ☐ Resubmission ☐ Renewal ☐ Continuation ☐ Revision

Federal Identifier: GRANT11418218

2. Change of Investigator / Change of Institution Questions

☐ Change of principal investigator / program director

Name of former principal investigator / program director:

Prefix:
* First Name:
Middle Name:
* Last Name:
Suffix:

☐ Change of Grantee Institution

* Name of former institution:

3. Inventions and Patents (For renewal applications only)

* Inventions and Patents: Yes ☐ No ☐

If the answer is "Yes" then please answer the following:

* Previously Reported: Yes ☐ No ☐

4. * Program Income

Is program income anticipated during the periods for which the grant support is requested?

☐ Yes ☒ No

If you checked "yes" above (indicating that program income is anticipated), then use the format below to reflect the amount and source(s). Otherwise, leave this section blank.

*Budget Period	*Anticipated Amount ($)	*Source(s)

5. * Disclosure Permission Statement

If this application does not result in an award, is the Government permitted to disclose the title of your proposed project, and the name, address, telephone number and e-mail address of the official signing for the applicant organization, to organizations that may be interested in contacting you for further information (e.g., possible collaborations, investment)?

☒ Yes ☐ No