11/29/21, 3:41 AM RePORT ) RePORTER

**∢** Back to Search Results

**Description** 

**Details** 

Sub-Projects

Publications

**Patents** 

**Outcomes** 

**Clinical Studies** 

News and More

History

Similar Projects

## **Mali International Center for Excellence in Research**

Project Number Contact PI/Project Leader 1ZIAAI001189-07 FELDMANN, HEINRICH

Awardee Organization
NATIONAL INSTITUTE OF
ALLERGY AND INFECTIOUS
DISEASES



#### **Abstract Text**

In 2010, we published the first description of a genetically unique strain of Lassa virus isolated from Mastomys natalensis captured in Mali, an area previously thought to be free of Lassa virus. Over the last nine years we have continued to conduct field studies mapping the geographic distribution of Lassa virus in peridomestic settings across sub-Saharan Mali. With a better understanding of the endemic regions for this virus in Mali, the Lassa program has transitioned into studies aimed at defining the infection dynamics and transmissibility of Lassa in the natural rodent hosts. For this we have established a colony of Mastomys natalensis at the Rocky Mountain Laboratories. Several studies have shown that the animals can be persistently infected with different Lassa strains without showing obvious clinical signs but virus shedding through different routes (studies still ongoing). We have also investigated the possibility of the Mastomys as a host for a spirochete Borrelia Crocidurae, a cause of relapsing fever. We found that these animals support a long-term infection and may in fact be an unreported host species for this disease-causing bacterium. Thus, this colony provides a unique tool for future Lassa virus infection studies in the natural host. More recently, we have established methodology and technology to study innate and adaptive immune responses in Mastomys natalensis. A few years back, we have started projects to define the incidence rates of Lassa virus infection in humans in southern Mali. Two human serosurvey studies were conducted at three sites; IgG seroprevalence was found at all sites ranging from 16-44%. Interestingly, in the follow-up study we identified an annual infection rate of 6.3%. As there are no clinical reports of Lassa fever in Mali, this indicates that asymptomatic and mild infections may frequently occur. Experimental studies using a Lassa isolate from Mali, designated Soromba, support this hypothesis as Soromba is less virulent in animal models and presents with an atypical respiratory disease in cynomologus macaques (Safronetz et al., J Infect Dis 2013). A new two-part human study covering a larger geographic area was planned for this fiscal year but had to be postponed due to the COVID pandemic. In this study we will examine a cross-section of the population as a whole looking for Lassa virus prevalence and collect clinical samples from hospitals to determine the prevalence of Lassa Fever. This study will confirm and expand upon our previous results and identify human infections to determine the public health importance of Lassa virus infections in Mali. The Mali field program has expanded to include other zoonotic viruses including surveillance for additional arenaviruses (Lassa, Lujo), bunyaviruses (hantaviruses, Crimean-Congo hemorrhagic fever virus (CCHFV), Rift Valley fever virus), filoviruses (Ebola and Marburg), flaviviruses (Dengue, Zika), and coronavirus (MERS-CoV, SARS-CoV-2). We have started to also test serum/blood from humans and livestock and wildlife species to determine the prevalence and importance of zoonotic pathogens for animal and public health in Mali. As of today, we could demonstrate MERS-CoV infections in Malian camels and high CCHFV infection rates in Malian cattle. For humans, we could establish serologic evidence for flavivirus (Dengue, Zika), bunyaviruses (hantavirus), and togaviruses (Chikungunya) infections as well as infections with Leptospira spp.; all contributing to human illness in Mali. Most recently, we could demonstrate seroprevalence for Ebola in southern Mali. These results implying that several of these zoonotic pathogens are widely distributed yet underreported throughout Mali. We have continued to test the preclinical efficacy of favipiravir for Crimean-Congo hemorrhagic fever virus (CCHFV) and Lassa virus in animal models. In addition, we are expanding vaccine research for CCHFV and Lassa virus using vectored vaccines such as vesicular stomatitis virus vectors. During a regular visit in February, we developed and established diagnostic testing for the emerging SARS-CoV-2. At that time Mali did not have any COVID cases, a situation that has changed dramatically. The ICER site (Point G) is now one of 4 national diagnostic centers for COVID testing in Mali. This program also includes education and training of young Malian scientists. Currently, Sidy Bane is in his second year of graduate studies for a PhD degree from the University of Bamako.

#### **Public Health Relevance Statement**

Data not available.

## **NIH Spending Category**

Biodefense Coronaviruses Emerging Infectious Diseases Immunization Infectious Diseases

Orphan Drug Prevention Rare Diseases Vaccine Related Vector-Borne Diseases

### **Project Terms**

2019-nCoV **British Animal Model Animals** Area **Arenavirus** Back **Bacteria** Borrelia Bunyaviridae **Camels** Cattle Clinical **Contracts** Coronavirus Dengue **Diagnostic tests Crimean-Congo Hemorrhagic Fever Virus** Diagnostic **Disease Flavivirus Follow-Up Studies Etiology Doctor of Philosophy Ebola Fever Filovirus** 

Thank you for your feedback!

RePORT ) RePORTER 11/29/21, 3:42 AM

#### **▼** Back to Search Results

**Description** 







Sub-Projects



Publications **Patents** 



**Outcomes** 



**Clinical Studies** 



<u>History</u>



Similar Projects

## Mali International Center for Excellence in Research

**Project Number** 1ZIAAI001189-07

**Contact PI/Project Leader FELDMANN, HEINRICH** 

**Awardee Organization NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES** 

## = Details

**Contact PI/ Project Leader** 

FELDMANN, HEINRICH

Title

Contact **Email not available** 

#### **Other Pls**

Not Applicable

## **Program Official**

Name Contact

**Email not available** 

#### **Organization**

Name **NATIONAL INSTITUTE OF ALLERGY** AND INFECTIOUS DISEASES

City Country Department Type Unavailable Organization Type Unavailable

State Code

**Congressional District** 

## **Other Information**

FOA Study Section Fiscal Year

2020 **Award Notice Date**  Administering Institutes or Centers NATIONAL INSTITUTE OF ALLERGY **AND INFECTIOUS DISEASES** 

**DUNS Number** CFDA Code **Project Start** Date

Project End Date

**Budget Start** Date

**Budget End Date** 

### **Project Funding Information for 2020**

**Total Funding Direct Costs Indirect Costs** \$578,156 \$0 \$0

Year	Funding IC	FY Total Cost by IC	
2020	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES \$5	\$578,156	

### **NIH Categorical Spending**

### **Click here for more information on NIH Categorical Spending**

Funding IC	FY Total Cost by IC	NIH Spending Category
NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	\$115,630	Immunization; Prevention; Vaccine Related;
NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	\$578,156	Biodefense; Coronaviruses; Emerging Infectious Diseases; Infectious Diseases; Orphan Drug; Rare Diseases; Vector-Borne Diseases;

# **品 Sub Projects**

No Sub Projects information available for 1ZIAAI001189-07

# **Publications**

No Publications available for 1ZIAAI001189-07



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RePORT ) RePORTER 11/29/21, 3:42 AM

**▼** Back to Search Results

**Description** 





Sub-Projects



**Publications** 



**Patents** 



**Clinical Studies** 



**News and More** 



<u>History</u>



Similar Projects

## Mali International Center for Excellence in Research

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**Awardee Organization NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES** 

The Project Outcomes shown here are displayed verbatim as submitted by the Principal Investigator (PI) for this award. Any opinions, findings, and conclusions or recommendations expressed are those of the PI and do not necessarily reflect the views of the National Institutes of Health. NIH has not endorsed the content below.

No Outcomes available for 1ZIAAI001189-07

## **Clinical Studies**

No Clinical Studies information available for 1ZIAAI001189-07

# News and More

#### **Related News Releases**

No news release information available for 1ZIAAI001189-07

## ← History

No Historical information available for 1ZIAAI001189-07

# **Similar Projects**

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