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Developing Diagnostics for Assessing Leptospirosis Burden of Disease in Sri Lanka

Parent Project Number
7U19AI115658-05

Sub-Project ID
6486

Contact PI/Project Leader
AGAMPODI, SUNETH BUDDHIKA

Awardee Organization
YALE UNIVERSITY

Description

Abstract Text

DESCRIPTION (provided by applicant): The proposed U19 ICIDR Program is focused on human infection and **disease** by Leptospira. Our overall approach is to use fundamental biological scientific methods combined with clinical/field studies in contrasting epidemiological contexts in Peru and Sri Lanka, to develop new, clinically actionable diagnostic tests. Taking into account the local, regional, and international diversity of Leptospira, the proposed research addresses a hitherto insurmountable gap in the field, that of obtaining diagnostic tests for leptospirosis that are inexpensive, sensitive and efficient, yet easily deployable and effective regardless of the underlying transmission dynamics. The improved accuracy and efficiency of these tests will enable timely administration of appropriate therapy, which is vital for improving clinical outcomes. The overall goal of this Program is to develop robust tools and approaches that will effectively quantify the Global Burden of Leptospirosis, addressing several key goals shared by the international leptospirosis research community as articulated by the World Health Organization's Leptospirosis Epidemiology Reference Group (LERG).1, 2 These approaches, which are applicable to all leptospirosis-endemic and epidemic-prone sites, are summarized as follows: 1. Carry out prospective, field-based clinical studies of suspected acute leptospirosis cases in known or suspected highly endemic settings in Peru (Project 1) and Sri Lanka (Project 2) where the diversity of Leptospira is high and includes the most highly pathogenic as well as less pathogenic (but still **infectious**) Leptospira. These sites will include contrasting urban vs. rural and seasonal vs. perennial leptospirosis risk areas in Peru and Sri Lanka. The projects will focus on both hospitalized cases (more severe **disease**) and outpatients (generally mild spectrum of **disease**) with dedicated attention to comprehensively follow up clinical and microbiological/molecular outcomes; 2. Characterize serum and urine samples from field studies with regard to leptospirosis diagnosis using conventional serology (MAT, ELISA),3, 4, 5 routine culture, our published culture-independent molecular techniques (conventional PCR,6, 7 qPCR,8 Multi Locus Sequence Typing (MLST)9, 10); 3. Test newly developed antigen-detection tests (LPS; alternatively, Leptospira proteins) and antibody- based serological tests using protein microarray technology based on our newly developed Leptospira Genome Project database (PATRIC, http://patricbrc.org; deposited in GenBank, http://www.ncbi.nlm.nih.gov/bioproject/?term=leptospira (both accessed March 7, 2014)) against conventional diagnostics (gold standard re-defined as MAT (on paired samples) plus PCR of blood/urine, given the insensitivity of current culture techniques (problems with past gold-standard diagnostics discussed in Refs.11, 12). The expected outcomes of this program are 1) New tools to diagnose leptospirosis and to identify leptospiral infection of humans; 2) Define and optimize the generalizability of these new tools in diverse and representative settings in Peru and Sri Lanka, and beyond (for example, through the U.S. Centers for **Disease** Control and Prevention that receives samples from all over the world; see Renee Galloway, Letter of Support); and 3) Enhancing research capacity of foreign collaborators by facilitating development of independent creative scientific thinking, hypothesis generation and testing, and new approaches to addressing clinical and translational research problems of highest priority to the endemic country. Additional benefits from this project include clear application to OneHealth medicine because human leptospirosis reflects interactions of humans with zoonotic domestic and agricultural sources such as dogs, cattle, pigs, and water buffalo, wild and peridomestic rodents and marsupials. The tools developed here will have direct application and translation to veterinary and agricultural settings but such work will be beyond the scope of the present project.

Public Health Relevance Statement

Narrative This project will take advantage of the high endemicity of leptospirosis in Sri Lanka and a high diversity of Leptospira present in the environment in this country that are transmitted to humans, towards making better diagnostic tests for leptospirosis. These improved tests for leptospirosis will be useful in Sri Lanka and elsewhere because of the generalizability of the approach, and will allow for accurate estimations in the future for Global Burden of Disease studies for leptospirosis.

NIH Spending Category

Behavioral and Social Science | Biodefense | Biotechnology | Burden of Illness | Clinical Research | Emerging Infectious Diseases | Infectious Diseases | Prevention

Project Terms

Activities of Daily Living | Acute | Address | Affect | Affinity | Agriculture | Antibodies | Antigens | Area | Attention | Awareness | Biological | Biological Assay | Blood | Canis familiaris | Carrier Proteins | Cattle | Centers for **Disease** Control and Prevention (U.S.) | Characteristics | Clinical | Clinical Microbiology | Clinical Research | Collaborations | Collection | Communities | Country | Culture Techniques | Culture-independent methods | Databases | Depos

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Details

Contact PI/ Project Leader

Name
AGAMPODI, SUNETH BUDDHIKA

Title
PROFESSOR IN COMMUNITY MEDICINE

Contact
sunethagampodi@yahoo.com

Other PIs

Not Applicable

Program Official

Name

Contact
Email not available Email not available

Organization

Name
YALE UNIVERSITY

City
NEW HAVEN

Country
UNITED STATES (US)

Department Type
Unavailable

Organization Type
Domestic Higher Education

State Code
CT

Congressional District
03

Other Information

FOA
RFA-AI-14-002

Study Section
ZAI1-AWA-M

Fiscal Year
2019

Award Notice Date
28-March-2019

Administering Institutes or Centers
NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

DUNS Number
043207562

CFDA Code

Project Start Date

Project End Date
28-February-2021

Budget Start Date
01-March-2019

Budget End Date
29-February-2020

Project Funding Information for 2019

Total Funding
$73,166

Direct Costs
$97,848

Indirect Costs
$0

Year	Funding IC	FY Total Cost by IC
2019	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	$73,166

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	$73,166	Behavioral and Social Science; Biodefense; Biotechnology; Burden of Illness; Clinical Research; Emerging Infectious Diseases; Infectious Diseases; Prevention;

Sub Projects

No Sub Projects information available for 7U19AI115658-05 6486

Publications

No Publications available for 7U19AI115658-05 6486

Thank you for your feedback!

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Outcomes

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 7U19AI115658-05 6486

Clinical Studies

No Clinical Studies information available for 7U19AI115658-05 6486

News and More

Related News Releases

No news release information available for 7U19AI115658-05 6486

History

No Historical information available for 7U19AI115658-05 6486

Similar Projects

No Similar Projects information available for 7U19AI115658-05 6486