Back to Search Results

Description
Details
Sub-Projects
Publications
Patents
Outcomes
Clinical Studies
News and More
History
Similar Projects

Development of an improved vaccine against Brucella abortus

Project Number
5R03AI151494-02

Contact PI/Project Leader
CASWELL, CLAYTON C

Awardee Organization
VIRGINIA POLYTECHNIC INST AND ST UNIV

Description

Abstract Text

Project Summary Brucella spp. are bacteria that naturally infect a variety of domesticated and wild animals leading to abortions and sterility, and these bacteria are also capable of causing debilitating human infections, which often result from human exposure to infected animals and animal products. Brucella spp. are considered threats as potential **biological weapons**. Importantly, antibiotic treatment against brucellosis is prone to disease relapse, and there is currently no safe and effective vaccine to protect humans against infection with Brucella. The brucellae are intracellular pathogens that reside within immune cells called macrophages where they replicate in a specialized compartment, and the capacity of Brucella to survive and replicate within macrophages is essential to their ability to cause disease. Over the last few years, our laboratory has characterized genetic pathways that are critical for the intracellular survival and pathogenesis of Brucella strains, and specifically, we have identified small regulatory RNAs (sRNAs) that are essential for Brucella virulence. Preliminary experiments have demonstrated that a family of sRNAs, called the AbcRs is required for the ability of B. abortus to chronically infect mice. When these genes encoding these two sRNAs (i.e., AbcR1 and AbcR2) are deleted, the resulting strain is highly attenuated, and moreover, we have determined that this deletion strain produces extremely high levels of Brucella immunogenic proteins. We hypothesize that the abcR1 abcR2 deletion strain can serve as a highly effective live, attenuation vaccine against B. abortus challenge, and the pilot studies outlined in this application will test this hypothesis. In the end, the information gleaned from these studies may be used to develop an effective vaccine against human Brucella infection.

Public Health Relevance Statement

Project Narrative Brucella spp. are bacteria that cause a debilitating, flu-like disease in humans, and these bacteria are classified as Select Agents due to their potential use as biological weapons. Currently, no safe and effective vaccine exists to protect against human Brucella infection. The proposed research will characterize the utility of a novel Brucella abortus strain as an improved live, attenuated vaccine against brucellosis.

Project Terms

Animal Model **Animals** **Antibiotic Therapy** **Antibiotics** **Antigen Presentation** **Attenuated** **Attenuated Vaccines** **Bacteria** **Binding** **Biological Process** **Brucella** **Brucella abortus** **Brucellosis** **Cell model** **Cells** **Chronic** **Critical Pathways** **Data** **Dendritic Cells** **Development** **Disease** **Domestic Animals** **Exposure to** **Family** **Future** **Gene Expression** **Genes** **Genetic** **Genetic Transcription** **Glean** **Goals** **Human** **Immune** **Immune response** **Immune system** **Infection** **Innate Immune System** **Laboratories** **Mediating** **Messenger RNA** **Mus** **Pathogenesis** **Pilot Projects** **Procedures** **Production** **Proteins** **RNA** **Recurrent disease** **Research** **Sterility** **T-Cell Proliferation** **Testing** **Transcript** **Vaccinated**

Read More

Details

Contact PI/ Project Leader

Name
CASWELL, CLAYTON C

Title
ASSOCIATE PROFESSOR

Contact
caswellc@vt.edu

Other PIs

Not Applicable

Program Official

Name
ZOU, LANLING

Contact
lanlingz@niaid.nih.gov

Organization

Name
VIRGINIA POLYTECHNIC INST AND ST UNIV

City

Department Type
VETERINARY SCIENCES

Organization Type

State Code
VA

Congressional District

Back to Search Results

Description
Details
Sub-Projects
Publications
Patents
Outcomes
Clinical Studies
News and More
History
Similar Projects

Development of an improved vaccine against Brucella abortus

Project Number
5R03AI151494-02

Contact PI/Project Leader
CASWELL, CLAYTON C

Awardee Organization
VIRGINIA POLYTECHNIC INST AND ST UNIV

FOA
PA-19-052

Study Section
Vaccines Against Microbial Diseases Study Section[VMD]

Fiscal Year
2021

Award Notice Date
27-January-2021

Administering Institutes or Centers
NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

DUNS Number
003137015

CFDA Code
855

Project Start Date
01-March-2020

Project End Date
28-February-2022

Budget Start Date
01-March-2021

Budget End Date
28-February-2022

Project Funding Information for 2021

Total Funding
$77,739

Direct Costs
$50,000

Indirect Costs
$27,739

Year	Funding IC	FY Total Cost by IC
2021	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	$77,739

Sub Projects

No Sub Projects information available for 5R03AI151494-02

Publications

No Publications available for 5R03AI151494-02

Patents

No Patents information available for 5R03AI151494-02

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 5R03AI151494-02

Clinical Studies

No Clinical Studies information available for 5R03AI151494-02

News and More

Related News Releases

No news release information available for 5R03AI151494-02

Back to Search Results

Description
Details
Sub-Projects
Publications
Patents
Outcomes
Clinical Studies
News and More
History
Similar Projects

Development of an improved vaccine against Brucella abortus

Project Number
5R03AI151494-02

Contact PI/Project Leader
CASWELL, CLAYTON C

Awardee Organization
VIRGINIA POLYTECHNIC INST AND ST UNIV

Similar Projects

No Similar Projects information available for 5R03AI151494-02