Back to Search Results

Description

Details

Sub-Projects

Publications

Patents

Outcomes

Clinical Studies

News and More

History

Similar Projects

Memory T cell protection of reproductive health following influenza infection

Project Number
5R21HD093948-02

Contact PI/Project Leader
STRUTT, TARA MARLENE

Awardee Organization
UNIVERSITY OF CENTRAL FLORIDA

Description

Abstract Text

Project Summary Respiratory tract infections are a leading cause of death worldwide. Compromised cell-mediated immune responses, low vaccine efficacy, and poor vaccine uptake all increase the likelihood that serious infection will ensue in pregnant women following exposure to respiratory viruses such as Influenza A virus (IAV); approximately 80% of pregnant women are at high risk for influenza-associated complications. Our best defense is vaccination. Vaccine-induced protection is mediated by immunological memory. The majority of immunological memory studies to date have focused on the differentiation, survival, and delineation of the antipathogen defense mechanisms employed by pathogen-specific T cells under normal physiological circumstances. The impact of pregnancy on the persistence and functional recall potential of memory T cells is surprisingly unknown. The overarching hypothesis of this proposal is that IAV-specific T cell memory generated prior to conception will mediate potent universal, heterosubtypic protection throughout pregnancy. This hypothesis arose from our observations that memory effector CD4 T cells isolated from influenza infected lungs express low levels of estrogen and progesterone hormone receptors in comparison to primary effector CD4 T cells. Pregnancy hormones are well known to have detrimental impacts on the generation and function of primary anti-viral immune responses. Preliminary findings herein show that heterosubtypic recall responses are indeed protective in gravid animals primed prior to conception. In the first aim, the persistence of IAV-specific CD4 and CD8 memory T cells during pregnancy, as well as their ability to differentiate into the many protective subsets that mediate diverse and potent anti-viral effector functions will be determined. Our prior work has shown that memory CD4 T cells regulate both local and systemic anti-viral inflammatory responses, and, additionally, mobilize innate lymphoid cells during pathogen infection. Innate lymphoid cells, which function in tissue repair, have recently been shown to be present in placental tissue. In the second aim, we will thus elucidate the role of IAV-specific memory T cells in preserving both healthy placental and fetal development through the regulation of systemic innate inflammatory and cellular responses following IAV infection. The insight gained from the proposed, `reverse-mechanism', studies will advance our ability to develop improved vaccines that elicit memory T cells capable of orchestrating protective anti-viral defenses during pregnancy. This research may also lead to the development of novel strategies to treat expectant mothers suffering from serious influenza for which current therapeutic options are lacking. Respiratory tract infection with Influenza A virus remains a serious public health concern, particularly for pregnant women, who have suffered disproportionally high morbidity and mortality in past epidemic and **pandemic** seasons. The proposed study has the potential to make a broad and significant translational impact on human reproductive health.

Public Health Relevance Statement

Relevance Pregnant women and their developing children are amongst those at the highest risk for serious influenza infection-associated complications and death. The best defense against viral pathogens, such as Influenza A virus, is vaccination-induced immunological memory. The insight gained from the proposed studies will advance our ability to develop improved vaccines that elicit immunity capable of preventing the adverse maternal and fetal outcomes of viral infection during pregnancy.

NIH Spending Category

Contraception/Reproduction Emerging Infectious Diseases Immunization Immunotherapy Infectious Diseases Influenza Pediatric Pneumonia & Influenza Pregnancy Prevention Vaccine Related Women's Health

Project Terms

Activities of Daily Living Animals Antiviral Agents B-Lymphocytes CD4 Positive T Lymphocytes CD8B1 gene Cause of Death Cell Survival Cell physiology Cells Cellular Immunity Cessation of life Child Conceptions Coupled Cytoprotection Data Defense Mechanisms Development Epidemic Estrogen Receptors Estrogens Exposure to Female Fetal Development Fetal health Generations Genes Gravid High Risk Woman Histopathology Hormone Receptor Hormones Human Immune response Immunity Immunologic Memory Immunosuppressive Agents Impairment Infant Infection Inflammation Inflammatory Inflammatory Response Influenza Influenza A virus Lead Lung

Read More

Back to Search Results

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

Memory T cell protection of reproductive health following influenza infection

Project Number
5R21HD093948-02

Contact PI/Project Leader
STRUTT, TARA MARLENE

Awardee Organization
UNIVERSITY OF CENTRAL FLORIDA

Title
ASSISTANT PROFESSOR

Contact
tara.strutt@ucf.edu

Contact
sai.majji@nih.gov

Organization

Name
UNIVERSITY OF CENTRAL FLORIDA

Department Type
OTHER BASIC SCIENCES

State Code
FL

City
ORLANDO

Organization Type
SCHOOLS OF MEDICINE

Congressional District
07

Country
UNITED STATES (US)

Other Information

FOA
PA-16-444

Study Section
Immunity and Host Defense Study Section[IHD]

Fiscal Year
2019

Award Notice Date
12-July-2019

Administering Institutes or Centers
EUNICE KENNEDY SHRIVER NATIONAL INSTITUTE OF CHILD HEALTH & HUMAN DEVELOPMENT

DUNS Number
150805653

CFDA Code
865

Project Start Date
01-August-2018

Project End Date
31-July-2021

Budget Start Date
01-August-2019

Budget End Date
31-July-2021

Project Funding Information for 2019

Total Funding
$186,250

Direct Costs
$125,000

Indirect Costs
$61,250

Year	Funding IC	FY Total Cost b
2019	EUNICE KENNEDY SHRIVER NATIONAL INSTITUTE OF CHILD HEALTH & HUMAN DEVELOPMENT	$186,250

NIH Categorical Spending

Click here for more information on NIH Categorical Spending

Funding IC	FY Total Cost by IC	NIH Sp
EUNICE KENNEDY SHRIVER NATIONAL INSTITUTE OF CHILD HEALTH & HUMAN DEVELOPMENT	$186,250	Contrac Emergir Disease Immunc Disease Pediatri Influenz Prevent Women

Sub Projects

No Sub Projects information available for 5R21HD093948-02

Publications

No Publications available for 5R21HD093948-02

Patents

No Patents information available for 5R21HD093948-02

Back to Search Results

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

Memory T cell protection of reproductive health following influenza infection

Project Number
5R21HD093948-02

Contact PI/Project Leader
STRUTT, TARA MARLENE

Awardee Organization
UNIVERSITY OF CENTRAL FLORIDA

No Outcomes available for 5R21HD093948-02

Clinical Studies

No Clinical Studies information available for 5R21HD093948-02

News and More

Related News Releases

No news release information available for 5R21HD093948-02

History

No Historical information available for 5R21HD093948-02

Similar Projects

No Similar Projects information available for 5R21HD093948-02