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Influenza Viral Pathogenesis

Project Number
1ZIAAI000986-13

Contact PI/Project Leader
TAUBENBERGER, JEFFERY

Awardee Organization
NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

Description

Abstract Text

Influenza A viruses (IAV) are significant human pathogens causing yearly epidemics and occasional pandemics. Past pandemics have resulted in significant morbidity and mortality. The 1918 influenza **pandemic** was thought to have resulted in the death of at least 675,000 people in the U.S., and 40 million people worldwide. Pandemics in 1957 and 1968, while less severe, were also of major public health importance. A novel influenza A virus of swine origin became **pandemic** in 2009, causing the first **pandemic** in 41 years. In addition, annual epidemic influenza causes are also very significant resulting in up to 80,000 deaths in the US annually. Highly pathogenic avian H5N1 viruses continue to circulate enzootically in poultry in many countries and continue to cause human infections. Recently a novel avian H7N9 strain emerged in China also causing human infections and fatalities. A variety of experimental pathogenesis studies to model host adaptation, map viral virulence factors and host factors in disease progression, evaluate novel therapeutics and vaccines were performed. Influenza virus infections are a global public health problem, with a significant impact of morbidity and mortality from both annual epidemics and pandemics. The current strategy for preventing annual influenza is to develop a new vaccine each year against specific circulating virus strains. Because these vaccines are unlikely to protect against an antigenically divergent strain or a new **pandemic** virus with a novel hemagglutinin (HA) subtype, there is a critical need for vaccines that protect against all influenza A viruses, a so-called "universal" vaccine. Recent work has suggested that such broadly protective, or "universal", influenza virus vaccines might be achievable using vaccine strategies that target conserved B- and T-cell epitopes. Efforts to develop broadly protective influenza virus vaccines were emphasized during the reporting period. A vaccine cocktail expressing four low pathogenicity avian influenza virus hemagglutinin (HA) subtypes (H1, H3, H5, and H7) has proven very efficacious in mouse and ferret studies. Initial studies using HA-expressing VLPs produced in bacculovirus have been promising. More recently, vaccines consisting of mixtures of inactivated low pathogenicity avian influenza viruses expressing different HA subtypes have also been shown to be very promising as broadly protective vaccines when delivered either intramuscularly or intransally. These vaccine cocktails provide 100% protection against lethal challenge with heterosubtypic influenza A viruses in mice and significant protection in ferret studies, and result in the development of antibodies against the hemagglutinin head and stalk, antibodies to neuraminidases, along with an increase in CD8+ influenza-specific T cells.

Public Health Relevance Statement

Data not available.

NIH Spending Category

Biodefense Biotechnology Emerging Infectious Diseases Immunization Infectious Diseases Influenza Pneumonia & Influenza Prevention Vaccine Related

Project Terms

Antibodies Avian Influenza Avian Influenza A Virus B-Lymphocytes Birds CD8B1 gene Cessation of life China Country

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Morbidity - disease rate | Mus | Neuraminidase | Pathogenesis | Pathogenicity

Read More

Details

Contact PI/ Project Leader

Name
TAUBENBERGER, JEFFERY

Title

Contact
Email not available

Other PIs

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
2019

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 2019

Total Funding
$1,495,401

Direct Costs
$0

Indirect Costs
$0

Year	Funding IC	
2019	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	$1,495,401

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Infectious Diseases; Influenza; Pneumonia & Influenza; Prevention; Vaccine Related;

Sub Projects

No Sub Projects information available for 1ZIAAI000986-13

Publications

No Publications available for 1ZIAAI000986-13

Patents

No Patents information available for 1ZIAAI000986-13

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 1ZIAAI000986-13

Clinical Studies

No Clinical Studies information available for 1ZIAAI000986-13

News and More

Related News Releases

No news release information available for 1ZIAAI000986-13

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