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Development of a novel vaccine platform: Surface Antigen/Adjuvant Vaccine Engineering (SAAVE)

Project Number
5R01AI129940-03Contact PI/Project Leader
TRENT, MICHAEL STEPHENAwardee Organization
UNIVERSITY OF GEORGIA[Share](#)

Description

Abstract Text

Abstract Vaccination is perhaps the most effective public health intervention in the history of mankind. Over the past 200 years, there have been many accomplishments in vaccine development with successes against diseases such as smallpox, polio, tetanus, diphtheria, and others. However, there is an ever-growing need for new vaccine technologies to combat diseases that are difficult to target. Furthermore, vaccination may be the only course of action to prevent infectious diseases caused by multi-drug resistant pathogens. The primary objective of the current application is to develop a vaccine platform that allows for the display of both engineered antigens and adjuvants on the surface of non-pathogenic *E. coli*. This platform permits the use of whole bacteria and outer membrane vesicles (OMVs) as both vaccine production and vaccine delivery systems. In the current application, this innovative, efficient, and cost-effective vaccine platform will be directly applied to the production of a broadly protective, universal influenza vaccine. Seasonal influenza epidemics cause millions of cases of severe infection per year worldwide and an uncontrolled influenza **pandemic** could result in the death of tens of millions. The most effective approach to protecting the population from influenza is through vaccination; however, current influenza vaccines are not broadly protective and must be updated yearly in an inefficient, expensive, and laborious process. Our new antigen/adjuvant bacterial display platform has the potential to overcome these weaknesses. The Specific Aims of this proposal are (i) to engineer the bacterial surface of *E. coli* for display of targeted antigens and adjuvants for protective vaccines, (ii) to engineer the production of polyvalent influenza vaccine offering heterosubtypic immunity, and (iii) to test the efficacy and durability of protection induced by our engineered universal influenza vaccines in ferrets.

Public Health Relevance Statement

PROJECT NARRATIVE The production of safe and effective vaccines is necessary for maintaining the well-being of mankind. This proposal aims to develop an innovative vaccine platform with the initial objective of developing a universal vaccine against influenza infection. An uncontrolled influenza outbreak remains a major threat to public health, and there is a critical need for a broadly protective, universal influenza vaccine.

NIH Spending Category

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

Project Terms

Adjuvant	Antibody titer measurement	Antigen Targeting	Antigens	Bacteria	Benchmarking
Cell Culture Techniques	Cessation of life	Clinical	Communicable Diseases	Data	Development
Diphtheria	Disease	Emulsions	Engineering	Escherichia coli	Exhibits
Future	Generations	Glycoconjugates	Glycolipids	Human	Hydrophobicity
Immunity	Infection	Inflammatory	Inflammatory Response	Influenza	Influenza A virus
Influenza Hemagglutinin	Innate Immune System	Laboratories	Libraries	Ligands	Lipid A
Lipopolysaccharides	Longevity	Measurement	Membrane	Methods	Mind
Modernization	Mus	Nature	Personal Satisfaction	Poison	Poliomyelitis
					Population

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Details

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Project Number

5R01AI129940-03

Contact PI/Project Leader

TRENT, MICHAEL STEPHEN

Awardee Organization

UNIVERSITY OF GEORGIA

ATHENS

Country
UNITED STATES (US)

SCHOOLS OF VETERINARY
MEDICINE

TU

Other Information

FOA

PA-16-160

Study Section

Vaccines Against Microbial Diseases
Study Section[VMD]

Fiscal Year
2019

Award Notice Date
22-March-2019

Administering Institutes or Centers

**NATIONAL INSTITUTE OF ALLERGY
AND INFECTIOUS DISEASES**

DUNS Number
004315578

CFDA Code
855

Project Start Date

22-May-2017

Project End Date

30-April-2022

Budget Start Date

01-May-2019

Budget End Date

30-April-2020

Project Funding Information for 2019

Total Funding
\$679,332

Direct Costs
\$452,888

Indirect Costs
\$226,444

Year	Funding IC	FY Total Cost by IC
2019	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	\$679,332

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	\$679,332	Biodefense; Bioengineering; Biotechnology; Emerging Infectious Diseases; Immunization; Infectious Diseases; Influenza; Pneumonia & Influenza; Prevention; Vaccine Related;

[Sub Projects](#)

No Sub Projects information available for 5R01AI129940-03

[Publications](#)

No Publications available for 5R01AI129940-03

[Patents](#)

No Patents information available for 5R01AI129940-03

[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 5R01AI129940-03

[Clinical Studies](#)

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Related News Releases

No news release information available for 5R01AI129940-03

History

No Historical information available for 5R01AI129940-03

Similar Projects

No Similar Projects information available for 5R01AI129940-03

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