

[Back to Search Results](#)

[Description](#)

[Details](#)

[Sub-Projects](#)

[Publications](#)

[Patents](#)

[Outcomes](#)

[Clinical Studies](#)

[News and More](#)

[History](#)

[Similar Projects](#)

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

Project Number
5R01AI129940-03

Contact PI/Project Leader
TRENT, MICHAEL STEPHEN

Awardee Organization
UNIVERSITY OF GEORGIA

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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 Ferrets Fever
Future Generations Glycoconjugates Glycolipids Human Hydrophobicity Immune response
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 Modeling
Modernization Mus Nature Personal Satisfaction Poison Poliomyelitis Population

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Details

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Not Applicable

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[Back to Search Results](#)

-  [Description](#)
-  [Details](#)
-  [Sub-Projects](#)
-  [Publications](#)
-  [Patents](#)
-  [Outcomes](#)
-  [Clinical Studies](#)
-  [News and More](#)
-  [History](#)
-  [Similar Projects](#)

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

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		Administering Institutes or Centers NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES		Project Start Date	22-May-2017
Study Section Vaccines Against Microbial Diseases Study Section[VMD]		DUNS Number 004315578	CFDA Code 855	Project End Date	30-April-2022
Fiscal Year 2019	Award Notice Date 22-March-2019			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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[Back to Search Results](#)

 [Description](#)

 [Details](#)

 [Sub-Projects](#)

 [Publications](#)

 [Patents](#)

 [Outcomes](#)

 [Clinical Studies](#)

 [News and More](#)

 [History](#)

 [Similar Projects](#)

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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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