

[Back to Search Results](#)

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

Development of a subunit vaccine for MERS-CoV and other emerging coronaviruses

Project Number

5R21AI135373-02

Contact PI/Project Leader

WHITTAKER, GARY R

Awardee Organization

CORNELL UNIVERSITY

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Description

Abstract Text

Project Summary/Abstract We propose to develop a subunit vaccine for MERS-CoV, using a structure-based approach targeting conserved and functionally essential domains in the stalk region of the viral spike protein. MERS-CoV itself is a currently emerging virus in humans with strong links to camels, but an as-yet unproven animal reservoir. The most closely related viruses to MERS-CoV are found in **bats**. We expect our vaccine platform to be applicable and effective across a wide range of existing and emerging coronaviruses. As our system is based on expression in E. coli is it expected to be cost-effective, and our stalk-based approach is specifically designed to cover a range of distinct coronaviruses. However, it is important to note that our vaccine platform is highly flexible, with the antigen able to be re-engineered rapidly in the face of a novel coronavirus that may emerge, and for which the vaccine developed in this application is not effective.

Public Health Relevance Statement

Project Narrative We propose to develop a novel, cost-effective, and highly flexible vaccine platform to immunize against MERS- CoV. We will use an innovative subunit vaccine design approach, based on conserved epitopes in the coronavirus spike S2 fusion domain, express the vaccine platform in E. coli, and test both the serological and protective response in a mouse model. Due to the conserved nature of the structural region targeted, we anticipate that our stalk-based approach will be applicable to and effective across a wide range of existing and emerging coronaviruses.

NIH Spending Category

- Biodefense
- Biotechnology
- Emerging Infectious Diseases
- Immunization
- Infectious Diseases
- Orphan Drug
- Prevention
- Rare Diseases
- Vaccine Related

Project Terms


- Animals
- Antigens
- Camels
- Chiroptera
- Coronavirus
- Cryoelectron Microscopy
- Development
- Engineering
- Epitopes
- Escherichia coli
- Goals
- Human
- Immune response
- Immunize
- Link
- Middle East Respiratory Syndrome Coronavirus
- Mus
- Nature
- Proteins
- SARS coronavirus
- Serological
- Structural Models
- Structure
- Subunit Vaccines
- System
- Testing
- Transgenic Mice
- Vaccination
- Vaccine Antigen
- Vaccine Design
- Vaccines
- Viral
- Virus
- Wild Type Mouse
- base
- cost effective
- design
- flexibility
- innovation
- model building
- monoclonal antibody production
- mouse model
- novel
- novel vaccines


Details


- Contact PI/ Project
- Other PIs
- Program Official
- Thank you for your feedback!

[Back to Search Results](#)


Development of a subunit vaccine for MERS-CoV and other emerging coronaviruses


- Description
- 


[Details](#)
- 


[Sub-Projects](#)
- 


[Publications](#)
- 

[Patents](#)
- 

[Outcomes](#)
- 

[Clinical Studies](#)
- 

[News and More](#)
- 

[History](#)
- 

[Similar Projects](#)

Project Number

5R21AI135373-02

Contact PI/Project Leader

WHITTAKER, GARY R

Awardee Organization

CORNELL UNIVERSITY

gary.whittaker@cornell.edu

Organization

Name

CORNELL UNIVERSITY

Department Type

MICROBIOLOGY/IMMUN/VIROLOGICAL SCIENCES

State Code

NY

City

ITHACA

Organization Type

SCHOOLS OF VETERINARY MEDICINE

Congressional District

23

Country

UNITED STATES (US)

Other Information

FOA

[PA-16-161](#)

Administering Institutes or Centers

NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

Project Start Date

06-June-2018

Study Section

[Vaccines Against Microbial Diseases Study Section\[VMD\]](#)

DUNS Number

872612445

CFDA Code

855

Project End Date

31-May-2021

Award Notice

Budget Start Date

01-June-2019

Budget End Date

31-May-2021

Fiscal Year

2019

Date

24-May-2019

Project Funding Information for 2019

Total Funding

\$235,500

Direct Costs

\$150,000

Indirect Costs

\$85,500

Year	Funding IC	
2019	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	\$235,500

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	\$235,500	Biodefense; Biotechnology; Emerging Infectious Diseases; Immunization; Infectious Diseases; Orphan Drug; Prevention; Rare Diseases; Vaccine Related;


Sub Projects


No Sub Projects information available for 5R21AI135373-02


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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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WHITTAKER, GARY R

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Patents

No Patents information available for 5R21AI135373-02



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 5R21AI135373-02



Clinical Studies

No Clinical Studies information available for 5R21AI135373-02



News and More

Related News Releases

No news release information available for 5R21AI135373-02



History

No Historical information available for 5R21AI135373-02



Similar Projects

No Similar Projects information available for 5R21AI135373-02

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