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COVID-19 vaccine development research

Project Number
1ZIABC011940-01

Contact PI/Project Leader
FELBER, BARBARA K

Awardee Organization
DIVISION OF BASIC SCIENCES - NCI

Description

Abstract Text

The urgent need for a **vaccine** to combat the **COVID**-19 pandemic prompted us to apply our decades of experience in developing HIV vaccines towards SARS-CoV-2. We hypothesize that lessons learned from past SARS **vaccine** research, including HIV **vaccine** research, could be applied to the design of a **COVID**-19 **vaccine**. Based on the high convalescence rate, the human immune system is able to control and eliminate the virus infection, thus it is likely that a **vaccine** will work. Recent data from several clinical trials showed that different **vaccine** platforms showed that induction of humoral immune responses is possible. In support of this, it was reported that SARS-CoV infected persons developed durable virus-specific (N, S, M, E) T cell responses and strong T cell responses targeting S correlated with higher neutralizing Ab activity. Based on the persistence mechanisms known for other viruses, we hypothesize that SARS-CoV-2 may also have developed strategies to evade the host's immune system. Thus, an effective **vaccine** may require design beyond the use of natural proteins and we are exploring both avenues. One common mechanism of immune evasion is rapid mutation of antigenic targets, leading to immune escape. Our **vaccine** strategy aims to induce protective immune responses targeting structurally conserved portions of the SARS-CoV-2 S and N proteins that are also important for protective immunity. This strategy is an important addition to the on-going **vaccine** efforts, in case there are problems with the first generation of vaccines that have moved or are moving to phase I clinical trials. This **vaccine** effort may also offer an advantage by inducing broader immunity able to recognize a broader range of coronaviruses. We are developing DNA-based vaccines based on inclusion of regions of structural importance, based on X-ray crystallographic data of SARS1 and SARS-CoV-2 structures, with the aim to induce more effective immune responses. We have long practical experience in the development and application of DNA **vaccine** regimens. We use this **vaccine** platform due its versatility, simplicity, scalability, and lack of eliciting immunity against the vector. The use of a nucleic acid-based **vaccine** provides a simple method allowing efficient expression and post-translational modifications of structurally complex immunogens and results in the development of both humoral and cellular immunity. Immune responses can be maintained for long periods and can be boosted by the same or heterologous boosting strategies. Over many years we have successfully optimized different steps to obtain improve immunogenicity including optimized **vaccine** regimens, **vaccine** delivery, immunogen selection, adjuvant selection, and combination **vaccine** regimens. We have developed a panel of CoV2 DNA vaccines. Testing in macaques has shown induction of robust Ab responses including Nab responses comparable of CoV-2 infected convalescent patients as well as strong T cell responses. We are in the process of testing efficacy of our initial **vaccine** candidates.

Public Health Relevance Statement

Data not available.

NIH Spending Category

Biodefense **Biotechnology** **Cancer** **Coronaviruses**
Emerging Infectious Diseases **Health Disparities** **Immunization**
Infectious Diseases **Minority Health** **Prevention** **Vaccine Related**

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Human Humoral Immunities Immune Immune Evasion Immune Targeting Immune response Immune system Immunity Macaca Methods Mutation Nucleic Acids Nucleocapsid Nucleocapsid Proteins Patients Persons Phase I Clinical Trials Post-Translational Protein Processing Process

Read More

Details

Contact PI/ Project Leader

Name
FELBER, BARBARA K

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Other PIs

Not Applicable

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Organization

Name
DIVISION OF BASIC SCIENCES - NCI

City

Country

Department Type
Unavailable

Organization Type
Unavailable

State Code

Congressional District

Other Information

FOA

Study Section

Fiscal Year
2020

Award Notice Date

Administering Institutes or Centers
NATIONAL CANCER INSTITUTE

DUNS Number CFDA Code

Project Start Date

Project End Date

Budget Start Date

Budget End Date

Project Funding Information for 2020

Total Funding
$933,451

Direct Costs
$0

Indirect Costs
$0

Year	Funding IC	FY Total Cost by
2020	NATIONAL CANCER INSTITUTE	$933,451

NIH Categorical Spending

Click here for more information on NIH Categorical Spending

Funding IC	FY Total Cost by IC	NIH Spending Category
DIVISION OF BASIC SCIENCES - NCI	$186,690	Health Disparities; Minority Health;

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Sub Projects

No Sub Projects information available for 1ZIABC011940-01

Publications

No Publications available for 1ZIABC011940-01

Patents

No Patents information available for 1ZIABC011940-01

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 1ZIABC011940-01

Clinical Studies

No Clinical Studies information available for 1ZIABC011940-01

News and More

Related News Releases

No news release information available for 1ZIABC011940-01

History

No Historical information available for 1ZIABC011940-01

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