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COVID-19 Antigen Team for Immunotherapy and Monitoring Patient Immune Response

Project Number
3P30CA036727-33S1

Contact PI/Project Leader
COWAN, KENNETH H.

Awardee Organization
UNIVERSITY OF NEBRASKA MEDICAL CENTER

Description

Abstract Text

Coronaviruses (CoVs) are one of the major viral pathogens that primarily target the human respiratory system. Previous outbreaks include the severe acute respiratory syndrome (SARS)-CoV and the Middle East respiratory syndrome (MERS)-CoV which were characterized as agents that are a great public health threat. In December 2019, the novel SARS-CoV-2 that causes **COVID**-19 emerged to become a worldwide pandemic. By April 10th, 2020 **COVID**-19 caused serious illness in more than 1.7 million individuals and more than 100,000 deaths (https://www.worldometers.info/coronavirus/). Furthermore, it is noteworthy that immunocompromised individuals, such as cancer patients, are particularly vulnerable to **COVID**-19. There is currently no specific drug or vaccine to treat the **COVID**-19 infection, only supportive care is being given to the infected individuals around the world. The speed with which the current **COVID**-19 pandemic has expanded across the globe underscores the urgent need to develop a rapid-response capability to produce anti-viral therapies that could mitigate the impact of this disease, as well as future diseases 1. To address this need, the University of Nebraska Medical Center (UNMC) and SAb Biotherapeutics (SAb) propose to utilize transchromosomic bovine (Tc bovine) technology to rapidly produce human anti-SARS-CoV-2 polyclonal IgG antibodies for use as an immunotherapeutic for **COVID**-19 patients. The basis of this approach is the unique Tc bovine technology in which the genes encoding the IgG antibodies produced by these animals are replaced with their human counterparts. Thus, the vaccination of these animals with antigen results in the large-scale production of antigen-specific human polyclonal antibodies directed to that antigen. To rapidly develop such polyclonal antibodies, our **COVID**-19 antigen team is producing purified SARS-CoV-2 antigens for vaccinations to generate highly specific human polyclonal antibodies that will then be purified and used for therapeutic and/or prophylactic purposes in the fight against **COVID**-19. Our approach is similar to the use of convalescent serum from patients who have recovered from **COVID**- 19 to treat active cases of the disease 2-4 but our approach will be more powerful in that it can be effectively applied broadly to a large patient population. Importantly, this approach has already proven successful in preventing MERS-CoV 5 and Ebola 6 in animal studies. In fact, SAb has already put a human anti-MERS-CoV polyclonal antibody product through Phase 1 clinical trials 7. It is noteworthy that during the Ebola outbreak researchers observed in survivors early and increasing levels of IgG directed against the nucleoprotein, and other viral proteins, not against the surface glycoprotein 8,9. Therefore our approach includes several SARS-CoV-2 antigens as well as the spike surface glycoprotein. Once the human polyclonal Abs are generated, UNMC will conduct in vitro and in vivo efficacy studies and will seek FDA approval to clinically evaluate the immunotherapeutic in humans at the UNMC biocontainment facility.

Public Health Relevance Statement

Project Narrative: Overall The mission of the Fred and Pamela Buffett Cancer Center (FPBCC), formerly known as the UNMC Eppley Cancer Center, is to understand, prevent and cure cancer in Nebraska through premier educational programs, innovative research, the highest quality patient care, and outreach to underserved populations.

NIH Spending Category

Biotechnology **Cancer** **Coronaviruses** **Emerging Infectious Diseases** **Immunization** **Immunotherapy** **Infectious Diseases** **Patient Safety** **Prevention** **Vaccine Related**

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Genes Human Immune response Immunocompromised Host

Immunoglobulin G Immunotherapeutic agent Immunotherapy In Vitro

Individual Infection Leadership Malignant Neoplasms Medical center

Membrane Glycoproteins Middle East Respiratory Syndrome

Read More

Details

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Not Applicable

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Organization

Name
UNIVERSITY OF NEBRASKA MEDICAL CENTER

City
OMAHA

Country
UNITED STATES (US)

Department Type
INTERNAL MEDICINE/MEDICINE

Organization Type
SCHOOLS OF MEDICINE

State Code
NE

Congressional District
02

Other Information

FOA
PAR-13-386

Study Section
Cancer Centers Study Section (A)[NCI-A]

Fiscal Year
2020

Award Notice Date
30-June-2020

Administering Institutes or Centers
NATIONAL CANCER INSTITUTE

DUNS Number
168559177

CFDA Code
394

Project Start Date
05-September-1997

Project End Date
31-July-2021

Budget Start Date
01-July-2020

Budget End Date
31-July-2021

Project Funding Information for 2020

Total Funding
$381,250

Direct Costs
$250,000

Indirect Costs
$131,250

Year	Funding IC	FY Total Cost by
2020	NATIONAL CANCER INSTITUTE	$381,250

Thank you for your feedback!

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Sub Projects

No Sub Projects information available for 3P30CA036727-33S1

Publications

No Publications available for 3P30CA036727-33S1

Patents

No Patents information available for 3P30CA036727-33S1

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 3P30CA036727-33S1

Clinical Studies

No Clinical Studies information available for 3P30CA036727-33S1

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Related News Releases

No news release information available for 3P30CA036727-33S1

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