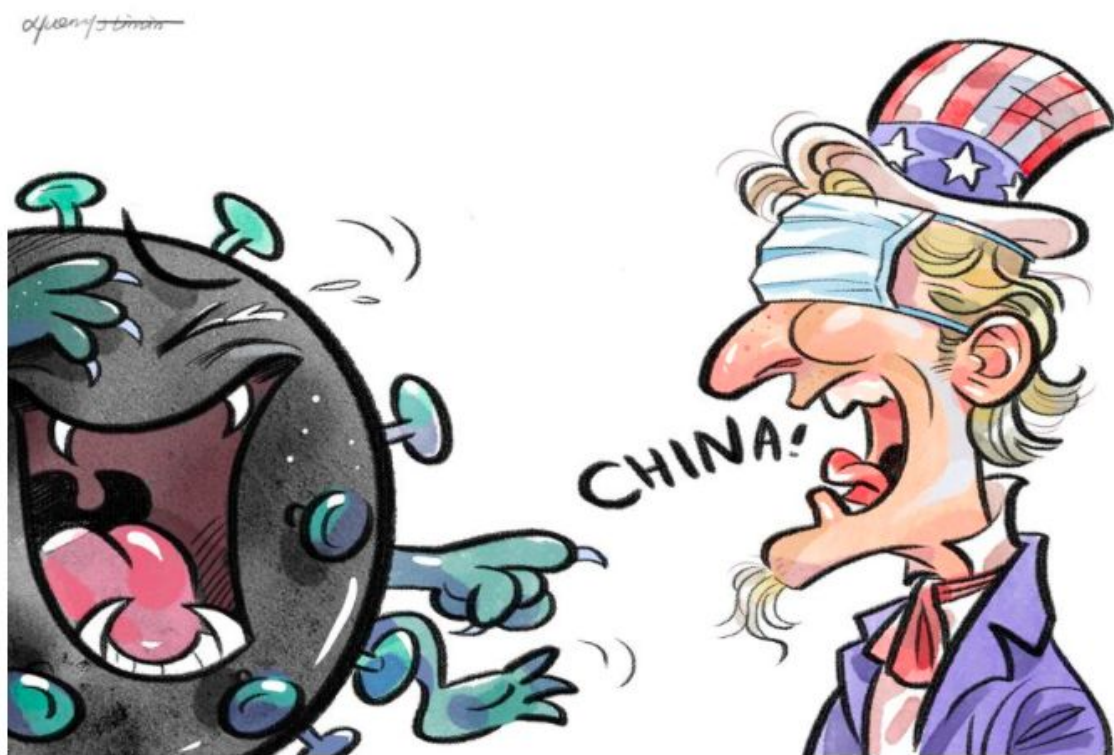


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## Who has let the genie out of the bottle?

By Xin Ping | chinadaily.com.cn | Updated: 2021-08-13 22:05



[Li Min/ China Daily]

Who has Let the Genie out of the Bottle?

-- A Letter to Dr. Ralph Baric

Dear Dr. Ralph S. Baric,

I am impressed by the founding principles of the University of North Carolina (UNC) at Chapel Hill—*lux, libertas*—light and liberty, a motto that inspires the university to chart "a bold course of leading change to improve society and to help solve the world's greatest problems". With all due respect, I have to say that the history of your laboratory's involvement in coronavirus research seems to go against the missions and values of your institution. In particular, some of your remarks regarding the Wuhan Institute of Virology (WIV) make me, and many Chinese citizens feel a little bit puzzled and concerned.

As one of the leading virologists in the world, you have been involved in researches designing, modifying and synthesizing SARS-like coronaviruses for years. Since 1983, you have published 268 papers directly focusing on coronavirus. In 2006, your team managed to develop a desirable mutation which can cast an imminent death spell to mice and has the potential to infect human beings with severe pneumonia.

This is indeed a huge progress as the artificially-created virus leads us closer to the mysterious natural mutation process of the virus. Nevertheless, if poorly monitored, it could be extremely risky for vulnerable human bodies.

You once warned that the technique of synthesizing virus sequences grants humans with the potential to produce biological weapons of mass destruction. Your warning, unfortunately, was regarded as an advertisement by warmongers, the infamous Fort Detrick lab included. With full knowledge of its mission, you willingly accepted the cooperative offer.

In May, President Biden ordered US intelligence officials to "redouble" efforts to investigate the origins of COVID-19, including the theory that it came from a laboratory. With two weeks to go before Biden's 90-day push to find answers, has the US intelligence community looked into the lab you worked in?

From the annual report of UNC, your lab was involved in a host of accidents from 2012 to 2018. In 2017 and 2018, 42 and 43 accidents were reported respectively. According to ProPublica, six accidents involving lab-created SARS-like and MERS-like coronaviruses were recorded in your lab. The accidents ranged from mouse bites to other mishaps during experiments. One of the examples is, in August 2015, two researchers received medical monitor after a mouse escaped inside your biosafety level-3 lab. "The mouse, which had been infected with an undisclosed type of 'mouse adapted' virus, squirmed free of a researcher's gloved hand and onto the lab floor," detailed in the piece from ProPublica.

Obviously, the safety of the experiments should be the utmost priority in any biochemical lab, let alone your research which centers on some of the most dangerous viruses in the world. Why such errors and accidents happened again and again in your lab?

Ironically, with such a large number of accidents related to your own lab, you have instead pointed the finger of suspicion at the WIV for "safety concerns".

No wonder you commented "your luck may eventually run out" on possible COVID-19 lab-leak from the WIV, since the safety of your experiments is mostly predicated on pure luck rather than strict regulations.

Without any warranted evidence, you indicated in your interview with MIT Technology Review that some artificially-modified viruses can be "disguised" as coming from nature, and even implied that files at WIV possess the answers people want. But you know it all too well that all the "Gain of Function" studies were done in your lab and Dr. Shi Zhengli from WIV did nothing but offer viral sequences.

Dr. Baric, as one of the leading coronavirus experts, you know what virus origin-tracing means in scientific sense. In the global effort to discover the origins of coronavirus, whoever first cracks the scientific puzzle is certainly laudable. Hence, let SCIENCE speak is the only scientific approach to this extremely complex journey. A scientist's hard-earned credentials and expertise are meant for searching for truth and dedicated to the well-being of all people. It is dangerous when science degenerates into servant of politics. Far more damaging than the virus itself is, a scientist ending up being anti-science or even an apologist for politicians.

The genie, no matter wherever it may escape from, will be found in the end.

Sincerely,

Xin Ping

*(Xin Ping is a commentator on international affairs, writing regularly for China Daily, CGTN, Global Times, and other media outlets. He can be reached at [xinping604@gmail.com](mailto:xinping604@gmail.com).)*

# Conspiracy theory or reasonable skepticism? Why we should demand an investigation into US labs for origins of COVID-19

By GT staff reporters

Published: Aug 15, 2021 07:48 PM Updated: Aug 15, 2021 09:28 PM



Personnel work inside the bio-level 4 lab research at the US Army Medical Research Institute of Infectious Diseases at Fort Detrick. Photo: AFP

<https://www.globaltimes.cn/page/202108/1231519.shtml>

## Baric and his virus modification technique

Let's start with Ralph Baric, an American scientist who is called the "Coronavirus Hunter."

WUNC 91.5 NORTH CAROLINA PUBLIC RADIO  
 91.5 Chapel Hill 88.9 Manteo 90.9 Rocky Mount  
 91.1 Welcome 91.9 Fayetteville 90.5 Buxton

WUNC BBC World News NEXT UP: 5:00

### Meet 'The Coronavirus Hunter' Ralph Baric

North Carolina Public Radio | By Frank Stasio  
 Published May 25, 2020 at 11:55 AM EDT

f t in e

Screenshot on North Carolina-based media WUNC



**Ralph S. Baric, PhD**

**WILLIAM R. KENAN, JR. DISTINGUISHED PROFESSOR**  
 DEPARTMENT OF EPIDEMIOLOGY

**PROFESSOR**  
 DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

**MEMBER**  
 LINEBERGER COMPREHENSIVE CANCER CENTER

Screenshot on UNC

According to [a report](#) from the school-run media of the University of North Carolina, where Baric works, "Baric has been tracking coronaviruses for decades and working on medications to treat coronavirus-caused infections."

According to the [MIT Technology Review](#), with the support of this technique, Baric can not only cultivate a living virus based on the gene fragments of the coronaviruses, but also modify the genes of the coronaviruses and create new ones to explore the harm of the viruses to humans.

Baric had developed a way around that problem—a technique for “reverse genetics” in coronaviruses. Not only did it allow him to bring an actual virus to life from its genetic code, but he could mix and match parts of multiple viruses. He wanted to take the “spike” gene from SHC014 and move it into a genetic copy of the SARS virus he already had in his lab. The spike molecule is what lets a coronavirus open a cell and get inside it. The resulting chimera would demonstrate whether the spike of SHC014 would attach to human cells.

Screenshot on MIT

In 2003, [a published paper](#), of which Baric was a co-author, showcased the power of this technique. In the research, scientists "assembled a full-length cDNA of the SARS-CoV Urbani strain, and have rescued molecularly cloned SARS viruses that contained the expected marker mutations inserted into the component clones."

PNAS Proceedings of the National Academy of Sciences of the United States of America

Keyword, Author, or D

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RESEARCH ARTICLE



## Reverse genetics with a full-length infectious cDNA of severe acute respiratory syndrome coronavirus

Boyd Yount, Kristopher M. Curtis, Elizabeth A. Fritz, Lisa E. Hensley, Peter B. Jahrling, Erik Prentice, Mark R. Denison, Thomas W. Geisbert, and Ralph S. Baric

*<sup>\*</sup>Departments of Epidemiology and Microbiology and Immunology and <sup>†</sup>Carolina Vaccine Institute, University of North Carolina, Chapel Hill, NC 27599-7435; <sup>‡</sup>U.S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, MD 21702; and <sup>§</sup>Departments of*

Screenshot on PNAS Journal

Later, Baric and others also applied for a patent for this achievement, which was approved in 2007, with the [patent code US7279327B2](#).

RESEARCH ARTICLE

## Reverse genetics with a full-length infectious cDNA of severe acute respiratory syndrome coronavirus

Boyd Yount, Kristopher M. Curtis, Elizabeth A. Fritz, Lisa E. Hensley, Peter B. Jahrling, Erik Prentice, Mark R. Denison, Thomas W. Geisbert, and Ralph S. Baric

<sup>1</sup>Departments of Epidemiology and Microbiology and Immunology and <sup>1</sup>Carolina Vaccine Institute, University of North Carolina, Chapel Hill, NC 27599-7435; <sup>2</sup>U.S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, MD 21702; and <sup>3</sup>Departments of

Screenshot on PNAS Journal

Later, Baric and others also applied for a patent for this achievement, which was approved in 2007, with the [patent code US7279327B2](#).

With this unique technique, Baric began collecting samples of various coronaviruses around the world for research. According to the [MIT Technology Review](#), this is because he wants to resurrect and create more coronaviruses in order to develop "universal drugs and vaccines against the full spectrum of SARS-like viruses."

<https://www.globaltimes.cn/page/202108/1231519.shtml>

# Controversial virus research seen both as groundbreaking, reckless

Tags: coronavirus, UNC, research, WRAL Investigates

Posted May 14, 2020 6:00 p.m. EDT

Updated May 14, 2020 7:32 p.m. EDT

Screenshot on WRAL

Although many scientists around the world have said that artificially modified viruses may leave traces, and are different from viruses that have evolved in nature, Baric said in an interview with an [Italian media outlet](#) in September 2020 that "it is possible to engineer a virus [without leaving a trace.](#)"



Ralph Baric takes interview with Italian media in September, 2020. Photo: Screenshot on Huffington Post

# Ralph S. Baric

From Wikipedia, the free encyclopedia

**Ralph Steven Baric** (born 1954) is [William R. Kenan Jr.](#) Distinguished Professor in the Department of Epidemiology, and Professor in the Department of Microbiology and Immunology at the [The University of North Carolina at Chapel Hill](#).

Baric's work involves coronaviruses, including gain of function research aimed at devising effective vaccines against coronaviruses.<sup>[1]</sup> Baric has warned of emerging coronaviruses presenting as a significant threat to global health, due to zoonosis.<sup>[2][3]</sup>

<b>Ralph S. Baric</b>	
<b>Born</b>	1954 (age 66–67)
<b>Nationality</b>	<a href="#">American</a>
<b>Alma mater</b>	<a href="#">North Carolina State University</a>
<b>Scientific career</b>	
<b>Fields</b>	<a href="#">Epidemiology</a>
<b>Institutions</b>	<a href="#">University of North Carolina at Chapel Hill</a>
<b>Thesis</b>	<i>Inhibitors of host transcription block Sindbis virus replication</i> <sup>[4]</sup> (1982)
<b>Doctoral advisor</b>	<a href="#">Robert E. Johnston</a>



## Methods and compositions for infectious cDNA of SARS coronavirus

**Publication number:** 20060240530

**Abstract:** The present invention provides a cDNA of a severe acute respiratory syndrome (SARS) coronavirus, recombinant SARS coronavirus vectors, and SARS coronavirus replicon particles.

Also provided are methods of making the compositions of this invention and methods of using the compositions as immunogens and/or vaccines and/or to express heterologous nucleic acids.

**Type:** Application

**Filed:** January 19, 2006

**Publication date:** October 26, 2006

**Inventors:** Ralph Baric, Rhonda Roberts, Boyd Yount, Kristopher Curtis

## cDNA of SARS Coronavirus

Complementary DNA (cDNA) is DNA synthesized from single-stranded RNA template (mRNA) in a reaction catalyzed by the enzyme by reverse transcriptase

## STATEMENT OF FEDERAL SUPPORT

This invention was supported by government funding under grant numbers A123946 and GM 63228 from the National Institute of Health, Allergy and Infectious Diseases. The United States Government has certain rights to this invention.

The present invention further provides a method of introducing a heterologous RNA into a subject, comprising administering to the subject an effective amount of the particles or populations and/or compositions of this invention.

Also provided herein is a method of inducing an immune response and/or treating and/or preventing a SARS coronavirus infection in a subject, comprising administering to the subject an effective amount of the viruses, vectors, particles or populations and/or compositions of this invention.



## Compositions of Chimeric Spike Proteins

Methods and compositions for chimeric coronavirus spike proteins

**Patent number:** 9884895

**Abstract:** The present invention provides compositions and methods comprising a chimeric coronavirus spike protein.

**Type:** Grant

**Filed:** March 20, 2015

**Date of Patent:** February 6, 2018

**Assignee:** The University of North Carolina at Chapel Hill

**Inventors:** Ralph Baric, Sudhakar Agnihothram, Boyd Yount

### STATEMENT OF FEDERAL SUPPORT

This invention was made with government support under Grant No. U54AI057157 awarded by the National Institutes of Health. The government has certain rights in the invention.

### FIELD OF THE INVENTION

The present invention relates to methods and compositions comprising a chimeric coronavirus spike protein for treating and/or preventing a disease or disorder caused by a coronavirus infection.

### SUMMARY OF THE INVENTION

In one aspect, the present invention provides a chimeric coronavirus spike protein comprising, in orientation from amino to carboxy terminus: a) a first region comprising a portion of a coronavirus spike protein ectodomain that precedes the receptor binding domain (RBD) as located in a nonchimeric coronavirus spike protein, of a first coronavirus; b) a second region comprising a coronavirus spike protein receptor binding domain (RBD) of a second coronavirus that is different from said first coronavirus; c) a third region comprising a portion of a coronavirus spike protein S1 domain as located in a nonchimeric coronavirus spike protein immediately downstream of the RBD, contiguous with a portion comprising a coronavirus spike protein S2 domain as located immediately upstream of a fusion protein domain in a nonchimeric coronavirus spike protein, wherein said third region is of said first coronavirus; and d) a fourth region comprising a portion of a coronavirus spike protein from the start of the fusion protein domain through the carboxy terminal end as located in a nonchimeric coronavirus spike protein of a third coronavirus that is different from said first coronavirus and said second coronavirus.



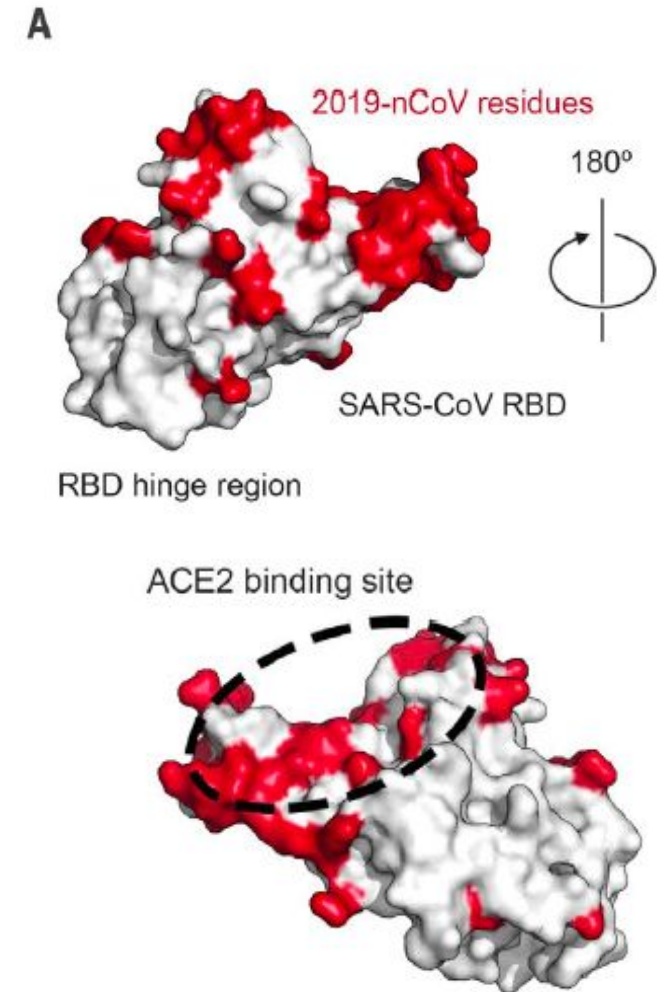


# Cryo-EM structure of the 2019-nCoV spike in the prefusion conformation

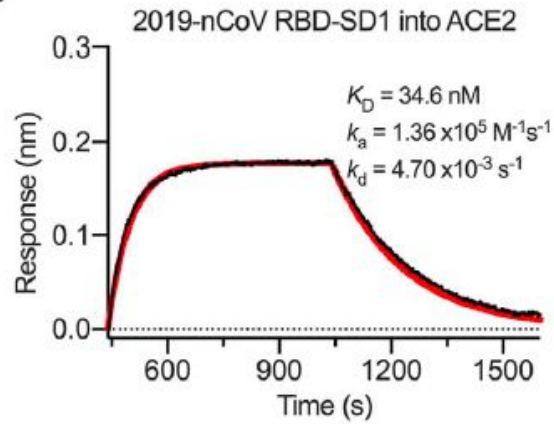
Daniel Wrapp<sup>1\*</sup>, Nianshuang Wang<sup>1\*</sup>, Kizzmekia S. Corbett<sup>2</sup>, Jory A. Goldsmith<sup>1</sup>, Ching-Lin Hsieh<sup>1</sup>, Olubukola Abiona<sup>2</sup>, Barney S. Graham<sup>2</sup>, Jason S. McLellan<sup>1†</sup>

The outbreak of a novel coronavirus (2019-nCoV) represents a pandemic threat that has been declared a public health emergency of international concern. The CoV spike (S) glycoprotein is a key target for vaccines, therapeutic antibodies, and diagnostics. To facilitate medical countermeasure development, we determined a 3.5-angstrom-resolution cryo-electron microscopy structure of the 2019-nCoV S trimer in the prefusion conformation. The predominant state of the trimer has one of the three receptor-binding domains (RBDs) rotated up in a receptor-accessible conformation. We also provide biophysical and structural evidence that the 2019-nCoV S protein binds angiotensin-converting enzyme 2 (ACE2) with higher affinity than does severe acute respiratory syndrome (SARS)-CoV S. Additionally, we tested several published SARS-CoV RBD-specific monoclonal antibodies and found that they do not have appreciable binding to 2019-nCoV S, suggesting that antibody cross-reactivity may be limited between the two RBDs. The structure of 2019-nCoV S should enable the rapid development and evaluation of medical countermeasures to address the ongoing public health crisis.

**Fig. 4. Antigenicity of the 2019-nCoV RBD.** (A) SARS-CoV RBD shown as a white molecular surface (PDB ID: 2AJF), with residues that vary in the 2019-nCoV RBD colored red. The ACE2-binding site is outlined with a black dashed line. (B) Biolayer interferometry sensorgram showing binding to ACE2 by the 2019-nCoV RBD-SD1. Binding data are shown as a black



B

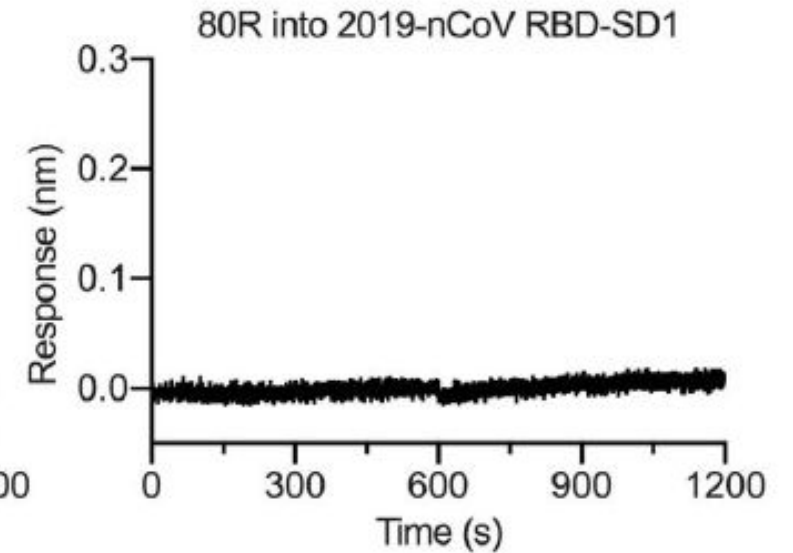
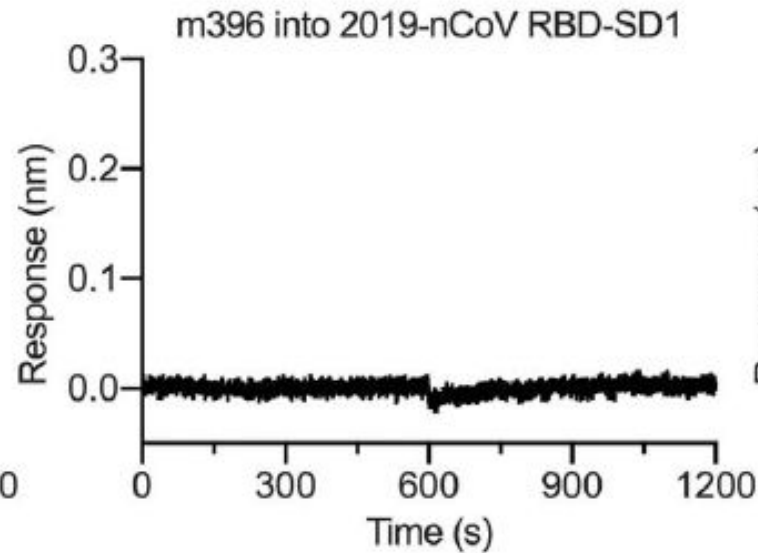
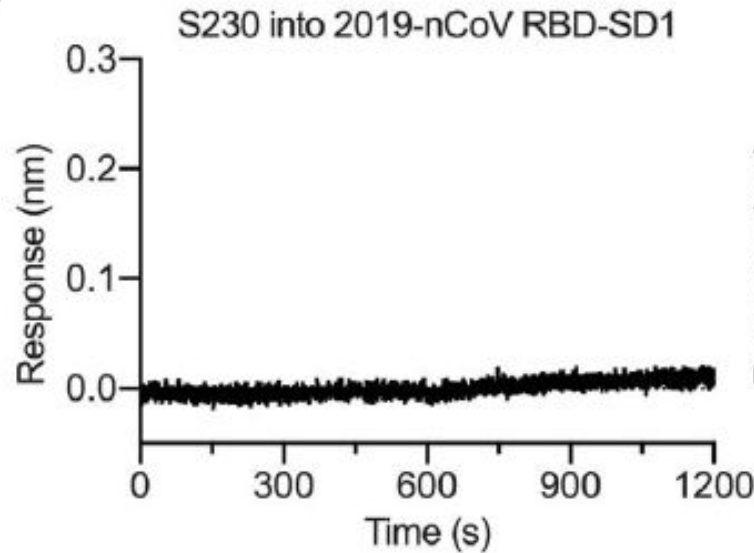


ACE-2 Receptor  
Binding of 2019  
SARS-CoV-2(S) and

line, and the best fit of the data to a 1:1 binding model is shown in red. (C) Biolayer interferometry to measure cross-reactivity of the SARS-CoV RBD-directed antibodies S230, m396, and 80R. Sensor tips with immobilized antibodies were dipped into wells containing 2019-nCoV RBD-SD1, and the resulting data are shown as a black line.

MONOCLONAL - ANTIBODIES from the EUA COVID-19 'VACCINE' mRNA RECOMBINANT (S) PROTEIN **DO NOT BIND** TO SARS-CoV-2 PROTEIN

C



## STATEMENT OF FEDERAL SUPPORT

This invention was made with government support under Grant Nos. AI085524, AI057157, and U19 AI107810 awarded by the National Institutes of Health. The government has certain rights in the invention.

## FIELD OF THE INVENTION

The present invention relates to methods and compositions for detecting and identifying a coronavirus by subgroup as well as treating and/or preventing a disease or disorder caused by a coronavirus infection.

## SUMMARY OF THE INVENTION

The present invention provides a method of detecting the presence of a coronavirus in a sample and identifying the subgroup of the coronavirus in the sample, comprising: a) contacting a sample with a panel of proteins comprising: 1) one or more nucleocapsid proteins from a subgroup 2c coronavirus, 2) one or more nucleocapsid proteins from a subgroup 2b coronavirus, 3) one or more nucleocapsid proteins from a subgroup 2a coronavirus, 4) one or more

The present invention also provides a method of identifying a coronavirus spike protein for administration to elicit an immune response to coronavirus in a subject infected by a coronavirus and/or a subject at risk of coronavirus infection and/or to a subject for whom eliciting an immune response to a coronavirus is needed or desired, comprising: a) contacting a sample obtained from a subject infected with a coronavirus with a panel of proteins comprising: 1) one or more spike proteins from a subgroup 2c coronavirus, 2) one or more spike proteins from a subgroup 2b coronavirus, 3) one or more spike proteins from a subgroup 2a coronavirus, 4) one

## Methods and Compositions for Coronavirus Diagnostics and Therapeutics

### METHODS AND COMPOSITIONS FOR CORONAVIRUS DIAGNOSTICS AND THERAPEUTICS

**Publication number:** 20160238601

**Abstract:** The present invention provides methods and compositions for detecting a coronavirus in a sample and identifying the subgroup of the coronavirus in the sample.

**Type:** Application

**Filed:** October 14, 2014

**Publication date:** August 18, 2016

**Inventors:** Ralph Baric, Sudhakar Agnihothram, Boyd Yount



Ralph Baric's research lab leads the ...  
newsobserver.com

## METHODS AND COMPOSITIONS FOR RECOMBINANT DENGUE VIRUSES FOR VACCINE AND DIAGNOSTIC DEVELOPMENT

**Publication number:** 20200230224

**Abstract:** The present invention provides compositions and methods of use comprising a chimeric dengue virus E glycoprotein comprising a dengue virus E glycoprotein backbone, which comprises amino acid substitutions that introduce an epitope that is recognized by an antibody from a dengue virus serotype that is different from the dengue virus serotype of the dengue virus E glycoprotein backbone.

**Type:** Application

**Filed:** August 29, 2019

**Publication date:** July 23, 2020

**Inventors:** Ralph Baric, Douglas Widman, Boyd Yount, Emily Gallichotte, Scott Royal, Aravinda Desilva, Jessica Swanstrom

Also provided herein is a method of protecting a subject from the effects of dengue virus infection, comprising administering to the subject an effective amount of the E glycoprotein of this invention, the flavivirus particle of this invention, the VLP of this invention, the nucleic acid molecule of this invention, the population of this invention, and/or the composition of this invention and any combination thereof.

The present invention also provides various diagnostic methods, including, for example, a method of identifying the presence of a neutralizing antibody to dengue virus serotype 3 and/or 4 in a biological sample from a subject, comprising: a) administering a composition comprising an E glycoprotein comprising an E glycoprotein backbone of serotype 4 comprising amino acid substitutions that introduce an epitope that is recognized by an antibody that is reactive with

## Recombinant Chimeric Dengue Viruses for Vaccines & Diagnostic Development

Dengue viruses are mosquito-borne viral disease, naturally occurring in tropical and subtropical areas with an estimated 400 million cases worldwide each year.

According to WebMD, risk is increasing for those living along the Texas-Mexico Border. People with weakened immune systems and second (subsequent) infection have greater risk of more severe disease symptoms.

1. <https://patents.justia.com/patent/20200230224>

2. <https://www.webmd.com/a-to-z-guides/dengue-fever-reference>

## Search Results

7 patents

Search Text: Baric

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Projects Publications Patents Clinical Studies News & More

## Filters

- Active Projects
- > Fiscal Years
- > Org Names
- > Agencies
- > States
- > Countries
- > Principal Investigators

Core NIH Project Number	Patent Number	Patent Title	Patent Owner	Primary Agency
U19AI109761	10829823	<a href="#">Compositions and methods for the rapid differential detection of Zika virus</a>	COLUMBIA UNIV NEW YORK MORNINGSIDE	<a href="#">NIH</a>
R01AI023946	7618802	<a href="#">Compositions of coronaviruses with a recombination-resistant genome</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	<a href="#">NIH</a>
R01GM063228	7618802	<a href="#">Compositions of coronaviruses with a recombination-resistant genome</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	<a href="#">NIH</a>
R01AI023946	6593111	<a href="#">Directional assembly of large viral genomes and chromosomes</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	<a href="#">NIH</a>
R01AI056351	9975923	<a href="#">Methods and compositions for norovirus blockade epitopes</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	<a href="#">NIH</a>
R01AI023946	7279327	<a href="#">Methods for producing recombinant coronavirus</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	<a href="#">NIH</a>
R01GM063228	7279327	<a href="#">Methods for producing recombinant coronavirus</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	<a href="#">NIH</a>

T Act Project	Year	Sub	Principal Investigator(s)/ Project Leader(s)	Organization	Fiscal Year	Admin IC	Funding IC	FY Total Cost by IC	Similar Projects
<b>Respiratory Virus Vaccine and Adjuvant Exploration</b>									
<a href="#">5U01AI149644-03</a>			<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2021	NIAID	NIAID	\$1,000,000	
<b>Task A24: Establishment of Chronic Pseudomonas aeruginosa and Staphylococcus aureus Infection in Mouse Models of Cystic Fibrosis</b>									
<a href="#">272201700036I-P00008-759301900131-1</a>			<a href="#">BARIC, RALPH</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2021	NIAID	NIAID	\$279,707	
<b>Determinants of Coronavirus Fidelity in Replication and Pathogenesis</b>									
<a href="#">5R01AI108197-09</a>			<a href="#">DENISON, MARK R.</a> <a href="#">BARIC, RALPH S</a>	VANDERBILT UNIVERSITY MEDICAL CENTER	2021	NIAID	NIAID	\$672,084	
<b>Antibody Landscape following Human Norovirus Infection and Vaccination</b>									
<a href="#">5R01AI148260-02</a>			<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2021	NIAID	NIAID	\$739,405	
<b>Determinants of Coronavirus Fidelity in Replication and Pathogenesis</b>									
<a href="#">3R01AI108197-09S1</a>			<a href="#">DENISON, MARK R.</a> <a href="#">BARIC, RALPH S</a>	VANDERBILT UNIVERSITY MEDICAL CENTER	2021	NIAID	NIAID	\$447,335	
<b>Project 3: SARS CoV-2 Lung Organoid Interactions in Replication and Pathogenesis</b>									
<a href="#">2U19AI116484-06</a>	6912		<a href="#">BARIC, RALPH S</a>	STANFORD UNIVERSITY	2021	NIAID		\$340,241	
<b>Human antibody-based countermeasures against the Wuhan Coronavirus SARS-CoV-2</b>									
<a href="#">1R01AI157155-01</a>			<a href="#">DIAMOND, MICHAEL S</a> <a href="#">BARIC, RALPH S</a> <a href="#">CROWE, JAMES E</a>	WASHINGTON UNIVERSITY	2020	NIAID	NIAID	\$1,193,309	

\$	279,707
\$	1,000,000
\$	672,084
\$	739,405
\$	447,335
\$	340,241
\$	1,193,309
\$	4,672,081

2020 CONTINUED  
NIH/NIAID GRANTS

RALPH BARIC  
(UNC/TEXAS/VANDERBILT)

\$	412,634
\$	517,617
\$	2,332,322
\$	1,088,512
\$	91,160
\$	658,139
\$	412,634
\$	220,411
\$	564,671
\$	6,298,100

<b>Systems Immunogenetics of Emerging Coronavirus Infections in the Collaborative Cross</b>						
<a href="#">3U19AI100625-09S26276</a>	<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID		\$412,634
<b>Core A: Administrative Core</b>						
<a href="#">1U54CA260543-01</a>	8131 <a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NCI		\$517,617
<b>Systems Immunogenetics of Biodefense and Emerging Pathogens in the Collaborative Cross</b>						
<a href="#">5U19AI100625-09</a>	<a href="#">BARIC, RALPH S</a> <a href="#">HEISE, MARK T</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID	NIAID	\$2,332,322
<b>Respiratory Virus Vaccine and Adjuvant Exploration - Equipment Supplement</b>						
<a href="#">3U01AI149644-02S1</a>	<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID	NIAID	\$1,088,512
<b>Systems Immunogenetics of Biodefense and Emerging Pathogens in the Collaborative Cross</b>						
<a href="#">3U19AI100625-09S3</a>	<a href="#">BARIC, RALPH S</a> <a href="#">HEISE, MARK T</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID	NIAID	\$91,160
<b>Project 1: Serological Correlates of SARS CoV2 Immunity and Disease</b>						
<a href="#">1U54CA260543-01</a>	8134 <a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NCI		\$658,139
<b>Systems Immunogenetics of Biodefense and Emerging Pathogens in the Collaborative Cross</b>						
<a href="#">3U19AI100625-09S2</a>	<a href="#">BARIC, RALPH S</a> <a href="#">HEISE, MARK T</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID	NIAID	\$412,634
<b>Administrative Core</b>						
<a href="#">5U19AI100625-09</a>	7724 <a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID		\$220,411
<b>Systems Immunogenetics of Biodefense and Emerging Pathogens in the Collaborative Cross</b>						
<a href="#">3U19AI100625-09S1</a>	<a href="#">BARIC, RALPH S</a> <a href="#">HEISE, MARK T</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID	NIAID	\$564,671
<b>Systems Immunogenetics of Emerging Coronavirus Infections in the Collaborative Cross</b>						
<a href="#">3U19AI100625-09S38833</a>	<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID		\$91,160

Systems Immunogenetics of Emerging Coronavirus Infections in the Collaborative Cross						
5U19AI100625-09	6276	<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID	\$428,666
Genetic Analysis of COVID-19 Susceptibility and Resistance Determinants in the Collaborative Cross						
1R01AI157253-01		<a href="#">HEISE, MARK T</a> <a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID NIAID	\$748,384
Cell entry, cross-species transmission and pathogenesis of novel coronavirus from Wuhan						
2R01AI110700-06		<a href="#">BARIC, RALPH S</a> <a href="#">LI, FANG</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID NIAID	\$766,414
North Carolina Seronet Center for Excellence						
1U54CA260543-01		<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NCI NCI	\$3,974,612
Respiratory Virus Vaccine and Adjuvant Exploration - Equipment Supplement						
3U01AI149644-02S1		<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID NIAID	\$1,088,512
Systems Immunogenetics of Biodefense and Emerging Pathogens in the Collaborative Cross						
3U19AI100625-09S2		<a href="#">BARIC, RALPH S</a> <a href="#">HEISE, MARK T</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID NIAID	\$412,634
Project 1: Serological Correlates of SARS CoV2 Immunity and Disease						
1U54CA260543-01	8134	<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NCI	\$658,139
Human antibody-based countermeasures against the Wuhan Coronavirus SARS-CoV-2						
1R01AI157155-01		<a href="#">DIAMOND, MICHAEL S</a> <a href="#">BARIC, RALPH S</a> <a href="#">CROWE, JAMES E</a>	WASHINGTON UNIVERSITY	2020	NIAID NIAID	\$1,193,309
Cell entry, cross-species transmission and pathogenesis of novel coronavirus from Wuhan						
2R01AI110700-06		<a href="#">BARIC, RALPH S</a> <a href="#">LI, FANG</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID NIAID	\$766,414
Broad-spectrum antiviral GS-5734 to treat MERS-CoV and related emerging CoV						
3R01AI132178-04S1		<a href="#">BARIC, RALPH S</a> <a href="#">SHEAHAN, TIMOTHY PATRICK</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID NIAID	\$458,053
Broad-spectrum antiviral GS-5734 to treat MERS-CoV and related emerging CoV						
3R01AI132178-03S1		<a href="#">BARIC, RALPH S</a> <a href="#">SHEAHAN, TIMOTHY PATRICK</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID NIAID	\$450,462
Broad-spectrum antiviral GS-5734 to treat MERS-CoV and related emerging CoV						
5R01AI132178-04		<a href="#">BARIC, RALPH S</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID NIAID	\$1,166,670

## 2020 CONTINUED NIH/NIAID GRANTS

RALPH BARIC  
(UNC/TEXAS/VANDERBILT)

\$	428,666
\$	748,384
\$	766,414
\$	3,974,612
\$	1,088,512
\$	412,634
\$	658,139
\$	1,193,309
\$	766,414
\$	458,053
\$	450,462
\$	1,166,670
\$	12,112,269



**Determinants of Coronavirus Fidelity in Replication and Pathogenesis**

3	<a href="#">R01AI108197-08S1</a>	<a href="#">DENISON, MARK R.</a> <a href="#">BARIC, RALPH S.</a>	VANDERBILT UNIVERSITY MEDICAL CENTER	2020	NIAID	NIAID	\$318,794
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**Determinants of Coronavirus Fidelity in Replication and Pathogenesis**

5	<a href="#">R01AI108197-08</a>	<a href="#">DENISON, MARK R.</a> <a href="#">BARIC, RALPH S.</a>	VANDERBILT UNIVERSITY MEDICAL CENTER	2020	NIAID	NIAID	\$672,084
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**Genetic Analysis of COVID-19 Susceptibility and Resistance Determinants in the Collaborative Cross**

1	<a href="#">R01AI157253-01</a>	<a href="#">HEISE, MARK T.</a> <a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2020	NIAID	NIAID	\$748,384
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\$	318,794
\$	672,084
\$	748,384
\$	1,739,262

2020 – 2021 TOTAL  
NIH/NIAID GRANTS  
RALPH BARIC

\$	4,672,081
\$	6,298,100
\$	12,112,269
\$	23,082,450

<https://reporter.nih.gov/search/709S4FzbS0ScdpKxNlg6Q/projects>

[https://en.wikipedia.org/wiki/Ralph\\_S.\\_Baric](https://en.wikipedia.org/wiki/Ralph_S._Baric)

# Ralph S. Baric

From Wikipedia, the free encyclopedia

**Ralph Steven Baric** (born 1954) is [William R. Kenan Jr.](#) Distinguished Professor in the Department of Epidemiology, and Professor in the Department of Microbiology and Immunology at the [The University of North Carolina at Chapel Hill](#).

Baric's work involves coronaviruses, including gain of function research aimed at devising effective vaccines against coronaviruses.<sup>[1]</sup> Baric has warned of emerging coronaviruses presenting as a significant threat to global health, due to zoonosis.<sup>[2][3]</sup>

<b>Ralph S. Baric</b>	
<b>Born</b>	1954 (age 66–67)
<b>Nationality</b>	<a href="#">American</a>
<b>Alma mater</b>	<a href="#">North Carolina State University</a>
<b>Scientific career</b>	
<b>Fields</b>	<a href="#">Epidemiology</a>
<b>Institutions</b>	<a href="#">University of North Carolina at Chapel Hill</a>
<b>Thesis</b>	<i>Inhibitors of host transcription block Sindbis virus replication</i> <sup>[4]</sup> (1982)
<b>Doctoral advisor</b>	<a href="#">Robert E. Johnston</a>

ESTABLISHMENT OF CHRONIC BACTERIAL INFECTION MODELS IN MOUSE MODELS WITH PSEUDOMONAS AERUGINOSA AND STAPHYL

272201700036I-0-75 9301900131-1	BARIC, RALPH	UNIV OF NORTH CAROLINA CHAPEL HILL	2019	NIAID	NIAID	\$442,129
<b>Respiratory Virus Vaccine and Adjuvant Exploration</b>						
1 U01AI149644-01	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2019	NIAID	NIAID	\$1,000,000
<b>Administrative Core</b>						
5 U19AI100625-08 7724	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2019	NIAID		\$818,006
<b>Systems Immunogenetics of Biodefense and Emerging Pathogens in the Collaborative Cross</b>						
5 U19AI100625-08	BARIC, RALPH S HEISE, MARK T	UNIV OF NORTH CAROLINA CHAPEL HILL	2019	NIAID	NIAID	\$2,769,729
<b>Mechanisms of MERS-CoV Entry, Cross-species Transmission and Pathogenesis</b>						
5 R01AI110700-05	BARIC, RALPH S LI, FANG	UNIV OF NORTH CAROLINA CHAPEL HILL	2019	NIAID	NIAID	\$721,207
<b>Broad-spectrum antiviral GS-5734 to treat MERS-CoV and related emerging CoV</b>						
5 R01AI132178-03	BARIC, RALPH S SHEAHAN, TIMOTHY PATRICK	UNIV OF NORTH CAROLINA CHAPEL HILL	2019	NIAID	NIAID	\$1,166,670
<b>Systems Immunogenetics of Emerging Coronavirus Infections in the Collaborative Cross</b>						
5 U19AI100625-08 7727	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2019	NIAID		\$428,666
<b>Determinants of Coronavirus Fidelity in Replication and Pathogenesis</b>						
5 R01AI108197-07	DENISON, MARK R. BARIC, RALPH S	VANDERBILT UNIVERSITY MEDICAL CENTER	2019	NIAID	NIAID	\$672,084
<b>Molecular Analysis of Serum Antibody Constituents in Zika Virus Infection</b>						
5 R21AI135682-02	GEORGIU, GEORGE GEORGIU BARIC, RALPH S	UNIVERSITY OF TEXAS, AUSTIN	2019	NIAID	NIAID	\$181,149
<b>Systems Immunogenetics of Biodefense and Emerging Pathogens in the Collaborative Cross</b>						
5 U19AI100625-07	BARIC, RALPH S HEISE, MARK T	UNIV OF NORTH CAROLINA CHAPEL HILL	2018	NIAID	NIAID	\$2,727,484
<b>Administrative Core</b>						
5 U19AI100625-07 7724	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2018	NIAID		\$342,898
<b>Mechanisms of MERS-CoV Entry, Cross-species Transmission and Pathogenesis</b>						
5 R01AI110700-04	BARIC, RALPH S LI, FANG	UNIV OF NORTH CAROLINA CHAPEL HILL	2018	NIAID	NIAID	\$727,370
<b>Diagnostic and Prognostic Biomarkers for Viral Severe Lung Disease</b>						
5 U19AI109761-05 8481	BARIC, RALPH S	COLUMBIA UNIVERSITY HEALTH SCIENCES	2018	NIAID		\$889,074
<b>Broad-spectrum antiviral GS-5734 to treat MERS-CoV and related emerging CoV</b>						
5 R01AI132178-02	BARIC, RALPH S SHEAHAN, TIMOTHY PATRICK	UNIV OF NORTH CAROLINA CHAPEL HILL	2018	NIAID	NIAID	\$1,166,670
<b>Systems Immunogenetics of Emerging Coronavirus Infections in the Collaborative Cross</b>						
5 U19AI100625-07 7727	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2018	NIAID		\$419,667
<b>Molecular Analysis of Serum Antibody Constituents in Zika Virus Infection</b>						
1 R21AI135682-01	GEORGIU, GEORGE GEORGIU BARIC, RALPH S	UNIVERSITY OF TEXAS, AUSTIN	2018	NIAID	NIAID	\$233,638
<b>Determinants of Coronavirus Fidelity in Replication and Pathogenesis</b>						
2 R01AI108197-06	DENISON, MARK R. BARIC, RALPH S	VANDERBILT UNIVERSITY MEDICAL CENTER	2018	NIAID	NIAID	\$686,584



2018 -2019  
NIH/NIAID GRANTS

RALPH BARIC  
(UNC/TEXAS/VANDERBILT)

\$	442,129
\$	1,000,000
\$	818,006
\$	2,769,729
\$	721,207
\$	1,166,670
\$	428,666
\$	672,084
\$	181,149
\$	2,727,484
\$	342,898
\$	727,370
\$	889,074
\$	419,667
\$	233,638
\$	686,584
\$	14,226,355

2016-2017  
CORONAVIRUS, GOF, ET AL.  
NIH/NIAID GRANTS

RALPH BARIC  
(UNC/Columbia/Vanderbilt)

T	Act	Project	Year	Sub	Principal Investigator(s)/ Project Leader(s)	Organization	Fiscal Year	Admin IC	Funding IC	FY Total Cost by IC
<b>Administrative Core</b>										
5		U19AI107810-05		8688	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2017	NIAID		\$211,216
<b>Mechanisms of MERS-CoV Entry, Cross-species Transmission and Pathogenesis</b>										
5		R01AI110700-03			BARIC, RALPH S LI, FANG	UNIV OF NORTH CAROLINA CHAPEL HILL	2017	NIAID	NIAID	\$733,354
<b>Diagnostic and Prognostic Biomarkers for Viral Severe Lung Disease</b>										
5		U19AI109761-04		8481	BARIC, RALPH S	COLUMBIA UNIVERSITY HEALTH SCIENCES	2017	NIAID		\$1,731,261
<b>Broad-spectrum antiviral GS-5734 to treat MERS-CoV and related emerging CoV</b>										
1		R01AI132178-01			BARIC, RALPH S SHEAHAN, TIMOTHY PATRICK	UNIV OF NORTH CAROLINA CHAPEL HILL	2017	NIAID	NIAID	\$1,455,240
<b>Systems Immunogenetics of Emerging Coronavirus Infections in the Collaborative Cross</b>										
2		U19AI100625-06		7727	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2017	NIAID		\$418,635
<b>Role of Uncharacterized Genes in High Pathogenic Human Coronavirus Infection</b>										
5		U19AI107810-05		8683	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2017	NIAID		\$396,549
<b>Characterization of novel genes encoded by RNA and DNA viruses</b>										
5		U19AI107810-05			BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2017	NIAID	NIAID	\$2,021,134
<b>Administrative and Education Core</b>										
4		U19AI100625-05		6159	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2016	NIAID		\$649,146
<b>Administrative Core</b>										
4		U19AI107810-04		8688	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2016	NIAID		\$252,483
<b>System Immunogenetics of SARS-CoV Infection</b>										
3		U19AI100625-04S1		5232	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2016	NIAID		\$135,110
<b>System Immunogenetics of SARS-CoV Infection</b>										
4		U19AI100625-05		6155	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2016	NIAID		\$739,947
<b>Mechanisms of MERS-CoV Entry, Cross-species Transmission and Pathogenesis</b>										
5		R01AI110700-02			BARIC, RALPH S LI, FANG	UNIV OF NORTH CAROLINA CHAPEL HILL	2016	NIAID	NIAID	\$739,162
<b>Diagnostic and Prognostic Biomarkers for Viral Severe Lung Disease</b>										
5		U19AI109761-03		8481	BARIC, RALPH S	COLUMBIA UNIVERSITY HEALTH SCIENCES	2016	NIAID		\$889,034
<b>Systems Immunogenetics of Biodefense Pathogens in the Collaborative Cross</b>										
4		U19AI100625-05			BARIC, RALPH S HEISE, MARK T	UNIV OF NORTH CAROLINA CHAPEL HILL	2016	NIAID	NIAID	\$4,853,040
<b>Characterization of novel genes encoded by RNA and DNA viruses</b>										
4		U19AI107810-04			BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2016	NIAID	NIAID	\$2,322,470
<b>Unlocking Zika Virus Immune Control and Pathogenesis with the Collaborative Cross</b>										
3		U19AI100625-04S1			BARIC, RALPH S HEISE, MARK T	UNIV OF NORTH CAROLINA CHAPEL HILL	2016	NIAID	NIAID	\$135,110
<b>Role of Uncharacterized Genes in High Pathogenic Human Coronavirus Infection</b>										
4		U19AI107810-04		8683	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2016	NIAID		\$704,107
<b>Determinants of Coronavirus Fidelity in Replication and Pathogenesis</b>										
5		R01AI108197-05			DENISON, MARK R BARIC, RALPH S	VANDERBILT UNIVERSITY MEDICAL CENTER	2016	NIAID	NIAID	\$548,803

\$	211,216
\$	733,354
\$	1,131,261
\$	1,455,240
\$	418,635
\$	396,549
\$	2,021,134
\$	649,146
\$	252,483
\$	135,110
\$	739,947
\$	739,162
\$	899,034
\$	4,853,040
\$	2,322,470
\$	135,110
\$	704,107
\$	548,803
\$	18,345,801

2014-2015  
CORONAVIRUS, GOF, ET AL.

RALPH BARIC  
(UNC/Vanderbilt/Columbia/)

Act	Project	Year	Sub	Principal Investigator(s)/ Project Leader(s)	Organization	Fiscal Year	Admin IC	Funding IC	FY Total Cost by IC
<b>Determinants of Coronavirus Fidelity in Replication and Pathogenesis</b>									
	<a href="#">R01AI108197-04</a>			<a href="#">DENISON, MARK R.</a> <a href="#">BARIC, RALPH S.</a>	VANDERBILT UNIVERSITY MEDICAL CENTER	2015	NIAID	NIAID	\$306,487
<b>Administrative Core</b>									
	<a href="#">U19AI107810-03</a>		8688	<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2015	NIAID		\$188,494
<b>Administrative and Education Core</b>									
	<a href="#">U19AI100625-04</a>		6159	<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2015	NIAID		\$279,874
<b>Diagnostic and Prognostic Biomarkers for Viral Severe Lung Disease</b>									
	<a href="#">U19AI109761-02</a>		8481	<a href="#">BARIC, RALPH S.</a>	COLUMBIA UNIVERSITY HEALTH SCIENCES	2015	NIAID		\$1,137,211
<b>Mechanisms of MERS-CoV Entry, Cross-species Transmission and Pathogenesis</b>									
	<a href="#">R01AI110700-01A1</a>			<a href="#">BARIC, RALPH S.</a> <a href="#">LI, FANG</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2015	NIAID	NIAID	\$754,420
<b>System Immunogenetics of SARS-CoV Infection</b>									
	<a href="#">U19AI100625-04</a>		6155	<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2015	NIAID		\$412,965
<b>Systems Immunogenetics of Biodefense Pathogens in the Collaborative Cross</b>									
	<a href="#">U19AI100625-04</a>			<a href="#">BARIC, RALPH S.</a> <a href="#">HEISE, MARK T.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2015	NIAID	NIAID	\$4,144,540
<b>Characterization of novel genes encoded by RNA and DNA viruses</b>									
	<a href="#">U19AI107810-03</a>			<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2015	NIAID	NIAID	\$2,115,911
<b>Role of Uncharacterized Genes in High Pathogenic Human Coronavirus Infection</b>									
	<a href="#">U19AI107810-03</a>		8683	<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2015	NIAID		\$370,377
<b>Determinants of Coronavirus Fidelity in Replication and Pathogenesis</b>									
	<a href="#">R01AI108197-03</a>			<a href="#">DENISON, MARK R.</a> <a href="#">BARIC, RALPH S.</a>	VANDERBILT UNIVERSITY	2015	NIAID	NIAID	\$242,311
<b>Administrative Core</b>									
	<a href="#">U19AI107810-02</a>		8688	<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2014	NIAID		\$223,265
<b>Administrative and Education Core</b>									
	<a href="#">U19AI100625-03</a>		6159	<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2014	NIAID		\$832,756
<b>Mechanisms of Norovirus Protective Immunity</b>									
	<a href="#">R56AI106006-01A1</a>			<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2014	NIAID	NIAID	\$759,938
<b>System Immunogenetics of SARS-CoV Infection</b>									
	<a href="#">U19AI100625-03</a>		6155	<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2014	NIAID		\$334,030
<b>Diagnostic and Prognostic Biomarkers for Viral Severe Lung Disease</b>									
	<a href="#">U19AI109761-01</a>		8481	<a href="#">BARIC, RALPH S.</a>	COLUMBIA UNIVERSITY HEALTH SCIENCES	2014	NIAID		\$1,184,414
<b>Systems Immunogenetics of Biodefense Pathogens in the Collaborative Cross</b>									
	<a href="#">U19AI100625-03</a>			<a href="#">BARIC, RALPH S.</a> <a href="#">HEISE, MARK T.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2014	NIAID	NIAID	\$4,148,261
<b>Role of Uncharacterized Genes in High Pathogenic Human Coronavirus Infection</b>									
	<a href="#">U19AI107810-02</a>		8683	<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2014	NIAID		\$420,831
<b>Characterization of novel genes encoded by RNA and DNA viruses</b>									
	<a href="#">U19AI107810-02</a>			<a href="#">BARIC, RALPH S.</a>	UNIV OF NORTH CAROLINA CHAPEL HILL	2014	NIAID	NIAID	\$2,102,641
<b>Determinants of Coronavirus Fidelity in Replication and Pathogenesis</b>									
	<a href="#">R01AI108197-02</a>			<a href="#">DENISON, MARK R.</a> <a href="#">BARIC, RALPH S.</a>	VANDERBILT UNIVERSITY	2014	NIAID	NIAID	\$547,101

\$ 306,487

\$ 188,494

\$ 279,874

\$ 1,137,211

\$ 754,420

\$ 412,965

\$ 4,144,540

\$ 2,115,911

\$ 370,377

\$ 242,311

\$ 233,265

\$ 832,756

\$ 759,938

\$ 334,030

\$ 1,184,414

\$ 4,148,261

\$ 420,831

\$ 2,102,641

\$ 547,101

\$ 20,515,827

T	Act	Project	Year	Sub	Principal Investigator(s)/ Project Leader(s)	Organization	Fiscal Year	Admin IC	Funding IC	FY Total Cost by IC
<b>Administrative Core</b>										
1	U19AI107810-01			8688	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2013	NIAID		\$196,909
<b>Administrative and Education Core</b>										
5	U19AI100625-02			6159	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2013	NIAID		\$206,337
<b>System Immunogenetics of SARS-CoV Infection</b>										
5	U19AI100625-02			6155	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2013	NIAID		\$367,995
<b>Systems Immunogenetics of Biodefense Pathogens in the Collaborative Cross</b>										
5	U19AI100625-02				BARIC, RALPH S HEISE, MARK T	UNIV OF NORTH CAROLINA CHAPEL HILL	2013	NIAID	NIAID	\$4,030,980
<b>Systems Pathogenomics of Severe Acute Respiratory Virus Infection</b>										
5	U54AI081680-05			6278	BARIC, RALPH S	OREGON HEALTH & SCIENCE UNIVERSITY	2013	NIAID		\$818,118
<b>Role of Uncharacterized Genes in High Pathogenic Human Coronavirus Infection</b>										
1	U19AI107810-01			8683	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2013	NIAID		\$371,153
<b>Characterization of novel genes encoded by RNA and DNA viruses</b>										
1	U19AI107810-01				BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2013	NIAID	NIAID	\$2,027,645
<b>Susceptibility and Protective Immunity to Noroviruses</b>										
5	R01AI056351-10				BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2013	NIAID	NIAID	\$409,466
<b>Determinants of Coronavirus Fidelity in Replication and Pathogenesis</b>										
1	R01AI108197-01				DENISON, MARK R. BARIC, RALPH S	VANDERBILT UNIVERSITY	2013	NIAID	NIAID	\$560,000
<b>Administrative and Education Core</b>										
1	U19AI100625-01			6159	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2012	NIAID		\$174,333
<b>SARS-CoV Pathogenic Mechanisms in Senescent Mice</b>										
5	R01AI075297-05				BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2012	NIAID	NIAID	\$484,651
<b>System Immunogenetics of SARS-CoV Infection</b>										
1	U19AI100625-01			6155	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2012	NIAID		\$435,565
<b>Systems Immunogenetics of Biodefense Pathogens in the Collaborative Cross</b>										
1	U19AI100625-01				BARIC, RALPH S HEISE, MARK T	UNIV OF NORTH CAROLINA CHAPEL HILL	2012	NIAID	NIAID	\$4,594,721
<b>Systems Pathogenomics of Severe Acute Respiratory Virus Infection</b>										
5	U54AI081680-04			6278	BARIC, RALPH S	OREGON HEALTH & SCIENCE UNIVERSITY	2012	NIAID		\$746,369
<b>Susceptibility and Protective Immunity to Noroviruses</b>										
5	R01AI056351-09				BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2012	NIAID	NIAID	\$435,605

2012-2013  
CORONAVIRUS, GOF, ET AL.

RALPH BARIC (UNC/Vanderbilt/OR)

\$ 196,909

\$ 206,337

\$ 367,995

\$ 4,030,980

\$ 818,118

\$ 371,153

\$ 2,027,645

\$ 409,466

\$ 560,000

\$ 174,333

\$ 484,651

\$ 435,565

\$ 4,594,721

\$ 746,369

\$ 435,605

\$ 15,859,847

SARS-CORONAVIRUS  
NIH/NIAID GRANTS  
PATHOGENECITY,  
GOF RESEARCH

RALPH BARIC (UNC/UVA/OR)

<b>Systems Pathogenomics of Severe Acute Respiratory Virus Infection</b>							
5	U54AI081680-03 6278	BARIC, RALPH S	OREGON HEALTH & SCIENCE UNIVERSITY	2011	NIAID		\$758,603
<b>Susceptibility and Protective Immunity to Noroviruses</b>							
5	R01AI056351-08	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2011	NIAID	NIAID	\$457,050
<b>SARS-CoV Pathogenic Mechanisms in Senescent Mice</b>							
5	R01AI075297-03	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2010	NIAID	NIAID	\$492,533
<b>Systems Pathogenomics of Severe Acute Respiratory Virus Infection</b>							
5	U54AI081680-02 6278	BARIC, RALPH S	OREGON HEALTH & SCIENCE UNIVERSITY	2010	NIAID		\$739,767
<b>Susceptibility and Protective Immunity to Noroviruses</b>							
5	R01AI056351-07	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2010	NIAID	NIAID	\$606,993
<b>High Throughput Assays for Chemical Screens Against SARS-CoV Targets</b>							
3	R21NS063854-01S1	ENGEL, DANIEL A BARIC, RALPH S	UNIVERSITY OF VIRGINIA	2010	NIHNS	OD	\$38,500
<b>Developing Vaccine Candidates for the SARS Coronavirus</b>							
5	P01AI059443-05	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2009	NIAID	NIAID	\$1,907,553
<b>Core--SARS Coronavirus Clone and Reagent</b>							
5	P01AI059443-05 9002	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2009	NIAID		\$202,418
<b>Rewiring SARS-CoV Genome Organization and Pathogenesis</b>							
5	P01AI059443-05 0001	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2009	NIAID		\$264,982
<b>Systems Pathogenomics of Severe Acute Respiratory Virus Infection</b>							
1	U54AI081680-01 6278	BARIC, RALPH S	OREGON HEALTH & SCIENCE UNIVERSITY	2009	NIAID		\$747,616
<b>SARS-CoV Pathogenic Mechanisms in Senescent Mice</b>							
5	R01AI075297-02	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2009	NIAID	NIAID	\$490,616
<b>Susceptibility and Protective Immunity to Noroviruses</b>							
2	R01AI056351-06A1	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2009	NIAID	NIAID	\$660,673
<b>Developing Vaccine Candidates for the SARS Coronavirus</b>							
5	P01AI059443-04	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2008	NIAID	NIAID	\$1,854,836
<b>Core--SARS Coronavirus Clone and Reagent</b>							
5	P01AI059443-04 9002	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2008	NIAID		\$196,600
<b>Rewiring SARS-CoV Genome Organization and Pathogenesis</b>							
5	P01AI059443-04 0001	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2008	NIAID		\$257,344
<b>SARS Reverse Genetics</b>							
5	R01AI059136-05	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2008	NIAID	NIAID	\$271,608
<b>SARS-CoV Pathogenic Mechanisms in Senescent Mice</b>							
1	R01AI075297-01A1	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2008	NIAID	NIAID	\$496,151
<b>High Throughput Assays for Chemical Screens Against SARS-CoV Targets</b>							
1	R21NS063854-01	ENGEL, DANIEL A BARIC, RALPH S	UNIVERSITY OF VIRGINIA	2008	NIHNS	OD	\$157,259
<b>SARS Reverse Genetics</b>							
5	R01AI059136-04	BARIC, RALPH S	UNIV OF NORTH CAROLINA CHAPEL HILL	2007	NIAID	NIAID	\$276,869

\$ 758,603

\$ 457,050

\$ 492,533

\$ 739,767

\$ 606,993

\$ 38,500

\$ 1,907,553

\$ 202,418

\$ 264,418

\$ 264,982

\$ 747,616

\$ 490,616

\$ 660,673

\$ 1,854,836

\$ 196,600

\$ 257,344

\$ 271,608

\$ 496,151

\$ 157,259

\$ 276,869

\$ 11,142,389

2003 – 2006  
SARS-CORONAVIRU,  
NOROVIRUS, Et al.  
NIH/NIAID GRANTS

RALPH BARIC (UNC)

T	Act	Year	Sub	Principal Investigator(s)/ Project Leader(s)	Organization	Fiscal Year	Admin IC	Funding IC	FY Total Cost by IC
<b>DETERMINANTS OF SUSCEPTIBILITY AND PROTECTIVE IMMUNITY TO NOROVIRUS INFECTION</b>									
5	R01RR00046-	46	1437	BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2006	NCRR		\$743
<b>Developing Vaccine Candidates for the SARS Coronavirus</b>									
5	P01AI059443-	02		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2006	NIAID	NIAID	\$1,840,683
<b>Core--SARS Coronavirus Clone and Reagent</b>									
5	P01AI059443-	02	9002	BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2006	NIAID		\$181,677
<b>Rewiring SARS-CoV Genome Organization and Pathogenesis</b>									
5	P01AI059443-	02	0001	BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2006	NIAID		\$239,406
<b>Studies into the Mechanisms for MHV Replication</b>									
5	R01AI023946-	17		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2006	NIAID	NIAID	\$337,090
<b>SARS Reverse Genetics</b>									
5	R01AI059136-	03		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2006	NIAID	NIAID	\$285,138
<b>Susceptibility and Protective Immunity to Noroviruses</b>									
5	R01AI056351-	04		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2006	NIAID	NIAID	\$377,578
<b>Administrative Core</b>									
1	P01AI059443-	01A17958		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2005	NIAID		\$146,495
<b>Developing Vaccine Candidates for the SARS Coronavirus</b>									
1	P01AI059443-	01A1		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2005	NIAID	NIAID	\$1,676,513
<b>Core--SARS Coronavirus Clone and Reagent</b>									
1	P01AI059443-	01A19002		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2005	NIAID		\$174,680
<b>Rewiring SARS-CoV Genome Organization and Pathogenesis</b>									
1	P01AI059443-	01A10001		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2005	NIAID		\$218,242
<b>Studies into the Mechanisms for MHV Replication</b>									
5	R01AI023946-	16		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2005	NIAID	NIAID	\$395,202
<b>SARS Reverse Genetics</b>									
5	R01AI059136-	02		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2005	NIAID	NIAID	\$290,054
<b>Susceptibility and Protective Immunity to Noroviruses</b>									
5	R01AI056351-	03		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2005	NIAID	NIAID	\$376,502
<b>REVERSE GENETICS WITH A CORONAVIRUS INFECTIOUS CONSTRUCT</b>									
5	R01AI059228-	04		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2004	NIAID	NIAID	\$290,054
<b>Studies into the Mechanisms for MHV Replication</b>									
5	R01AI023946-	15		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2004	NIAID	NIAID	\$345,202
<b>SARS Reverse Genetics</b>									
1	R01AI059136-	01		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2004	NIAID	NIAID	\$278,647
<b>Remodeling SARS Coronavirus Genome Regulatory Networks</b>									
1	R01AI061819-	01		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2004	NIAID	NIAID	\$367,042
<b>Susceptibility and Protective Immunity to Noroviruses</b>									
5	R01AI056351-	02		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2004	NIAID	NIAID	\$384,133
<b>REVERSE GENETICS WITH A CORONAVIRUS INFECTIOUS CONSTRUCT</b>									
5	R01AI059228-	03		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2003	NIAID	NIAID	\$129,665
<b>Studies into the Mechanisms for MHV Replication</b>									
2	R01AI023946-	14A1		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2003	NIAID	NIAID	\$519,733
<b>Susceptibility and Protective Immunity to Noroviruses</b>									
1	R01AI056351-	01		BARIC, RALPH S	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL	2003	NIAID	NIAID	\$129,665

\$	743
\$	1,840,683
\$	181,677
\$	239,406
\$	337,090
\$	285,138
\$	377,578
\$	146,495
\$	1,676,513
\$	174,680
\$	218,242
\$	395,202
\$	290,054
\$	367,042
\$	345,202
\$	367,042
\$	384,133
\$	519,733
\$	129,665
\$	8,554,965

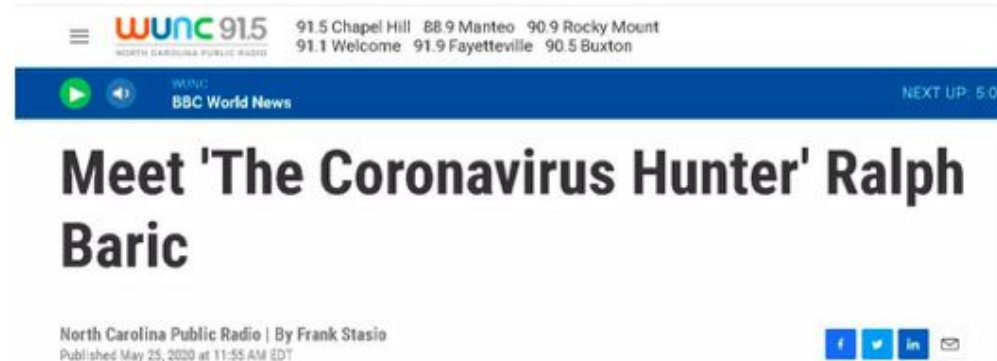
2003 – 2021 TOTAL  
NIH/NIAID GRANTS  
RALPH BARIC

\$	23,082,450
\$	14,226,335
\$	18,345,801
\$	20,515,827
\$	15,859,847
\$	11,142,389
\$	8,554,965
\$	111,727,614



**US TAX DOLLARS**

Let's start with Ralph Baric, an American scientist who is called the "Coronavirus Hunter."



Screenshot on North Carolina-based media WUNC



Screenshot on UNC

According to [a report](#) from the school-run media of the University of North Carolina, where Baric works, "Baric has been tracking coronaviruses for decades and working on medications to treat coronavirus-caused infections."





UNIVERSITY NEWS

# Leading COVID experts to deliver Carolina's Spring Commencement address

Drs. Anthony Fauci and Kizzmekia Corbett have been pivotal in understanding and combatting the virus.

By University Communications, Thursday, March 4th, 2021



2014 -2020  
NIAID GRANTS  
HIV ENVELOPE (GP120)

[ANTHONY FAUCI](#)

T	Act	Project	Year	Sub	Principal Investigator(s)/ Project Leader(s)	Organization	Fiscal Year	Admin IC	Funding IC	FY Total Cost by IC
		<b>Interaction of HIV envelope with cell surface receptors</b>								
1	ZIAAI000883	-20			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2020	NIAID	NIAID	\$1,001,661
		<b>Role of HIV Envelope Proteins in Viral Replication and HIV Pathogenesis</b>								
1	ZIAAI000887	-20			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2020	NIAID	NIAID	\$1,001,661
		<b>Interaction of HIV envelope with cell surface receptors</b>								
1	ZIAAI000883	-19			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2019	NIAID	NIAID	\$1,069,830
		<b>Role of HIV Envelope Proteins in Viral Replication and HIV Pathogenesis</b>								
1	ZIAAI000887	-19			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2019	NIAID	NIAID	\$1,069,830
		<b>Interaction of HIV envelope with cell surface receptors</b>								
1	ZIAAI000883	-18			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2018	NIAID	NIAID	\$984,045
		<b>Role of HIV Envelope Proteins in Viral Replication and HIV Pathogenesis</b>								
1	ZIAAI000887	-18			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2018	NIAID	NIAID	\$984,045
		<b>Interaction of HIV envelope with cell surface receptors</b>								
1	ZIAAI000883	-17			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2017	NIAID	NIAID	\$1,117,501
		<b>Role of HIV Envelope Proteins in Viral Replication and HIV Pathogenesis</b>								
1	ZIAAI000887	-17			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2017	NIAID	NIAID	\$921,475
		<b>Interaction of HIV envelope with cell surface receptors</b>								
1	ZIAAI000883	-16			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2016	NIAID	NIAID	\$744,742
		<b>Role of HIV Envelope Proteins in Viral Replication and HIV Pathogenesis</b>								
1	ZIAAI000887	-16			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2016	NIAID	NIAID	\$744,742
		<b>Interaction of HIV envelope with cell surface receptors</b>								
1	ZIAAI000883	-15			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2015	NIAID	NIAID	\$853,062
		<b>Role of HIV Envelope Proteins in Viral Replication and HIV Pathogenesis</b>								
1	ZIAAI000887	-15			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2015	NIAID	NIAID	\$853,062
		<b>Role of Viral Reservoirs in the Pathogenesis of HIV Disease</b>								
1	ZIAAI000851	-15			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2015	NIAID	NIAID	\$1,384,173
		<b>Therapeutic Strategies for the Management of HCV/HIV co- infection</b>								
1	ZIAAI000390	-31			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2014	NIAID	NIAID	\$689,091
		<b>Interaction of HIV envelope with cell surface receptors</b>								
1	ZIAAI000883	-14			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2014	NIAID	NIAID	\$612,656
		<b>Role of HIV Envelope Proteins in Viral Replication and HIV Pathogenesis</b>								
1	ZIAAI000887	-14			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2014	NIAID	NIAID	\$501,264
		<b>Role of Viral Reservoirs in the Pathogenesis of HIV Disease</b>								
1	ZIAAI000851	-14			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2014	NIAID	NIAID	\$966,899
		<b>Role of B Lymphocytes in HIV Infection And Pathogenesis</b>								
1	ZIAAI000825	-17			FAUCI, ANTHONY S.	NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES	2014	NIAID	NIAID	\$772,682

\$	1,001,661
\$	1,069,830
\$	984,045
\$	1,175,501
\$	921,475
\$	744,742
\$	853,062
\$	1,384,173
\$	689,091
\$	612,656
\$	501,264
\$	966,899
\$	772,682
\$	11,677,081

[https://reporter.nih.gov/search/3\\_Ch3YpiTEum9vw2qeurBA/projects?PI=2403678](https://reporter.nih.gov/search/3_Ch3YpiTEum9vw2qeurBA/projects?PI=2403678)

## ANTHONY FAUCI - US PATENTS – HIV GP120

**Search Results**  
6 patents

Search Text: FAUCI, ANTHONY

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- > Org Names
- > Agencies
- > Countries
- > Principal Investigators

Core NIH Project Number	Patent Number	Patent Title	Patent Owner ?	Primary Agency ?
Z01AI000887	9896509	<a href="#">Use of antagonists of the interaction between HIV GP120 and .alpha.4.beta.7 integrin</a>		<a href="#">NIH</a>
Z01AI000887	9441041	<a href="#">Use of antagonists of the interaction between HIV GP120 and .alpha.4.beta.7 integrin</a>		<a href="#">NIH</a>
ZIAAI000887	9441041	<a href="#">Use of antagonists of the interaction between HIV GP120 and .alpha.4.beta.7 integrin</a>		<a href="#">NIH</a>
ZIAAI000887	9896509	<a href="#">Use of antagonists of the interaction between HIV GP120 and .alpha.4.beta.7 integrin</a>		<a href="#">NIH</a>
Z01AI000887	9193790	<a href="#">Use of antagonists of the interaction between HIV GP120 and A4B7 integrin</a>		<a href="#">NIH</a>
ZIAAI000887	9193790	<a href="#">Use of antagonists of the interaction between HIV GP120 and A4B7 integrin</a>		<a href="#">NIH</a>