

# COVID-19 RESPONSE FUNDING UPDATE

June 12-18, 2020

## FACTS

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**\$104,406,239**

**Funds Mobilized**

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**756 Grants Funded**

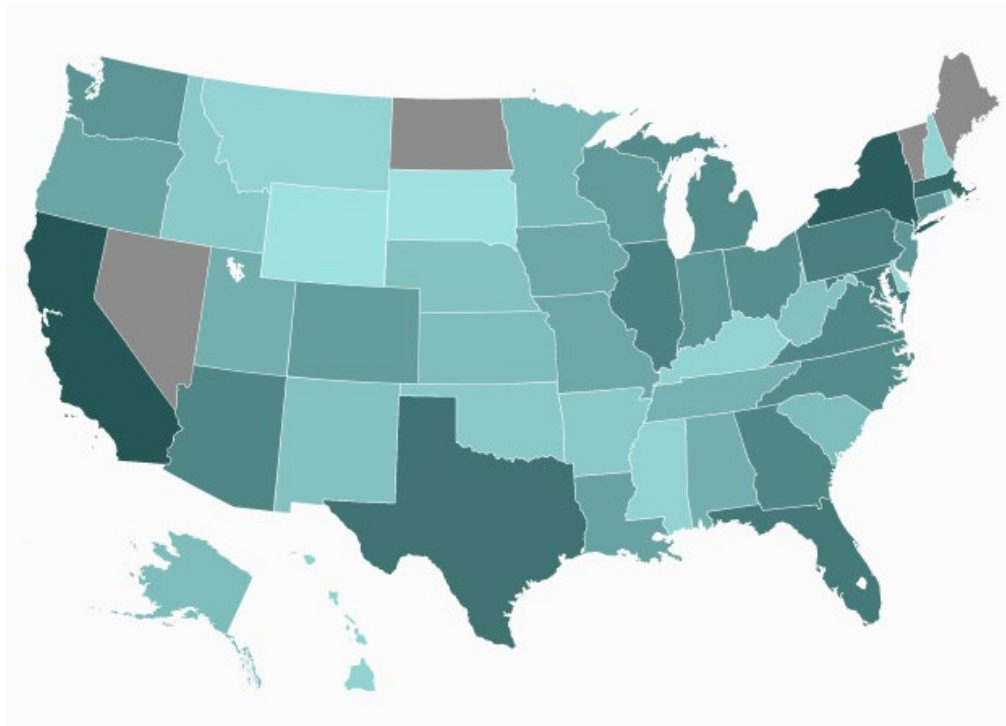
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# OVERVIEW

In response to the COVID-19 virus, the National Science Foundation (NSF) is mobilizing funding from the FY2020 budget and supplemental appropriations through the Coronavirus Aid, Relief, and Economic Security (CARES) Act. CARES Act funding supports a wide range of research areas to help the country fight and recover from the COVID-19 crisis through several research funding mechanisms, including Rapid Response Research (RAPID), a fast-tracked grant process to accelerate critical discoveries.

## AWARDS



COVID-19 related awards by state, shade of blue correlates to number of awards.

	CARES Act	All COVID-19
<b>Number of Awards</b>	488	756
<b>Funding Deployed</b>	\$70,366,805	\$104,406,239

This update spotlights several recent awards, just a snapshot of the essential work NSF is funding through the CARES Act and FY2020 appropriations. You can explore all of the COVID-19 related research grants awarded through the National Science Foundation at [this link](#).

## DIVISION OF MOLECULAR AND CELLULAR BIOSCIENCES

### CARES ACT \$200,000

<b>Title</b>	RAPID: Membrane remodeling dynamics by SARS-CoV-2
<b>Institution</b>	University of Rochester; Rochester, NY
<b>What</b>	To understand the biological mechanism that coronaviruses use to spread between species, this project will investigate the role of autophagy—the process cells use to recycle and degrade cellular components—in viral replication.
<b>Why</b>	SARS, MERS, and COVID-19 are illnesses caused by coronaviruses that originated in bats. To better prepare for future coronavirus transmission, there's a critical need to understand the biological mechanism coronaviruses use to move from natural hosts to humans.

## DIVISION OF INFORMATION AND INTELLIGENT SYSTEMS

### CARES Act \$200,000

<b>Title</b>	RAPID: Geospatially-Enabled Deep Analytics for Real-time Mitigation and Response to COVID-19 Outbreak for American Rural Populations
<b>Institution</b>	University of Missouri; Columbia, MO
<b>What</b>	This project delivers resources to three rural Missouri communities. Through new computational methods, integrated geospatial analytics will enable data analysis, recourse management, need assessment, and tracking.
<b>Why</b>	With fewer necessary resource such as hospital access, reliable internet and emergency response, rural communities are especially vulnerable to disease outbreaks—the impacts of COVID-19 are anticipated to be devastating. This project will enhance understanding of disease transmission behavior and bolster resilience preparation in rural populations.

## DIVISION OF EMERGING FRONTIERS AND MULTIDISCIPLINARY ACTIVITIES

### CARES Act \$300,000

<b>Title</b>	EAGER: Engineering Optical Nanobiosensors for Detection of Coronavirus Proteases
<b>Institution</b>	Kansas State University; Manhattan, KS
<b>What</b>	The goal of this project is to design and validate optical nanobiosensors—sensitive nanoscale sensors of biological substances—to detect active coronavirus infections.
<b>Why</b>	Current techniques for detecting the virus that causes COVID-19 are limited—they cannot clearly differentiate between active or past infection. Optical nanobiosensors could offer a new technique to obtain a quantitative measure of virus activity.

## DIVISION OF ELECTRICAL, COMMUNICATIONS AND CYBER SYSTEMS

### FY2020 \$299,963

<b>Title</b>	EAGER: Decomposing Covid-19 Virus Using the Dual Action of Microwaves and Plasma
<b>Institution</b>	University of Arkansas; Fayetteville, AR
<b>What</b>	This research will investigate the effectiveness of microwaves and plasma for low-temperature disinfection of personal protective equipment contaminated with viruses like the coronavirus behind COVID-19.
<b>Why</b>	A shortage of medical supplies has created unprecedented need to disinfect medical personal protective equipment. Microwaves and plasma can effectively inactivate microbial pathogens and may be used to disinfect heat-sensitive materials such as masks, gloves, and gowns.

## DIVISION OF INFORMATION AND INTELLIGENT SYSTEMS

### CARES Act \$200,000

- Title** RAPID: Information Retrieval and Graph Mining Techniques to Enable Self-Assessment and Clinical Monitoring of Emergent Infectious Diseases
- Institution** Brown University; Providence, RI
- What** This project will develop a real-time symptom monitoring system for self-assessment. The system will enable individuals in Rhode Island to record symptoms and take appropriate action based on automated guidance to either seek immediate assessment for COVID-19 infection, manage symptoms at home, or continue monitoring.
- Why** This project offers much-needed infrastructure to support monitoring COVID-19 symptoms at population-level. It will better empower patients to monitor symptoms and support healthcare systems to manage patient loads.

## DIVISION OF MATHEMATICAL SCIENCES

### CARES Act \$200,000

- Title** RAPID: Collaborative Research: Mathematical tools for analysis of genomic diversity of SARS-CoV-2 virus in the context of its co-evolution with host populations
- Institution** William Marsh Rice University; Houston, TX  
Columbia University; New York City, NY
- What** This project aims to describe viral mechanisms—including host-pathogen interactions—enabling viral mutation and evolution. Researchers will use novel statistics and computational techniques to estimate genomic drift and mutations that lead to selection patterns of the virus population.
- Why** Effective public health interventions require knowing how the COVID virus is likely to evolve in humans. Deeper understanding of how mutations in viral genomes are accumulating and the evolutionary origins of SARS-CoV-2 can help guide the development of vaccines against the current virus and infer its evolutionary potential for future recurrences.

## DIVISION OF SOCIAL AND ECONOMIC SCIENCES

### CARES Act \$111,999

<b>Title</b>	RAPID: Systemic Differences in Employee Outcomes from COVID-19 and the Effectiveness of Organizational Response
<b>Institution</b>	University of Memphis; Memphis, TN
<b>What</b>	The COVID-19 pandemic has forced millions of employees to: (a) work remotely, (b) continue to work in low-paying “essential” work, at great risk to their own health, or (c) face sudden unemployment. This research will study how these changes have impacted people from different demographic and socioeconomic backgrounds.
<b>Why</b>	The pandemic is a critical time to gather data on how businesses and workers react to major work disruptions. Results will help us understand how rapid changes in work conditions affect the well-being and job performance of workers and how organizations can best support their employees during times of crisis.

## DIVISION OF INTEGRATIVE ORGANISMAL SYSTEMS

### CARES Act \$199,594

<b>Title</b>	RAPID: The potential of SARS-CoV2 to utilize the ACE2 receptor of domesticated and wild animals for cell entry.
<b>Institution</b>	University of Idaho; Moscow, ID
<b>What</b>	This project will use computational modeling and empirical research to identify animal cell receptors associated with SARS-CoV-2 susceptibility in animal species that may serve as intermediate hosts for the virus between its likely origination in bats and its transmission to humans.
<b>Why</b>	By identifying animal populations susceptible to the virus causing the current pandemic, this research will help identify species that could potentially act as conduits for viruses that may cause future outbreaks.

## Related NSF Research News

- NSF Science Matters Blog: [#NSFstories: Leading an army of citizen scientists in the fight against COVID-19](#)
- [Wildlife territorial behavior could play larger role in disease spread than thought](#)
- WTTW PBS: [UIC Study Analyzes How COVID-19 Has Changed Travel Behavior, Lifestyles](#)