



## **COVID-19 Emergency Supplemental Appropriations**

In light of the COVID-19 pandemic, now more than ever, robust federal investment is required in the nation's scientific enterprise. Our national security is threatened when global pandemics essentially shut down research and development (R&D) and force our economy into a recession. The U.S. Department of Defense (DoD) is by far the largest federal sponsor of scientific R&D<sup>1</sup>, including the second largest funder of medical research<sup>2</sup>, so it is crucial that funding be provided to help with the response to COVID-19. Funding should not only be provided to DoD to aid in mitigating the impacts of COVID-19, but also targeted to support efforts to prevent future global health pandemics.

As outlined in the recommendations below, CNSR urges Congress and the Administration to provide emergency supplemental appropriations to support our national security now and into the future as we deal with the short-term and long-term consequences of COVID-19.

### ***Sustaining Vital DoD & Scientific R&D***

A recent report from the Congressional Research Service forecasts a concerning number of COVID-19 related costs and impacts facing the research enterprise<sup>3</sup>. This includes the costs of shutting down and restarting laboratory operations and university-based shared research infrastructure, as well as disrupted access to critical supplies and services needed to conduct research. In addition, the impact of disruptions and lost opportunities for students, post-docs, and early career faculty may discourage aspiring scientists and engineers, and may have potentially grim implications for America's scientific and technical workforce. Supplemental funding will allow the defense research enterprise to address these disruptions and rebuild its capacity to serve DoD's critical needs.

CNSR supports the emergency supplemental appropriations request of \$26 billion from the higher education community<sup>4</sup>. Under the request, a portion of the appropriations would address pressing needs in the Defense S&T program. Also, supplemental appropriations would support graduate students who could not complete their degrees due to pandemic disruptions and their inability to perform research. It is more important to our national security than ever that we develop the next generation of scientists and engineers who will conduct the fundamental research to create the military capabilities of tomorrow while solving the current challenges facing the National Security Innovation Base (NSIB) and DoD.

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<sup>1</sup> [https://www.whitehouse.gov/wp-content/uploads/2020/02/ap\\_17\\_research\\_fy21.pdf](https://www.whitehouse.gov/wp-content/uploads/2020/02/ap_17_research_fy21.pdf)

<sup>2</sup> <https://www.nap.edu/catalog/23652/evaluation-of-the-congressionally-directed-medical-research-programs-review-process>

<sup>3</sup> <https://crsreports.congress.gov/product/pdf/R/R46309>

<sup>4</sup> <https://www.aplu.org/members/councils/governmental-affairs/CGA-library/higher-ed-community-phase-iv-research-priorities/file>



### ***Newton Award for Transformative Ideas during the COVID-19 Pandemic***

This recently established award sponsored by the DoD Basic Research Office will support transformative ideas and produce disruptive ways of thinking about fundamental scientific problems that have evaded resolution, which would be of immense potential benefit to DoD and the nation at large. The Newton Award was created at a total funding level of \$500,000 with up to 10 awards anticipated. The award emphasizes the need to conduct research in compliance with social distancing requirements and stay-at-home orders, allowing the production of datasets, provided the data is “generated without the use of any experimentation or instrumentation, as the nation-wide closure of laboratories limits the ability of investigators to follow normal safety procedures set by their institutions.” This new award has the potential to stimulate theoretical scientific research that is novel and pioneering, and additional funding would help develop a cadre of premier researchers across the country with the potential to drive national security research to the leading edge in support of the *National Defense Strategy* objective of maintaining technological dominance in the face of known and emerging adversarial capabilities.

### ***Vannevar Bush Faculty Fellowship (VBFF)***

VBFF is a highly selective competitive fellowship that supports new, out-of-the-box ideas that have the potential for transformative impact. VBFF researchers are involved in cutting-edge research that can solve pandemic-related challenges, such as developing a point-of-care diagnostic for rapid, reliable and adaptable virus testing with triple verification; designing, building, and testing face shields that meet the clinical needs of frontline responders; 3D printing masks; predicting epidemic trends of COVID-19; and developing optimal testing strategies for estimating the spread of the epidemic, and undertaking policy evaluation schemes by posing the “reopening problem” as a stochastic control problem. VBFF fellows not only conduct scientific research with the potential for extraordinary outcomes, but they gain an awareness and familiarity through the program with the highest priority defense and national security challenges, fostering a long-term connection between university researchers and the DoD and increasing the number of exceptional technical experts contributing to DoD’s mission. In FY 2020, DoD received more than 200 VBFF white papers, invited 35 full proposals for review and selected only eight fellows<sup>5</sup>.

### ***Laboratory University Collaboration Initiative (LUCI)***

LUCI awards sponsor research engagements between DoD lab scientists and DoD-funded VBFF researchers in fields of critical interest to the Department. LUCI fellows are researching methods for early-stage pathogen detection, including a ground-breaking study leveraging computer algorithms to quantitatively characterize in vitro cellular phenotype with the aid of computer vision detect phenotypic deviations or anomalies due to the onset of viral infection with the aid of machine learning. The technology will be the first to quantify the time lag between viral infection and significant deviations in cellular behavior with high temporal resolution (minutes). The technique is compatible with hand-held microscopes, and thus readily deployable, and can be coupled with fluorescently-tagged antibody assays for specific pathogen determination, such as COVID-19. Such advances are required not only to address the current COVID-19 pandemic but to anticipate and prepare for the likelihood of similar threats in the future. The DoD has funding for just 25 LUCI fellows in FY 2020.

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<sup>5</sup> <https://www.defense.gov/Newsroom/Releases/Release/Article/2184513/dod-awards-24-million-for-the-2020-class-of-the-vannevar-bush-faculty-fellowship/source/GovDelivery/>



### ***Minerva Research Initiative***

DoD's premier social science research program, Minerva, is aimed at improving our basic understanding of many security-related issues. Minerva-funded researchers are examining how foreign nation-state competitors or terrorists may seek to capitalize on the pandemic; tracking disinformation and false narratives spreading about COVID-19; developing a framework to help optimize the design of serological surveys to support decision-making about interventions; leveraging data science to track government restrictions; and understanding the national security implications of the COVID-19 crisis. Despite the relevance and direct applicability of Minerva-funded research to understanding multiple facets of the pandemic as well as potential work in support of the Department's modernization priorities in artificial intelligence, cybersecurity, and supply chain resilience, the DoD has proposed elimination of this unique program in FY 2021. The Minerva Research Initiative has a demonstrated track record of impact and offers opportunities to conduct research that will advance the field of social and behavioral science tied directly to national security needs while adhering to the limitations on laboratory access and social distancing restrictions imposed by the current crisis. Minerva allows for a deeper scientific understanding that provides a more informed basis to shape doctrine, analysis, and other strategic and operational decisions made by war planners and warfighters.

### ***Congressionally Directed Medical Research Programs (CDMRPs)***

CDMRPs advance medical and scientific research by filling research gaps through funding high impact, high risk and high gain projects that other agencies may not venture to fund. The National Academies concluded that CDMRPs appropriately coordinate research priorities with other funding agencies and have an effective review and selection process for awarding funds not dissimilar to the process used by the National Institutes of Health (NIH)<sup>6</sup>. With NIH only being able to fund approximately 20 percent of proposals it receives, CDMRPs play an important role in ensuring that military-relevant innovative biomedical research is conducted. CDMRPs have already dedicated a small amount of funding to support COVID-19 research related to emerging viral diseases and respiratory health. Given that in FY 2018 CDMRPs funded just 10 percent of proposals it received, there are clearly additional untapped opportunities to fund groundbreaking medical research including opportunities for COVID-19 scientific research in the short and long term<sup>7</sup>.

### ***Multidisciplinary University Research Initiative (MURI)***

The MURI program sponsors transformational university research that has regularly produced revolutionary biomedical technologies. Nanotechnology, biological detection capabilities, biological countermeasures, innovations in ultrasound technology and advances in disease diagnosis and treatment through nanoparticles all stem from MURI-sponsored research. Additionally, MURI outcomes have helped with the creation of military drones, stealth detection sensors, quantum computing, laser technology and numerous innovations in semiconductors. As noted in a report from the Institute for Defense Analyses, MURIs have become an essential skunkworks for creating innovation<sup>8</sup>. The existing mechanisms of the MURI program could

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<sup>6</sup> <https://www.nap.edu/catalog/23652/evaluation-of-the-congressionally-directed-medical-research-programs-review-process>

<sup>7</sup> <https://cdmrp.army.mil/pubs/annreports/2019annrep/2019annreport.pdf>

<sup>8</sup> <https://www.ida.org/idamedia/Corporate/Files/Publications/IDA.../STD/D-5361.pdf>



rapidly fund transformative COVID-19 related research by leveraging the expertise of the teams of multidisciplinary researchers from across the country.

***Defense-Wide Manufacturing Science & Technology (DMS&T)***

The eight DoD Manufacturing Innovation Institutes (MII), through public-private partnerships, advance discoveries from the nation's universities and research laboratories to the defense industrial base while enhancing the workforce. DoD leadership has noted the impact of COVID-19 on the supply chain and workforce for critical national security sectors, such as aviation, shipbuilding, and space. Manufacturing USA is essential to creating technology solutions and manufacturing innovations in those sectors and preparing a workforce capable of pivoting to supply the nation's most urgent needs for medical supplies and long-term needs for domestic products.

For the long term, the DoD MIIs are uniquely positioned to support economic recovery in a post-COVID-19 environment by bolstering domestic capabilities in advanced and digital manufacturing, workforce development and readiness, and the research, development, testing, and evaluation (RDT&E) of new manufacturing processes and workflows that support the anticipated changes to the way we work, social distancing requirements, and the connectivity of the supply chain. Based on their distinct public-private partnership model and ability to leverage industry cost-share, the MIIs are poised to align their long-term efforts with industrial base skills shortages and critical technology needs identified by the Department of Defense, defense industrial base (DIB), commercial suppliers, academic and training institutions, and partner agencies in the national security enterprise. Presidential Executive Order 13806 on Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States reinforces that "strategic support for a vibrant domestic manufacturing sector, a vibrant defense industrial base, and resilient supply chains" is a "significant national priority," and urges strategic and swift action in creating education and workforce development programs and policies that support job growth in manufacturing and the defense industrial base<sup>9</sup>. The executive order further states that U.S. readiness, and the ability "to surge in response to an emergency," is a direct reflection of the capacity, capabilities, and resiliency of the manufacturing and defense industrial base and supply chains.

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<sup>9</sup> <https://www.whitehouse.gov/presidential-actions/presidential-executive-order-assessing-strengthening-manufacturing-defense-industrial-base-supply-chain-resiliency-united-states/>