



August 24, 2021

Eric S. Lander
Director
White House Office of Science and Technology Policy (OSTP)
Executive Office of the President
725 17th Street Room 5228
Washington, DC 20502

Francis S. Collins
Director
National Institutes of Health (NIH)
9000 Rockville Pike
Bethesda, MD 20892

Re: The Advanced Research Project Agency - Health

Dear Drs. Lander and Collins:

The Biodiversity Collections Network (BCoN) is a national initiative led by the American Institute of Biological Sciences (AIBS), Natural Science Collections Alliance (NSC Alliance), and Society for the Preservation of Natural History Collections (SPNHC). We appreciate the opportunity to provide comments on the Advanced Research Project Agency - Health (ARPA-H) as the OSTP and NIH work to develop a scientific framework to outline the new agency's potential research priorities and scientific portfolio.

Through the membership of its founding organizations, BCoN represents the diversity of biological science societies, natural history museums and herbaria, living collections, and other research centers and organizations. We represent the scientists, administrators, curators and collection managers, and other professionals who work in or use scientific collections and their associated data in research and education. Our member institutions and their expert staff build, maintain, study, and make accessible the vast biological collections that provide critical specimens and data for documenting, monitoring, and preserving biodiversity now and into the future.

An important contribution to human health lies in preserving and documenting biological diversity. The development of break-through technologies and broadly applicable platforms,

capabilities, resources, and solutions with respect to biodiversity will yield substantial benefits to human health if appropriate investments are made.

The loss of biological diversity and the concomitant negative implications for human health and well-being are of significant concern. As the human population grows and people increasingly come into contact with new environments and species migrating into new habitats, the risk of new diseases increases. Human health is inextricably linked to the health of other species in our shared environment. One Health (<https://www.cdc.gov/onehealth/index.html>), an approach that recognizes that the health of people is closely connected to the health of animals and our shared environment, is increasingly being recognized as an effective approach to address health issues at the human-animal-environment interface, including zoonotic diseases, antimicrobial resistance, vector-borne diseases, and environmental contamination.

Biodiversity collections are critical to improving our understanding of the linkage between biodiversity and human health. An example of where information on biodiversity would greatly facilitate research on human health issues is zoonotic disease. There is substantial evidence that SARS-CoV-2 and other viruses have crossed over from animal vectors with many more such events yet to be discovered. A key opportunity for getting ahead of future pandemics lies in understanding the relationships of viruses to the broader, global vertebrate host community. Biodiversity collections provide a unique insight into historical evidence of pathogen initiation and spread within biological systems. With modern research tools, more accessible and integrated databases associated with well-curated collections, we can document how pathogens evolve across biodiversity through time and space, and learn what kinds of solutions biodiversity has come up with to combat such viruses. ARPA-H must work with the biodiversity community to strengthen our capacity to archive and study viruses in the wild before they cross over to humans.

The rest of biodiversity (going beyond model organisms) has evolved solutions in non-humans to neurological issues or diseases that have not been adequately surveyed or studied in the wild. Research and the necessary infrastructure to support biodiversity collections and their associated data could be expanded and improved by funding through ARPA-H. Generation of biodiversity genomic data offers the opportunity to study genotype-phenotype interactions in a comparative framework in ways never possible before. These data and associated voucher and living specimens need to be archived and maintained in a well-supported collections network that can be used to understand how the wide range of organisms with which we share the planet adapt to a changing environment. Such a network is described in the 2019 Biodiversity Collections Network (BCoN) Extended Specimen Network report (<https://academic.oup.com/bioscience/article/70/1/23/5637849>) and National Academies of Sciences, Engineering and Medicine report on Biological Collections (<https://www.nationalacademies.org/our-work/biological-collections-their-past-present-and-future-contributions-and-options-for-sustaining-them>). To improve the reproducibility of science and foster the principles of FAIR (findable, accessible, interoperable, and reusable) data integration, attribution, as well as the subsequent linking of related data, we recommend that OSTP, NIH, and ARPA-H consider working collaboratively with a wide variety of stakeholder

communities to develop and deploy standards and best practices for metadata associated with sequence information.

Finally, we want to stress the importance of peer review as a central tenet of scientific research. The OSTP and NIH must ensure that the research supported through ARPA-H undergoes independent peer review in order to ensure that its work is of the highest quality and to sustain public trust in its scientific work. It is important to establish mechanisms to prevent the politicization of research funding by ensuring that grant review processes are independent and based on scientific merit.

Thank you for the opportunity to provide input. Please do not hesitate to contact Jyotsna Pandey at jpandey@aibs.org if you have any questions or require more information.

Sincerely,



Scott Glisson
CEO
American Institute of
Biological Sciences



John Bates, Ph.D.
President
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Paul Mayer
President
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Preservation of Natural
History Collections