

**Testimony of the
American Museum of Natural History
presented to the
House Appropriations Subcommittee on Defense/Darpa**

April 15, 2010

Overview

Recognizing its potential to aid the Department of Defense in its goal to support research to prepare for and respond to the full range of threats, the American Museum of Natural History seeks in \$3.5 million in FY11 to contribute its unique resources to the advancement of research in areas of science closely aligned with DOD's research priorities and to extend the research effort with an associated STEM (science, technology, engineering, mathematics) education component, to help build a workforce adequate to meet the nation's security needs.

About the American Museum of Natural History

The American Museum of Natural History (AMNH) is one of the nation's preeminent institutions for scientific research and public education. Since its founding in 1869, the Museum has pursued its mission to "discover, interpret, and disseminate—through scientific research and education—knowledge about human cultures, the natural world, and the universe." The AMNH research staff numbers over 200, with tenure track faculty carrying out cutting-edge research in fields ranging from molecular biology and genome science to earth and space science, anthropology, and astrophysics. Museum scientists publish nearly 450 scientific articles each year and enjoy a success rate in competitive (peer reviewed) scientific grants that is approximately double the national average. The work of its scientists forms the basis for all the Museum's activities that seek to explain complex issues and help people to understand the events and processes that created and continue to shape the Earth, life and civilization on this planet, and the universe beyond.

Advancing Research Aligned With National Security Goals

The Department of Defense (DOD) ensures the nation's security and its capacity to understand and respond to threats in this new era of complex defense challenges. DOD is committed to the research, tools, and technology that will achieve these goals, and to ensuring that the nation's 21st century science, technology, engineering, and mathematics (STEM) workforce is prepared to meet U.S. preparedness and security needs.

The American Museum of Natural History (AMNH), in turn, is a preeminent research and public education institution, home to leading research programs in biocomputation, comparative genomics, and the life, physical, environmental, and social

sciences—programs that are positioned to advance the Nation’s capacity to prepare for and respond to security threats. AMNH is also a recognized leader in STEM education—in both out-of-school settings and with formal education partners—with local, regional, and national reach, and, with the recently launched Richard Gilder Graduate School, became the first American museum authorized to grant the Ph.D. degree.

In FY05, AMNH and DOD launched a multi-faceted research partnership via DARPA that leverages the Museum’s unique expertise and capacity. Since that time, AMNH has been carrying out research that directly relates to DARPA goals by increasing our capacity to predict where disease outbreaks might occur and to effectively monitor disease-causing agents and their global spread. This research project has been centered on the development of a computational system to rapidly compare genetic sequences of pathogens, and, utilizing the computational system, generating a global map showing the spread of disease-causing viruses over time and place.

Throughout this partnership, DARPA program managers have supported AMNH’s work, have made the research known to other DOD-supported scientists, and have invited AMNH scientists to participate in DARPA conferences. With DARPA support to date, the project has: advanced understanding of emerging infectious disease through the analysis of the origins and genomic evolution of SARS coronavirus; studied re-assortment and drug resistance among influenza strains; and developed methods for mapping the spread of pathogens over time and geography. We are now able to track global evolution of pathogenic viruses such as avian influenza, and can identify, for any geographic region, the major and minor sources of pathogenic viruses. The research has investigated progressively more complex systems, moving from viruses to the study of bacteria, including ecological data into the realm of biogeographical and host-pathogen research.

In FY11, the Museum seeks DARPA support to advance its research in this and other high-priority areas for the Agency, and to enhance the research program with an associated STEM education component, providing diverse urban students with science content, research experiences, and mentoring in the project’s STEM areas. In so doing, AMNH hopes to help meet the need for a well-educated population of college-level graduates in STEM fields. With this support, which AMNH will leverage with funds from nonfederal and federal sources, AMNH will be able to continue to draw on its unique research, training, and education capabilities to advance goals critical to DOD and our national preparedness and security.