

National Institute of Allergy and Infectious Diseases (NIAID) Bioinformatics Resources Centers for Biodefense and Emerging/Re-Emerging Infectious Diseases Contract (BRC)

The Bioinformatics Resource Centers (BRC) for biodefense and emerging/re-emerging infectious diseases contract is a 5-year contract to determine the system requirements, develop a system design, and implement a distributed scientific data management system for NIH, NIAID, Division of Microbiology and Infectious Diseases (DMID) data. The BioHealthBase (BHB) system was developed by the Northrop Grumman BRC Team to provide scientists with an integrated source of complex, high-quality genomic, proteomic, and supporting scientific data, as well as a bioinformatics framework in which to contribute, access, process, and exchange data during scientific collaboration. The BHB system supports critical public health and biodefense research, while enhancing the scientific discovery process through data integration and novel analysis approaches.

The Northrop Grumman BRC Team participates in meetings with representatives from the scientific user community to assist in gathering requirements for the BHB system. The BRC system design was developed using the SEI CMMI Level 3 and IEEE/EIA 12207 processes and the iterative, incremental development (IID) methodology.

The BHB system is focused on six microorganisms with critical public health and biodefense implications, including the bacteria *Mycobacterium tuberculosis* and *Francisella tularensis*, the influenza virus, the parasite *giardia lamblia*, the fungi *microsporidia*, and the plant *ricinus communis*. The four critical scientific goals of the project are to:

- Support researchers who develop rapid, inexpensive, and broad-based diagnostic approaches using genomics and proteomics
- Assist researchers who develop drugs and vaccines
- Analyze responses at the genome level of infection with bioterrorism agents
- Collect and present data and information to investigate mechanisms by which the intracellular inhalation bacteria (e.g., TB) survive.

In addition, the Northrop Grumman BRC Team includes our partner, the University of Texas Southwestern Medical Center (UTSW), and two subcontractors, AMAR International and Vecna Technologies. Our team has recently been given the additional responsibility of expanding the knowledge base developed for the influenza virus by integrating the genomic and proteomic Influenza Sequence Database (ISD) database currently maintained at the Los Alamos National Laboratory. With the recent emergence of avian flu, with associated fears that it could mutate to cause a human disease and create a world-wide influenza pandemic, BHB will provide a central repository for integrating avian flu data thus becoming one of the premier data repositories for the influenza virus.