A Strategic Landscape for
NIEHS Informatics and Information Technology

David C. Fargo, Ph.D.
NIEHS Acting Director of Environmental Science Cyberinfrastructure

To advance strategic goals in Environmental Health Science and biomedical research, the NIEHS requires an agile, robust, and modern cyberinfrastructure. Increasingly, scientific discovery and technological innovation are inseparable, demanding coordination and integration of diverse skills and expertise. If cyberinfrastructure is to be on the frontlines of innovation and operational excellence, it must extend beyond a traditional Information Technology (IT) model. NIEHS has created a new Office of Environmental Science Cyberinfrastructure (OESC) to embrace a new model that supports our rapidly advancing scientific and technological landscape. The OESC leads and organizes domain experts with diverse skills including enterprise IT, scientific IT, data and knowledge management sciences, communications management, bio- and biomedical informatics, computer science, and IT project and program management. With broad collaboration across NIEHS, the OESC has laid the groundwork for a cyberinfrastructure that fosters a holistic vision for all Informatics and Information Technology (I&IT).

The NIEHS I&IT strategic vision prioritizes the implementation of new cyberinfrastructure enhancing technologies. These include: new models for cloud and high-performance computing that support sharing and analysis of massive datasets; an internet of things applied within the laboratories; machine- and deep-learning methods for in silico discovery and natural language processing; data categorization, predictive analytics, and other forms of model building; increased automation including via robotics; expanded mobile technologies, including sensors and wearables; enhanced interoperability of experimental and clinical data through LIMS, electronic medical records, and expansion of controlled vocabularies; and enhanced security, privacy, and data sharing systems that support essential protections and maintain compliance. Most importantly, planning and prioritization of NIEHS I&IT is directly aligned to NIEHS strategic goals, enabling the transformation of data to knowledge to action.