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VBI awarded \$27 million from NIH to support infectious disease research

BLACKSBURG, Va., October 5, 2009 – The National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH), has awarded a 5-year, \$27,670,448 contract to the CyberInfrastructure Group (CIG) of the Virginia Bioinformatics Institute (VBI) at Virginia Tech to support the biomedical research community’s work on infectious diseases. The funding will be used to integrate vital information on pathogens, provide key resources and tools to scientists, and help researchers to analyze genomic, proteomic and other data arising from infectious disease research.

Bruno Sobral, Professor and Director of CIG and Principal Investigator of the project, commented: “The new award from the NIH will allow us to continue our work to support infectious disease research and the development of vaccine, diagnostic or therapeutic targets for countermeasures. Over the past five years, VBI’s CIG has led its own Bioinformatics Resource Center (BRC), PATRIC, and worked with other leading BRCs across the country to put in place informatics-based capabilities deployed as large-scale information systems.” He added: “As we move ahead, we will be working hand-in-hand with a wide range of partners, including medical schools and public health institutions interested in translating the very latest scientific discoveries and innovation into practical health benefits for society at large.”

The overall NIAID program will comprise four new Bioinformatics Resource Centers or BRCs and a new gateway portal for the entire project. Each BRC will focus on one of the following pathogen types: bacterial species; viral families; protozoan species; and invertebrate vectors of human pathogens. CIG will develop, implement, and manage the BRC for selected NIAID category A-C priority bacterial species* and it will also develop the new gateway portal for the entire BRC program, which will be called the Pathogen Portal. Sobral remarked, “PATRIC 2.0 will position CIG to handle the designated bacterial data in the context of infectious diseases – the change in scale of data acquisition and analysis is astonishing and we are poised to learn a lot.”

The new contract covers the development of two web-based resources for biomedical research. The first

part of the project supports the development of the Pathogen Portal for the entire BRC program. The Pathogen Portal will serve as an informatics coordinating center and gateway for the four newly established BRCs. This publicly accessible web portal will provide general information about the BRC program, serve as a gateway to the individual BRC web sites, and provide a central data repository and analysis resource for all selected NIAID category A-C priority pathogens supported by the individual BRCs. Said Sobral, “In addition to its centralized coordination role, the Pathogen Portal project will work closely with other external partners, for example NIAID’s Clinical Proteomics Centers for Infectious Diseases and Biodefense, among others, which is making candidate protein biomarkers linked to disease available to the wider scientific community.”

The second part of the project supports the development of the PATRIC 2.0 BRC. In June 2004, NIAID awarded CIG a five-year, \$10.3 million contract to establish a multi-organism relational database for infectious disease research that focused on biodefense and emerging infectious diseases. The PathoSystems Resource Integration Center (PATRIC; see <http://patric.vbi.vt.edu/>) was created to serve as a comprehensive web-based resource for an important subset of pathogens – from the set of selected NIAID category A-C priority pathogens. The work supported by the PATRIC 2.0 award, which will span all bacterial species in the selected NIAID category A-C priority pathogens list, will consolidate earlier PATRIC work, as well as the work of other BRC systems that handled bacterial data, into PATRIC 2.0. CIG will build on its successes and experiences gained in executing PATRIC by providing a new, expanded web-based system that serves as a robust point of entry for access to a host of information, tools and resources for selected NIAID category A-C priority bacterial pathogen species.

In PATRIC 2.0, CIG will work with a wide range of collaborators. Rick Stevens, Professor in the Department of Computer Science at the University of Chicago and Associate Laboratory Director for Computing, Environment, and Life Sciences at Argonne National Laboratory, remarked: “We will be working closely with the bacterial BRC to make our RAST annotation services available as a key resource to the scientific community. RAST is a fully automated genomics tool that can greatly help in accelerating the identification of genes and assigning functions to those genes.”

Text mining capabilities will also be a key offering for the new bioinformatics center. Said Sophia Ananiadou, Professor in Computer Science, University of Manchester and Director of the UK National Centre for Text Mining (NaCTeM): “We will collaborate with the new BRC to provide tools and resources that will facilitate the extraction of high-quality information from a wide range of text-based information sources. This effort dovetails nicely with one of the key priorities of the BRC project, namely

to facilitate the availability of biological information on bacterial pathogens to the wider scientific community.”

Said Sobral, “As part of our on-going commitment to the biomedical research community, we will be looking to integrate existing and future collaborations in immunology, biosystems modeling, and large-scale population-based modeling into our offerings. Our goal will be to fully involve the infectious disease community as we work to meet their research needs. ”

* A full list of the selected NIAID category A-C priority pathogens, which includes the selected NIAID category A-C priority bacterial pathogens, is available at:

<http://www3.niaid.nih.gov/topics/BiodefenseRelated/Biodefense/research/CatA.htm>

About CIG

The Cyberinfrastructure Group (CIG) at VBI develops methods, infrastructure, and resources to help enable scientific discoveries in infectious disease research and other research fields. The group applies the principles of cyberinfrastructure to integrate data, computational infrastructure, and people. CIG has developed many public resources for curated, diverse molecular and literature data from various infectious disease systems, and implemented the processes, systems, and databases required to support them. It also conducts research by applying its methods and data to make new discoveries of its own. CIG has developed PATRIC, the PathoSystems Resource Integration Center (<http://patric.vbi.vt.edu/>), which serves as a comprehensive web-based resource for bacterial pathogens, biodefense research, and the study of emerging infectious diseases.

About VBI

The [Virginia Bioinformatics Institute](#) (VBI) at Virginia Tech has a research platform centered on understanding the "disease triangle" of host-pathogen-environment interactions in plants, humans and other animals. By successfully channeling innovation into transdisciplinary approaches that combine information technology and biology, researchers at VBI are addressing some of today's key challenges in the biomedical, environmental and plant sciences.