

Poster B-4

Cyberinfrastructure for Emerging and Re-Emerging Infectious Diseases



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Short Abstract: We have established functional cyberinfrastructure (CI) systems in the area of bioinformatics. The resources and outreach activities developed include tools for the

curation of the genomes and pathosystems, database and knowledgebase systems for organizing the high-throughput data from pathosystems biology and software systems for analysis and visualization of the data.

Long Abstract:

Cyberinfrastructure for Emerging and Re-Emerging Infectious Diseases

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Abstract

The integration of knowledge from various fields such as computer science, mathematics, chemistry and biology has resulted in a vast opportunity based upon the concepts of cyberinfrastructure (CI) for creating new research environments [1]. In part, this has been accomplished by providing effective and efficient platforms that empower scientists and engineers to conduct transdisciplinary team research. The CI group at the Virginia Bioinformatics Institute has established functional CI systems in the areas of bioinformatics and computational biology, with a focus on infectious diseases. Specifically, the CI projects include the Pathogen Portal project [2], the PathoSystems Resource Integration Center [3] and the Proteomics Data Center [4]. The bioinformatics resources developed by the CI group include tools for the curation of the genomes (Fig. 1) and pathosystems (Fig. 2) [5] of a wide range of infectious organisms, database systems for organizing the high-throughput data generated from the study of pathosystems biology and software systems for analysis and visualization of the data (Fig. 3) [6].

The outreach activities include the training of current and future generations of scientists and collaborative research activities with a primary goal of generating knowledge through analysis, integration and ensuring the interoperability of diverse data sets. The progress made in the development of resources such as curation data, databases and software systems will be presented together with a description of some of the forward-looking research, cyberinfrastructure development and outreach initiatives of the CI group.

[1] <http://www.nsf.gov/od/oci/reports/toc.jsp>)

[2] <http://pathport.vbi.vt.edu/>

[3] <https://patric.vbi.vt.edu/>

[4] <http://proteinbank.vbi.vt.edu/ProteinBank/>

[5] He, Y, R Vines, AR Wattam, G Abramochkin, A Dickerman, J Eckart, B Sobral. 2005. PIML: the Pathogen Information Markup Language. *Bioinformatics* 21:116-121.

[6] Eckart, J.D. & Sobral, B.W. A life scientist's gateway to distributed data management and computing: the PathPort/ToolBus framework. *Omics* 7, 79-88 (2003).

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