



## OSC, Nationwide Children's use supercomputers to speed diagnoses

By EurekAlert

Wednesday, January 19, 2011

Worried about her high fever and severe abdominal pain, a young couple rushed their baby daughter to the emergency department of Nationwide Children's Hospital. Physicians there found a lump in her belly, and, after examining X-rays and blood work, confirmed the parents' worst fear: their 18-month-old little girl had neuroblastoma, a rare pediatric cancer that involves the adrenal glands.

Several years ago, every child diagnosed with neuroblastoma would have received a standardized treatment regimen of chemotherapy, bone marrow transplant, surgery and radiation.

With the advancements in "omics" (genomics, proteomics, etc.) technologies and the aim to support personalized medicine, physicians would have the capability to modify this 'one-size-fits-all' approach through advanced computation. Physicians may now look at 10 to 12 different genes with a neuroblastoma tumor and conduct a complete biological and molecular analysis that leads to a diagnosis - and treatment recommendation - tailored to the child's genetics.

Medical data is often so complex that using visualization to track the progression of the disease and potential cures is still computationally intensive. Visualization technologies can help simplify and magnify the drug identification process and greatly assist medical researchers in developing faster, more personalized medical solutions.

Working from an agreement inked last year to collaborate on informatics services, the Ohio Supercomputer Center (OSC) and The Research Institute at Nationwide Children's Hospital have begun offering a production environment, services and support to speed discovery techniques of childhood diseases, from pediatric cancers to muscular dystrophy.

"Our intent is to assist institutions and medical professionals by developing innovative and cost-effective solutions to enhance their research and translational initiatives," said Dave Billiter, director of the Research Informatics Core at Nationwide Children's Biopathology Center. "We believe this partnership with OSC will aid in transforming pediatric patient treatment by adding a translational component to speed the 'bench to bedside' process essential to biomedical findings."



Under the agreement, OSC provides The Research Institute with production-level storage, computation and software for running simulations on the Center's sophisticated systems. In 2009, the Center deployed a \$4 million expansion to its flagship IBM Glenn system dedicated to Ohio's bioscience communities, such as those found at Nationwide Children's Hospital. OSC also recently added storage upgrades as part of its plan to develop a statewide computational infrastructure for genomics data analysis.

"We are working with research hospitals and university medical centers to push forward a plan to synthesize computation and storage that allows medical researchers to focus on the science and expedite results, while realizing cost savings," said Ashok Krishnamurthy, senior director of research at the Ohio Supercomputer Center. "OSC's comprehensive collection of resources

enables researchers to store, organize and visualize this data-intensive information."

Medical specialists at the hospital and/or collaborating institution can download the resulting data for local analysis by accessing a new, high-speed network The Research Institute had installed last year to connect directly to OSC. By harnessing The Research Institute's engineering technology and advanced computational and multiphysics analysis capabilities, specialists are able to explore, develop and apply alternative solutions without the delays and expense associated with traditional testing and evaluation.

Another activity between OSC and The Research Institute is focused on implementing a regional digital repository for the Children's Oncology Group (COG). This effort has already been partially funded by COG to place equipment at OSC with the hopes of receiving NIH funding to build its capabilities to house more data. In addition to COG, the Gynecological Oncology Group (GOG) and The Cancer Genome Atlas (TCGA) are also using these services.

These partnerships build off of national collaborations begun in 2005 between The Research Institute and OSC, including the Virtual Microscopy to Microarray, or VM2M program, which allows multiple pathologists to quickly, simultaneously and securely review, via the Internet, digitally formatted, diagnostic-quality microscopy scans of diseased tissue with the corresponding molecular expression data. OSC provided a secure repository and hosted the development platform during the project's first phase, which allowed the group to prototype the research project's concept.

### Upcoming presentation offered to medical community

In order to thoroughly orient researchers and medical professionals to the new computing environment, OSC is offering a presentation titled "Ohio Supercomputer Center: Software Support for Remote Instrumentation Services." The presentation, by David Hudak, program director of HPC Engineering at OSC, will be given from noon to 1 p.m., Jan. 25, in Room WA1020 at The Research Institute at Nationwide Children's Hospital.

Following the presentation, Kevin Wohlever, director of supercomputer operations at OSC, will be available for walk-in consultations from 2-3:30 p.m., in room W421, in addition to his biweekly office hours at The Research Institute to consult with pediatric medical researchers.

By having OSC offer these services to Nationwide Children's and oncology departments at other research hospitals, "The benefits realized could be significant," Billiter said.

SOURCE

Register or log in to comment on this article!

0 COMMENTS