

The Division of Biomedical Informatics (BMI) supports researchers at Cincinnati Children's Research Foundation and the University of Cincinnati College of Medicine with resources such as a computational cluster, electronic lab notebook software, collaboration tools, data storage systems, web/database servers and more. We also maintain an inventory of research software applications being used on the Cincinnati Children's and UC College of Medicine campuses. Our team of IT professionals provides support for many of these applications, as well as for the Mac, Linux and Solaris operating systems. Our research staff provides assistance with sequence analysis, microarray analysis and protein informatics, both informally and through grant consultation.

Computational cluster

As an alternative to performing computationally intensive tasks on desktop machines or even dedicated servers, BMI maintains a Linux-based computational cluster that currently comprises more than 200 large-memory processing cores. Available both inside and outside the Cincinnati Children's network, the cluster can be used to perform tasks such as:

- Protein-protein and protein-ligand docking
- Protein structure prediction
- Microarray analysis using GeneSpring®, RMAExpress, BioConductor and other tools
- Genome-wide association studies using Plink or the Wake Forest analysis suite
- Memory-/processor-intense statistical analysis with R

Learn more: <http://bmi.cchmc.org/resources/clusters>

Electronic lab notebook

To avoid potential pitfalls associated with paper notebooks such as incomplete or missing records, difficulty sharing data, and a lack of access and version control, BMI encourages investigators to consider using CERF™ commercial electronic lab notebook software. Available at no charge on a first-come, first-served basis to Cincinnati Children's investigators, CERF offers benefits such as:

- Permissions management
- Document version control
- Audit trails
- Regular data backups
- Powerful search engine

Learn more: <http://eln.cchmc.org>

Data storage/management

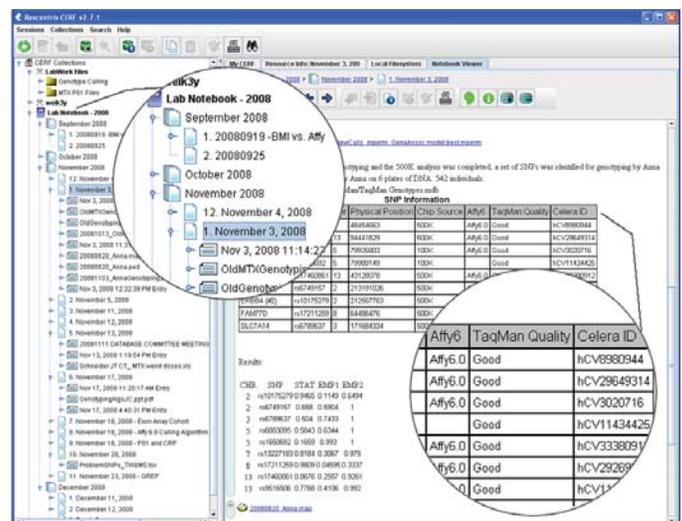
In coordination with the Department of Information Services, BMI offers investigators centralized data storage space with backup at low or no cost. By using the Research Data Storage system, or RDS, every investigator is allotted 10GB of free personal storage space and access to the division's 100GB shared directory. In addition, investigators can request dedicated space for storing project data, and via a web interface, can manage access privileges and permissions for institutional collaborators.

Project drives and increases to personal and divisional share quotas are available at the following rates:

- \$1/GB/year for storage with backup
- 50¢/GB/year for storage without backup and for one-time archive snapshots

Learn more:

<http://bmi.cchmc.org/resources/storage-servers>



The screenshot shows the CERF Lab Notebook interface. On the left is a file tree with folders for 'Lab Notebook - 2008' and sub-folders for 'September 2008', 'October 2008', and 'November 2008'. The main window displays a table of SNP information. A circular callout highlights a specific entry in the table.

SNP Information	Physical Position	Chrom	Source	Allel	TaqMan Quality	Celera ID
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425
rs1017279	111,142,270	10	NCBI	A/T	Good	hCV11434425

An example lab notebook managed in CERF.

Collaboration tools

Several tools are available to facilitate collaboration among investigators including:

- **SharePoint®/Plone** – for developing public and private web portals
- **Xythos** – for securely sharing large files
- **WebCalendar / Research Equipment Booking System** – for maintaining calendars of staff and shared resources
- **Mailing Lists** – for managing email communication among groups

Learn more:

<http://bmi.cchmc.org/resources/collaboration>

Hosting and design

Rather than take the high-cost route of purchasing your own server or the low-cost, low-tech route of repurposing a desktop machine, you can use BMI's secure server infrastructure for hosting resources such as:

- **Web sites** – SharePoint, Plone and stand-alone
- **Web applications** – commercial and open-source
- **Databases** – Oracle®, Microsoft SQL Server, MySQL, FileMaker® and Postgres

If needed, our staff can help with web and database design. Hosting and development fees are kept as low as possible. For example, the cost of one Apache virtual web server with a 10GB quota is just \$10 per year. One MySQL database with a 10GB quota is free!

Learn more: <http://bmi.cchmc.org/services/hosting>

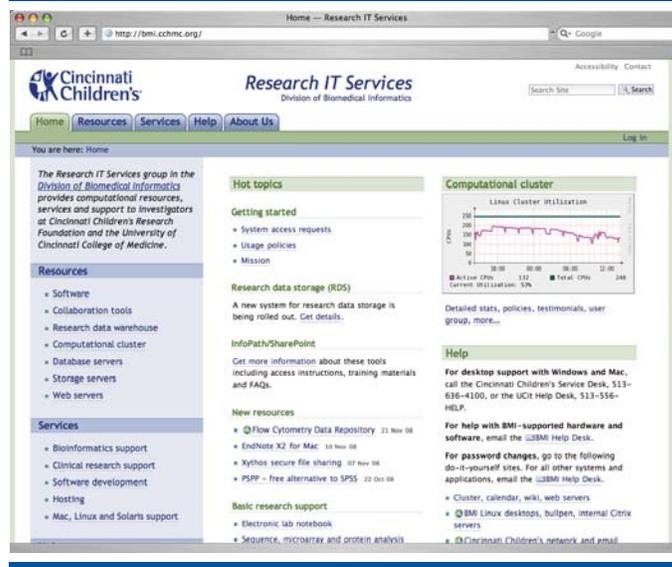
Software

To help coordinate software purchases and enable researchers to obtain volume/educational discounts, BMI maintains an inventory of applications being used by Cincinnati Children's and UC College of Medicine investigators. Popular categories and titles include:

- **Desktop office productivity** – Adobe® Acrobat®, Photoshop® Elements, EndNote®
- **Statistical analysis** – SAS®, JMP®, SPSS®, R, Matlab
- **Sequence and expression analysis** – GeneSpring®, Plink, GCG, Wake Forest GWA suite
- **Protein modeling** – AutoDock, Discovery Studio®, Mascot

Learn more: <http://bmi.cchmc.org/resources/software>

More on the web... <http://bmi.cchmc.org>



Bioinformatics support

Informal and formal (grant-funded) support is available in the following areas:

- **Sequence analysis** – sequence retrieval/editing, similarity searching, annotations, alignments
- **Microarray analysis** – data preparation, normalization, visualization and analysis
- **Protein informatics** – protein structure prediction, protein docking, homology modeling

Learn more:

<http://bmi.cchmc.org/services/basic-research-support>

Mac, Linux and Solaris Support

While Cincinnati Children's Information Services and UCIT provide basic desktop support, BMI provides additional support for Macintosh, Linux and Solaris users. If you have a question or issue related to one of these operating systems, our staff can help.

Learn more:

<http://bmi.cchmc.org/services/linux-solaris-support>

BMI Help Desk

Have a question that's not answered on our web site, or need help accessing or using any of our resources? Simply send an email to help@bmi.cchmc.org. This will open a ticket with our online help desk, and a member of the BMI staff will respond as quickly as possible.