

Core Day highlights resources available to NIEHS researchers

By Aleksandra Adomas

Each year, Core Day brings together support organizations within NIEHS to highlight their resources and provide information to potential Institute users. This year's event, held April 7 in Rodbell Auditorium, was organized by Bob Petrovich, Ph.D., head of the Protein Expression Core. During the course of the event, more than 125 researchers talked to presenters of 34 posters from 18 different support groups. A slide show rolling in the background provided attendees with additional details on each group.

The core facilities are a unique resource available to NIEHS researchers. They handle routine tasks involving a high number of samples, such as genotyping or DNA sequencing; provide support with experiments requiring specialized technical skills, such as performing microarray hybridization or creating a specialized breed of mouse; offer expertise in less common specialties, such as data analysis, pathology, or clinical research; and provide access to expensive and state-of-the-art equipment, including flow cytometry, confocal microscopy, and mass spectrometry.

An information scavenger hunt encouraged Core Day participants to talk to poster presenters and gather their signatures.

(Aleksandra Adomas, Ph.D, is a former research fellow in the NIEHS Laboratory of Molecular Carcinogenesis.)



Core facilities make tremendous contributions to the work done by intramural researchers, by performing experiments and also offering expert advice on experimental design and data analysis. (Photo courtesy of Steve McCaw)



Core Day was an opportunity for representatives from different groups to get better acquainted with what the support facilities have to offer. Hong Xu, right, of the Molecular Genomics Core, engages with contract bioinformatician Xiaojiang Xu. According to Hong Xu, the Molecular Genomics Core ran 70,000 genotypes last year. (Photo courtesy of Steve McCaw)



Pamela Owigho, right, shows NIEHS Deputy Director Rick Woychik, Ph.D., examples of tissue staining the histology group can provide. (Photo courtesy of Steve McCaw)



Kathy Laber, D.V.M., center, of the Comparative Medicine Branch, explains operations in the NIEHS animal care and use program. (Photo courtesy of Steve McCaw)



The Fluorescence Microscopy and Imaging Center, led by Jeff Tucker, left, is one of the most-used cores, with over 200 active users from 49 different laboratories at the Institute. (Photo courtesy of Steve McCaw)



Lalith Perera, Ph.D., right, head of the Computational Chemistry Molecular Modeling Support Group, explained that while protein crystal structures are static, quantum dynamics can provide insights into what happens when an enzyme undergoes reorganization. (Photo courtesy of Steve McCaw)

NIEHS Core Facilities

Integrative Bioinformatics supports the management and analyses of large genomic datasets, such as those derived from Next Generation (NextGen) sequencing platforms, including those generated by the Epigenomics Core.

The **Epigenomics Core** provides NextGen sequencing capacity with Illumina MiSeq and manages a Sanger sequencing contract with Genewiz Inc.

The **Molecular Genomics Core** includes:

- The **Microarray Group**, which offers multiple microarray platforms for DNA methylation, ChIP-chip, comparative genomic hybridization, and single nucleotide polymorphism analysis.
- The **Genotyping Group**, which handles mouse tail genotyping.

Microarray and Genome Informatics specializes in data mining and computational data analysis for array-based platforms, NextGen sequencing, genomic scanning, and gene expression coregulation. It includes bioinformaticians, computational biologists, and scientific programmers from the Biostatistics Branch, Microarray Group, and Integrative Bioinformatics Group.

The **Flow Cytometry Center** offers fluorescent-activated cell sorting and analysis.

The **Fluorescence Microscopy and Imaging Center** provides access to state-of-the-art microscopy techniques, image analysis protocols, and tools.

The **Protein Expression Core Facility** assists NIEHS investigators with their protein expression requirements and specializes in production of heterologous proteins in *E. coli*, insect cells, and mammalian cells.

The **Protein Microcharacterization Core Facility** provides cutting-edge mass spectrometry services, including protein identification and characterization of post-translational protein modifications.

The **Collaborative Mass Spectrometry Group** specializes in characterizing proteins, quantifying changes in protein abundance in cells and animals upon exposure to external factors, and identifying and quantifying small molecules.

The **Collaborative X-ray Crystallography Group** manages instruments necessary for structural determinations using X-ray crystallography.

The **Computational Chemistry Molecular Modeling Support Group** assists investigators with structural alignments, docking, modeling, energetics, and graphics visualizations.

The **Knockout Core** can generate a mutant mouse customized to research needs, including traditional knockouts, conditional knockouts, and knockins.

The **Comparative Medicine Branch** is in charge of animal resources:

- The **Quality Assurance Laboratory** oversees detection, isolation, and elimination of pathogenic, microbial, and chemical contaminants.
- **Veterinary Medicine** offers training and assistance in rodent imaging, rodent behavior phenotyping, animal health oversight, surgery, anesthetic selection, and animal study development.

The **Pathology Support Core Facilities** provide diagnostic pathology support and includes:

- The **Histology** Group, specializing in immunohistochemistry, electron microscopy, and necropsy.
- The **Special Techniques Laboratory**, which handles mouse phenotyping, laser microdissection, digital image analysis, and graphics.
- The **Clinical Pathology** Group, which handles clinical chemistry and hematology.

Scientific Resources

The **Clinical Research Unit** is a resource for collaborative, translational research involving basic and clinical science.

- The **Clinical Research Unit Laboratory** handles human biospecimen and clinical sample testing.
- The **Environmental Polymorphisms Registry** contains blood samples from over 18,000 participants in North Carolina, and is a resource for studying rare disease variants.

The **Library** offers training classes, including data management training, and assists with literature searches, access to electronic journals, and book rentals.

The Environmental Factor is produced monthly by the [National Institute of Environmental Health Sciences \(NIEHS\)](#)

(<http://www.niehs.nih.gov/>)

, Office of Communications and Public Liaison. The content is not copyrighted, and it can be reprinted without permission. If you use parts of Environmental Factor in your publication, we ask that you provide us with a copy for our records. We welcome your [comments and suggestions](#).
(bruskec@niehs.nih.gov)

This page URL: NIEHS website: <http://www.niehs.nih.gov/>

Email the Web Manager at webmanager@niehs.nih.gov