

May 2007
Happy Memorial Day!



Proteomics and Phenotyping

The term "proteomics", (coined to make an analogy to the term "genomics") refers to the large-scale study of proteins (the collection of all the proteins expressed from the genome in all isoforms, polymorphisms and post-translational modifications). The Phenotyping Core not only embraces functional genomics as a critical element in phenotyping, but also protein expression levels and the post-translational modifications (PTMs) unique in such models as transgenic rodents and rabbits. Based upon the findings of The Human Genome Project, there are far fewer protein coding genes in the human genome than proteins in the human proteome due to the large number of isoforms and potential PTMs. The same applies to other mammalian models, making proteomics useful in characterizing cells and tissues, where gene expression analysis may fall short.

Potential applications of proteomics to rodent phenotyping include quantitative assessments of multiple proteins and protein isoforms and specialized applications involving multiplex assay measurement of hormones, cytokines (such as interleukins, integrins, adhesion molecules), coagulation factors, growth factors, tumor suppressors, enzymes, tumor necrosis factor, in tissues, serum or plasma.

Dr. David Graham recently joined the Department of Molecular and Comparative Pathobiology. He is a pioneer as well as a leader in the field of viral proteomics. Understanding the viral proteome and viral-associated host-proteins, the structure and function of each protein and the complexities of protein-protein interaction will be crucial for developing the most effective diagnostic techniques and disease treatments in the future. Dr. Graham also has extensive experience in with broad-based proteomics studies (see review), which are particularly powerful when applied to animal models. Dr. Graham uses various protein separation and enrichment technologies, quantitative methods and mass spectrometry approaches to obtain both quantitative and functional information on proteins of interest. Read more about Dr. Graham's projects by visiting: [resonance](http://www.hopkinsmedicine.org/mcp/faculty_webpages/Graham.html). Read more about Dr. David Graham's projects at: http://www.hopkinsmedicine.org/mcp/faculty_webpages/Graham.html



ABI 4800 Plus MALDI TOF/TOF Analyzer

Phenocore Analyses

Diverse multidisciplinary / interdisciplinary assessments and collaborations are available through Phenotyping Core faculty and resources. These include:

- **Acoustic/Auditory phenotyping**
- **Anatomic pathology** (necropsy, histopathology, photography, photomicroscopy)
- **Cardiovascular assessment** (echo/ECG)
- **Clinical pathology** (hematology, chemistry, cytospin, urinalysis, fecal occult blood)
- **Imaging** (molecular, optical) SAIRP
- **Infectious agent testing** (serology, microbiology, parasitology)
- **Metabolic phenotyping**
- **Neurobehavioral phenotyping**
- **Proteomics**
- **Pulmonary phenotyping**

For additional details, contact information, pricing, collaboration go to :

<http://www.hopkinsmedicine.org/mcp/>

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Upcoming 2007 Events

Courses at Charles River, Cold Spring Harbor, Covance, Jackson etc.

<http://www.hopkinsmedicine.org/mcp/PHENOCORE/UPcoming.html>

Clinical Chemistry for Phenotyping

Serum (or plasma) chemistry tests measure levels of various circulating substances that are released from tissues. Commonly used analytes give insight to renal and liver function, coronary risk factors, lipid metabolism, infections, etc. The Phenotyping Core clinical pathology laboratory offers clinical chemistry testing to the Johns Hopkins Community usually with a same day turn around.

Our Vet Ace® analyzer can perform multitest panels on only 80–250ul of serum or plasma from a wide variety of species. The small volume requirements compared to many clinical analyzers



is especially useful for testing mice.

Examples of available tests include:

BUN and Creatinine – increase with significant kidney disease.

Total protein (TP) - decreases in a variety of conditions including chronic kidney or liver disease.

Immunoglobulins (IG) - increase in infections, and with some tumors (myelomas, plasma cell tumor).

AST, ALT, LDH, AP – increase with liver disease. However these enzymes occur in other tissues, so elevations should be interpreted with caution and awareness of other sources, such as hemolysis, muscle damage, intestinal disease, various drug treatments or virus infections.

Cholesterol and triglycerides are useful in the assessment of lipid metabo-

lism. Rodent lipoprotein (LDL, HDL) measurements should be interpreted with caution due to peculiarities of rodent lipoproteins.

For additional information, go to:

<http://www.hopkinsmedicine.org/mcp/PHENOCORE/07tests.html>

Procuring blood specimens from animals must be included on the approved IACUC protocols (contact Kinta Diven kdiven1@jhmi.edu for additional information), and must be obtained by trained personnel (contact Dr. Watson jwatso19@jhmi.edu for training). To optimize results for your project, specimen handling, special panels and needs should be discussed with the clinical pathology and research technician Nadine Forbes, nforbes1@jhmi.edu before submitting specimens.

JHMI GEM Database / Website

The phenotyping core has initiated a database at <http://www.hopkinsmedicine.org/JHUp/phenotyping/JHMIGEM/home.html>

The aim is to post information about genetically engineered animals available here

at JH, and how to contact people who are willing to share their mice or collaborate on projects involving them.

Participation and submission are completely voluntary, and without the information or admission requirements and restric-

tions of IMSR, MMRRRC, KOMP and other repositories or databases.

Contact phenocore@jhmi.edu for additional information, for a submission form, or to participate in development of the site.

Comparative Pathology Slide Conference

The Department of Molecular and Comparative Pathobiology and the Phenotyping Core host an **informal monthly slide conference**, to emphasize recent interesting phenotyping and comparative pathology cases, and to provide a friendly and educational venue for colleagues within and outside of the JHU community to present and discuss interesting cases.

To be added to our mailing list, contact phenocore@jhmi.edu

The next slide conference will be Tuesday May 15, 2007, 4-6PM, in 801 BRB. **Please email cbrayton@jhmi.edu if you have slides or a case that you would like to present.**

April 2007 – What's your diagnosis: Mouse, heart, coronary arteritis, periarteritis.

For additional information and references, **Follow links from :**

<http://www.hopkinsmedicine.org/mcp/phenotypingcore/newsletter.html>

Cases from April 17, 2007:

- Dr.'s Southard, Brayton – mouse - Left Atrial/auricular thrombus, LV dilatation ; cardiomyopathy
- Dr.'s Southard, Brayton - mouse - Arteritis, periarteritis heart mesentery pancreas
- Dr.'s Southard, Brayton - Skh hairless mouse - haired skin, intestinal amyloidosis, mucometra
- Dr. Klinkenberg – guinea pig – wild type and mutant *Mycobacterium tuberculosis*
- Dr. Klinkenberg - mice - *Mycobacterium tuberculosis* in subcutaneous hollow fiber
- Dr. Simons - tg mice-rhabdomyosarcoma
- Dr. Simons – mice – naphthalene toxicity

- Dr. Montali - Cat-Post vaccinal asarcoma
- Dr. Montali - Budgerigar – xanthoma

WHAT'S YOUR DIAGNOSIS ?

Tissue from a mouse.

