Division of Molecular Pathology, Department of Pathology, University of Maryland School of Medicine
Molecular Diagnostics Laboratory, Laboratories of Pathology, University of Maryland Medical Center

Molecular Profile

A newsletter of Molecular Diagnostics & Molecular Pathology

HAPPY NEW YEAR!

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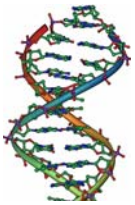
News highlights

- Division of Molecular Pathology hosted its second annual symposium
- New molecular diagnostic tool for psychiatric therapies
- A genome-based prognostic tool to predict cardiac allograft rejection
- A new way to predict recurrence of breast cancer
- Drug susceptibility test for Warfarin/Coumadin



Inside this issue:

Possible New Molecular Diagnostic Tests for Individualized Testing

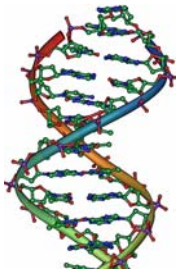
A number of new molecular tests that are designed to assist in personalized testing could be added to our in house test menu if there are sufficient interests by the UMMC community (see Table 1 on the back page).

The Onco*type* DX™ test is a 21 gene panel-based diagnostic assay that has been used to predict the likelihood of breast cancer recurrence in women with breast cancer. The AlloMap test™ is a 20 gene panel that is used to predict cardiac allograft rejection. Cytochrome P450 proteins, encoded by a 57 gene family including the *CPY2D6* and *CYP2C19* genes, are drug metabolizing enzymes. The Roche Diagnostics has developed an AmpliChip CYP450™ test, which was cleared by FDA as a diagnostic test and, can be used to predict the ability of each individual to metabolize drugs. This test, based on the Affymetrix microarray technology, analyzes an individual's genotypic profile of the Cytochrome P450 *CPY2D6* (27 allelic variations) and *CPY2C19* (3 allelic variations) genes. Test results allow physicians to consider unique genetic information in selecting medications and doses of medications for a wide variety of diseases. Recently, a prototype system that is based on the same test will be offered for drug selection and dosing information in psychotropic therapeutics. It is well known that psychiatric care often requires the need to fine-tune therapy. Addition of this test to psychiatric care could thus help psychiatrists to choose the right medicine and the right dose for the individual patient. Similar to the AmpliChip® assay, the Third Wave also offers three Invader™ tests that can be used to predict susceptibility of each individual to drugs that treat arterial and venous thromboembolic disorders such as Warfarin/Coumadin. If you are interested in any of these tests being developed in house, please contact Dr. Richard Zhao at 6-6301 or email: rzhao@som.umaryland.edu. Please note that each of these tests has to be further evaluated before implementation in house.

Symposium on "From Nanotechnology to Personalized Medicine"

The Second Annual Symposium on Translational Research in Molecular Pathology was held at HSFII auditorium on November 14th, 2006. Ten experts presented at this symposium. A total of 140 people registered and attended the conference. Besides the University of Maryland School of Medicine and University of Maryland Biotechnology Institute, this year's attendants came from 19 other institutions. Dr. Robert C Gallo, co-discoverer of the HIV/AIDS and Director of the Institute of Human Virology delivered a keynote speech on "the End or the Beginning of the Drive to an HIV Preventive Vaccine: a view from over quarter of a century". E. Albert Reece, MD, PhD, MBA, Vice President for Medical Affairs, University of Maryland John Z. and Akiko K. Bowers Distinguished Professor and Dean, School of Medicine introduced Dr. Gallo and emphasized the importance of this symposium. The symposium is organized by the Division of Molecular Pathology, Department of Pathology, co-sponsored by the University of Maryland Marlene and Stewart Greenebaum Cancer Center and the Center for Nanomedicine and Cellular Delivery.

Keynote speech by Dr. Robert C. Gallo



Our goal is to meet the molecular diagnostic needs of physicians and to improve our patient care at the UMMC community, your feedback is important to us

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Table 1. Possible new molecular tests for individualized testing*

Test	Gene/disease tested	Implication in personalized medicine
AlloMap test*	Genomics-derived 20 gene panel/Heart disease	To predict cardiac allograft rejection
AmpliChip CYP450 tests*	Cytochrome P450 2D6 and 2C19 gene polymorphism/Psychiatric disorders	To predict ability of each individual to metabolize drugs; assist in drug selection and dosing
Invader UGT1A1*	UGT1A1 TA repeats/Colon cancer	To predict susceptibility of individual to chemotherapy drug Camptosar
Invader CYP2C9*	CYP2C9/ Arterial and venous thromboembolic disorders	To predict susceptibility of individual to Warfarin/Coumadin
Invader VKORC1*	VKORC1/ Arterial and venous thromboembolic disorders	
Oncotype Dx test*	Breast cancer	Genomics-derived 21 gene panel to predict recurrence with newly diagnosed, early stage invasive breast cancer.
*, implementation of these tests in house are subject to the consideration of test cost and test volume.		

Table 2. Current test menu of molecular diagnostics laboratory at UMMC

Infectious Diseases	CMV Quantitative Real-time PCR	Ashkenizi Familial Dysautonomia (FD)*
HIV-1 Quantitative RT-PCR (Std)	EBV Qualitative PCR**	Factor V Leiden Mutation Analysis by PCR
HIV-1 Quant. RT-PCR (Ultra)	Toxoplasma gondii Qualitative PCR	Factor II Mutation Analysis by PCR
HIV-1 Genotyping	**Genetic and Familiar Disorders**	**Hematology/Oncology**
HIV-1 Virtual Phenotyping	Cystic Fibrosis (CF)*	Immunoglobulin Gene Arrangement by Southern hybridization
HCV Qualitative RT-PCR	Ashkenazi Canavan Disease (CD)*	Immunoglobulin Gene Arrangement by PCR (VDJ PCR)
HCV Genotpying	Ashkenazi Gaucher Disease*	T-cell receptor (TCR) gene arrangement by Southern hybridication
HSV-1/2 Qualitative PCR	Ashkenazi Tay-Sachs (TS)*	T-cell receptor gene arrangement analysis by PCR
CMV Qualitative Real-time PCR	Ashkenazi Niemann-Pick (NP)*	* special request; **available soon

Green top should be avoided for molecular testing

Please pay attention to the tube requirement when you order a specific molecular-based diagnostic test. In general, DO NOT use green-top (heparin) tube as heparin inhibits PCR reactions. Yellow-top (ACD) tube or lavender-top (EDTA) tube are acceptable for molecular testing. Call 8-2969 if you will have any questions.

Need a new molecular test done in house?

If you are interested in implementing a new molecular test in house for rapid turn around time, please call Dr. Richard Zhao at 6-6301 or email: rzhao@som.umaryland.edu.