P450 2C19 Genotyping for Determination of Clopidogrel (Plavix) Resistance

Summary and Explanation of the Test:
Loss of function variants of the cytochrome P450 2C19 (CYP2C19) gene are associated with reduced blood levels of the active metabolite of clopidogrel (Plavix) and a lack of efficacy (stent thrombosis, recurrent myocardial infarction, and death) in a gene-dose dependent manner (1). The ultra-metabolizing variant CYP2C19*17 is associated with an increased blood levels of active metabolite and increased risk of bleeding in patients on clopidogrel therapy (2). The CYP2C19 enzyme is also involved in the metabolism of many other drugs, so patients with reduced or increased metabolism may also have altered response to other drugs (3). Alleles *6 through *10 and *12 have been shown to exhibit reduced or poor metabolism in vitro, but significant clinical outcomes data in these uncommon variants is limited. Clinical consultation is available with the medical director (Dr. Kenneth Muldrew at 419-383-6444) regarding the response of other drugs with certain P450 2C19 genotypes. Useful guidelines and more information can be found in the Pharmacogenomics Knowledgebase (www.pharmgkb.org/).
The P450 2C19 genotype is determined by interrogation of eleven single nucleotide polymorphisms or SNPs (*2, *3, *4, *5, *6, *7, *8, *9, *10, *12, *17) by a liquid bead-based assay on a Luminex 100/200 flow cytometer. Targets are amplified from genomic DNA by PCR and the alleles are interrogated by oligoligation and fluorescent signal detection.

Turn-Around-Time: 5-7 days

Sample Requirements:
Whole blood collected in EDTA (purple top) or ACD (yellow top) Vacutainer tubes is the specimen of choice. *Samples collected in a green top tube (heparin anticoagulated) are not acceptable.

Results Reporting:
A report is issued containing the results of the test (normal, heterozygous, or homozygous genotype) and an interpretation with reference to the metabolizer phenotype and expected clopidogrel (Plavix) response.

References:

1. Jang JS, Choi KI, et al. Am J Cardiol. 2012 Aug 15;110(4):502-8.
2. Li Y, Tang HL, et al. J Thromb Haemost. 2012 Feb;10(2):199-206.

Further information can also be found on the Molecular Diagnostics website:
http://www.utoledo.edu/med/depts/path/moldx/index.html
For any further questions regarding pharmacogenetic testing, please contact the Molecular Diagnostics laboratory at 419-383-5636 or the medical director (Dr. Muldrew) at 419-383-6444.