

## CYP2C19 GENOTYPING

This test identifies the *CYP2C19* genotype to determine the patient's predicted rate of metabolism for drugs activated or inactivated by the cytochrome P450 2C19 enzyme. Clopidogrel is an antiplatelet drug frequently prescribed to prevent atherothrombotic events after acute myocardial infarction, stroke and/or after percutaneous coronary interventions. Clopidogrel is metabolized to its active form by the *CYP2C19* enzyme. Numerous factors influence a patient's response to this drug including genetic variations in *CYP2C19*.

CYP2C19 ALLELES DETECTED BY ASSAY				
Allele	dbSNP	Nucleotide*	Protein**	Effect
*1	None	No variant	None	Normal
*2	rs4244285	c.681G>A	Splicing Defect	Loss of function
*3	rs4986893	c.636G>A	p.Trp212*	Loss of function
*4	rs28399504	c.1A>G	p.Met1Leu	Loss of function
*5	rs56337013	c.1297C>T	p.Arg433Trp	Loss of function
*6	rs72552267	c.395G>A	p.Arg132Gln	Loss of function
*7	rs72558186	c.819+2T>A	Splicing Defect	Loss of function
*8	rs41291556	c.358T>C	p.Trp120Arg	Loss of function
*9	rs17884712	c.431G>A	p.Arg144His	Unknown
*10	rs6413438	c.680C>T	p.Pro227Leu	Unknown
*17	rs12248560	c.-806C>T	Promoter	Increased transcription

\*NM\_000769.2,\*\*NP\_000760.1

### REPORTED RESULTS AND CLINICAL INTERPRETATION

CYP2C19 Genotype

Predicted Phenotype:

Extensive (\*1/\*1), Intermediate (\*1/\*2-\*8, \*17//\*2-\*8), Poor Metabolizer (\*2-\*8/\*2-\*8) or

Ultra-rapid (\*17/\*17, \*1/\*17)

### METHOD

*CYP2C19* gene regions are amplified and then analyzed using allele-specific signal probes and the genotype determined by voltammetry. The corresponding phenotype is assigned based on the current Clinical Pharmacogenetics Implementation Consortium (CPIC) guidelines.

### LIMITATIONS

This test detects only the *CYP2C19* variants specified. It will not detect other *CYP2C19* sequence variants that may influence metabolizer status. DNA-based testing is highly accurate, however, the potential for error exists due to rare variations in the DNA sequence analyzed, sample contamination, or other causes. The predicted phenotype does not take into account additional clinical or environmental factors that can affect drug metabolism.

## **SPECIMEN REQUIREMENTS**

3 ml EDTA (lavender top) whole blood

## **TESTING SCHEDULE**

Turnaround time is 3 days. Assay is performed Monday, Wednesday and Friday.

## **CPT CODE**

81225

## **REFERENCES**

1. Scott SA, Sangkuhl K, Stein CM, et al. Clinical Pharmacogenetics Implementation Consortium guidelines for CYP2C19 genotype and clopidogrel therapy: 2013 update. *Clin Pharmacol Ther.* 2013;94:317-323.
2. Mega JL, Close SL, Wiviott SD, et al. Cytochrome p-450 polymorphisms and response to clopidogrel. *N Engl J Med.* 2009;360:354-362.
3. Simon T, Verstuyft C, Mary-Krause M, et al. Genetic Determinants of Response to Clopidogrel and Cardiovascular Events. *N Engl J Med* 2009;360:363-75.