CYP 1A2

Clinical Relevance:

- CYP1A2 is one of the major hepatic CYPs in human liver that metabolizes about 15% of clinical drugs such as clozapine, theophylline, tacrine, and zolmitriptan. CYP1A2 is one of the major enzymes that bioactivate a number of procarcinogens. This enzyme also metabolizes several important endogenous compounds such as steroids, retinols, melatonin, uroporphyrinogen, and arachidonic acids, suggesting its potential role in some physiologic processes in addition to xenobiotic metabolism.
- CYP1A2 metabolizes many medications, including theophylline, diazepam, caffeine, and amitriptyline. CYP1A2 can be induced by several medications, substrates, and constituents of tobacco smoke. CYP1A2 can also be inhibited by several medications. Basal metabolic capacity remains relatively consistent among the different genotypes in the absence of an inducer.
- Detecting variants of the CYP1A2 gene that cause altered enzymatic induction in the presence of an inducer can identify patients who may be at increased risk of having adverse drug reactions or therapeutic failure to standard dosages of CYP1A2 substrates.
- The enzyme CYP1A2 increasingly is involved in drug interactions as new medications metabolized by this enzyme are released. Some of the substrates that warrant particular attention are theophylline, clozapine, olanzapine, and tizanidine. Some of the more potent CYP1A2 inhibitors include cimetidine, ciprofloxacin, enoxacin, and fluvoxamine.
- CYP1A2 plays a minor role (<10%) in the metabolism of fluvoxamine, pranidipine, zolpidem, thalidomide, cyclobenzaprine, naproxen, coumarin, ondansetron, haloperidol, guanabenz, rofecoxib, efavirenz, bufuralol, cinnarizine, flunarizine, azelastine, almotriptan, carvedilol, amitriptyline, nortriptyline, clomipramine, carbamazepine, albendazole, methadone, amiodarone, and diphenhydramine.

Alleles Detected

- CYP1A2*1A, *1C, *1E, *1F, *1J, *1K, *1L

Sample Type:

- Buccal Swab

CPT Code

- 81479

Reference:

Insights into the substrate specificity, inhibitors, regulation, and polymorphisms and the clinical impact of human cytochrome P450 1A2.Zhou SF, Yang LP, Zhou ZW, Liu YH, Chan E. AAPS J. 2009 Sep;11(3):481-94. doi: 10.1208/s12248-009-9127-y. Review.