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PharmGKB Update: I. Genetic Variants of the Organic Cation Transporter 2 (OCT2, SLC22A2)

MAYA K. LEABMAN, CONRAD C. HUANG, DOUG STRYKE, SUSAN J. JOHNS, MICHIKO KAWAMOTO, THOMAS E. FERRIN, JOSEPH DEYOUNG, TRAVIS R. TAYLOR, MELANIE DE LA CRUZ, IRA HERSKOWITZ, AND KATHLEEN M. GIACOMINI

Pharmacogenetics of Membrane Transporters Group, Department of Biopharmaceutical Sciences, University of California San Francisco

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Category: genotype

PharmGKB Submission Number: PS202784
http://www.pharmgkb.org/do/serve?objId=PA331&objCls=Gene

Project: Pharmacogenetics of Membrane Transporters

HGNC Symbol: SLC22A2
HGNC Name: solute carrier family 22 (organic cation transporter), member 2
Synonyms: OCT2

Gene Ontology Terms: GO:0005624 membrane fraction, GO:0005887 integral to plasma membrane, GO:0007589 fluid secretion, GO:0015101 organic cation transporter activity, GO:0015695 organic cation transport
Locus ID: 6582
GenBank Accession: X98333

Pharmacogenetic Significance: Genetic variation in SLC22A2 may result in variation in renal elimination and/or toxicities of its substrates.

Pharmacological Significance: SLC22A2 is predominately expressed in the kidney and appears to play a role in renal elimination of hydrophilic organic cations of diverse chemical structure including many drugs such as metformin and cimetidine as well as the neurotoxin MPP^+ (1-methyl-4-phenylpyridinium).

Potential Drug Interactions: cimetidine, ranitidine, metformin, phenformin, pindolol, procainamide

Functional Characteristics: SLC22A2 is a facilitated transporter found on the basolateral membrane of renal proximal tubules. The protein mediates the transport of small molecular weight hydrophilic organic cations from the extracellular fluids into the proximal tubule cell.

Summary of Data Submitted:

Size of sample set: 247 (494 chromosomes)
Number of gene regions assayed: 11
Total bases assayed: 3502
Coding bases: 1668
Noncoding bases: 1834
Number of variant sites: 27
PCR primers reported: 22

Publications:

Leabman MK, Huang CC, DeYoung J, Carlson EJ, Taylor TR, DeLaCruz M, Johns SJ, Stryke D, Kawamoto M, Urban TJ, Kroetz DL, Ferrin TE, Clark AG, Risch N, Herskowitz I, and Giacomini KM (2003) Natural variation in human membrane trasporter genes reveals evolutionary and functional constraints. *Proc Natl Acad Sci (USA)* **100:**5896-5901.

Leabman MD, Huang CC, Kawamoto M, Johns SJ, Stryke D, Ferrin TE, DeYoung J, Taylor T, Clark AG, Herskowitz I, and Giacomini KM (2002) Polymorphisms in a human kidney xenobiotic transporter, OCT2, exhibit altered function. *Pharmacogenetics* **12:** 395-405.

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