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PharmGKB Update: III. Genetic Variants of SLC22A1, Solute Carrier Family 22 (Organic Cation Transporter), Member 1

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Category: Genotype

PharmGKB Submission Number: PS203001
http://www.pharmgkb.org/do/serve?objId=PA329&objCls=Gene

Date of Submission: June 16, 2003

Project: Pharmacogenetics of Membrane Transporters

HGNC Symbol: SLC22A1
HGNC Name: solute carrier family 22 (organic cation transporter), member 1
Synonym: SLC22A1

Gene Ontology Terms: GO:0005624 membrane fraction, GO:0005887 integral to plasma membrane, GO:0006811 ion transport, GO:0015075 ion transporter activity, GO:0015101 organic cation transporter activity, GO:0015695 organic cation transport, GO:0016021 integral to membrane
Locus ID: 6580
GenBank Accession: AV684761, U77086, X98332

Pharmacogenetic Significance: Genetic variation in SLC22A1 may result in variation in hepatic absorption, therapeutic effects, and/or toxicities of its substrates.

Pharmacological Significance: SLC22A1 is predominately expressed in the liver and appears to play a role in hepatic absorption 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: clonidine, cimetidine, debrisoquine, ranitidine, metformin, phenformin, pindolol, procainamide

Functional Characteristics: SLC22A1 is a facilitated transporter found on the sinusoidal membrane of hepatocytes. The protein mediates the transport of small molecular weight hydrophilic organic cations from the extracellular fluids into the hepatocyte.

Summary of Data Submitted:
Size of sample set assayed: 247 (494 chromosomes)
Number of gene regions assayed: 10
Total bases assayed: 2824
Coding Bases: 1665
Noncoding Bases: 1159
Number of variant sites: 52
PCR primers reported: 20

Publications:

Shu Y, Leabman MK, Feng B, Mangravite LM, Huang CC, Stryke D, Kawamoto M, Johns SJ, DeYoung J, Carlson E, Ferrin TE, Herskowitz I, Giacomini KM. Pharmacogenetics Of Membrane Transporters Investigators. (2003) Evolutionary conservation predicts function of variants of the human organic cation transporter, OCT1. *Proc Natl Acad Sci (USA)* **100:**5902–5907.

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