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PharmGKB Submission Update: VII. PAT Submissions of Genetic Variation in *KCND3* to the PharmGKB Network

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Category: genotype

Project: Pharmacogenetics of Arrhythmia Therapy

Table 1 provides the HUGO Gene Nomenclature Committee (HGNC) symbol, PharmGKB submission URLs, submission dates, and release dates. Table 2 provides the HGNC symbol, HGNC names, synonyms, GenBank accession number, and locus ID.

Gene Ontology Terms:

GO:0005249 voltage-gated potassium channel activity
GO:0005250 A-type (transient-outward) potassium channel activity
GO:0005515 protein binding
GO:0006812 cation transport
GO:0006813 potassium ion transport
GO:0008076 voltage-gated potassium channel complex
GO:0016020 membrane
GO:0016021 integral to membrane

Pharmacogenetic Significance: Thorough sequencing of the entire coding region of *KCND3* in Caucasian, Asian, and African American individuals yielded no nonsynonymous variants and only six synonymous variants.

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Article, publication date, and citation information can be found at http://pharmrev.aspetjournals.org.
doi:10.1124/pr.58.2.1.

Pharmacological Significance: I_{TO} is a key component of cardiac repolarization, a process that is manifest on the surface ECG as the QT interval. The most common cause for drug withdrawal or relabeling in the United States in the last decade is that of drug-induced-variable QT interval prolongation and subsequent development of the potentially lethal ventricular arrhythmia torsade de pointes. Given the role of *KCND3* in repolarization, it becomes a candidate gene in mediating this problem.

Potential Drug Interactions: No clinically relevant drug interactions with this channel have been described, with the possible exception of a potential benefit of I_{TO} block by quinidine (a drug that blocks many ion channels) in a rare congenital arrhythmia syndrome (the Brugada syndrome).

Functional Characteristics: *KCND3* encodes the α subunit whose expression results in the homotetramer that generates I_{TO}.

Summary of Data Submitted:

Size of sample set assayed: 190 (380 chromosomes)
Number of gene regions assayed: 7 exons
Total bases assayed: 3219
Coding bases: 1908
Number of variant sites: 6
Polymerase chain reaction primers reported: 24

TABLE 1
HGNC symbol, PharmGKB submission URLs, submission dates, and release dates

HGNC Symbol	PharmGKB Submission	Submission Date	Release Date
KCND3	http://www.pharmgkb.org/views/index.jsp?objId = PS203658&objCls = Submission	9/30/03	2/4/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203659&objCls = Submission	9/30/03	3/29/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203663&objCls = Submission	9/30/03	3/29/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203671&objCls = Submission	9/30/03	3/29/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203660&objCls = Submission	9/30/03	2/4/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203665&objCls = Submission	9/30/03	2/4/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203667&objCls = Submission	9/30/03	2/4/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203669&objCls = Submission	9/30/03	2/4/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203672&objCls = Submission	9/30/03	2/4/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203673&objCls = Submission	9/30/03	2/4/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203675&objCls = Submission	9/30/03	2/4/04
	http://www.pharmgkb.org/views/index.jsp?objId = PS203676&objCls = Submission	9/30/03	2/4/04

TABLE 2
HGNC symbol, HGNC names, synonyms, GenBank accession number, and locus ID

HGNC Symbol	HGNC Name	Synonyms	GenBank Accession No.	Locus ID
KCND3	Potassium voltage-gated channel, Shal-related subfamily, member 3	$K_v4.3$, I_{TO}	AL512665	3