

## Legend to *CYP2D6* Allelic Variation Summary Table (R2)

A literature search was performed using the following search terms: *CYP2D6*, ethnic, ethnicity, populations, cytochrome P450 2D6, names of countries and/or populations such as 'Spain, Spanish, Brazil, Brazilian, etc or a combination thereof. In addition, reports were also identified from citations by others or review articles.

Manuscripts published before 1995 were excluded due to the sparse amount of genotype information provided in these reports. Also, only reports describing cohorts  $\geq 50$  subjects were included, with few selected exceptions (i.e. smaller cohorts were part of larger studies).

'-' indicates that this allele has not been tested. N/a indicates that no average, minimum or maximum allele frequencies are available. Healthy subjects and patient cohorts are listed separately or were combined in some instances if 'no difference' was reported. The number of total subjects was not determined for each major ethnic group, because some reports utilized the same cohort(s), or a substantial number of subjects, in more than one study, e.g. to determine additional sequence variations/allelic variants.

A few studies did not report allele frequencies, but genotype counts/frequencies. In these instances, allele frequencies were calculated from the data provided.

In some instances allele frequency calculation errors were detected and are shown corrected. In some instances authors were contacted for additional information and verification. Hence, allele frequencies in this table do not always correspond with those in their original publications.

Some papers did not report the frequency of *CYP2D6\*1*; in such cases, its frequency was calculated as 100% - the sum of variants. *CYP2D6\*1* is indicated as '-', if a manuscript only reported on a particular rare allelic variant or few variants which would dramatically overestimate the frequency of *CYP2D6\*1*.

For some alleles, including *CYP2D6\*14* and *\*56*, manuscripts report an allele subtype. The reader is referred to the original article for further detail.

Note that frequencies tabulated for *CYP2D6\*36* refer to the 'single' *CYP2D6\*36* gene and not to the *CYP2D6\*36+\*10* tandem. This tandem is typically found in Asians and is often not discriminated from alleles carrying a 'single' *CYP2D6\*10* gene. Particularly in Asians, reported *CYP2D6\*10* allele frequencies comprise *CYP2D6\*10* and the *CYP2D6\*36+\*10* tandem.

*CYP2D6\*41* was tabulated as reported regardless of whether genotyping was performed using -1584C>G or 2988G>A. Note that the P450 AmpliChip Test determines *CYP2D6\*41* via -1584C>G, which may particularly impact the accurate determination of *CYP2D6\*2* and *\*41* in Africans and their descendants. *CYP2D6\*41* allele frequencies may dramatically differ depending on whether -1584C>G or 2988G>A was used for its detection.

*CYP2D6\*45* and *\*46* are shown separately and combined, because these alleles share a key SNP and are often not discriminated.

Note that some reports have used a re-sequencing approach. For some, only the alleles specifically reported on have been tabulated, while other alleles are shown as '-'. If absence of particular alleles could be inferred, their frequencies are shown as '0'. Please see original articles for specific information.

Many studies tested for the presence of ‘gene duplications’, but did not determine whether the duplication affected a *CYP2D6*\*1, \*2, \*4 or other gene. Often, duplications are defaulted to and reported as *CYP2D6*\*2xN. Unless duplications were clearly discriminated, they were tabulated in this summary table as ‘undefined/other duplications’. Sometimes it may be possible to infer the nature of a duplication allele from a genotype (e.g. *CYP2D6*\*2/\*2x2); this however, could not systematically be captured in this tabulation. Also, some manuscripts reported on the number of gene copies, e.g. x2, x3, etc. Since there are few reports, these were combined with their respective x2 group.

Some alleles, including *CYP2D6*\*1 and \*2, have a wide range of allele frequencies. These alleles are ‘default’ alleles, which means that if no sequence variations are detected or only a small number of variants are tested, an allele is assigned as (or defaulted to) *CYP2D6*\*1 or \*2. In such instances, *CYP2D6*\*1 and \*2 frequencies are likely over-estimated.

The nomenclature for *CYP2D7/2D6* hybrid alleles has recently been updated. All alleles carrying a gene composed of *CYP2D7* and *2D6* and have a T-insertion in exon 1, have been consolidated under the *CYP2D6*\*13 designation. This change affects *CYP2D6*\*13, \*16, \*66, \*67, \*79 and \*80; each is shown in its own respective column, but are also shown as ‘\*13 revised’. Note that *CYP2D6*\*76, \*77 and \*78 have only been reported in tandem arrangements to date. These are listed separately along their revised genotypes.

This *CYP2D6* allele frequency summary may not be complete. If you wish to have your paper and/or data included into this resource, or identify any errors, please contact Andrea Gaedigk, PhD at [agaedigk@cmh](mailto:agaedigk@cmh). This table will be periodically updated to include additional reports and *CYP2D6* allelic variants.

To access the *CYP2D6* allelic variation summary table in excel format please see [http://www.pharmgkb.org/download.action?filename=CYP2D6\\_allele\\_frequency\\_table\\_R2.xlsx](http://www.pharmgkb.org/download.action?filename=CYP2D6_allele_frequency_table_R2.xlsx). The excel table was last updated August 2013.

If this legend is reached through the *CPIC Guidelines for CYP2D6 Genotype and Codeine Therapy – Supplement v.1.0* published in 2012, please note the allele frequencies for some populations have changed in the excel table referred above.

Please see

[http://www.pharmgkb.org/download.action?filename=CYP2D6\\_allele\\_frequency\\_table.xlsx](http://www.pharmgkb.org/download.action?filename=CYP2D6_allele_frequency_table.xlsx) to access the previous version of *CYP2D6* allelic Variation Summary Table.

Authors	Major ethnicity	*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*14	*17	*41	*1xN	*2xN	*4xN
Daly et al	Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leathart et al	Africa	83.00	-	0.60	7.30	6.90	-	-	-	-	-	-	-	-	-	-	-
Leathart et al	Africa	-	-	-	-	-	0.00	-	-	0.70	5.00	-	26.00	-	-	-	-
Wan et al	Africa	34.70	26.90	0.30	7.80	6.20	-	-	-	-	7.50	-	14.60	-	-	-	-
Gaedigk et al	Africa	29.70	19.10	0.20	5.40	6.60	0.40	0.00	0.00	0.20	3.60	0.00	21.30	-	0.12	0.16	0.30
Gaedigk et al	Africa	29.70	19.10	0.20	5.40	6.60	0.40	0.00	0.00	0.20	3.60	0.00	21.30	-	1.20	1.60	0.30
Gaedigk et al	Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gaedigk et al	Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gaedigk et al	Africa	-	-	-	-	-	-	-	-	-	-	-	-	2.10	-	-	-
Cai et al	Africa	36.20	4.20	0.38	7.60	5.00	0.38	0.00	0.00	1.15	2.70	0.00	15.60	14.90	0.00	2.30	1.90
Cai et al	Africa	34.10	4.90	0.55	4.90	6.60	0.00	0.00	0.00	0.55	4.90	0.00	13.70	13.70	0.00	2.20	2.20
Cai et al	Africa	35.30	4.50	0.45	6.50	5.60	0.23	0.00	0.00	0.90	3.60	0.00	14.90	14.40	0.00	2.25	2.00
Gaedigk et al	Africa	-	-	-	-	-	-	-	-	-	6.63	-	-	-	-	-	-
Gaedigk et al	Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	1.20	2.40	2.00
Gaedigk et al	Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	0.71	1.42	2.68
Gaedigk et al	Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.68	4.11
Gaedigk et al	Africa	-	-	-	-	-	-	-	-	-	3.20	-	-	-	-	-	-
Gaedigk et al	Africa	32.90	13.98	0.18	3.86	6.43	0.55	0.00	0.00	0.18	2.94	-	19.12	1.84	0.37	1.84	2.76
de Leon et al	Africa	59.70	6.00	0.20	5.50	2.80	0.20	-	0.00	0.40	3.80	-	18.40	14.90	0.80	1.20	2.40
Gaedigk et al	Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yee et al	African	30.70	28.7	0	8	8.7	0	0	0	0	2.7	0	17.3	4	-	-	-
Average		40.60	14.15	0.31	6.23	6.14	0.24	0.00	0.00	0.48	4.18	0.00	18.22	9.41	0.44	1.61	2.07
Min		29.70	4.20	0.00	3.86	2.80	0.00	0.00	0.00	0.00	2.70	0.00	13.70	1.84	0.00	0.16	0.30
Max		83.00	28.70	0.60	8.00	8.70	0.55	0.00	0.00	1.15	7.50	0.00	26.00	14.90	1.20	2.40	4.11
Akiliu et al	Africa	61.90	-	0.00	1.20	3.30	-	-	-	-	8.60	-	9.00	-	-	-	-
Akiliu et al	Africa	21.50	13.60	0.00	4.10	3.30	-	-	-	-	8.60	-	11.30	21.60	-	-	-
Akiliu et al	Africa	18.50	14.20	0.00	5.90	3.10	0.00	-	-	-	8.00	-	14.90	25.30	-	-	-
Griese et al	Africa	43.70	10.60	0.00	7.00	6.00	0.00	0.00	0.00	0.00	3.10	0.00	27.70	-	-	-	-
Gaedigk et al	Africa	26.77	15.15	0.00	7.07	17.17	0.00	0.00	0.00	0.00	2.53	0.51	12.63	3.54	1.52	1.01	0.00
Sistonen et al	Africa	24.40	32.70	0.00	2.80	5.90	0.00	-	-	0.00	4.30	-	12.20	2.80	2.40	0.80	3.50
Bathum et al	Africa	87.00	-	0.00	4.00	-	27.47	-	-	-	-	-	-	-	-	-	-
Dandara et al	Africa	42.10	21.00	0.00	2.30	4.50	-	-	-	-	-	-	30.10	-	-	-	-
Dandara et al	Africa	56.10	18.40	0.50	1.40	3.30	-	-	-	-	-	-	20.30	-	-	-	-
Wennerholm et al	Africa	27.80	40.00	0.00	0.90	6.30	0.00	-	-	-	3.80	-	17.00	-	-	-	1.00
Wennerholm et al	Africa	27.80	20.30	0.00	0.90	6.10	0.00	-	-	-	3.80	-	17.00	-	-	-	0.09
Man et al	Africa	29.90	30.90	0.00	6.10	1.00	0.00	0.00	-	0.40	5.70	-	20.70	-	-	-	-
Dandara et al	Africa	50.00	17.80	0.00	3.30	4.60	-	-	-	-	-	-	24.00	-	-	-	-
Wright et al	Africa	24.04	13.94	0.00	1.44	16.35	0.00	-	0.00	-	19.23	-	14.90	1.44	0.48	2.88	2.40
Masimirembwa et al	Africa	-	-	-	-	-	-	-	-	-	-	-	34.00	-	-	-	-
Dandara et al	Africa	47.00	13.00	0.00	2.00	4.00	-	-	-	-	-	-	34.00	-	-	-	-
Average		39.23	20.12	0.03	3.36	6.07	3.05	0.00	0.00	0.10	6.77	0.26	19.98	10.94	1.47	1.56	1.40
Min		18.50	10.60	0.00	0.90	1.00	0.00	0.00	0.00	0.00	2.53	0.00	9.00	1.44	0.48	0.80	0.00
Max		87.00	40.00	0.50	7.07	17.17	27.47	0.00	0.00	0.40	19.23	0.51	34.00	25.30	2.40	2.88	3.50
Mendoza et al	Americas	10.29	45.60	0.57	20.63	4.58	-	-	-	-	14.90	-	1.43	-	-	-	-
Casner	Americas	75.00	-	0.00	17.00	2.00	0.00	0.00	0.00	-	1.00	-	2.00	-	-	-	-
Luo et al	Americas	55.10	22.00	0.20	10.00	1.70	0.40	0.00	0.00	1.10	2.80	0.00	0.20	5.50	0.00	0.60	0.20
Gaedigk et al	Americas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Baillet et al	Americas	39.90	23.80	0.00	17.80	0.00	4.20	-	0.60	-	7.10	1.80	-	-	-	-	-
da Silva Silveira et al	Americas	78.91	-	7.89	13.16	-	-	-	-	-	-	-	-	-	-	-	-
da SilvaSilveira et al	Americas	87.88	-	3.03	9.09	-	-	-	-	-	-	-	-	-	-	-	-
da SilvaSilveira et al	Americas	82.87	-	3.09	14.04	-	-	-	-	-	-	-	-	-	-	-	-
da SilvaSilveira et al	Americas	88.76	-	1.69	9.55	-	-	-	-	-	-	-	-	-	-	-	-
Kohlrusch et al	Americas	41.38	12.65	1.15	6.32	4.02	0.00	-	-	0.00	4.02	0.00	9.20	10.92	0.00	1.72	0.00
Kohlrusch et al	Americas	42.93	12.50	0.00	10.33	1.09	2.17	-	-	2.17	2.72	0.54	2.17	7.07	0.54	4.35	1.62
Kohlrusch et al	Americas	38.44	18.28	1.07	13.18	2.15	0.54	-	-	1.61	2.15	0.00	1.34	8.33	0.54	2.96	0.54
Antunes et al	Americas	37.11	17.53	2.06	14.43	4.64	0.52	0.00	0.00	3.61	1.03	-	1.03	4.12	-	-	1.03
Jurima-Romet et al	Americas	89.10	-	0.00	8.62	-	-	-	-	-	2.30	-	-	-	-	-	-
Nowak et al	Americas	94.00	-	0.00	3.00	-	-	-	-	-	3.00	-	-	-	-	-	-
Nowak et al	Americas	68.00	-	0.00	24.00	-	-	-	-	-	8.00	-	-	-	-	-	-
Sistonen et al	Americas	60.20	30.10	0.00	3.20	0.90	0.00	-	-	0.00	0.00	-	0.50	0.00	2.30	2.80	0.00
Munoz et al	Americas	66.10	18.50	0.00	3.60	4.20	-	-	-	0.00	1.80	-	-	-	-	-	-
Roco et al	Americas	-	-	0.99	11.86	-	-	-	-	-	-	-	-	-	-	-	-
Isaza et al	Americas	38.80	37.00	1.20	19.40	0.80	0.00	0.00	0.00	-	-	-	1.60	-	-	-	-
Llerena et al	Americas	67.20	-	0.00	14.30	1.60	1.20	-	-	-	0.80	-	10.20	-	-	-	0.00
Llerena et al	Americas	76.48	-	0.00	14.60	1.90	0.08	-	-	-	0.40	-	2.70	-	-	-	0.04
Dorado et al	Americas	47.90	31.35	0.40	10.60	2.10	0.00	-	-	-	1.30	-	0.42	2.54	0.42	0.42	0.85
Lopez et al	Americas	43.42	19.34	1.44	11.21	2.67	-	-	-	-	12.45	-	1.65	-	1.65	3.29	-
Contreras et al	Americas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Contreras et al	Americas	50.00	25.50	0.00	14.00	2.00	-	-	-	-	2.60	-	0.00	-	-	-	-
Salazar-Flores	Americas	96.12	-	0	3.88	-	0	0	0	-	-	-	-	-	-	-	-
Salazar-Flores	Americas	93.20	-	1.2	5.6	-	0	0	0	-	-	-	-	-	-	-	-
Sosa-Macias et al	Americas	83.70	-	0.90	13.10	-	0.00	-	-	-	2.30	-	-	-	-	-	-
Sosa-Macias et al	Americas	99.40	-	0.00	0.60	-	0.00	-	-	-	0.00	-	-	-	-	-	-
Agundez et al	Americas	70.10	-	1.80	15.70	3.60	-	-	-	4.40	3.30	-	-	-	-	-	-
Llerena et al	Americas	76.10	-	0.00	14.20	4.60	0.00	-	-	-	3.10	-	0.00	-	-	-	0.00
Jorge et al	Americas	84.90	-	0.00	14.00	0.00	1.10	-	-	-	-	-	-	-	-	-	-
Jorge et al	Americas	82.40	-	0.00	17.10	0.00	0.50	-	-	-	-	-	-	-	-	-	-
Ruaño et al	Americas	-	-	-	0.20	-	-	-	-	-	-	-	-	-	-	-	-
Gaedigk et al	Americas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane et al	Americas	36.89	13.59	0.49	1.94	5.34	0	0	0	0	2.91	0	16.5	1.46	0.49	4.37	2.91
Montane et al	Americas	44.61	17.37	0.6	11.68	2.69	0	0	0	0.3	5.09	0	0	13.47	0.6	0.9	0
Griman et al	Americas	62.80	22.10	0.00	12.30	0.00	0.00	-	-	-	2.80	-	-	-	-	-	-
Griman et al	Americas	39.90	11.30	0.00	42.50	0.00	0.00	-	-	-	6.30	-	-	-	-	-	-
Griman et al	Americas	59.80	31.50	0.00	5.40	0.00	0.00	-	-	-	3.30	-	-	-	-	-	-
Griman et al	Americas	81.20	15.00	0.00	2.50	0.00	0.00	-	-	-	1.30	-	-	-	-	-	-
Griman et al	Americas	63.80	32.80	0.00	1.70	0.00	0.00	-	-	-	1.70	-	-	-	-	-	-
Griman et al	Americas	75.00	20.80	0.00	4.20	0.00	0.00	-	-	-	0.00	-	-	-	-	-	-
Griman et al	Americas	41.50	37.90	0.00	13.40	2.00	1.20	-	-	-	4.00	-	-	-	-	-	-
Average		64.28	23.48	0.73	11.28	1.88	0.43	0.00	0.07	1.32	3.37	0.33	3.00	5.93	0.73	2.38	0.60

Authors	Major ethnicity	*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*14	*17	*41	*1xN	*2xN	*4xN
Min		10.29	11.30	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00
Max		99.40	37.90	3.09	42.50	5.34	2.17	0.00	0.00	4.40	12.45	0.54	16.50	13.47	2.30	4.37	2.91
Gaedigk et al	Asian	-	-	-	-	-	-	-	-	-	18.42	-	-	-	-	-	-
Man et al	Asian	31.00	11.20	0.00	0.40	3.20	0.00	0.00	-	0.00	49.40	0.60	0.00	-	-	-	-
Ji et al	East Asia	37.90	-	0.00	0.20	7.20	0.00	-	0.00	-	51.30	2.00	-	-	-	-	-
Ismail et al	East Asia	38.35	-	0.00	0.21	2.54	-	-	-	1.27	56.99	-	0.21	-	-	-	-
Cai et al	East Asia	-	-	-	-	-	-	-	-	-	55.80	1.80	-	-	-	-	-
Sheng et al	East Asia	-	-	-	-	-	-	-	-	-	-	-	-	-	0.41	0.00	0.00
Myrand et al	East Asia	21.60	16.00	0.00	0.00	6.40	0.00	0.00	0.00	-	53.00	0.50	-	-	-	-	-
Qin et al	East Asia	25.68	10.87	0.00	0.00	7.06	0.00	0.00	0.00	0.00	50.54	1.63	-	-	-	-	-
Qin et al	East Asia	24.72	15.73	0.00	0.56	3.67	0.00	0.00	0.00	0.00	46.63	1.12	-	-	-	-	-
Qin et al	East Asia	17.95	8.33	0.00	0.00	3.85	0.00	0.00	0.00	0.00	64.10	2.56	-	-	-	-	-
Zhou et al	East Asia	18.50	14.00	0.00	1.00	7.00	0.50	0.00	0.00	0.00	49.00	1.50	0.00	4.00	0.00	0.50	0.00
Kim et al	East Asia	27.50	13.50	-	-	9.60	-	-	-	-	43.80	1.10	-	2.20	-	-	-
Man et al	East Asia	28.10	11.00	0.00	1.10	6.10	0.00	0.00	-	0.00	48.40	1.10	0.00	-	-	-	-
Zuo et al	East Asia	-	-	-	-	-	-	-	-	-	57.35	-	-	-	-	-	-
Zuo et al	East Asia	-	-	-	-	-	-	-	-	-	22.43	-	-	-	-	-	-
Zuo et al	East Asia	-	-	-	-	-	-	-	-	-	39.72	-	-	-	-	-	-
Zuo et al	East Asia	-	-	-	-	-	-	-	-	-	46.52	-	-	-	-	-	-
Qin et al	East Asia	30.23	9.30	0.00	0.00	4.07	0.00	0.00	0.00	0.00	48.84	0.00	-	-	-	-	-
Yin et al	East Asia	-	-	-	-	-	-	-	-	-	48.72	-	-	-	-	-	-
Yin et al	East Asia	-	-	-	-	-	-	-	-	-	51.00	-	-	-	-	-	-
Yin et al	East Asia	-	-	-	-	-	-	-	-	-	25.22	-	-	-	-	-	-
Jin et al	East Asia	25.00	42.71	0	0	2.08	0	0	0	0	28.13	0	0	1.56	-	-	-
Sistonen et al	East Asia	30.90	16.40	0.00	2.70	5.80	0.00	-	-	0.00	39.40	-	0.00	2.30	0.40	0.60	0.00
Love et al	East Asia	30.00	12.40	0.00	0.00	2.40	0.00	-	-	-	52.40	-	-	2.80	-	-	-
Chida et al	East Asia	93.79	-	0.00	0.77	4.10	-	-	-	-	-	-	-	-	-	-	-
Tateishi et al	East Asia	42.30	9.20	0.00	0.50	6.10	-	-	-	-	40.80	-	-	-	-	-	-
Kubota et al	East Asia	40.20	12.96	0.00	0.00	6.17	-	-	-	-	38.58	2.16	0.00	-	-	-	-
Nishida et al	East Asia	43.00	12.30	-	0.20	4.50	-	-	-	-	38.10	0.70	-	-	0.50	0.50	-
Chida et al	East Asia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ishiguro et al	East Asia	39.80	12.30	-	0.00	6.20	-	-	-	-	37.00	2.20	-	-	0.30	0.30	-
Yamazaki et al	East Asia	41.10	9.20	0.00	0.50	6.10	0.00	0.00	0.00	0.00	40.80	0.00	0.00	-	-	-	-
Soyama et al	East Asia	-	-	-	0	3.52	-	-	-	-	31.22	0.7	-	-	-	-	-
Ebisawa et al	East Asia	42.66	11.36	-	0.17	7.17	-	-	-	-	36.19	-	-	-	-	-	-
Ikenaga et al	East Asia	-	10.20	-	-	-	-	-	-	-	-	-	-	2.60	-	-	-
Myrand et al	East Asia	27.00	15.50	0.00	0.50	7.00	0.00	0.00	0.00	-	43.00	0.50	-	-	-	-	-
Myrand et al	East Asia	32.30	14.40	0.00	0.50	7.10	0.00	0.00	0.00	-	42.80	0.00	-	-	-	-	-
Myrand et al	East Asia	33.50	18.30	0.00	0.00	4.80	0.00	0.00	0.00	-	37.30	0.00	-	-	-	-	-
Hosono et al	East Asia	43.40	12.80	0.00	0.40	5.70	0.00	0.00	0.00	0.00	8.60	0.30	0.00	-	0.50	0.40	0.00
Kiyotani et al	East Asia	38.78	7.65	0.00	0.51	7.14	0.00	0.00	0.00	0.00	8.67	0.00	0.00	1.53	0.51	0.00	0.00
Man et al	East Asia	44.50	10.00	0.00	0.10	5.10	0.00	0.00	-	0.00	37.80	0.10	0.00	-	-	-	-
Kiyotani et al	East Asia	47.45	-	-	0.00	4.59	0.00	-	-	-	45.92	0.00	-	0.51	-	-	-
Lee et al	East Asia	33.25	10.13	0.00	0.25	6.13	0.00	0.00	0.00	0.00	45.00	0.50	0.00	1.88	0.13	0.50	0.00
Myrand et al	East Asia	17.50	17.50	0.00	0.50	7.50	0.00	0.00	0.00	-	50.00	3.00	-	-	-	-	-
Lee et al	East Asia	32.32	10.88	0.00	0.00	5.61	-	-	-	-	45.58	0.33	-	2.24	0.07	0.99	0.00
Kim et al	East Asia	32.30	10.10	-	-	5.60	-	-	-	-	45.60	0.30	-	2.20	-	-	-
Man et al	East Asia	33.60	12.10	0.00	0.80	6.20	0.00	0.00	-	0.00	44.10	0.50	0.00	-	-	-	-
Kim et al	East Asia	34.69	12.24	0.00	0.00	9.18	0.00	0.00	0.00	0.00	17.35	0.00	0.00	0.00	-	-	-
Suwannasri et al	East Asia	21.00	9.70	-	0.70	4.30	0.00	-	-	-	44.60	1.04	-	-	-	-	-
Chamnannphon et al	East Asia	35.00	9.6	0	0.9	4.4	0	0	0	0	45.6	0.9	0	1.8	0	0	0
Veiga et al	East Asia	47.10	-	-	1.40	8.00	-	-	-	-	43.50	-	-	-	-	-	-
Kim et al	East Asia	24.60	7.80	-	-	6.10	-	-	-	-	57.00	1.20	-	2.90	-	-	-
Love et al	East Asia	24.00	11.00	0.00	0.50	5.00	0.00	-	-	-	58.50	-	-	1.00	-	-	-
Average		34.17	12.82	0.00	0.42	5.61	0.02	0.00	0.00	0.07	42.31	0.86	0.01	1.97	0.28	0.38	0.00
Min		17.50	7.65	0.00	0.00	2.08	0.00	0.00	0.00	0.00	8.60	0.00	0.00	0.00	0.00	0.00	0.00
Max		93.79	42.71	0.00	2.70	9.60	0.50	0.00	0.00	1.27	64.10	3.00	0.21	4.00	0.51	0.99	0.00
Daly et al	Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marez et al	Europe	33.50	32.70	1.70	17.20	6.90	1.20	0.10	0.10	2.70	1.50	0.00	0.10	-	-	-	-
Sachse et al	Europe	36.40	32.40	2.04	20.70	1.95	0.93	0.08	0.00	1.78	1.53	0.00	-	-	0.51	1.34	0.08
Leathart et al	Europe	76.00	-	1.20	18.00	2.90	-	-	-	-	-	-	-	-	-	-	-
Leathart et al	Europe	-	-	-	-	-	0.70	-	-	2.00	4.00	-	0.00	-	-	-	-
Griese et al	Europe	36.60	32.20	1.00	19.50	4.10	1.30	0.30	0.30	2.00	2.00	-	0.00	-	-	-	-
Gaedigk et al	Europe	37.00	33.70	1.00	17.50	3.80	1.00	0.00	0.00	2.90	1.90	-	0.20	-	0.20	0.70	0.20
Aynacioglu et al	Europe	37.10	35.30	0.00	11.30	1.49	0.74	0.50	0.00	0.62	6.06	0.00	1.11	-	3.59	1.98	0.25
Wan et al	Europe	40.60	26.20	1.40	19.90	2.10	-	-	-	-	8.00	-	0.30	-	-	-	-
Tamminga et al	Europe	79.30	-	1.80	18.40	-	0.40	0.10	0.00	-	-	-	-	-	-	-	-
Molden et al	Europe	71.08	-	0.00	21.08	6.02	1.81	-	-	-	-	-	-	-	-	-	-
Niewinski et al	Europe	75.70	-	1.30	23.00	-	-	-	-	-	-	-	-	-	-	-	-
Gaikovitch et al	Europe	70.86	-	1.03	17.07	2.41	1.21	-	-	-	4.14	-	-	-	1.72	0.52	0.00
Bozina et al	Europe	76.75	-	2.75	14.00	1.00	1.50	-	-	-	-	-	-	-	-	-	-
Gaedigk et al	Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Raimundo et al	Europe	36.40	17.50	-	-	-	-	-	-	2.10	1.80	-	-	8.40	0.00	1.10	-
Scordo et al	Europe	75.00	-	0.70	15.30	3.40	1.40	-	-	-	-	-	-	-	-	-	-
Fuselli et al	Europe	41.18	35.29	0.00	17.65	1.96	0.00	-	-	0.98	0.98	-	0.98	-	0.00	0.98	0.00
Fuselli et al	Europe	36.46	40.63	0.00	12.50	1.04	0.00	-	-	0.00	4.17	-	0.00	-	0.00	2.08	0.00
Zachrisson et al	Europe	36.70	32.40	1.40	24.40	4.30	0.09	-	-	-	-	-	-	-	-	-	-
Zachrisson et al	Europe	42.80	34.10	1.50	16.90	3.80	0.80	-	-	-	-	-	-	-	-	-	-
Gaedigk et al	Europe	-	-	-	-	-	-	-	-	-	-	-	-	7.60	-	-	-
Aydin et al	Europe	83.00	-	2.00	15.00	-	-	-	-	-	-	-	-	-	-	-	-
Halling et al	Europe	61.60	-	0.20	33.40	-	1.90	-	-	0.80	-	-	-	-	-	-	-
Pedersen et al	Europe	69.38	-	2.17	22.64	-	1.99	-	-	3.80	-	-	-	-	-	-	-
Li et al	Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toscano et al	Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gaedigk et al	Europe	-	-	-	-	-	-	-	-	-	3.83	-	-	-	-	-	-
Menoyo et al	Europe	31.00	40.47	0.95	13.80	3.33	0.95	0.00	0.00	2.38	1.90	0.00	-	-	1.90	1.90	0.47
Rasmussen et al	Europe	36.90	22.40	3.10	19.10	2.90	1.60	0.00	0.00	3.60	0.90	-	0.00	6.90	0.20	1.80	0.00
Gaedigk et al	Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.76	0.38
Gaedigk et al	Europe	-	-	-	-	-	-	-	-	-	1.47	-	-	-	-	-	-

Authors	Major ethnicity	*1	*2	*3	*4	*5	*6	*7	*8	*9	*10	*14	*17	*41	*1xN	*2xN	*4xN
Sistonen et al	Europe	34.40	28.70	0.30	17.20	3.20	0.60	-	-	2.50	2.90	-	0.00	7.00	0.60	1.30	0.60
Scott et al	Europe	28.60	16.40	0.80	22.60	0.80	0.20	-	-	0.80	6.20	-	0.80	14.00	2.20	5.80	-
Arvanitidis et al	Europe	72.44	-	2.30	17.84	-	-	-	-	-	-	-	-	-	-	-	-
Rasmussen et al	Europe	38.50	18.40	1.60	19.70	5.30	1.30	0.00	0.00	2.90	1.60	-	0.00	9.80	0.00	0.80	0.00
Koseler et al	Europe	-	-	-	21.00	-	-	-	-	-	-	-	-	-	-	-	-
Crescenti et al	Europe	79.2	-	0.9	16.5	2.7	0.7	-	-	-	-	-	-	-	-	-	-
Crescenti et al	Europe	77	-	2	19	2	1	-	-	-	-	-	-	-	-	-	-
Crescenti et al	Europe	78	-	1	20	0	2	-	-	-	-	-	-	-	-	-	-
Gaedigk et al	Europe	36.46	21.90	1.01	19.74	3.31	1.01	0.14	0.00	3.03	2.16	-	0.43	8.07	0.29	0.58	0.43
Myrand et al	Europe	37.50	32.80	2.10	18.20	1.70	2.10	0.00	0.00	-	1.40	0.00	-	-	-	-	-
Gjerde et al	Europe	74.83	-	0.33	20.53	2.32	0.33	-	-	-	-	-	-	-	-	-	-
Buzková	Europe	69.50	-	1.10	22.90	3.10	0.20	-	-	-	-	-	-	-	-	-	-
de Leon et al	Europe	37.40	15.90	1.80	21.00	2.30	1.10	0.00	0.00	2.90	1.00	-	0.30	9.80	0.70	0.50	0.10
Gaedigk et al	Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rebsamen et al	Europe	35.50	15.50	0.60	20.60	2.40	1.20	0.30	0.00	2.70	2.70	0.00	0.30	7.30	0.60	1.50	0.30
Correia et al	Europe	74.60	-	1.40	13.30	2.80	1.87	-	-	-	-	-	-	-	-	-	-
Man et al	Europe	32.00	25.10	2.20	18.80	3.30	1.70	0.10	-	1.70	2.80	0.00	0.10	-	-	-	-
Gaedigk et al	Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gaedigk et al	Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fernandez-Santander et al	Europe	81.30	-	0.90	15.90	1.90	0.00	0.00	0.00	-	-	-	-	-	-	-	-
Fernandez-Santander et al	Europe	78.20	-	1.60	18.50	1.00	0.50	0.20	0.00	-	-	-	-	-	-	-	-
De Luca et al	Europe	68.60	-	3.20	17.70	0.00	0.90	-	-	-	-	-	-	9.50	-	-	-
De Luca et al	Europe	68.30	-	0.90	16.10	1.80	0.90	-	-	-	-	-	-	11.90	-	-	-
Vangsted	Europe	70.90	-	1.30	21.90	3.80	0.60	-	-	-	-	-	-	-	-	-	-
Zachrisson et al	Europe	41.40	33.70	1.50	16.30	3.60	0.80	-	-	-	-	-	-	-	1.30	0.80	0.60
Zachrisson et al	Europe	41.30	29.70	3.10	18.50	3.10	0.80	-	-	-	-	-	-	-	1.00	1.80	0.60
Wesmler et al	Europe	33.48	29.46	0.45	19.64	0	-	-	-	2.23	1.79	-	-	-	-	-	-
Serin et al	Europe	69.00	-	1	10	3	2.5	-	-	-	14.5	-	-	-	-	-	-
Häber et al	Europe	28.20	20	2.7	29.1	0	1.8	0	0	1.8	1.8	0	0	6.4	0	0	0
Zafra-Ceres et al	Europe	35.00	20	0	18.89	5.6	0	0	0	5	3.89	0	1.11	6.11	2.22	0.56	0
Fernández_Santander et al	Europe	65.04	10.53	0.75	11.65	3.38	0.38	0	0	1.5	0.38	0	0.75	3.76	-	-	-
Zachrisson et al	Europe	40.70	31.50	2.40	19.30	3.90	0.70	-	-	-	-	-	-	-	0.50	0.00	1.00
Rideg et al	Europe	39.80	15.10	1.80	20.40	1.80	0.40	0.40	-	1.40	-	-	-	8.00	0.40	1.40	-
Beer et al	Europe	35.90	27.30	0.50	14.00	1.60	0.50	0.00	0.00	1.60	4.30	0.00	0.00	12.40	0.50	1.10	0.00
Sahin et al	Europe	-	-	-	12.00	-	-	-	-	-	-	-	-	-	-	-	-
Slanar et al	Europe	72.40	-	1.00	20.20	3.50	0.00	-	-	-	-	-	-	-	-	-	-
Average		53.63	26.91	1.32	18.50	2.69	0.95	0.11	0.02	2.14	3.16	0.00	0.32	8.56	0.80	1.27	0.25
Min		28.20	10.53	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	3.76	0.00	0.00	0.00
Max		83.00	40.63	3.20	33.40	6.90	2.50	0.50	0.30	5.00	14.50	0.00	1.11	14.00	3.59	5.80	1.00
McLellan et al	Middle East	89.50	-	-	3.50	1.00	-	-	-	-	3.00	-	3.00	-	-	-	-
Fuselli et al	Middle East	47.06	30.39	0.00	9.80	0.98	0.98	-	-	0.00	2.94	-	0.00	-	3.92	3.92	0.00
Luo et al	Middle East	49.00	9.00	0.00	4.00	3.00	-	-	-	-	2.00	-	2.00	29.00	-	-	-
Sistonen et al	Middle East	35.10	25.00	0.00	6.80	3.70	1.40	-	-	0.00	0.70	-	2.00	16.90	3.70	3.40	0.00
Kouhi et al	Middle East	56.50	32.00	-	12.50	3.00	-	-	-	-	9.00	-	0.00	-	-	-	-
Qumsieh et al	Middle East	39.1	12.2	0	9	-	0	0	0	0	3.3	0	2.5	15.2	1.6	4.3	-
Hashemi-Soteh et al	Middle East	90.00	-	0.50	9.00	-	0.50	-	-	-	-	-	-	-	-	-	-
Average		58.04	21.72	0.10	7.80	2.34	0.72	0.00	0.00	0.00	3.49	0.00	1.58	20.37	3.07	3.87	0.00
Min		35.10	9.00	0.00	3.50	0.98	0.00	n/a	n/a	0.00	0.70	n/a	0.00	15.20	1.60	3.40	0.00
Max		90.00	32.00	0.50	12.50	3.70	1.40	n/a	n/a	0.00	9.00	n/a	3.00	29.00	3.92	4.30	0.00
Griese et al	Oceania	85.80	3.80	0.00	1.50	7.50	0.00	0.00	0.00	0.00	0.80	-	0.20	-	-	-	-
Sistonen et al	Oceania	71.80	0.00	0.00	0.00	1.30	0.00	-	-	0.00	2.60	-	0.00	0.00	11.50	0.00	0.00
von Ahsen et al	Oceania	63.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	-	-
von Ahsen et al	Oceania	60.00	1.00	0.00	3.00	8.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	13.00	-	-
Average		70.15	1.20	0.00	1.13	4.95	0.00	0.00	0.00	0.00	1.60	0.00	0.05	0.00	11.83	0.00	0.00
Min		60.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	0.00	0.00
Max		85.80	3.80	0.00	FALSE	8.00	0.00	0.00	0.00	0.00	3.00	0.00	0.20	0.00	13.00	0.00	0.00
Ismail & The	South/Central Asia	69.00	-	0.00	8.00	1.00	-	-	-	1.00	15.00	-	1.00	-	-	-	-
Teh et al	South/Central Asia	37.90	-	0.00	2.80	5.10	-	-	-	3.30	49.50	-	0.50	-	-	-	-
Adithan et al	South/Central Asia	72.20	-	0.00	6.60	0.90	-	-	-	-	20.30	-	-	-	-	-	-
Naveen et al	South/Central Asia	46.10	34.80	0.00	7.30	1.90	-	-	-	-	10.20	0.00	0.00	-	-	-	-
Sistonen et al	Central/South Asians	43.30	29.00	0.00	8.10	3.80	0.00	-	-	0.00	3.80	-	0.00	10.50	0.50	0.50	0.00
Average		53.70	31.90	0.00	6.56	2.54	0.00	n/a	n/a	1.43	19.76	0.00	0.38	10.50	0.50	0.50	0.00
Min		37.90	29.00	0.00	2.80	0.90	0.00	n/a	n/a	0.00	3.80	0.00	0.00	10.50	0.50	0.50	0.00
Max		72.20	34.80	0.00	8.10	5.10	0.00	n/a	n/a	3.30	49.50	0.00	1.00	10.50	0.50	0.50	0.00

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Authors	*1a	*2a	*4a	*6a	*10a	*17a	*20a	*26a	*36a	*45a	*48a	Undefined/ other duplications	All duplications combined a1	*28a*10	*36a*10a	*28a*10	*36a*10	*78a*2 *70a*2a	*77a*2 *70a*2a	*78a*2 *70a*2a	Other rearrange- ments
Motani et al												Undefined/ other duplications 10.40	10.40								
Furetti et al	3.92	3.92	0.00	-	-	-	-	-	-	-	-	-	7.84	-	-	-	-	-	-	-	-
Lee et al	-	-	-	-	-	-	-	-	-	-	-	2.00	2.00	-	-	-	-	-	-	-	-
Stanton et al	3.79	3.40	0.00	-	0.00	-	-	-	-	0.00	-	-	7.59	-	-	-	-	-	-	-	-
Koulu et al	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chen et al	1.8	4.3	-	-	-	-	-	-	-	-	-	-	6.20	-	0.00	12.40	-	-	-	-	-
Hopkins-Schell et al	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average	3.07	3.97	0.00	n/a	0.15	n/a	n/a	n/a	n/a	0.00	n/a	0.20	6.71	n/a	0.00	12.40	-	n/a	n/a	n/a	n/a
Min	1.69	3.40	0.00	n/a	0.00	n/a	n/a	n/a	n/a	0.00	n/a	2.00	2.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Max	3.92	4.30	0.00	n/a	0.30	n/a	n/a	n/a	n/a	0.00	n/a	10.40	10.40	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a
Greiss et al	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	-	-	-	-	-	-	-	-
Stanton et al	11.00	0.00	0.00	-	0.00	-	-	-	-	0.00	-	-	11.00	-	-	-	-	-	-	-	-
van Alphen et al	11.00	-	-	-	-	-	-	-	-	-	-	-	11.00	-	-	-	-	-	-	-	-
van Alphen et al	11.00	-	-	-	-	-	-	-	-	-	-	-	11.00	-	-	-	-	-	-	-	-
Average	11.81	0.00	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0	8.88	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a
Min	11.00	0.00	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a
Max	13.00	0.00	0.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00	13.00	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a
Wong & Troy	-	-	-	-	-	-	-	-	-	-	-	2.00	2.00	-	-	-	-	-	-	-	-
Tan et al	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	-	-	-	-	-	-	-	-
Auligan et al	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stanton et al	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stanton et al	0.00	0.00	0.00	-	0.00	-	-	-	-	0.00	-	-	1.00	-	-	-	-	-	-	-	-
Average	0.00	0.00	0.00	n/a	0.00	n/a	n/a	n/a	n/a	0.00	n/a	1.45	1.30	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a
Min	0.00	0.00	0.00	n/a	0.00	n/a	n/a	n/a	n/a	0.00	n/a	0.00	0.00	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a
Max	0.00	0.00	0.00	n/a	0.00	n/a	n/a	n/a	n/a	0.00	n/a	2.00	2.00	n/a	n/a	n/a	-	n/a	n/a	n/a	n/a
Geordak et al	1.80	3.30	3.20	0.00	0.10	0.10	0.00	0.10	0.00	0.10	0.10	0.00	8.80	0.00	-	-	-	0.10	0.20	0.10	0.00
Geordak et al	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30
Shukla et al	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Geordak et al	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.00

CYP2D6 Allele Frequencies

date	for R2	Change Note
8/13/13	X	corrected spelling of von Ahsen
8/16/13	X	added number of subjects for Yin et al. and updated year of publication
8/16/13	X	added number of subjects for Ebisawa et al.
8/16/13	X	corrected entries for *13 'revised' for all ethnicities (0 was incorrect for most)
8/17/13	X	corrected *76+*2 to *76+*1
8/16/13	X	added columns for *61, *62, *84, *85, *86, *100, *101, *36x3+*10 and *1x2+*83
8/16/13	X	revised/updated ethnicities and populations for Americas
8/16/13	X	added 5 papers (6 line entires) for East Asia
8/16/13	X	added 5 papers (5 line entries) for Europe
8/16/13	X	added 4 papers (6 line entires) for Americas
8/16/13	X	added 2 papers (2 line entries) for Africa
8/16/13	X	added 1 paper with 'unspecified' ethnicity and approximate frequency
8/16/13	X	added 1 paper with approxomate frequency
8/16/13	X	sorted ethnicities by 1) major ethnicity, 2) population, 3) year and 4) author
8/28/13	X	excluded Zihlif et al. *10 incorrectly called; corresponded with author revealing this mishap
8/29/13	X	correponded with Antunes; mistake in paper re some freq;
8/30/13	X	have not heard back from Zafra-Ceres to confirm allele freq
9/9/13	X	Added data for *1, *2 and *35 received from Ana Santander for PMID 23922954