Supplementary Material: Figure Information

Figure S1: Per-residue TANGO aggregation scores of native GCK and the three mutant GCK proteins.

Figure S2: Multiple sequence alignment of the amino acids of ten selected sequences in the *GCK* gene. The alignment of the sequences was obtained using MUSCLE. The accession numbers are as follows: *Homo sapiens* (NP_000153.1-465aa), *Oncorhynchus mykiss* (NP_001117721-471aa), *Mus musculus* (NP_034422-465aa), *Rattus norvegicus* (NP_036697-465aa), *Cavia porcellus* (XP_003462245-495aa), *Gallus gallus* (AAP03050-249aa), *Xenopus laevis* (AAI69458-458aa), *Cyprinus carpio* (AAC33587-476aa), *Sparus aurata* (AAC33585-478aa), and *Sus scrofa* (XP_003484115-465aa).

Figure S3: Generated WebLogo of selected GCK sequences. The diagram shows the sequence logos of up to 140 amino acids; the sequences from different species are highly conserved.

Figure S4: Distribution of amino acids in the native GCK protein.

Figure S5: Comparison of the occurrence of mutant and mutated residues in GCK.

Figure S6: Modelling of the mutant protein structure (E70K) with PDB ID 1V4S using Swiss-PDB Viewer. The surrounding amino acid residue changes (within a range of 4 Å from the mutational point) were analysed using PyMol. **(A)** Superimposition of the native (sky blue) and mutant (E70K) structures (bright orange) of the GCK protein (1V4S), which were visualised as cartoons using PyMol. **(B)** Close-up view of the superimposed native Glu70 (green colour) and substituted amino acid Lys70 (red colour) as a stick

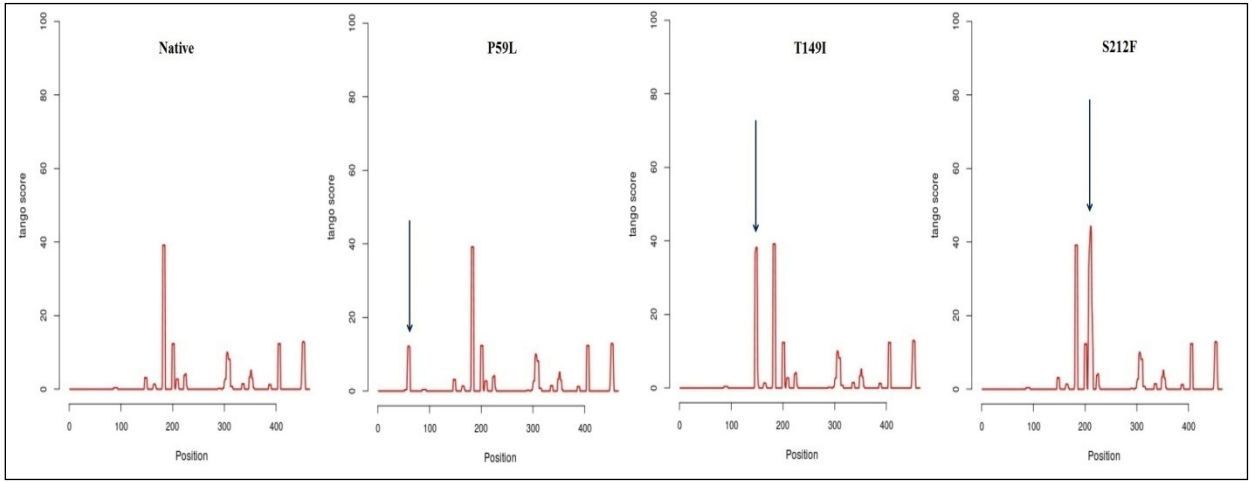
model. **(C)** Native glutamine residue (green colour) at position 70 and line model of the surrounding residues (blue colour). **(D)** Substitution of lysine at position 70 results in conformational changes that bring two amino acids, Cys457 and Cys467 (pink colour), within the surrounding range of 4 Å.

Figure S7: Modelling of the mutant protein structure (A188T) with PDB ID 1V4S using Swiss-PDB Viewer. The surrounding amino acid residue changes (within a range of 4 Å from the point mutation) were analysed using PyMol. **(A)** Superimposition of the native (sky blue) and mutant (A188T) structures (bright orange) of the GCK protein (1V4S), which were visualised as cartoons using PyMol. **(B)** Close-up view of the superimposed native Ala188 (Green colour) and substituted amino acid Thr70 (red colour) as a stick model. **(C)** Native Ala residue (green colour) at position 188 and line model of its surrounding residues (blue colour). **(D)** Substitution of threonine at position 188 results in conformational changes that bring one additional amino acid, Glu120 (pink colour), within the surrounding range of 4 Å.

Figure S8: Modelling of the mutant protein structure (W257R) with PDB ID 1V4S using Swiss-PDB Viewer. The surrounding amino acid residue changes (within a range of 4 Å from the mutational point) were analysed using PyMol. **(A)** Superimposition of the native and mutant (W257R) structures of the GCK protein (1V4S), which were visualised as cartoons using PyMol. **(B)** Close-up view of the superimposed native Trp257 (green colour) and substituted amino acid Arg257 (red colour) as a stick model. **(C)** Native Trp residue (green colour) at position 257 and line model of the surrounding amino acids (blue colour). **(D)** Substitution of arginine at position 257 results in conformational changes that bring two additional amino acid residues, Ile225 and Val226 (pink colour), within

the surrounding range of 4 Å and remove four amino acids (Cys382, Gly385, Leu386, and Val389 (pink colour)) from the surrounding range.

Figure S1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S212F
tango score
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40
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80
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0
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200
300
400

Figure S2

Figure S3

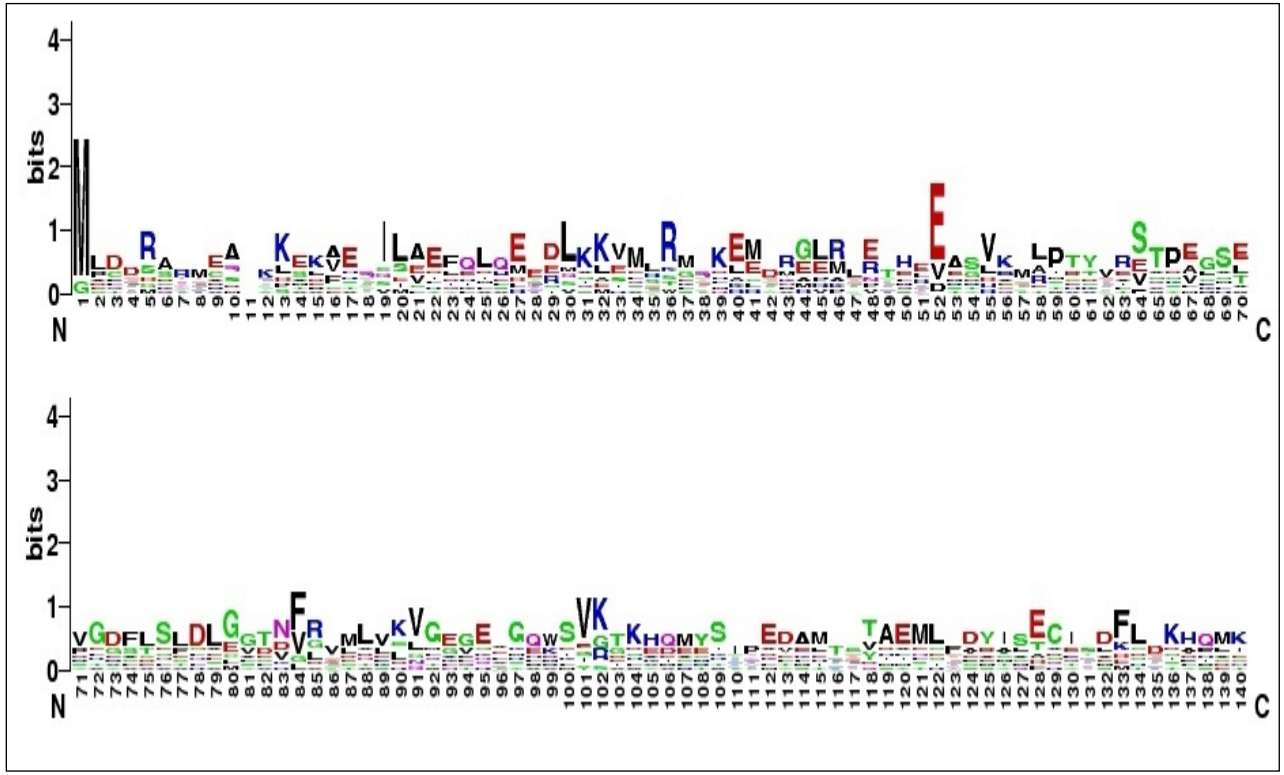


Figure S4

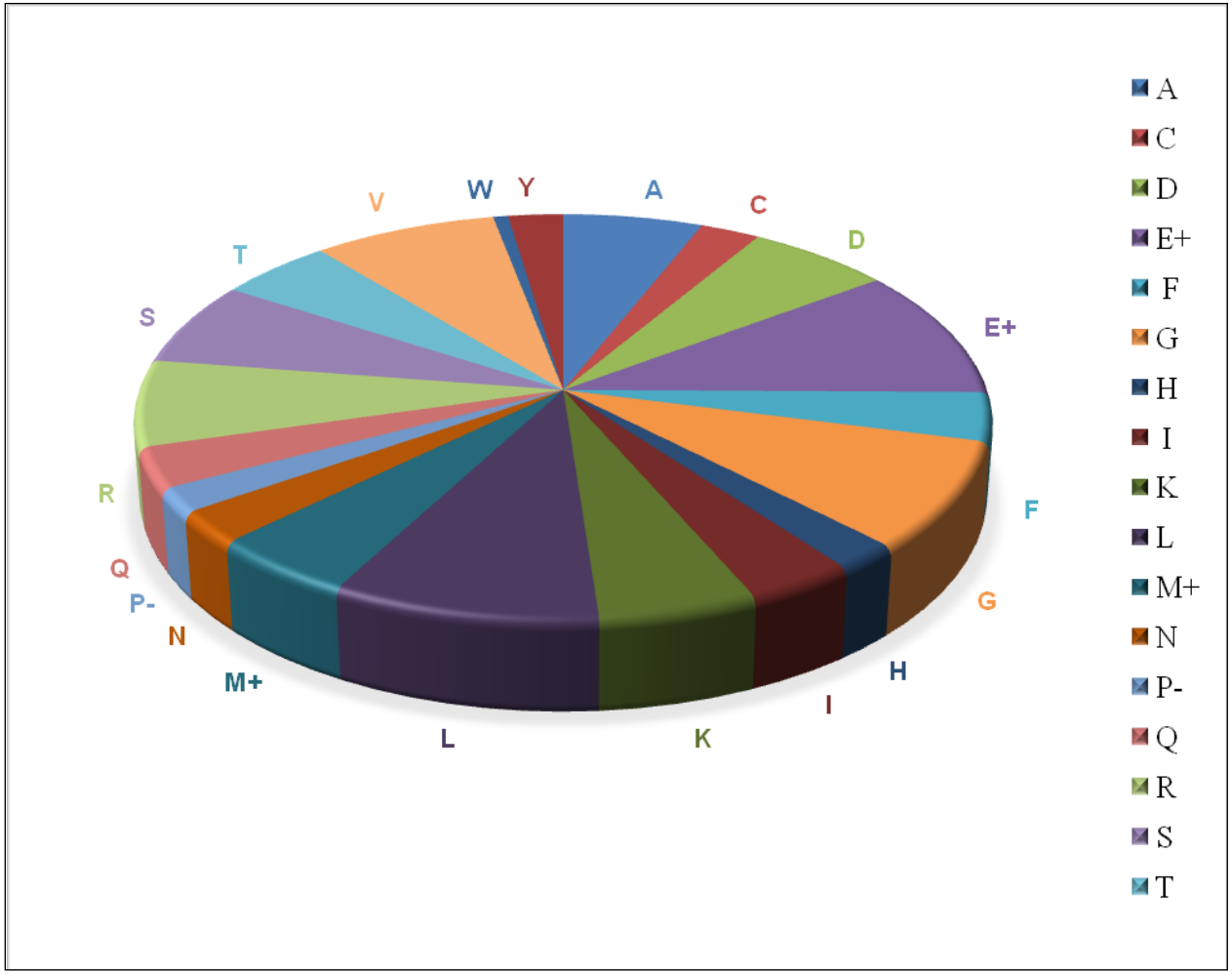


Figure S5

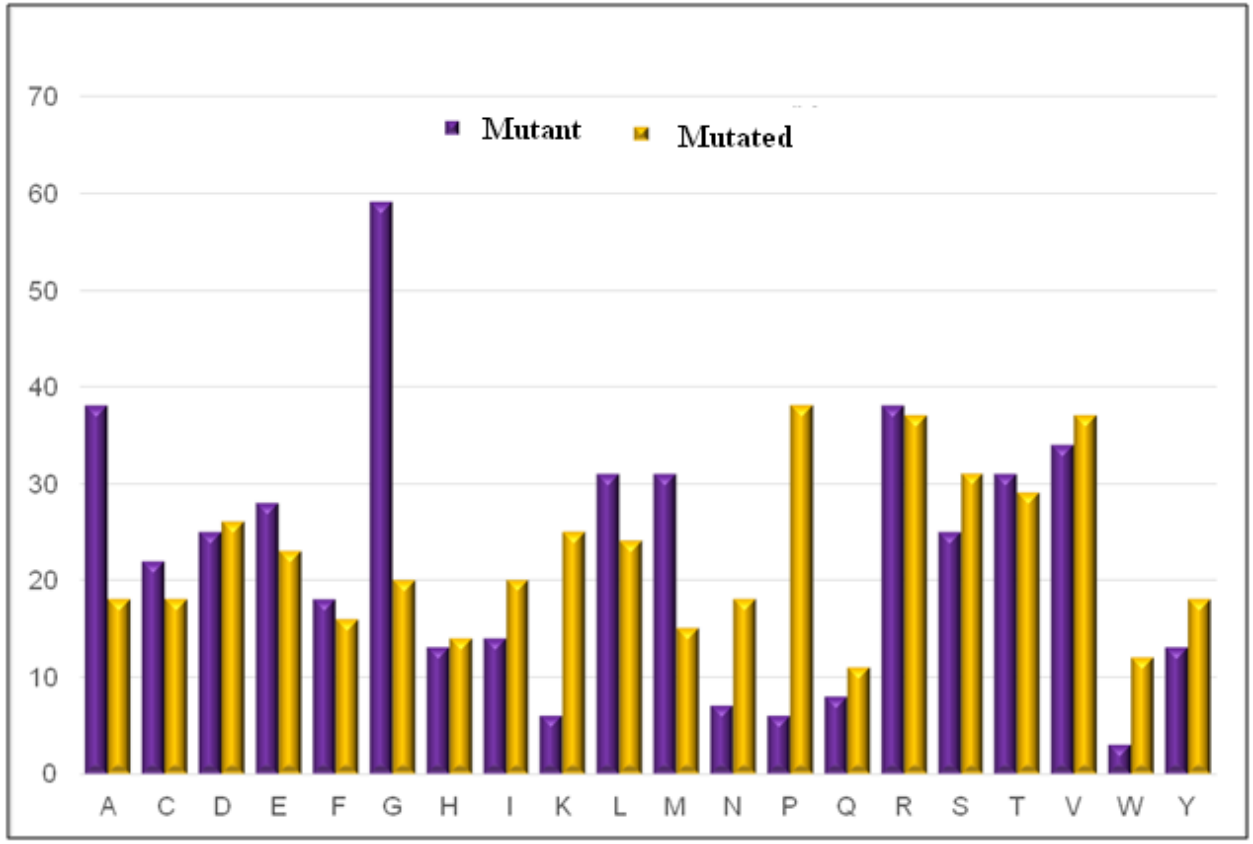
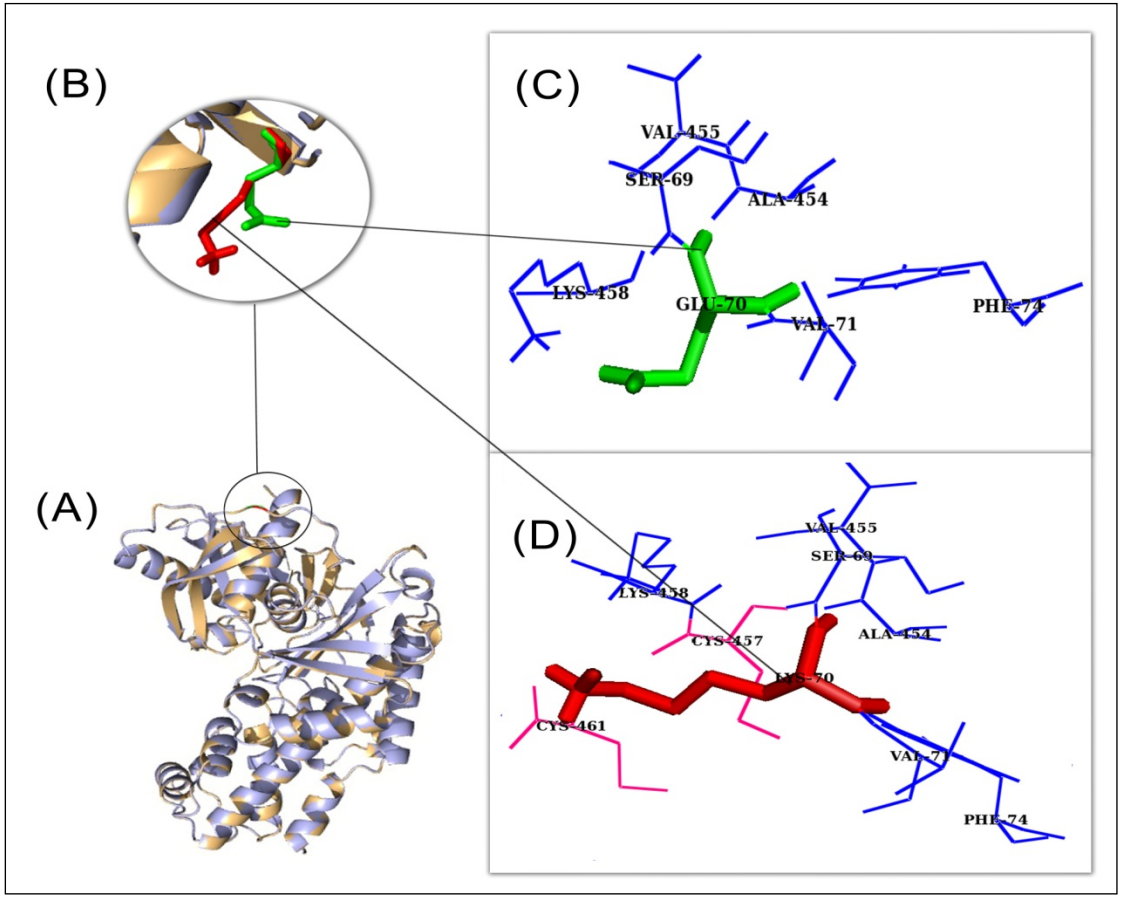


Figure S6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LYS-458
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VAL-71
PHE-74
(A)
(D)
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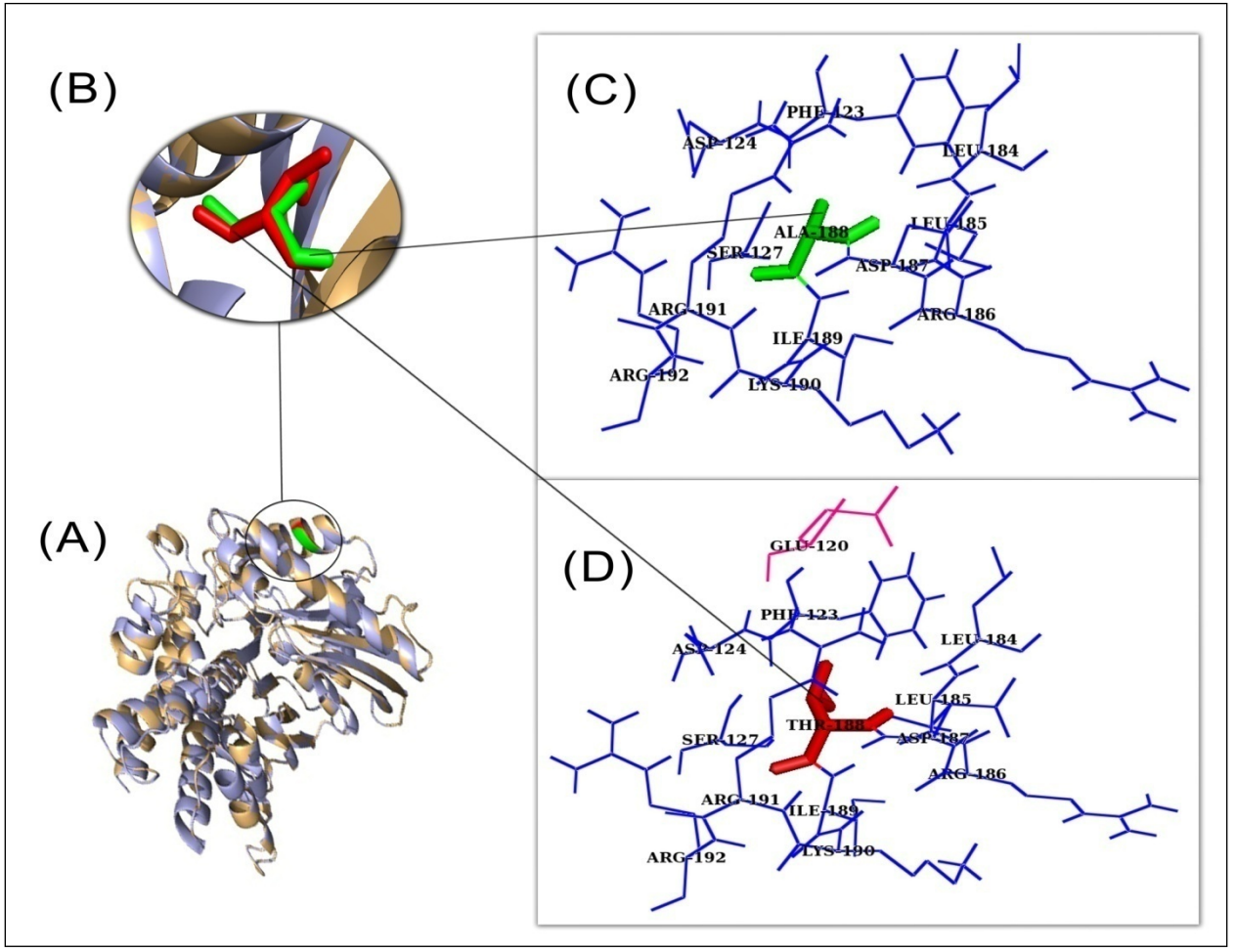
SER-69
LYS-458
CYS-457
ALA-454
LYS-70
CYS-461
VAL-71
PHE-74

Figure S7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(A)
(D)
GLU-120
PHE-123
LEU-184
ASP-124
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THR-188
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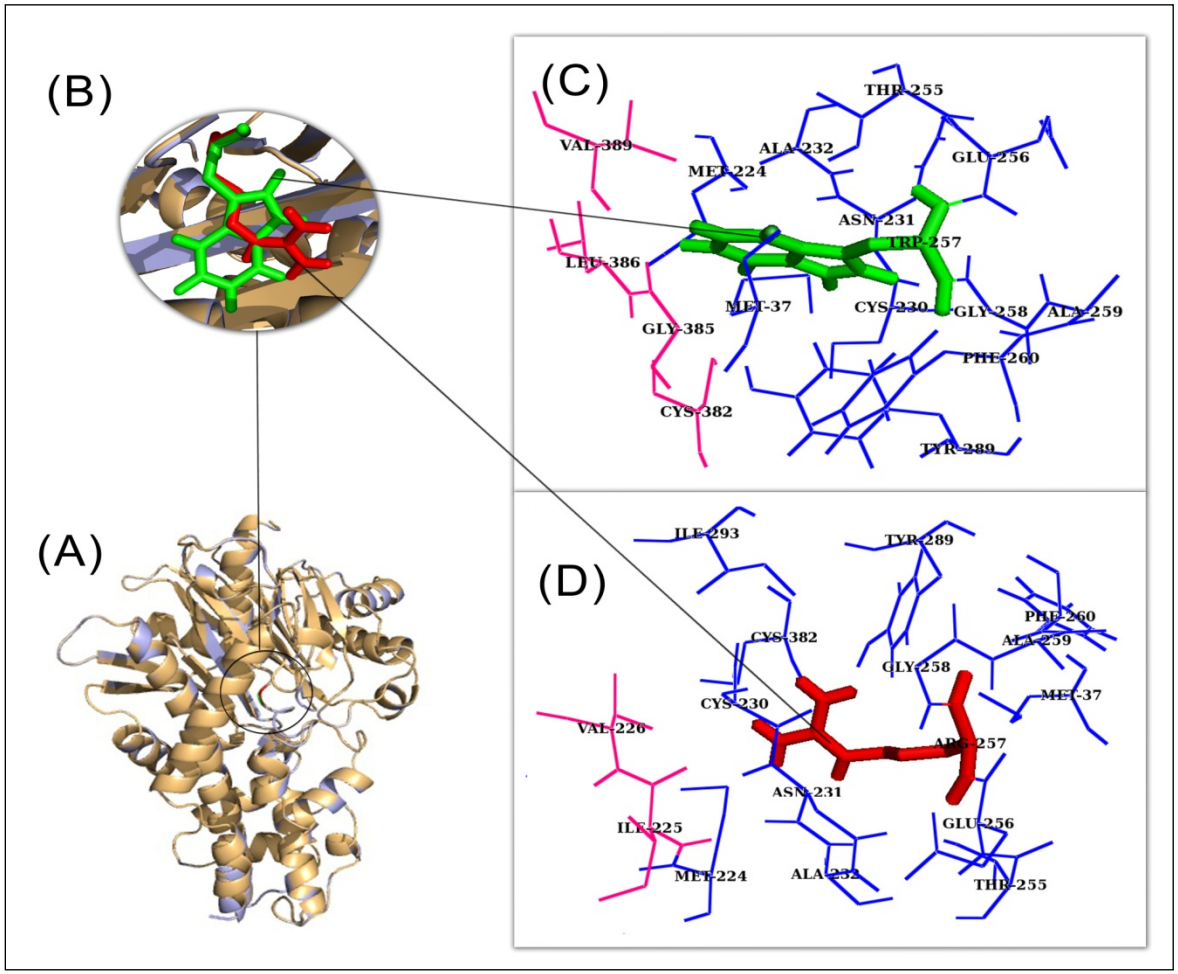
ARG-191
ILE-189
ARG-192
LYS-190

Figure S8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CYS-382
TYR-289
(A)
(D)
ILE-293
TYR-289
PHE-260
CYS-382
ALA-259
GLY-258
MET-37
CYS-230
VAL-226
ASN-231
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GLU-256
MET-224
ALA-232
THR-255

Supplementary Material:Table Information

Table S1. Summary of the nsSNPs in GCK. The scores obtained from the various *in silico* prediction methods and the ranking systems are shown.

Table S2. Biophysical characterisation of nsSNPs in the *GCK* gene by Align GVGD.

Table S3. Molecular phenotyping of nsSNPs in GCK by SNPeffect 4.0.

Table S4. Characterisation of functional SNPs and FS scores by F-SNP.

Table S5. Homologous protein sequences utilised in the MUSCLE analysis of the GCK protein.

Table S1. Summary of the nsSNPs in GCK. The scores obtained from the various *in silico* prediction methods and the ranking systems are shown.

S.No	IDs	Variants	SIFT	PolyPhen 2	PhD-SNP	PopMusic 2.0	SNAP	SNPs&GO	FATHMM	I-Mutant 3	D Mutant	Rank
1	CM096802	M1I	0.05	0.525	N	NA	N	D	-5.44	-0.27	NA	2
2	VAR_003692	D4N	0.49	0	N	NA	N	D	-5.55	-0.56	NA	3
3	CM052879	M8I	0.25	0.525	N	NA	NN	D	-5.48	0	NA	2
4	VAR_010583	A11T	0.73	0.002	N	NA	N	D	-5.59	-0.61	NA	3
5	**CM074236**	**V16E**	0	0.995	D	1.7	NN	D	-6.97	-1.22	1.55	1
6	rs113565983	E17G	0.11	0.176	N	0.71	N	D	-7.23	-1.53	1.14	3
7	**CM074221**	**I19N**	0.28	1	D	2.16	NN	D	-6.77	-1.76	2.41	1
8	rs193922308	I19M	0.2	1	N	0.85	N	D	-6.73	-0.94	0.4	2
9	**CM074228**	**L20P**	0.03	1	D	3.52	NN	D	-6.86	-1.2	3.8	1
10	**CM096803**	**F23V**	0.02	0.972	D	2.91	NN	D	-6.9	-0.02	3.08	1
11	**rs193922325**	**L25R**	0	1	D	1.45	NN	D	-6.94	-0.44	1.1	1
12	CM096804	E28K	0.18	0.022	D	0.59	N	D	-6.9	-0.72	0.33	2
13	**CM032900**	**L30P**	0	1	D	3.4	NN	D	-8.14	-0.5	3.53	1
14	**CM087911**	**V33A**	0	0.888	D	1.69	N	D	-6.9	-0.05	1.42	1
15	**CM096805**	**R36Q**	0.04	1	N	0.33	N	D	-6.69	0.03	2.22	1
16	**VAR_010584**	**R36W**	0	1	D	0.39	NN	D	-6.79	0.48	0.35	1
17	rs193922261	R36P	0.02	1	D	1.95	NN	D	-6.77	0.07	-1.57	2
18	**CM096806**	**M37R**	0	0.993	D	1.42	NN	D	-6.74	0.05	1.51	1
19	CM012104	Q38P	0.28	0.995	D	2.25	N	D	-7.17	-1.25	2.14	2
20	**CM030440**	**E40K**	0.04	1	D	0.99	NN	D	-7.44	-0.52	0.8	1
21	**CM096807**	**M41T**	0	0.997	D	2.67	NN	D	-7.51	0.05	1.85	1
22	**CM096810**	**R43P**	0.01	1	D	1.79	NN	D	-6.76	-0.43	2.75	1
23	**CM074225**	**R43S**	0.01	1	D	1.13	N	D	-6.7	-0.43	1.13	1

24	**CM096808**	**R43G**	0.01	1	D	2.08	N	D	-6.74	-0.76	1.89	1
25	CM020439	R43H	0.01	1	N	0.77	N	D	-6.75	-0.72	1.05	2
26	CM096809	R43C	0	1	N	1.8	N	D	-6.78	-0.36	2.41	2
27	**CM013265**	**G44S**	0	1	D	0.76	NN	D	-7.36	-1.96	0.31	1
28	**CM096811**	**G44C**	0	1	D	0.29	NN	D	-7.45	-1.97	1.95	1
29	**rs193922279**	**G44D**	0	1	D	1.08	NN	D	-7.43	-2	-0.96	1
30	**rs193922286**	**T49N**	0.01	1	D	0.76	N	D	-7.25	-1.97	0.04	1
31	**CM096812**	**H50L**	0.02	0.99	D	0.1	NN	D	-7.22	0.51	-0.91	1
32	CM012106	H50Y	0.01	0.998	N	0.01	NN	D	-7.23	0.16	-1.53	2
33	CM012105	H50R	0.14	0.979	N	0.84	NN	D	-7.18	0.05	-2.67	2
34	**CM096813**	**A53V**	0.04	1	D	0.89	NN	D	-7.27	-0.85	0.04	1
35	VAR_010585	A53S	0.14	0.999	N	0.45	N	D	-6.98	-1.22	-0.43	2
36	**CM096814**	**M57R**	0.06	1	D	1.55	NN	D	-7.43	-0.3	0.94	1
37	**CM096815**	**P59L**	0.12	1	D	1.39	N	D	-7.21	0.43	1.34	1
38	rs193922287	P59S	0.03	1	D	1.46	NN	D	-7.16	-0.53	-2	2
39	**CM082777**	**T60I**	0	1	D	0.76	NN	D	-6.9	-0.66	-2.64	1
40	**CM074238**	**Y61S**	0	1	D	2.15	NN	D	-6.8	-0.33	3.03	1
41	**CM051044**	**V62M**	0	1	D	0.93	NN	D	-7.25	-0.34	0.1	1
42	**CM984183**	**V62A**	0	1	D	1.54	NN	D	-7.24	-0.45	2.21	1
43	**CM082786**	**S64Y**	0.04	1	N	0.05	NN	D	-7.33	-1.58	-3.04	1
44	CM032901	T65I	0.37	0.999	N	0.05	N	D	-6.61	0.03	-0.19	3
45	**CM077934**	**G68V**	0	1	D	0.62	NN	D	-8.37	-0.33	-0.57	1
46	**CM096816**	**G68D**	0	1	D	1.13	NN	D	-8.37	-0.66	-0.22	1
47	**CM081274**	**E70D**	0	0.965	D	0.27	NN	D	-7.66	-0.52	-0.09	1
48	**VAR_003693**	**E70K**	0	0.997	D	0.16	NN	D	-7.69	-0.7	-0.35	1
49	CM096817	V71I	0.26	0.929	N	0.31	N	D	-6.65	0.44	-0.11	3
50	**rs193922289**	**G72R**	0	1	D	1.73	NN	D	-8.37	-0.14	-0.83	1
51	CM012107	D73G	0.06	1	D	1.11	N	D	-6.86	-0.97	0.24	2
52	**CM086540**	**S76Y**	0	0.998	D	-0.96	NN	D	-7.22	-0.39	-3.28	1
53	CM096818	S76F	0	0.994	N	-0.8	NN	D	-7.22	0.03	-2.68	2

54	**CM074229**	**L77P**	0	1	N	5.32	NN	D	-7.82	-1.43	4.78	1
55	**CM096819**	**D78G**	0	1	D	1.08	NN	D	-8.12	-2.27	0.74	1
56	**CM032902**	**D78E**	0	0.999	D	1.06	NN	D	-8.01	-1.01	-1.23	1
57	**CM032903**	**D78H**	0	1	D	-0.36	NN	D	-8.15	-1.52	-0.2	1
58	**CM074234**	**G80D**	0	1	D	2.16	NN	D	-9.53	-1.04	1.9	1
59	**VAR_003695**	**G80S**	0	1	D	1.59	NN	D	-9.51	-1.24	0.07	1
60	**VAR_003694**	**G80A**	0	1	D	1.78	NN	D	-9.51	-1.52	-0.5	1
61	**CM012108**	**G81S**	0	1	D	0.51	NN	D	-9.17	-2.03	-0.63	1
62	**CM074219**	**T82I**	0	0.999	D	0.2	NN	D	-8.13	-0.22	-1.01	1
63	**rs193922290**	**R85W**	0	1	D	0.48	NN	D	-8.44	-0.88	-1.78	1
64	CM032904	W99R	0.88	0.918	N	0.77	NN	D	-7.02	-0.57	0.46	2
65	CM093651	W99L	0.21	0.998	D	0.68	N	D	-7.02	-0.67	0.51	2
66	**CM032905**	**V101M**	0.02	0.975	D	0.8	N	D	-6.89	-0.41	0.07	1
67	CM096820	T103I	0.06	1	D	0.16	N	D	-7.14	-0.92	0.28	2
68	CM012109	T103N	0	0.999	N	0.69	N	D	-7.23	-1.78	-0.71	2
69	**CM082778**	**Q106P**	0.02	0.805	D	1.52	N	D	-6.73	-0.85	0.05	1
70	VAR_003696	M107T	0.03	0.068	N	-0.08	N	D	-6.55	-2.1	0.02	2
71	**CM021265**	**Y108C**	0	1	D	2.43	NN	D	-7.12	-1.68	1.95	1
72	**CM032906**	**Y108F**	0.18	0.996	N	0.57	NN	D	-6.93	-1.48	3.1	1
73	**VAR_010586**	**Y108H**	0	1	D	2.05	NN	D	-7.1	-1.86	1.29	1
74	rs193922292	Y108D	0	1	D	3.57	NN	D	-7.11	-1.35	-0.43	2
75	**VAR_012352**	**I110T**	0.05	0.999	D	1.75	NN	D	-6.95	-1.44	1.5	1
76	**CM032908**	**P111L**	0	0.975	D	2.29	NN	D	-7.12	-0.26	-0.36	1
77	CM074231	T116P	0.23	0.994	D	0.22	N	D	-6.73	-0.49	0.65	2
78	**CM096821**	**T118I**	0	0.999	D	1.01	NN	D	-7.37	-0.28	-0.34	1
79	**VAR_012353**	**A119D**	0	1	D	1.32	NN	D	-6.66	0.07	1.32	1
80	**CM052881**	**L122P**	0	1	D	2.86	NN	D	-8.18	-0.42	1.53	1
81	**CM096822**	**L122F**	0	1	D	0.49	NN	D	-7.97	0.16	4.56	1
82	**CM012110**	**L122V**	0	0.989	D	1.16	NN	D	-8.1	-0.42	-2.04	1
83	**CM081279**	**F123L**	0	0.999	D	1.74	NN	D	-8.15	0.46	2.16	1

84	**CM096824**	**D124H**	0	1	D	0.36	NN	D	-7.11	-0.21	0.25	1
85	**CM096823**	**D124N**	0	1	D	0.36	N	D	-7.05	-0.52	-0.25	1
86	**CM096825**	**Y125C**	0	1	D	2.39	NN	D	-6.86	-0.23	1.74	1
87	**CM012111**	**C129Y**	0	1	D	0.76	NN	D	-6.79	-1.34	1.33	1
88	**CM096826**	**C129F**	0	1	D	0.85	NN	D	-6.78	-1.1	1.35	1
89	**CM096827**	**I130N**	0	0.981	D	3.37	NN	D	-7.61	-1.1	4.55	1
90	**CM032909**	**I130T**	0	0.691	D	2.87	N	D	-7.58	-0.82	3.42	1
91	**VAR_003697**	**S131P**	0.03	1	D	1.4	NN	D	-6.74	0.2	0.68	1
92	CM081273	D132N	0.68	0.024	N	0.33	N	D	-7.2	0.14	0.12	3
93	**CM012112**	**L134P**	0	1	D	2.99	NN	D	-6.94	-0.79	3.65	1
94	CM081276	H137D	0.13	0.367	D	1.92	NN	D	-7.22	-0.67	0.66	2
95	VAR_010587	H137R	0.31	0.278	D	1.23	NN	D	-7.18	-0.18	0.35	2
96	CM012113	Q138P	0.08	0.062	N	0.22	N	D	-7.15	-0.23	1.39	3
97	rs150779253	P145S	0	1	N	1.26	N	D	-7.35	-2.25	0.78	2
98	**CM068315**	**L146R**	0	0.999	D	2.5	NN	D	-7.27	-0.06	4.3	1
99	**CM096828**	**L146P**	0	1	D	4.55	NN	D	-7.28	-0.32	5.21	1
100	**rs193922296**	**G147D**	0	1	D	2.31	NN	D	-9.22	-0.58	1.02	1
101	CM096829	F148I	0	1	D	1.07	N	D	-7.76	0.08	2.3	2
102	**CM984217**	**T149I**	0	1	D	0.28	NN	D	-7.92	-2.28	1.08	1
103	**CM032910**	**T149P**	0	1	D	3.17	NN	D	-7.94	-2.05	-2.07	1
104	**CM030442**	**F150L**	0	1	D	1.25	NN	D	-8.42	-0.07	2.41	1
105	**CM097114**	**F150Y**	0	1	D	1.17	NN	D	-8.42	-0.18	6.63	1
106	**VAR_010588**	**F150S**	0	1	D	3.96	NN	D	-8.53	0.24	1.8	1
107	**CM097115**	**S151P**	0	1	D	0.9	NN	D	-8.16	-0.45	0.06	1
108	**CM064011**	**F152L**	0	1	D	1.17	NN	D	-7.9	-1.24	1.73	1
109	**CM096830**	**F152I**	0	1	D	1.04	NN	D	-7.92	-0.61	1.91	1
110	**rs193922300**	**P153S**	0	1	D	1.84	NN	D	-9.16	-1.89	0.92	1
111	**CM097171**	**R155T**	0.22	0.999	N	0.4	N	D	-6.63	-0.25	1.42	1
112	rs193922301	R155G	0.03	0.999	D	1.73	N	D	-6.7	-0.93	0.61	2
113	**CM096831**	**H156D**	0.01	1	D	1.8	NN	D	-6.58	-0.13	0.93	1

114	**CM032911**	**H156Y**	0	1	D	0.44	NN	D	-6.65	0.31	-3.51	1
115	CM012114	E157K	0.82	1	D	0.09	N	D	-6.62	-0.23	-0.23	2
116	CM020440	D158A	0.1	0.934	N	0.71	N	D	-7.14	-1.19	-0.21	2
117	CM096832	D160N	0.73	1	N	-0.05	N	D	-6.62	-0.31	-0.13	2
118	CM096833	D160E	0.25	0.996	N	0.83	N	D	-6.78	0.15	-0.13	3
119	CM032574	K161N	0.13	1	N	0.38	N	D	-7.17	-0.04	0.38	2
120	**CM081277**	**G162D**	0	1	D	1.4	NN	D	-8.4	-0.18	0.24	1
121	**CM096834**	**G162S**	0.09	1	D	0.57	NN	D	-8.3	-0.3	1.16	1
122	**CM082779**	**L164F**	0	1	D	0.33	NN	D	-7.84	-0.27	2.32	1
123	**VAR_012350**	**L164P**	0	1	D	0.96	NN	D	-7.88	-0.28	-0.3	1
124	HM060571	L165F	0.06	0.994	D	0.82	N	D	-6.85	-0.9	-0.27	2
125	**CM081275**	**T168A**	0	0.999	D	1.87	NN	D	-7.53	-1.2	0.19	1
126	**CM096835**	**T168I**	0	1	D	0.48	NN	D	-7.59	-0.42	0.52	1
127	**VAR_010589**	**T168P**	0	1	D	1.96	NN	D	-7.61	-0.8	-0.89	1
128	**CM012115**	**K169N**	0	1	D	0.04	NN	D	-8.14	-1.93	-0.11	1
129	**CM091669**	**G170D**	0	1	D	1.44	NN	D	-7.46	-0.32	-0.37	1
130	**CM096836**	**G170S**	0	1	D	1.77	N	D	-7.44	-1.23	-0.09	1
131	**rs193922303**	**G170V**	0	1	D	2.11	NN	D	-7.48	0.09	-0.55	1
132	**CM032575**	**F171L**	0	0.999	D	1.84	NN	D	-8.19	-1.5	1.62	1
133	**CM096837**	**F171C**	0	1	D	2.31	NN	D	-8.36	-1.95	2.66	1
134	CM012116	A173S	0.06	0.997	D	0.99	N	D	-6.73	-1.99	0.5	2
135	**CM096838**	**S174L**	0	1	D	0.86	N	D	-7.33	-0.58	-1.13	1
136	**CM012117**	**G175E**	0	1	D	1.9	NN	D	-7.24	-0.06	-1.08	1
137	**CM097281**	**G175R**	0	1	D	1.69	NN	D	-7.34	-0.2	NA	1
138	**CM090144**	**G175A**	0	0.999	D	1.65	N	D	-7.35	-0.55	-0.28	1
139	**CM015224**	**G175V**	0	1	D	2.25	NN	D	-7.41	0.29	-0.57	1
140	**VAR_003698**	**G175R**	0	1	D	1.69	NN	D	-7.34	-0.2	-1.49	1
141	**CM020441**	**A176S**	0.01	0.998	D	0.81	N	D	-6.73	-0.81	0.49	1
142	**CM096839**	**A176T**	0.03	1	N	0.8	N	D	-6.69	-0.57	0.96	1
143	rs193922304	A176G	0.01	0.999	D	1.83	N	D	-6.76	-1.45	-0.11	2

144	**CM052882**	**G178E**	0.02	1	D	1.99	NN	D	-7.23	-2.07	-0.74	1
145	**CM096840**	**G178V**	0	1	D	2.33	NN	D	-7.27	-1.07	-0.04	1
146	**rs193922305**	**G178R**	0	1	D	1.78	NN	D	-7.27	-1.85	-0.75	1
147	**CM096841**	**N180S**	0.01	0.996	D	0.41	NN	D	-7.19	-0.71	0.12	1
148	**CM004390**	**N180K**	0	1	D	0.81	NN	D	-7.22	-0.58	-0.33	1
149	**rs193922306**	**V181A**	0	0.142	D	2.08	NN	D	-7.32	-1.09	2.14	1
150	**CM096842**	**V182G**	0.07	1	D	2.11	NN	D	-7.03	-2.72	3.01	1
151	**CM074227**	**V182L**	0	0.991	D	0.91	NN	D	-6.99	-0.91	-0.08	1
152	**VAR_003699**	**V182M**	0	1	D	1.02	NN	D	-7.06	-1.49	-1	1
153	CM032912	R186Q	0.03	1	N	0.29	N	D	-6.62	-1.46	0.56	2
154	**CM074220**	**D187Y**	0	1	D	0.19	N	D	-6.84	-0.44	-1.26	1
155	**CM096843**	**A188P**	0	1	D	2.46	NN	D	-6.94	-0.07	1.77	1
156	**VAR_003700**	**A188T**	0	1	D	1.48	NN	D	-6.9	-0.19	-0.01	1
157	**rs193922307**	**A188V**	0	1	D	0.94	NN	D	-6.92	0.37	-0.64	1
158	**CM096844**	**I189T**	0	0.999	D	2.51	N	D	-7.02	-0.84	1.87	1
159	**CM012120**	**R191Q**	0	1	D	0.46	NN	D	-6.91	-0.53	0.07	1
160	**CM096845**	**R191L**	0	0.998	D	0.17	NN	D	-6.95	0.04	0.55	1
161	**CM001170**	**R191W**	0	1	D	0.57	NN	D	-6.99	-0.06	-0.95	1
162	**CM012121**	**G193R**	0.03	1	D	0.98	NN	D	-7.39	0	-1.02	1
163	rs193922309	E196G	0.05	1	D	0.57	N	D	-7.17	-1.41	0.64	2
164	**CM096846**	**M197K**	0	0.988	D	2.72	NN	D	-7.23	-1.35	1.7	1
165	CM093652	M197I	1	0.972	N	0.26	N	D	-6.93	-0.49	-1.67	2
166	CM096847	V199L	0.04	0.995	D	0.47	N	D	-7.11	0.26	-0.91	2
167	CM074235	V200L	0.12	0.987	D	1.55	N	D	-6.87	-1.14	-0.28	2
168	**CM096848**	**A201S**	0.01	0.999	D	1.04	N	D	-7.3	-1.91	0.8	1
169	**CM064009**	**M202R**	0	1	D	1.85	NN	D	-7.29	-0.82	2.26	1
170	**rs193922311**	**M202T**	0.01	0.999	D	2.31	NN	D	-7.28	-1.12	-0.38	1
171	rs193922310	M202V	0.91	0.997	D	0.96	N	D	-7.01	-0.80	1.85	2
172	**VAR_003701**	**V203A**	0.01	0.757	D	2.97	NN	D	-7.02	-3.09	2.63	1
173	**CM097116**	**D205Y**	0	1	D	0.92	NN	D	-8.41	-0.86	0.03	1

174	**CM096849**	**D205N**	0	1	D	0.76	NN	D	-8.31	-1.49	-0.66	1
175	**rs193922312**	**D205E**	0	1	D	1.32	NN	D	-8.3	-1.12	-4.55	1
176	**CM023384**	**T206R**	0	1	D	1.09	NN	D	-7.97	-0.8	0.9	1
177	**CM076211**	**T206P**	0	1	D	1.89	NN	D	-7.97	-1.3	1.06	1
178	**CM096850**	**T206K**	0	1	D	1.86	NN	D	-7.97	-1.26	1.29	1
179	**CM012122**	**T206M**	0	1	D	0.27	NN	D	-7.98	-0.67	-0.47	1
180	**CM096851**	**V207E**	0.01	1	D	2.99	NN	D	-7.25	-0.93	3.64	1
181	**CM096852**	**A208V**	0	1	D	0.15	NN	D	-6.67	-1.07	1.11	1
182	**CM068316**	**A208T**	0	1	D	1.11	NN	D	-6.66	-2.42	-1.22	1
183	**CM082783**	**A208P**	0	1	D	2.22	NN	D	-6.68	-2.25	-0.16	1
184	**CM096853**	**T209R**	0	1	D	0.51	NN	D	-7.6	-0.34	-0.55	1
185	**VAR_010590**	**T209M**	0	1	D	0.01	NN	D	-7.61	-0.06	-1.21	1
186	**CM096854**	**M210V**	0.01	0.997	D	1.52	NN	D	-6.74	-0.53	2.21	1
187	**VAR_012351**	**M210K**	0	1	D	2.31	NN	D	-6.83	-1.14	0.11	1
188	**VAR_010591**	**M210T**	0	0.999	D	2.59	NN	D	-6.81	-0.98	1.44	1
189	**rs193922313**	**M210I**	0.04	0.994	D	0.98	NN	D	-6.73	-0.38	-0.69	1
190	**rs150077934**	**S212F**	0	1	N	0.27	NN	D	-7.36	-0.27	-0.52	1
191	**CM082788**	**C213Y**	0	1	D	0.18	NN	D	-6.78	-0.43	0.96	1
192	**VAR_010592**	**C213R**	0	1	D	0.68	NN	D	-6.71	-0.41	0.91	1
193	**rs104894015**	**Y214C**	0.04	1	D	1.92	N	D	-7.17	-1.97	1.09	1
194	**CM096856**	**D217E**	0.41	0.999	D	1.53	N	D	-7.34	-0.6	0.19	1
195	CM077742	D217V	0	1	D	0.63	NN	D	-7.43	-0.39	-0.25	2
196	rs147065275	D217N	0.9	1	N	0.35	N	D	-7.3	-1.05	-1.07	2
197	**rs193922316**	**C220Y**	0	0.998	D	1.4	NN	D	-6.62	-0.60	1.12	1
198	**rs193922315**	**C220R**	0.02	0.073	D	2.58	NN	D	-6.6	-0.40	1.41	1
199	VAR_003702	E221K	0.54	1	N	0.51	N	D	-6.41	-1.22	0.25	2
200	**CM096857**	**G223R**	0	1	D	0.42	NN	D	-8.26	0.08	0.06	1
201	**CM096858**	**G223V**	0	1	D	-0.54	NN	D	-8.26	0.32	4.02	1
202	**CM012123**	**G223S**	0	1	D	0.5	NN	D	-8.23	-0.31	-1.88	1
203	**CM012124**	**M224T**	0	0.905	N	2.01	N	D	-6.36	-0.12	1.86	1

204	CM074222	M224R	0	0.962	D	1.94	NN	D	-6.4	0.2	2.27	2
205	**CM020444**	**I225F**	0	1	D	1.12	NN	D	-7.84	0.03	0.84	1
206	**CM012125**	**I225M**	0	1	D	1.05	NN	D	-7.84	-0.1	-0.95	1
207	**VAR_003703**	**V226M**	0	1	D	1.29	NN	D	-7.18	-0.95	2.15	1
208	rs193922319	V226A	0.12	0.999	N	3.34	NN	D	-7.17	-1.63	-0.19	2
209	**CM074233**	**G227S**	0	0.999	D	1.32	NN	D	-9.29	-0.8	-2.02	1
210	**CM096859**	**G227R**	0	1	D	1.36	NN	D	-9.32	-0.24	-0.47	1
211	**VAR_003704**	**G227C**	0	1	D	0.62	NN	D	-9.32	-0.71	-2.32	1
212	**CM096860**	**T228K**	0	0.991	D	0.74	NN	D	-8.07	-0.68	0.31	1
213	**CM032576**	**T228A**	0	0.548	D	0.61	NN	D	-8.02	-1.11	-0.56	1
214	**CM032577**	**T228R**	0	1	D	0.57	NN	D	-8.07	-0.27	-0.03	1
215	**VAR_003705**	**T228M**	0	1	D	0.61	NN	D	-8.08	-0.01	-0.68	1
216	**CM096862**	**G229D**	0	1	D	1.07	NN	D	-9.65	-1.33	-0.19	1
217	**CM096861**	**G229V**	0	1	D	-0.03	NN	D	-9.66	-1.06	-1.02	1
218	**CM086541**	**N231S**	0	1	D	1.04	NN	D	-8.5	-0.33	0.14	1
219	**CM064010**	**N231H**	0	1	D	0.25	NN	D	-8.53	-0.63	-1.2	1
220	**CM058211**	**A232D**	0	0.99	D	2.63	NN	D	-6.81	-0.94	1.5	1
221	**rs193922322**	**A232T**	0	0.191	D	1.03	NN	D	-6.77	-0.36	-0.2	1
222	**CM074230**	**C233R**	0	0.731	D	2.8	NN	D	-7.39	-0.56	3.17	1
223	**CM096863**	**C233S**	0	0.997	D	2.55	N	D	-7.28	-1.23	4.31	1
224	**CM096864**	**Y234H**	0	0.995	D	2.39	NN	D	-7.43	-1.13	3.82	1
225	**CM070147**	**M235V**	0.5	0.053	N	0.99	NN	D	-6.42	0.25	0.29	1
226	CM096865	M235R	0	0.809	D	1.27	N	D	-6.57	0.14	0.97	2
227	rs193922323	M235T	0	0.754	D	1.61	N	D	-6.53	-0.17	-0.11	3
228	**CM096866**	**E236K**	0	0.919	D	0.91	NN	D	-6.94	0.42	-0.07	1
229	CM045539	E237K	1	0.973	D	0.62	N	D	-6.96	-0.16	-0.34	2
230	CM015312	Q239R	0.74	0	N	0.07	N	D	-6.96	-0.05	-1.23	3
231	CM096867	N240T	0.12	0.002	N	0.59	N	D	-6.42	-0.28	-0.54	2
232	CM096868	N240I	0.01	0.938	D	1.29	N	D	-6.47	0.53	-0.06	3
233	CM096869	V241A	0.28	0.936	D	2.21	N	D	-7.18	-1.25	1.19	2

234	**CM096870**	**V244G**	0.03	0.953	D	1.74	NN	D	-6.52	-2.44	1.28	1
235	**CM096871**	**V244E**	0.02	0.829	D	1.62	NN	D	-6.53	-1.43	1.68	1
236	**CM096872**	**G246R**	0.02	0.985	D	2.38	NN	D	-6.62	-0.12	-0.01	1
237	CM082784	G246E	0.06	0.054	D	2.2	NN	D	-6.53	-0.36	-1.14	2
238	CM032915	E248K	0.77	0.738	D	-0.09	N	D	-6.36	-0.43	-0.42	2
239	CM096873	G249S	0.23	0.943	D	1.23	N	D	-6.33	-0.6	-0.25	2
240	CM096874	G249A	0.24	0.992	D	0.97	N	D	-6.36	-0.36	-0.2	2
241	**CM070148**	**R250C**	0.01	1	D	1.31	N	D	-6.55	-0.17	0.55	1
242	CM097117	R250P	0.03	0.998	D	1.97	N	D	-6.47	0.07	2.27	2
243	**CM012126**	**M251I**	0.03	0.979	D	0.01	NN	D	-6.61	-0.05	0.23	1
244	**CM096875**	**M251K**	0	0.991	D	2.62	N	D	-6.61	-0.49	1.71	1
245	**CM030443**	**M251V**	0.67	0.978	D	0.49	N	D	-6.56	-0.06	1.17	1
246	rs193922326	M251T	0	0.995	D	1.7	N	D	-6.65	-0.65	-0.36	2
247	**CM021266**	**C252Y**	0.02	1	D	0.63	NN	D	-6.48	-0.18	0.05	1
248	**CM030444**	**C252R**	0.01	0.999	D	1.75	N	D	-6.48	-0.15	2.66	1
249	**CM074237**	**C252G**	0.01	0.976	D	3.02	N	D	-6.48	-1.26	3.27	1
250	**rs193921400**	**V253A**	0	0.046	D	2.93	NN	D	-7.49	-1.35	2.13	1
251	**rs193921400**	**V253G**	0	0.984	D	4.02	NN	D	-7.53	-2.16	3.17	1
252	**rs193922327**	**N254H**	0	1	D	0.27	NN	D	-7.65	-1.42	-0.26	1
253	CM096879	T255S	0.01	0.491	N	1.56	N	D	-6.4	-0.49	0.1	2
254	CM097172	T255I	0.08	0.998	D	0.11	N	D	-6.26	0.39	0.77	2
255	CM074240	T255A	0.1	0.059	D	1.14	NN	D	-6.36	-0.42	-2.43	2
256	**rs193922328**	**E256D**	0	0.986	D	0.5	NN	D	-7.49	-0.45	-0.34	1
257	**VAR_003706**	**E256K**	0	1	D	0.9	NN	D	-7.52	-0.49	-0.07	1
258	**VAR_003707**	**W257R**	0	0.998	D	3.29	NN	D	-6.87	-0.75	5.44	1
259	**CM066089**	**G258D**	0	1	D	1.41	NN	D	-7.39	-0.64	-0.82	1
260	**CM096880**	**G258S**	0	1	D	0.64	NN	D	-7.32	-0.48	-0.48	1
261	**CM032578**	**G258C**	0	1	D	-0.37	NN	D	-7.34	-0.4	-2.47	1
262	**CM096881**	**A259V**	0	0.901	D	0.77	NN	D	-6.56	0.42	-0.41	1
263	**VAR_010593**	**A259T**	0	0.922	D	0.4	NN	D	-6.53	0.07	-0.46	1

264	**rs193922330**	**F260S**	0	1	D	3.95	NN	D	-6.85	-1.48	4.27	1
265	**VAR_010594**	**G261E**	0	1	D	3.33	NN	D	-7.26	-1.06	1.66	1
266	**VAR_003708**	**G261R**	0	1	D	2.02	NN	D	-7.27	0.07	0.18	1
267	rs193922331	S263P	0	0.186	D	1.86	N	D	-7.09	-1.26	0.76	2
268	**rs193929373**	**G264S**	0.01	0.838	N	1.75	NN	D	-6.43	-0.63	-0.28	1
269	CM984218	E265K	0.56	0.99	N	0.9	N	D	-6.35	-0.72	-0.75	2
270	CM096882	E265V	0.43	0.977	N	-0.01	N	D	-6.36	-0.39	-1.43	2
271	**CM096884**	**L266Q**	0	0.999	D	2.47	N	D	-6.63	-0.34	2.57	1
272	CM096883	L266V	0	0.624	N	1.3	N	D	-6.5	0.01	1.48	2
273	CM096885	E268K	0.28	0.345	N	0.08	N	D	-7.04	-0.78	-0.05	3
274	CM097118	F269L	0.41	0.926	N	1.3	N	D	-6.91	-0.19	0.37	2
275	**rs193922332**	**L271P**	0.02	1	D	1.78	NN	D	-7.03	-0.44	2.49	1
276	**CM096887**	**D274E**	0	0.984	D	0.57	NN	D	-7.66	-0.49	0.47	1
277	**CM096886**	**D274G**	0	0.997	D	1.25	NN	D	-7.72	-1.35	-0.5	1
278	**CM077743**	**D274V**	0	0.803	D	-0.31	NN	D	-7.75	-0.38	-2.36	1
279	**CM015282**	**R275C**	0.01	0.999	D	1.22	NN	D	-6.42	-0.58	0.7	1
280	CM097119	L276P	0.24	0.243	D	1.76	N	D	-6.46	-1.2	2.12	2
281	rs143387473	L276V	0.34	0	N	0.61	N	D	-6.31	-0.76	0.62	3
282	**CM032916**	**D278E**	0	0.981	D	0.19	N	D	-7.03	-0.54	-0.15	1
283	**rs193922333**	**D278V**	0	0.904	D	-0.13	NN	D	-7.14	-0.01	-0.49	1
284	**VAR_003709**	**E279Q**	0.15	0.941	N	-0.07	N	D	-6.45	-1.40	0.63	1
285	rs143484733	E279G	0.06	0.94	D	1.01	NN	D	-6.54	-2.23	-0.27	2
286	CM077739	S280N	0.66	0	N	0.22	N	D	-6.38	-1.06	-0.19	3
287	**CM012128**	**S281F**	0	1	D	0.69	NN	D	-7.17	-0.1	-0.9	1
288	**CM096889**	**Q287K**	0.01	0.997	D	1.17	NN	D	-6.75	-1.05	-0.43	1
289	**CM096890**	**Q287L**	0	0.998	D	0.51	NN	D	-6.84	-0.1	-0.17	1
290	**CM096892**	**Y289C**	0	0.93	D	3.19	NN	D	-6.63	-2.12	4.08	1
291	**CM097120**	**Y289H**	0.04	0.961	D	3.06	NN	D	-6.6	-2.03	5.2	1
292	**CM096891**	**Y289N**	0.01	0.027	D	4.44	NN	D	-6.62	-2.08	2.79	1
293	**CM096893**	**E290D**	0	0.918	D	1.12	NN	D	-8.04	-2.06	0.26	1

294	**CM096894**	**K291E**	0	0.126	D	1.31	NN	D	-7.04	-0.97	1.54	1
295	**CM030446**	**G294D**	0	0.992	D	0.88	NN	D	-7.15	-1.05	0.25	1
296	**CM096895**	**G295S**	0	0.766	D	-0.19	NN	D	-9.3	-2.6	-0.35	1
297	**CM096896**	**Y297H**	0	0.992	D	1.51	NN	D	-8.16	-0.81	3.15	1
298	**CM096898**	**M298T**	0	0.605	D	2.36	NN	D	-7.15	-0.56	1.99	1
299	**CM096897**	**M298V**	0.01	0.809	D	1.06	NN	D	-7.04	0.06	1.54	1
300	**CM021267**	**M298K**	0	0.157	D	2.81	NN	D	-7.15	-1.05	-0.08	1
301	**CM096900**	**G299V**	0	1	D	-0.08	NN	D	-8.68	0.2	0.26	1
302	**CM096899**	**G299D**	0	0.998	D	1.23	NN	D	-8.66	-0.28	-0.35	1
303	**VAR_003710**	**G299R**	0	0.999	D	0.33	NN	D	-8.68	0.01	-1.25	1
304	**VAR_003711**	**E300Q**	0	0.986	D	0.65	NN	D	-7.02	-0.36	0.17	1
305	**VAR_003712**	**E300K**	0	0.991	D	1.18	NN	D	-7.01	-0.39	-0.1	1
306	CM096901	V302M	0	0.918	D	0.89	N	D	-6.68	0.51	0.31	2
307	**rs193922336**	**R303W**	0	1	D	0.79	NN	D	-7.7	-0.82	-1.7	1
308	**CM020445**	**L304P**	0.03	0.999	D	2.49	NN	D	-7.33	-0.68	4.02	1
309	**CM096902**	**L306R**	0	0.99	D	1.9	NN	D	-7.41	-0.03	6.09	1
310	**rs193922337**	**L306P**	0.02	0.999	D	3.86	NN	D	-7.42	-0.43	4.3	1
311	**CM070146**	**R308W**	0	0.835	D	0.7	N	D	-6.43	-0.26	-1.31	1
312	**CM096904**	**L309H**	0	0.997	D	1.9	NN	D	-7.1	-0.37	4.93	1
313	**VAR_003713**	**L309P**	0	0.032	D	3.48	NN	D	-7.1	-0.01	3.3	1
314	CM073084	E312Q	0.4	0.957	N	-0.27	N	D	-6.36	-1.54	-0.14	2
315	CM082780	L314P	0	0.068	D	2.36	N	D	-6.64	-0.43	2.75	2
316	**CM064013**	**L315F**	0	0.978	N	0.22	N	D	-7.02	0.49	2.81	1
317	rs193922338	L315H	0	0.997	D	0.93	NN	D	-7.12	-0.65	-0.32	2
318	**CM070151**	**F316V**	0	0.848	D	2.22	NN	D	-6.68	-0.16	3.32	1
319	**rs193922339**	**F316Y**	0.01	0.011	D	0.43	NN	D	-6.69	-0.17	0.64	1
320	**CM030447**	**G318R**	0	0.006	D	1.23	NN	D	-7.24	-0.39	-1.04	1
321	**CM032918**	**G318A**	0.01	0.998	D	1.71	N	D	-7.23	-0.53	-0.12	1
322	**rs193922340**	**G318W**	0	1	D	1.11	NN	D	-7.31	-0.28	-1.24	1
323	CM096905	E319Q	0.65	0.001	N	-0.33	N	D	-6.25	-0.27	-0.18	3

324	**rs193922341**	**L324P**	0	0.997	D	3.2	NN	D	-7.97	-1.59	4.67	1
325	CM097121	T326P	0.01	0.001	D	2.55	N	D	-7.12	-1.37	1.1	2
326	CM092843	R327H	0.05	0.961	D	0.04	N	D	-7.09	-1.12	0.15	2
327	CM077744	A329V	0.32	0.829	N	0.61	N	D	-6.36	-1.69	-0.74	2
328	CM097122	E331K	0.48	0.025	D	-0.01	N	D	-7.05	-0.96	0.08	2
329	**CM097174**	**T332K**	0	0.994	D	1.57	NN	D	-6.71	-0.36	0.11	1
330	CM077740	R333H	0.06	0.99	N	0.19	NN	D	-6.41	-2.31	0.18	2
331	**rs193922254**	**V335C**	0	0.996	D	1.47	N	D	-7.2	-1.53	-0.39	1
332	**CM096906**	**S336W**	0	1	D	0.65	NN	D	-7.04	0.42	-2.03	1
333	**VAR_010595**	**S336L**	0	0.999	D	0.7	NN	D	-7	0.60	-2.96	1
334	**CM096916**	**Q337P**	0.01	0.825	D	1.72	N	D	-6.44	-0.58	1.41	1
335	**CM077745**	**E339K**	0	0.996	D	0.77	NN	D	-6.63	-0.76	0.71	1
336	**CM068317**	**E339G**	0	0.999	D	1.79	NN	D	-6.7	-1.41	-0.22	1
337	CM096917	S340I	0	0.98	N	0.73	N	D	-6.43	0.48	0.47	2
338	CM086014	S340T	0.02	0.001	N	0	N	D	-6.41	-0.16	-0.36	2
339	rs193922255	S340G	0.19	0.009	N	0.06	N	D	-6.44	-0.89	-0.64	3
340	VAR_066615	T342P	1	0	D	0.41	N	D	-7	-0.41	-0.03	2
341	**rs193922260**	**I348F**	0.02	0.998	D	0.88	N	D	-6.43	-0.15	-0.08	1
342	**CM096918**	**G356V**	0	0.994	D	2.31	N	D	-7.3	-0.16	-0.72	1
343	CM087912	P359L	0.64	0.927	N	0.39	N	D	-6.99	0.23	-1.29	2
344	**CM096919**	**D363N**	0.01	0.987	D	0.84	NN	D	-6.62	-1.31	-1.88	1
345	**CM096920**	**D363V**	0	0.992	D	-0.61	N	D	-6.68	-0.36	-0.12	1
346	**VAR_010596**	**V367M**	0	1	D	0.96	NN	D	-6.77	-1.79	0.21	1
347	**CM021268**	**R369P**	0.06	0.943	D	1.78	NN	D	-6.5	-0.03	0.15	1
348	CM090143	R369C	0.05	0.992	D	1.49	N	D	-6.52	-0.42	2.78	2
349	**CM096925**	**C371W**	0	1	D	0.67	NN	D	-6.71	-1.51	2.47	1
350	**CM096921**	**C371R**	0	1	D	1.5	NN	D	-6.68	-1.82	-2.03	1
351	**CM096923**	**C371Y**	0	1	D	0.18	NN	D	-6.69	-1.66	-0.95	1
352	**CM096924**	**C371F**	0	1	D	0.1	NN	D	-6.68	-1.37	-0.24	1
353	CM096926	S373N	0.02	0.235	N	1.15	N	D	-6.39	-1.31	-0.09	2

354	**CM096927**	**V374M**	0	1	D	1.18	NN	D	-6.97	-1.22	0.22	1
355	**CM096928**	**V374E**	0	1	D	3.02	NN	D	-7	-1.79	2.98	1
356	**CM096929**	**S375P**	0	1	D	1.77	NN	D	-6.57	-0.68	0.17	1
357	**rs193922263**	**S375F**	0	1	D	-0.35	N	D	-6.56	-0.52	-3.39	1
358	**CM096930**	**R377S**	0	1	D	2.53	NN	D	-8.6	-1.39	0.32	1
359	**CM096931**	**R377L**	0	1	D	0.04	NN	D	-8.59	-0.77	1.44	1
360	**CM068318**	**R377C**	0	1	D	1.65	NN	D	-8.62	-1.11	-1.1	1
361	**rs193922264**	**R377H**	0	1	D	1.26	NN	D	-8.6	-1.41	-2.59	1
362	**CM096932**	**A378D**	0	0.777	D	2.38	NN	D	-7.94	-1.61	1.29	1
363	**CM096933**	**A378G**	0.01	0.996	N	1.77	N	D	-7.82	-2.41	1.66	1
364	**rs104894016**	**A378T**	0	0.992	D	1.5	N	D	-7.9	-1.62	0.23	1
365	rs193929374	A378V	0	0.99	D	0.32	NN	D	-7.91	-1.02	-1.51	2
366	**CM074232**	**A379V**	0	0.995	D	-0.09	NN	D	-8.14	0.03	1.18	1
367	**rs193922265**	**A379E**	0	0.979	D	1.47	NN	D	-8.18	-0.33	-0.74	1
368	**CM032920**	**H380D**	0.04	0.175	D	0.71	NN	D	-6.32	-0.83	0.87	1
369	**CM096935**	**H380P**	0.02	0.001	D	1.81	NN	D	-6.36	-0.79	1.45	1
370	CM015313	H380Q	0.27	0.001	N	-0.01	N	D	-6.24	-1.32	-0.11	3
371	**CM096936**	**M381T**	0	0.8	D	2.24	NN	D	-6.46	-0.36	2.45	1
372	**rs193922266**	**M381R**	0	0.997	D	1.78	NN	D	-6.48	-0.67	1.82	1
373	**CM096938**	**C382G**	0	1	D	2.44	NN	D	-6.48	-1.12	3.87	1
374	**CM096937**	**C382R**	0	1	D	1.71	NN	D	-6.5	0.01	2.95	1
375	VAR_010597	C382Y	0	1	D	0.38	N	D	-6.51	0.06	-1.56	2
376	CM096939	S383T	0.03	0.986	N	0.74	N	D	-7.1	-0.62	-0.16	2
377	CM020446	S383L	0.02	0.443	D	-0.18	N	D	-7.11	-0.43	-2.66	2
378	**CM096940**	**A384E**	0	0.999	D	2.68	NN	D	-6.64	-0.32	1.87	1
379	**VAR_010598**	**A384T**	0.03	0.978	D	1.65	N	D	-6.6	-0.60	0.37	1
380	**VAR_012354**	**G385V**	0.02	1	D	-0.99	NN	D	-6.63	-1.2	0.82	1
381	**rs193922267**	**G385R**	0	1	D	0.61	NN	D	-6.64	-1.8	-1.89	1
382	**CM096942**	**L386V**	0.25	0.996	N	1.53	N	D	-6.53	-0.91	5.14	1
383	rs193922268	L386P	0	1	D	4.35	NN	D	-6.81	-1.32	1.48	2

384	**CM032921**	**A387T**	0.03	0.999	D	1.62	NN	D	-7.03	-1.08	1.9	1
385	**rs193921338**	**A387V**	0	1	D	0.44	N	D	-7.06	-0.64	0.53	1
386	**rs193921338**	**A387E**	0	1	D	2.24	NN	D	-7.09	-0.82	-0.83	1
387	**CM096943**	**G388D**	0.01	0.987	N	1.07	NN	D	-7.31	-1.09	0.47	1
388	**CM096944**	**V389D**	0	0.999	D	3.79	NN	D	-6.82	-0.82	3.45	1
389	**CM082785**	**V389A**	0.01	0.937	D	2.81	N	D	-6.77	-0.31	2.1	1
390	**rs193921340**	**I390N**	0	0.999	D	3.81	N	D	-6.47	-0.93	2.84	1
391	rs193921340	I390T	0.02	0.953	N	3.23	N	D	-6.42	-0.48	3.58	2
392	**CM081272**	**R392S**	0.03	0.312	D	2.09	NN	D	-6.45	-0.26	2.34	1
393	**VAR_010599**	**R392C**	0	1	D	1.72	NN	D	-6.53	-0.62	1	1
394	rs193922269	R392L	0.11	0.018	D	0.76	NN	D	-6.52	0	0.09	2
395	CM096945	M393T	0.1	0.881	D	2.23	N	D	-6.31	-1.19	1.5	2
396	**CM096946**	**R397C**	0	1	D	1.19	NN	D	-6.61	-0.62	0.93	1
397	**rs193929375**	**R397L**	0.02	0.998	D	0.54	N	D	-6.57	-0.14	0.64	1
398	rs193922271	R403G	0.29	0.143	D	0.85	NN	D	-6.43	-1.51	1.49	2
399	**CM015283**	**I404S**	0	1	D	4.22	N	D	-7.1	-1.09	2.82	1
400	**CM096947**	**T405I**	0.03	0.993	D	0.13	N	D	-6.46	-1.49	-0.76	1
401	**CM096948**	**V406M**	0	0.7	D	1.57	NN	D	-7.65	-0.24	0.36	1
402	**CM096949**	**G407D**	0	1	D	2.01	NN	D	-7.69	-1.04	0.73	1
403	**CM015284**	**G407S**	0.01	1	D	0.1	NN	D	-7.63	-1.14	-0.3	1
404	**CM021269**	**S411F**	0	0.997	D	0.96	NN	D	-7.49	-0.66	-3	1
405	**CM096951**	**V412A**	0	0.999	D	1.91	NN	D	-6.86	-1.78	1.53	1
406	**CM096950**	**V412M**	0.01	1	D	0.65	NN	D	-6.87	-1.31	-0.18	1
407	**CM097446**	**Y413C**	0	1	D	2.83	NN	D	-6.58	-1.26	2	1
408	**rs193922272**	**K414E**	0.01	0.999	D	1.12	N	D	-6.89	-0.99	0.87	1
409	CM012129	L415V	0.09	0.984	N	0.16	N	D	-7.06	-0.24	0.33	2
410	**CM074224**	**H416P**	0	1	D	2.21	NN	D	-6.55	-1.03	0.99	1
411	**CM096952**	**H416D**	0	1	D	1.7	NN	D	-6.52	-1.13	1.2	1
412	**CM070150**	**F419L**	0	0.998	D	1.62	NN	D	-7.82	-0.23	2.13	1
413	**CM096953**	**F419V**	0	0.999	D	2.08	NN	D	-7.88	-0.54	3.18	1

414	CM074223	K420E	0.78	0.52	D	0.93	N	D	-6.45	-1.49	0.55	2
415	rs193922273	F423Y	0	0.998	N	0.54	N	D	-6.41	-1.78	1.1	2
416	CM097176	H424Y	0.3	1	N	0.12	N	D	-6.43	-0.47	-0.94	2
417	rs193922275	R428Q	0.57	0.902	N	0.22	N	D	-6.53	-0.96	0.08	2
418	rs146683328	R429K	0.43	0	N	-0.02	N	D	-6.33	-1.11	0.32	3
419	**rs193922277**	**L430P**	0	1	D	3.29	NN	D	-7.04	-0.43	3.1	1
420	rs188718376	T431A	0.4	0.002	N	1.15	N	D	-6.28	-2.2	0.2	3
421	**CM096955**	**C434W**	0.09	1	D	0.9	NN	D	-6.43	-1.47	1.02	1
422	CM064014	C434F	0.34	0.999	D	0.62	N	D	-6.41	-1.19	0.04	2
423	CM030448	C434Y	0.63	1	D	0.85	N	D	-6.41	-1.62	-0.06	2
424	**CM096956**	**I436F**	1	1	D	0.93	N	D	-6.77	-0.78	2.76	1
425	rs193922278	I436N	0	1	D	3.44	NN	D	-6.8	-1.75	-0.42	2
426	**CM097124**	**F438Y**	0.01	1	D	0.74	N	D	-6.5	-1.05	0.65	1
427	CM098180	E440G	0.02	0.564	N	0.6	N	D	-7.04	-1.42	0.57	2
428	**CM012130**	**S441W**	0	1	D	0.08	NN	D	-6.74	-0.5	2.01	1
429	CM098181	E442K	0.01	0.996	N	-0.21	N	D	-6.51	-1.7	-0.33	2
430	**CM096957**	**S445C**	0	1	D	-0.46	NN	D	-6.9	-0.74	-2.06	1
431	**CM032923**	**G446R**	0	1	D	0.13	NN	D	-8.26	-1.12	2.59	1
432	**CM032924**	**R447Q**	0.01	1	D	0.55	N	D	-7.05	-1.16	1.6	1
433	**rs193922281**	**R447G**	0	1	D	1.53	NN	D	-7.06	-1.73	0.54	1
434	**CM097177**	**A449S**	0	1	D	1.32	N	D	-8.11	-2.31	0.79	1
435	**rs193922282**	**A449T**	0	1	D	1.13	NN	D	-8.15	-2.56	0.41	1
436	**CM096959**	**A450T**	0	1	D	1.72	NN	D	-8.38	-1.28	0.4	1
437	**CM096960**	**A450D**	0	1	D	2.16	NN	D	-8.4	-0.85	1.78	1
438	CM093717	V452L	0.01	0.012	N	0.83	N	D	-6.63	0.18	-0.9	3
439	**CM096961**	**S453W**	0	1	D	0.09	N	D	-7.11	-0.16	0.26	1
440	rs193922283	S453L	0.01	1	N	0.53	N	D	-7.05	0.02	-3.3	2
441	**CM070152**	**A454E**	0	1	D	1.86	NN	D	-6.79	-0.66	1.58	1
442	**CM032926**	**A454V**	0	1	D	0.88	NN	D	-6.7	0.09	-1.05	1
443	**CM090145**	**V455E**	0	0	D	0.76	NN	D	-6.74	-1.59	1.25	1

444	VAR_003715	V455M	0	0.229	D	0.3	N	D	-6.73	-1.44	-0.18	2
445	**rs104894014**	**A456V**	0	0.741	D	0.96	NN	D	-6.58	-0.41	-1.22	1
446	**CM085976**	**C457W**	0.02	0.96	D	0.82	NN	D	-6.39	-0.76	-1.21	1
447	**rs193922284**	**K458E**	0	0.988	D	0.32	N	D	-6.69	-1.42	0.46	1
448	rs193922285	M462I	0.25	0	N	NA	N	D	-5.44	0.32	NA	3
449	CM096964	G464D	0.17	0.012	N	NA	N	D	-5.53	-0.27	NA	3
450	CM096965	Q465R	0.3	0.281	N	NA	N	D	-5.54	-0.61	NA	3

ID s highlighted in bold were found to be highly deleterious by all the prediction methods; N-Neutral; NN-Non-Neutral; D-Disease; NA-Not available . PoPMusic 2.1 and Dmutant were not able to predict the scores for few nsSNPs. Based on this only seven tools SIFT, PolyPhen2, PhD-SNP, SNAP, SNPs&GO, fathmm, and I-Mutant 3.0. were considered for ranking system.

Table S2. Biophysical characterisation of nsSNPs in the *GCK* gene by Align GVGD.

IDs	Variants	Align GVGD		
		GV	GD	Prediction
CM074228	L20P	0	97.78	Class C65
rs193922325	L25R	0	101.88	Class C65
CM032900	L30P	0	97.78	Class C65
CM096811	G44C	0	158.23	Class C65
rs193922279	G44D	0	93.77	Class C65
CM096813	A53V	0	65.28	Class C65
VAR_010585	A53S	0	99.13	Class C65
CM096814	M57R	0	91.64	Class C65
CM096815	P59L	0	97.78	Class C65
rs193922287	P59S	0	73.35	Class C65
CM984183	V62A	0	65.28	Class C65
CM077934	G68V	0	109.55	Class C65
CM096816	G68D	0	93.77	Class C65
rs193922289	G72R	0	125.13	Class C65
CM074229	L77P	0	97.78	Class C65
CM032903	D78H	0	81.24	Class C65
CM096819	D78G	0	93.77	Class C65
CM074234	G80D	0	93.77	Class C65
CM074219	T82I	0	89.28	Class C65
rs193922290	R85W	0	101.29	Class C65
CM021265	Y108C	0	193.72	Class C65
VAR_010586	Y108H	0	83.33	Class C65
rs193922292	Y108D	0	159.94	Class C65
VAR_012352	I110T	0	89.28	Class C65
CM032908	P111L	0	97.78	Class C65

CM096821	T118I	0	89.28	Class C65
CM052881	L122P	0	97.78	Class C65
CM096824	D124H	0	81.24	Class C65
CM012111	C129Y	0	193.72	Class C65
CM096826	C129F	0	204.39	Class C65
CM096827	I130N	10.12	141.15	Class C65
CM012112	L134P	0	97.78	Class C65
rs150779253	P145S	0	73.35	Class C65
CM068315	L146R	0	101.88	Class C65
CM096828	L146P	0	97.78	Class C65
CM984217	T149I	0	89.28	Class C65
VAR_010588	F150S	0	154.81	Class C65
CM097115	S151P	0	73.35	Class C65
rs193922300	P153S	0	73.35	Class C65
VAR_012350	L164P	0	97.78	Class C65
CM096835	T168I	0	89.28	Class C65
CM012115	K169N	0	93.88	Class C65
CM091669	G170D	0	93.77	Class C65
rs193922303	G170V	0	109.55	Class C65
CM096837	F171C	0	204.39	Class C65
CM012116	A173S	0	99.13	Class C65
CM052882	G178E	0	97.85	Class C65
CM096840	G178V	0	109.55	Class C65
rs193922305	G178R	0	125.13	Class C65
CM001170	R191W	0	101.29	Class C65
CM096845	R191L	0	101.88	Class C65
CM096848	A201S	0	99.13	Class C65
VAR_003701	V203A	0	65.28	Class C65
CM097116	D205Y	0	159.94	Class C65
CM012122	T206M	0	81.04	Class C65

CM023384	T206R	0	70.97	Class C65
CM096850	T206K	0	77.74	Class C65
CM096851	V207E	0	121.34	Class C65
CM096853	T209R	0	70.97	Class C65
VAR_010590	T209M	0	81.04	Class C65
VAR_012351	M210K	0	94.49	Class C65
VAR_010591	M210T	0	81.04	Class C65
CM082788	C213Y	0	193.72	Class C65
VAR_010592	C213R	0	179.53	Class C65
rs193922316	C220Y	0	193.72	Class C65
rs193922315	C220R	0	179.53	Class C65
CM096857	G223R	0	125.13	Class C65
CM096858	G223V	0	109.55	Class C65
CM096859	G227R	0	125.13	Class C65
VAR_003704	G227C	0	158.23	Class C65
CM032577	T228R	0	70.97	Class C65
CM096860	T228K	0	77.74	Class C65
VAR_003705	T228M	0	81.04	Class C65
CM096861	G229V	0	109.55	Class C65
CM096862	G229D	0	93.77	Class C65
CM064010	N231H	0	68.35	Class C65
CM074230	C233R	0	179.53	Class C65
CM096863	C233S	0	111.67	Class C65
CM096864	Y234H	0	83.33	Class C65
CM096865	M235R	0	91.64	Class C65
rs193922323	M235T	0	81.04	Class C65
CM082784	G246E	0	97.85	Class C65
CM096872	G246R	0	125.13	Class C65
CM096875	M251K	0	94.49	Class C65
rs193922326	M251T	0	81.04	Class C65

CM021266	C252Y	0	193.72	Class C65
CM030444	C252R	0	179.53	Class C65
CM074237	C252G	0	158.23	Class C65
rs193922327	N254H	0	68.35	Class C65
VAR_003707	W257R	0	101.29	Class C65
CM032578	G258C	0	158.23	Class C65
CM066089	G258D	0	93.77	Class C65
rs193922330	F260S	0	154.81	Class C65
VAR_003708	G261R	0	125.13	Class C65
VAR_010594	G261E	0	97.85	Class C65
CM096884	L266Q	4.86	108.57	Class C65
CM077743	D274V	0	152.22	Class C65
CM096886	D274G	0	93.77	Class C65
rs193922333	D278V	0	152.22	Class C65
CM012128	S281F	0	154.81	Class C65
CM096890	Q287L	0	112.44	Class C65
CM096896	Y297H	0	83.33	Class C65
CM096899	G299D	0	93.77	Class C65
CM096900	G299V	0	109.55	Class C65
VAR_003710	G299R	0	125.13	Class C65
rs193922336	R303W	0	101.29	Class C65
CM096902	L306R	0	101.88	Class C65
rs193922337	L306P	0	97.78	Class C65
rs193922338	L315H	0	98.69	Class C65
CM030447	G318R	0	125.13	Class C65
rs193922340	G318W	0	183.79	Class C65
rs193922341	L324P	0	97.78	Class C65

Table S3. Molecular phenotyping of nsSNPs in GCK by SNPeffect 4.0.

SNP IDs	Variants	SNP Effect			
		TANGO	WALTZ	LIMBO	FoldX
CM052879	M8I	Not affect	Not affect	Not affect	Slightly Reduces
CM074236	V16E	Not affect	Not affect	Not affect	Slightly Reduces
CM074221	I19N	Not affect	Not affect	Not affect	Reduces
rs193922308	I19M	Not affect	Not affect	Not affect	Reduces
CM074228	L20P	Not affect	Not affect	Not affect	Severely Reduces
CM096803	F23V	Not affect	Not affect	Not affect	Reduces
CM032900	L30P	Not affect	Not affect	Not affect	Reduces
CM087911	V33A	Not affect	Not affect	Decreases	Reduces
CM096806	M37R	Not affect	Not affect	Not affect	Severely Reduces
CM012104	Q38P	Not affect	Not affect	Not affect	Reduces
CM030440	E40K	Not affect	Not affect	Not affect	Enhances
CM096807	M41T	Not affect	Not affect	Not affect	Reduces
CM020439	R43H	Not affect	Not affect	Not affect	Slightly Reduces
CM074225	R43S	Not affect	Not affect	Not affect	Slightly Reduces
CM096808	R43G	Not affect	Not affect	Not affect	Reduces
CM096809	R43C	Not affect	Not affect	Not affect	Reduces
CM096810	R43P	Not affect	Not affect	Not affect	Reduces
CM096811	G44C	Not affect	Not affect	Increases	Severely Reduces
CM013265	G44S	Not affect	Not affect	Decreases	Severely Reduces
CM096812	H50L	Not affect	Not affect	Increases	Not affect
CM012105	H50R	Not affect	Not affect	Decreases	Not affect
CM012106	H50Y	Not affect	Not affect	Decreases	Not affect
CM012105	H50R	Not affect	Not affect	Not affect	Reduces
CM096813	A53V	Not affect	Not affect	Not affect	Reduces
VAR_010585	A53S	Not affect	Not affect	Not affect	Reduces

CM096814	M57R	Not affect	Not affect	Decreases	Reduces
CM096815	P59L	Increases	Increases	Decreases	Reduces
rs193922287	P59S	Not affect	Increase	Not affect	Not affect
CM082777	T60I	Not affect	Not affect	Not affect	Reduces
CM074238	Y61S	Not affect	Not affect	Not affect	Reduces
CM051044	V62M	Not affect	Not affect	Not affect	Reduces
CM082786	S64Y	Not affect	Not affect	Decreases	Enhances
CM032901	T65I	Not affect	Not affect	Not affect	Slightly Reduces
CM077934	G68V	Not affect	Not affect	Not affect	Slightly Enhances
VAR_003693	E70K	Not affect	Not affect	Not affect	Reduces
CM086540	S76Y	Not affect	Increases	Decreases	Severely Reduces
CM096818	S76F	Not affect	Increases	Decreases	Reduces
CM074229	L77P	Not affect	Not affect	Not affect	Severely Reduces
CM032902	D78E	Not affect	Not affect	Not affect	Reduces
rs193922290	R85W	Increase	Not affect	Not affect	Not affect
CM032904	W99R	Not affect	Not affect	Not affect	Slightly Reduces
CM093651	W99L	Not affect	Not affect	Not affect	Slightly Enhances
CM012109	T103N	Not affect	Not affect	Not affect	Reduces
CM082778	Q106P	Not affect	Not affect	Not affect	Reduces
CM021265	Y108C	Not affect	Not affect	Not affect	Reduces
CM032908	P111L	Not affect	Not affect	Not affect	Reduces
CM074231	T116P	Not affect	Not affect	Not affect	Reduces
CM096821	T118I	Not affect	Not affect	Not affect	Reduces
CM012110	L122V	Not affect	Not affect	Not affect	Reduces
CM052881	L122P	Not affect	Not affect	Not affect	Severely Reduces
CM096822	L122F	Not affect	Not affect	Not affect	Reduces
CM081279	F123L	Not affect	Not affect	Not affect	Reduces
CM096823	D124N	Not affect	Increases	Not affect	Not affect
CM096824	D124H	Not affect	Increases	Not affect	Not affect
CM096823	D124N	Not affect	Not affect	Not affect	Reduces

CM096825	Y125C	Not affect	Not affect	Not affect	Reduces
CM012111	C129Y	Not affect	Not affect	Not affect	Reduces
CM096826	C129F	Not affect	Not affect	Not affect	Reduces
CM032909	I130T	Not affect	Not affect	Not affect	Reduces
CM096827	I130N	Not affect	Not affect	Not affect	Reduces
CM081273	D132N	Not affect	Not affect	Decreases	Enhances
CM012112	L134P	Not affect	Not affect	Not affect	Severely Reduces
CM081276	H137D	Not affect	Not affect	Not affect	Reduces
CM012113	Q138P	Not affect	Not affect	Not affect	Reduces
CM068315	L146R	Not affect	Not affect	Not affect	Severely Reduces
CM096828	L146P	Not affect	Not affect	Not affect	Severely Reduces
rs193922296	G147D	Not affect	Increase	Not affect	Not affect
CM096829	F148I	Not affect	Not affect	Not affect	Reduces
CM984217	T149I	Increases	Increases	Not affect	Not affect
CM032910	T149P	Not affect	Not affect	Not affect	Severely Reduces
CM984217	T149I	Not affect	Not affect	Not affect	Reduces
CM097114	F150Y	Not affect	Increases	Not affect	Reduces
CM030442	F150L	Not affect	Not affect	Not affect	Reduces
CM064011	F152L	Not affect	Not affect	Not affect	Reduces
CM096830	F152I	Not affect	Not affect	Not affect	Reduces
rs193922300	P153S	Increase	Not affect	Not affect	Not affect
CM097171	R155T	Not affect	Not affect	Not affect	Slightly Reduces
CM032911	H156Y	Not affect	Not affect	Not affect	Reduces
CM096831	H156D	Not affect	Not affect	Not affect	Enhances
CM020440	D158A	Not affect	Not affect	Not affect	Reduces
CM096832	D160N	Not affect	Not affect	Not affect	Slightly Enhances
CM081277	G162D	Not affect	Not affect	Not affect	Severely Reduces
CM096834	G162S	Not affect	Not affect	Not affect	Reduces
CM082779	L164F	Not affect	Not affect	Not affect	Severely Reduces
HM060571	L165F	Not affect	Increases	Not affect	Reduces

CM096835	T168I	Not affect	Increases	Not affect	Not affect
CM081275	T168A	Not affect	Not affect	Not affect	Reduces
VAR_010589	T168P	Not affect	Not affect	Not affect	Reduces
CM012115	K169N	Not affect	Not affect	Not affect	Reduces
CM091669	G170D	Not affect	Not affect	Not affect	Reduces
CM096836	G170S	Not affect	Not affect	Not affect	Reduces
CM032575	F171L	Not affect	Not affect	Not affect	Reduces
CM096837	F171C	Not affect	Not affect	Not affect	Reduces
CM012116	A173S	Not affect	Not affect	Not affect	Slightly Reduces
CM012117	G175E	Not affect	Not affect	Not affect	Reduces
CM015224	G175V	Not affect	Not affect	Not affect	Reduces
CM090144	G175A	Not affect	Not affect	Not affect	Reduces
CM097281	G175R	Not affect	Not affect	Not affect	Reduces
CM020441	A176S	Not affect	Not affect	Not affect	Reduces
CM096839	A176T	Not affect	Not affect	Not affect	Reduces
CM052882	G178E	Not affect	Not affect	Not affect	Reduces
CM096840	G178V	Not affect	Not affect	Not affect	Reduces
CM004390	N180K	Decreases	Not affect	Not affect	Reduces
CM096841	N180S	Not affect	Not affect	Not affect	Reduces
rs193922306	V181A	Decrease	Not affect	Not affect	Not affect
CM074227	V182L	Decreases	Not affect	Not affect	Reduces
CM096842	V182G	Decreases	Not affect	Not affect	Reduces
VAR_003699	V182M	Decrease	Not affect	Not affect	Reduces
CM032912	R186Q	Decreases	Not affect	Not affect	Not affect
CM074220	D187Y	Decreases	Not affect	Not affect	Not affect
CM096843	A188P	Not affect	Not affect	Not affect	Reduces
CM096844	I189T	Not affect	Not affect	Not affect	Reduces
CM001170	R191W	Not affect	Not affect	Not affect	Slightly Reduces
CM012120	R191Q	Not affect	Not affect	Not affect	Slightly Reduces
CM012121	G193R	Not affect	Not affect	Not affect	Reduces

CM096846	M197K	Increases	Not affect	Not affect	Reduces
CM093652	M197I	Not affect	Increases	Not affect	Reduces
CM096847	V199L	Not affect	Not affect	Not affect	Slightly Enhances
CM096848	A201S	Decreases	Not affect	Not affect	Not affect
CM064009	M202R	Decreases	Not affect	Not affect	Reduces
rs193922310	M202V	Increase	Not affect	Not affect	Not affect
VAR_003701	V203A	Decrease	Not affect	Not affect	Not affect
CM096849	D205N	Increases	Not affect	Not affect	Not affect
CM097116	D205Y	Increases	Not affect	Not affect	Not affect
CM096849	D205N	Not affect	Increases	Not affect	Reduces
rs193922312	D205E	Not affect	Not affect	Not affect	Reduces
CM023384	T206R	Increases	Not affect	Not affect	Not affect
CM076211	T206P	Increases	Not affect	Increases	Not affect
CM012122	T206M	Not affect	Not affect	Not affect	Reduces
CM023384	T206R	Not affect	Not affect	Not affect	Severely Reduces
CM076211	T206P	Not affect	Not affect	Not affect	Reduces
CM096850	T206K	Not affect	Not affect	Not affect	Slightly Enhances
CM096851	V207E	Not affect	Not affect	Not affect	Reduces
CM096852	A208V	Increases	Not affect	Increases	Reduces
CM068316	A208T	Not affect	Not affect	Not affect	Reduces
CM082783	A208P	Not affect	Not affect	Not affect	Severely Reduces
CM096853	T209R	Not affect	Not affect	Not affect	Severely Reduces
CM096854	M210V	Increases	Not affect	Not affect	Reduces
rs193922313	M210I	Increase	Not affect	Not affect	Not affect
rs150077934	S212F	Increase	Increase	Not affect	Not affect
CM082788	C213Y	Not affect	Increases	Not affect	Severely Reduces
VAR_010592	C213R	Increase	Not affect	Not affect	Not affect
CM077742	D217V	Not affect	Not affect	Not affect	Reduces
CM096856	D217E	Not affect	Not affect	Not affect	Reduces
rs193922315	C220R	Increase	Not affect	Not affect	Not affect

VAR_003702	E221K	Not affect	Not affect	Not affect	Reduces
CM096858	G223V	Increases	Not affect	Not affect	Severely Reduces
CM012123	G223S	Not affect	Not affect	Not affect	Severely Reduces
CM096857	G223R	Not affect	Not affect	Not affect	Severely Reduces
CM012124	M224T	Not affect	Not affect	Not affect	Reduces
CM074222	M224R	Not affect	Not affect	Not affect	Severely Reduces
CM012125	I225M	Not affect	Not affect	Not affect	Slightly Reduces
rs193922319	V226A	Not affect	Not affect	Not affect	Reduces
CM096859	G227R	Increases	Not affect	Not affect	Reduces
CM074233	G227S	Not affect	Not affect	Not affect	Slightly Reduces
CM032576	T228A	Increases	Not affect	Not affect	Slightly Enhances
CM096860	T228K	Increases	Not affect	Not affect	Not affect
VAR_003705	T228M	Not affect	Not affect	Not affect	Reduces
CM096861	G229V	Increases	Not affect	Not affect	Severely Reduces
CM096862	G229D	Not affect	Not affect	Not affect	Severely Reduces
CM064010	N231H	Not affect	Not affect	Not affect	Reduces
CM058211	A232D	Not affect	Not affect	Not affect	Reduces
CM074230	C233R	Not affect	Not affect	Not affect	Severely Reduces
CM096863	C233S	Not affect	Not affect	Not affect	Reduces
CM096864	Y234H	Not affect	Not affect	Not affect	Reduces
CM070147	M235V	Not affect	Not affect	Not affect	Reduces
CM096865	M235R	Not affect	Not affect	Not affect	Reduces
CM096866	E236K	Not affect	Not affect	Not affect	Severely Reduces
CM045539	E237K	Not affect	Not affect	Not affect	Enhances
CM015312	Q239R	Not affect	Not affect	Not affect	Slightly Enhances
CM096867	N240T	Not affect	Not affect	Not affect	Reduces
CM096868	N240I	Not affect	Not affect	Not affect	Slightly Enhances
CM096869	V241A	Not affect	Not affect	Not affect	Reduces
CM096870	V244G	Not affect	Not affect	Not affect	Reduces
CM096871	V244E	Not affect	Not affect	Not affect	Reduces

CM082784	G246E	Not affect	Not affect	Not affect	Reduces
CM096872	G246R	Not affect	Not affect	Not affect	Reduces
CM096873	G249S	Not affect	Not affect	Not affect	Severely Reduces
CM096874	G249A	Not affect	Not affect	Not affect	Reduces
CM070148	R250C	Not affect	Not affect	Not affect	Reduces
CM012126	M251I	Not affect	Not affect	Not affect	Reduces
CM030443	M251V	Not affect	Not affect	Not affect	Reduces
CM096875	M251K	Not affect	Not affect	Not affect	Reduces
CM021266	C252Y	Not affect	Not affect	Not affect	Reduces
CM030444	C252R	Not affect	Not affect	Not affect	Reduces
CM074237	C252G	Not affect	Not affect	Not affect	Reduces
CM074240	T255A	Not affect	Not affect	Not affect	Reduces
CM096879	T255S	Not affect	Not affect	Not affect	Reduces
CM097172	T255I	Not affect	Not affect	Not affect	Slightly Reduces
rs193922328	E256D	Not affect	Not affect	Not affect	Reduces
VAR_003706	E256K	Not affect	Not affect	Not affect	Reduces
CM032578	G258C	Not affect	Not affect	Not affect	Reduces
CM066089	G258D	Not affect	Not affect	Not affect	Severely Reduces
CM096880	G258S	Not affect	Not affect	Not affect	Reduces
CM096881	A259V	Not affect	Not affect	Not affect	Reduces
CM096883	L266V	Not affect	Not affect	Not affect	Reduces
CM096884	L266Q	Not affect	Not affect	Not affect	Reduces
CM097118	F269L	Not affect	Not affect	Not affect	Slightly Reduces
CM077743	D274V	Not affect	Increases	Not affect	Slightly Reduces
CM096886	D274G	Not affect	Not affect	Increases	Reduces
CM096887	D274E	Not affect	Not affect	Not affect	Reduces
CM097119	L276P	Not affect	Not affect	Not affect	Reduces
CM032916	D278E	Not affect	Not affect	Not affect	Reduces
rs193922333	D278V	Not affect	Not affect	Not affect	Reduces
rs143484733	E279G	Not affect	Not affect	Not affect	Reduces

CM077739	S280N	Not affect	Not affect	Not affect	Reduces
CM012128	S281F	Not affect	Not affect	Not affect	Slightly Enhances
CM096890	Q287L	Not affect	Decreases	Not affect	Not affect
CM096889	Q287K	Not affect	Not affect	Not affect	Reduces
CM096890	Q287L	Not affect	Not affect	Not affect	Slightly Enhances
CM096891	Y289N	Not affect	Decreases	Not affect	Reduces
CM096892	Y289C	Not affect	Decreases	Not affect	Reduces
CM097120	Y289H	Not affect	Not affect	Not affect	Slightly Enhances
CM096893	E290D	Not affect	Decreases	Not affect	Reduces
CM030446	G294D	Not affect	Not affect	Not affect	Severely Reduces
CM096895	G295S	Not affect	Decreases	Not affect	Severely Reduces
CM021267	M298K	Not affect	Not affect	Not affect	Reduces
CM096897	M298V	Not affect	Not affect	Not affect	Reduces
CM096898	M298T	Not affect	Not affect	Not affect	Reduces
CM096899	G299D	Not affect	Not affect	Not affect	Reduces
CM096900	G299V	Not affect	Not affect	Not affect	Severely Reduces
VAR_003710	G299R	Increase	Not affect	Not affect	Not affect
CM096901	V302M	Increases	Not affect	Not affect	Not affect
CM096901	V302M	Not affect	Not affect	Not affect	Severely Reduces
rs193922336	R303W	Increase	Not affect	Not affect	Not affect
CM020445	L304P	Not affect	Not affect	Not affect	Reduces
CM096902	L306R	Decreases	Not affect	Increases	Severely Reduces
rs193922337	L306P	Decrease	Not affect	Not affect	Not affect
CM070146	R308W	Decreases	Not affect	Not affect	Severely Reduces
CM096904	L309H	Increases	Not affect	Decreases	Not affect
VAR_003713	L309P	Decrease	Not affect	Not affect	Not affect
CM073084	E312Q	Decreases	Not affect	Not affect	Reduces
CM082780	L314P	Decreases	Not affect	Not affect	Enhances
CM064013	L315F	Not affect	Not affect	Decreases	Severely Reduces
CM070151	F316V	Not affect	Not affect	Decreases	Severely Reduces

CM032918	G318A	Increases	Not affect	Not affect	Reduces
CM030447	G318R	Not affect	Not affect	Not affect	Severely Reduces
CM096905	E319Q	Not affect	Not affect	Not affect	Reduces
CM092843	R327H	Not affect	Not affect	Not affect	Severely Reduces
CM077744	A329V	Not affect	Not affect	Not affect	Severely Reduces
CM097174	T332K	Not affect	Not affect	Not affect	Reduces
CM077740	R333H	Not affect	Not affect	Not affect	Slightly Reduces
CM096906	S336W	Increases	Not affect	Not affect	Slightly Reduces
VAR_010595	S336L	Increase	Not affect	Not affect	Reduces
CM096916	Q337P	Not affect	Not affect	Not affect	Reduces
CM068317	E339G	Not affect	Not affect	Not affect	Reduces
CM077745	E339K	Not affect	Not affect	Not affect	Reduces
CM096917	S340I	Not affect	Increases	Not affect	Reduces
CM086014	S340T	Not affect	Not affect	Not affect	Reduces
VAR_066615	T342P	Not affect	Not affect	Not affect	Reduces
rs193922260	I348F	Not affect	Increase	Not affect	Not affect
CM096918	G356V	Increases	Decreases	Decreases	Reduces
CM087912	P359L	Not affect	Not affect	Not affect	Severely Reduces
CM096919	D363N	Not affect	Not affect	Not affect	Reduces
CM096920	D363V	Not affect	Not affect	Not affect	Reduces
CM021268	R369P	Not affect	Not affect	Not affect	Reduces
CM090143	R369C	Not affect	Not affect	Not affect	Reduces
CM096925	C371W	Not affect	Not affect	Increases	Not affect
CM096921	C371R	Not affect	Not affect	Not affect	Severely Reduces
CM096923	C371Y	Not affect	Not affect	Not affect	Severely Reduces
CM096924	C371F	Not affect	Not affect	Not affect	Severely Reduces
CM096925	C371W	Not affect	Not affect	Not affect	Reduces
CM096926	S373N	Not affect	Not affect	Not affect	Reduces
CM096927	V374M	Not affect	Not affect	Not affect	Slightly Reduces
CM096928	V374E	Not affect	Not affect	Not affect	Reduces

CM096929	S375P	Not affect	Not affect	Not affect	Severely Reduces
CM068318	R377C	Not affect	Not affect	Not affect	Reduces
CM096930	R377S	Not affect	Not affect	Not affect	Reduces
CM096931	R377L	Not affect	Not affect	Not affect	Slightly Reduces
CM096932	A378D	Not affect	Not affect	Not affect	Reduces
CM096933	A378G	Not affect	Not affect	Not affect	Reduces
CM074232	A379V	Not affect	Not affect	Not affect	Reduces
CM015313	H380Q	Not affect	Not affect	Not affect	Slightly Reduces
CM032920	H380D	Not affect	Not affect	Not affect	Reduces
CM096936	M381T	Not affect	Not affect	Not affect	Reduces
CM096937	C382R	Not affect	Not affect	Not affect	Severely Reduces
CM096938	C382G	Not affect	Not affect	Not affect	Reduces
CM020446	S383L	Not affect	Not affect	Not affect	Severely Reduces
CM096939	S383T	Not affect	Not affect	Not affect	Reduces
CM096940	A384E	Not affect	Not affect	Not affect	Severely Reduces
VAR_010598	A384T	Not affect	Not affect	Not affect	Reduces
VAR_012354	G385V	Increase	Not affect	Not affect	Not affect
CM096942	L386V	Not affect	Not affect	Not affect	Reduces
CM032921	A387T	Not affect	Not affect	Not affect	Reduces
rs193921338	A387V	Increase	Not affect	Not affect	Not affect
CM096943	G388D	Not affect	Not affect	Not affect	Severely Reduces
CM082785	V389A	Not affect	Not affect	Not affect	Reduces
CM096944	V389D	Not affect	Not affect	Not affect	Reduces
CM081272	R392S	Not affect	Not affect	Not affect	Reduces
rs193922269	R392L	Increase	Not affect	Not affect	Not affect
CM096945	M393T	Not affect	Not affect	Not affect	Reduces
rs193929375	R397L	Not affect	Not affect	Not affect	Reduces
CM015283	I404S	Decreases	Not affect	Not affect	Reduces
CM096947	T405I	Increases	Not affect	Not affect	Reduces
CM096948	V406M	Decreases	Not affect	Not affect	Reduces

CM096949	G407D	Decreases	Not affect	Not affect	Reduces
CM096949	G407D	Not affect	Not affect	Not affect	Severely Reduces
CM021269	S411F	Not affect	Not affect	Not affect	Enhances
CM096950	V412M	Not affect	Not affect	Not affect	Reduces
CM097446	Y413C	Not affect	Not affect	Not affect	Reduces
CM012129	L415V	Not affect	Not affect	Not affect	Reduces
CM074224	H416P	Not affect	Not affect	Not affect	Reduces
CM096952	H416D	Not affect	Not affect	Not affect	Reduces
CM070150	F419L	Not affect	Not affect	Not affect	Reduces
CM096953	F419V	Not affect	Not affect	Not affect	Reduces
CM074223	K420E	Not affect	Not affect	Not affect	Reduces
CM097176	H424Y	Not affect	Not affect	Not affect	Severely Reduces
rs193922275	R428Q	Not affect	Not affect	Not affect	Reduces
rs146683328	R429K	Not affect	Not affect	Not affect	Reduces
CM030448	C434Y	Not affect	Not affect	Not affect	Severely Reduces
CM064014	C434F	Not affect	Not affect	Not affect	Severely Reduces
CM096955	C434W	Not affect	Not affect	Not affect	Severely Reduces
CM096956	I436F	Not affect	Not affect	Not affect	Severely Reduces
CM097124	F438Y	Not affect	Not affect	Not affect	Reduces
CM098180	E440G	Not affect	Not affect	Not affect	Slightly Reduces
CM012130	S441W	Not affect	Not affect	Not affect	Severely Reduces
CM096957	S445C	Not affect	Not affect	Not affect	Slightly Enhances
CM032923	G446R	Not affect	Not affect	Not affect	Severely Reduces
CM032924	R447Q	Not affect	Not affect	Not affect	Slightly Reduces
CM097177	A449S	Not affect	Not affect	Not affect	Reduces
CM096959	A450T	Not affect	Not affect	Not affect	Reduces
CM096960	A450D	Not affect	Not affect	Not affect	Severely Reduces
CM093717	V452L	Not affect	Not affect	Not affect	Enhances
CM096961	S453W	Increases	Not affect	Not affect	Severely Reduces
rs193922283	S453L	Increase	Not affect	Not affect	Not affect

CM032926	A454V	Increases	Not affect	Not affect	Reduces
CM070152	A454E	Decreases	Not affect	Not affect	Reduces
CM090145	V455E	Decreases	Not affect	Not affect	Not affect
VAR_003715	V455M	Decrease	Not affect	Not affect	Reduces
rs104894014	A456V	Increase	Not affect	Not affect	Reduces
CM085976	C457W	Not affect	Not affect	Not affect	Slightly Enhances
rs193922284	K458E	Not affect	Not affect	Not affect	Increase

Table S4. Characterisation of functional SNPs and FS scores by F-SNP.

rsIDs	Region	Functional Category	Prediction Tool	FS Score
rs2908277	Upstream	Transcriptional_Regulation	Consite	0.05
rs2908276	3Prime_UTR	Transcriptional_Regulation	Consite	0.05
rs2908275	3prime_UTR	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2908274	Splice_Site, Intronic	Splicing_Regulation	Ensembl-NS/Ensembl-SR	1
rs887688	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2971680	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs887687	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs887686	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2010825	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.271
rs2268577	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2268576	Intronic	Transcriptional_Regulation	Consite	0.05
rs2268575	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2268574	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2268573	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs6971410	Intronic	Transcriptional_Regulation	Consite	0.05
rs2971679	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs3808323	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2971678	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs3808321	Intronic	Transcriptional_Regulation	Consite	0.05
rs12534623	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2971677	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2908298	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2908297	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2908296	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2971676	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208

rs2908295	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2268572	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2971675	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs4724290	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2070971	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs11768239	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2041547	Intronic	Transcriptional_Regulation	TFSearch/Consite	0
rs11974018	Intronic	Transcriptional_Regulation	TFSearch/Consite	0
rs758989	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs741039	Intronic	Transcriptional_Regulation	Consite	0.05
rs2971674	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2080033	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs10246064	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2908294	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs7793213	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs12540369	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs12535229	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2971672	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs12673242	Intronic	Transcriptional_Regulation	Consite	0.05
rs11772934	Intronic	Transcriptional_Regulation	Consite	0.05
rs2908293	Intronic	Transcriptional_Regulation	Consite	0.05
rs2908292	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2971671	Intronic	Transcriptional_Regulation	TFSearch	0.158
rs2908291	Intronic	Transcriptional_Regulation	TFSearch	0.158
rs12702068	Intronic	Transcriptional_Regulation	TFSearch	0.158
rs2908290	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2284779	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2284778	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2284777	Intronic	Transcriptional_Regulation	Consite	0.05
rs2284776	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208

rs2244164	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2300587	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2300586	Intronic	Transcriptional_Regulation	Consite	0.05
rs4724291	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs1303722	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs1303721	Intronic	Transcriptional_Regulation	TFSearch/Consite	0
rs2300584	Intronic	Transcriptional_Regulation	Consite	0.05
rs10259649	Intronic	Transcriptional_Regulation	Consite	0.05
rs12534104	Intronic	Transcriptional_Regulation	Consite	0.05
rs12702069	Intronic	Transcriptional_Regulation	Consite	0.05
rs11766576	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2284773	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2284772	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs758988	Intronic	Transcriptional_Regulation	Consite	0.05
rs758987	Intronic	Transcriptional_Regulation	Consite	0.05
rs2284769	Intronic	Transcriptional_Regulation	Consite	0.05
rs758986	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs758985	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs1990458	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs741038	Intronic	Transcriptional_Regulation	TFSearch	0.158
rs730497	Intronic	Transcriptional_Regulation	Consite	0.05
rs2908289	Intronic	Transcriptional_Regulation	Consite	0.05
rs3808320	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs3808319	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs6945550	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2971670	Intronic	Transcriptional_Regulation	Consite	0.05
rs6952751	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs2268569	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs1799884	Upstream	Transcriptional_Regulation	TFSearch/Consite	0.208
rs12702070	Upstream	Transcriptional_Regulation	TFSearch/Consite	0

rs1476891	Upstream	Transcriptional_Regulation	TFSearch	0.158
rs13306388	3prime_UTR	Transcriptional_Regulation	TFSearch/Consite	0.208
rs13306387	Intronic	Transcriptional_Regulation	TFSearch	0.158
rs13306394	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs13306389	Synonymous _Coding	Splicing_Regulation	ESRSearch/PESX	0.237
rs13306393	Intronic	Transcriptional_Regulation	TFSearch	0.158
rs13306392	Intronic	Transcriptional_Regulation	TFSearch	0.158
rs17832252	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs28684786	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs28491181	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs28639899	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs16881016	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs13227198	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs13239987	Intronic	Transcriptional_Regulation	TFSearch/Consite	0.208
rs17172566	Intronic	Transcriptional_Regulation	Consite	0.05
rs13239289	Intronic	Transcriptional_Regulation	Consite	0.05
rs13306391	5prime_UTR	Transcriptional_Regulation	TFSearch/Consite	0.208
rs13306390	5prime_UTR	Transcriptional_Regulation	TFSearch/Consite	0.208

rsIDs highlighted in bold were predicted to be functional by FASTSNP

Table S5. Homologous protein sequences utilised in the MUSCLE analysis of the GCK protein.

Seq No	Different Species	Protein/ gene ID	Other Information	Length
1	Homo sapiens	UniProtKB/Swiss-Prot: P35557.1	ACCESSION P35557 VERSION P35557.1 GI:547696	465 aa
2	Oncorhynchus mykiss (rainbow trout)	NCBI Reference Sequence: NP_001117721.1	ACCESSION NP_001117721 VERSION NP_001117721.1 GI:185132953	471 aa
3	Mus musculus (house mouse)	NCBI Reference Sequence: NP_034422.2	ACCESSION NP_034422 VERSION NP_034422.2 GI:31982798	465 aa
4	Rattus norvegicus (Norway rat)	UniProtKB/Swiss-Prot: P17712.2	ACCESSION P17712 VERSION P17712.2 GI:123902	465 aa
5	Cavia porcellus (domestic guinea pig)	NCBI Reference Sequence: XP_003462245.1	ACCESSION XP_003462245 VERSION XP_003462245.1 GI:348552860	495 aa
6	Gallus gallus (chicken)	GenBank: AAP03050.2	ACCESSION AAP03050 VERSION AAP03050.2 GI:44888570	249 aa
7.	Xenopus laevis (African clawed frog)	GenBank: AAI69458.1	CCESSION AAI69458 VERSION AAI69458.1 GI:213623226	458 aa
8	Cyprinus carpio (common carp)	GenBank: AAC33587.2	ACCESSION AAC33587 VERSION AAC33587.2 GI:7662685	476 aa
9	Sparus aurata	GenBank:	ACCESSION AAC33585	478 aa

	(gilthead seabream)	AAC33585.2	VERSION AAC33585.2 GI:7662681	
10	Sus scrofa (pig)	NCBI Reference Sequence: XP_003484115.1	ACCESSION XP_003484115 VERSION XP_003484115.1 GI:350595465	465 aa