Supplementary data for

α-Glucosidase inhibitors: consistency of *in silico* docking data with *in vitro* inhibitory data, and inhibitory effect prediction of quercetin derivatives

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Table S1 CDOCKER parameters

Parameters	**value**
Top Hits	1
Pose Cluster Radius	0.5
Random Conformations	200
Dynamics Steps	1000
Dynamics Target Temperature	1000
Include Electrostatic Interactions	TRUE
Orientations to Refine	10
Maximum Bad Orientations	800
Orientation VDW Energy Threshold	300
Simulated Annealing	TRUE
Heating Steps	2000
Heating Target Temperature	700
Cooling Steps	5000
Cooling Target Temperature	300
Advanced	
Forcefield	CHARMm
Use Full Potential	FALSE
Ligand Partial Charge Method	Momany-Rone
Final Minimization	Full Potential
Final Minimization Gradient Tolerance	0
Prepare Input Receptor	TRUE
Grid Extension	8
Random Number Seed	314159 314159 314159 314159

Table S2 -CD_E of the 47 polyphenols to searched cavities (selected)

polyphenols	site 1	site 2	site 3	site 23
luteolin	36.0037	29.9889	34.3686	32.6422
chrysoeriol	29.8589	27.7328	31.9232	29.4626
vitexin	24.9295	5.46192	15.3623	15.7258
isovitexin	29.8045	7.24688	22.2198	13.5562
isorhamnetin-3-O-D-rutinoside	12.3073	fail	fail	fail
phloretin	33.8801	29.9409	33.8869	28.4538
kaempferol	30.5058	27.3006	30.0184	28.5485
xanthohumol	13.9334	-3.92161	12.4963	3.58587
luteolin-7-O-glucuronide	32.2643	15.2568	26.7229	22.0976
luteolin 7-O-glucoside	26.5557	6.9591	16.522	14.2205
diosmetin 7-O-glucuronide	29.7556	7.36632	16.3437	13.7679
myricetin	37.0643	31.6409	38.5717	32.498
quercetin	34.0031	29.4135	36.2535	31.9603
apigenin	29.2016	26.6837	29.6853	29.1386
morin	32.0056	30.127	31.4594	30.0063
baohuoside I	1.10243	fail	fail	-17.8466
betulinic acid	-62.9067	fail	fail	fail
hederagenin	-55.8728	fail	fail	fail
naringenin	31.1319	22.9996	30.1045	29.6025
catechin	33.8522	30.2502	34.4909	29.2904
epicatechin gallate	57.0219	-2.22155	49.4252	46.1734
epigallocatechin gallate	59.4284	-5.47163	48.4786	46.8781
gallocatechin gallate	60.9281	-39.8803	54.4073	42.4305
afzelin	18.8876	-59.33	9.00791	5.1644
quercitrin	22.6623	-121.79	13.0075	6.63025
acacetin-7-O-glucopyranoside	24.6675	9.61994	8.35996	15.8555
acacetin-7-O-rhamopyranoside	23.5556	8.31034	12.4662	14.8995
kaempferol-3-O-rutinoside	10.7441	fail	fail	-18.9031
kaempferol-3-O-D-glucopyranoside	15.2542	-121.708	4.56573	8.12872
rutin	15.9205	fail	fail	fail
orientin	28.502	-124.516	18.5162	17.7768
isoorientin	34.4515	12.0486	24.8962	19.8596
isoquercetin	19.9396	-88.2459	4.4138	11.9228
3’ -prenylchalconaringenin	14.0823	4.36402	12.6677	3.05271
3’ -geranylchalconaringenin	-0.28066	-32.9743	-15.7167	-11.6583
8-prenylnaringenin	15.7494	4.97667	15.7658	8.87387
8-geranylnaringenin	6.42331	-113.394	-6.98618	-9.72399
chalconaringenin	26.1249	23.9953	26.9467	20.5843
narirutin	12.7785	fail	fail	-20.0856
poncirin	14.9094	fail	fail	fail
didymin	8.87368	fail	fail	-26.0821

naringin	20.2718	fail	fail	fail
hesperidin	11.5788	fail	fail	-8.52103
neoeriocitrin	24.7352	fail	fail	fail
cassigarol E	45.131	-173.14	-101.464	33.8065
scirpusin A	33.258	-260.76	fail	8.97893
scirpusin B	37.9913	-306.822	22.9264	12.574

Table S3 IC_{50} and $-CD_E$ data of collected compounds

Compounds	Enzyme studied	IC_{50} value	$-CD_E$
catechin	ScαG[a]	31	34.491
epicatechin gallate		18.1 ± 5.20	57.022
epigallocatechin gallate		0.25 ± 0.01	59.428
gallocatechin gallate		1.35 ± 0.12	60.928
quercetin	ScαG[b]	17	36.254
isoquercetin		185	19.940
rutin		196	15.921
myricetin	rat intestinal	3	37.761
quercetin	sucrase[c]	3.5	34.875
avicularin		6.5	17.030
guaijaverin		6.2	14.414
hyperin		7.5	17.766
kaempferol		5.2	29.457
apigenin	ScαG[b]	10.5 ± 0.05	29.685
morin		4.48 ± 0.04	32.006
myricetin		2.25 ± 0.05	38.572
cyclic imine Δ1 piperidine-naringenin	YαG[c]	249.4	29.719
cyclic imine Δ1 piperideine-hesperetin		>500	32.103
apigenin	YαG[a]	0.29 IC_{20}	29.685
chryseriol		1.89	31.923
quercetin 3-O-galactoside	rat intestinal	>1	44.162
quercetin 3-O-(6-O-caffeoyl)-galactoside	maltase[c]	0.085	42.562
quinic acid	maltase	NI	14.828
3-caffeoyl quinic acid	ScαG[d]	0.39	32.706
4- caffeoyl quinic acid		0.34	41.949
5- caffeoyl quinic acid		0.3	38.478
3,4-dicaffeoyl quinic acid		0.27	51.728
3,5-dicaffeoyl quinic acid		0.27	57.629
4,5-dicaffeoyl quinic acid		0.16	53.704
3'-prenylchalconaringenin	YαG[b]	22.42	14.082
chalconaringenin		20.02	26.947
8-prenylnaringenin		45.92	15.766
naringenin		44.65	31.132

[a] corresponding IC_{50} values are expressed as μg/mL,

[b] corresponding IC_{50} values are expressed as μmol/L,

[c] corresponding IC_{50} values are expressed as mmol/L,

[d] corresponding IC_{50} values are expressed as mg/mL.

Table S4 Modification of quercetin with galloyl, and caffeoyl group

No.	C3	C5	C7	C3'	C4'	C6, 8, 2’, 5', 6’
1	galloyl group	OH	OH	OH	OH	H
2	OH	galloyl group	OH	OH	OH	H
3	OH	OH	galloyl group	OH	OH	H
4	OH	OH	OH	galloyl group	OH	H
5	OH	OH	OH	OH	galloyl group	H
6	caffeoyl group	OH	OH	OH	OH	H
7	OH	caffeoyl group	OH	OH	OH	H
8	OH	OH	caffeoyl group	OH	OH	H
9	OH	OH	OH	caffeoyl group	OH	H
10	OH	OH	OH	OH	caffeoyl group	H

Table S5 ADMET properties of chosen molecules

No.	Absorption Level	Aqueous Solubility Level	Blood Brain Barrier Level	CYP2D6 Prediction	Hepatotoxic Prediction
1	3	2	4	TRUE	TRUE
2	3	2	4	FALSE	TRUE
3	3	2	4	FALSE	TRUE
4	3	2	4	FALSE	TRUE
5	3	2	4	FALSE	TRUE
6	3	2	4	TRUE	TRUE
7	3	2	4	FALSE	TRUE
8	3	2	4	FALSE	TRUE
9	3	2	4	FALSE	TRUE
10	3	2	4	FALSE	TRUE

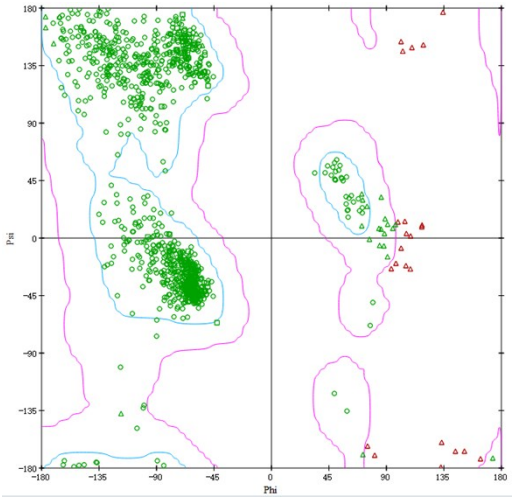

Figure S1 Ramachandran plot of built model.

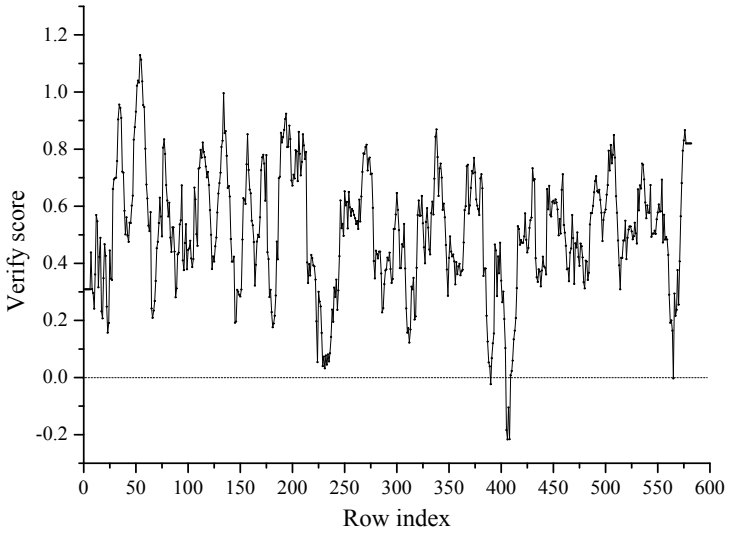

Figure S2 Profile-3D graph showing the verify score of amimo acid residues.

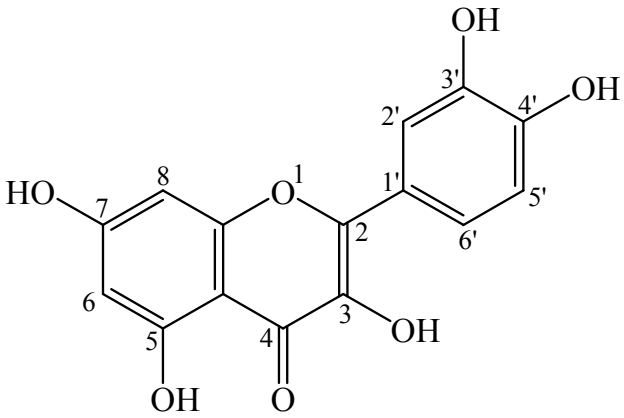

Figure S3 Structure of quercetin.