

Supplementary table 1: binding affinity of E2 and phytoestrogens to ER α and ER β (expressed as IC50 values from competitive binding assays).

chemical	IC50 E2 (nM)		IC50 phytoestrogen (nM)		reference
	ERalpha	ERbeta	ERalpha	ERbeta	
bavachin	1.4	1.4	65700	38000	Park <i>et al.</i> , 2012
B-erythroidin	8.3	5.5	111000	96100	Djiogue <i>et al.</i> , 2014
B-sitosterol	3.5	65	4000	4000	Gutendorf and Westendorf, 2
coumestrol	0.93	1.06	2.7	1.1	Kuiper <i>et al.</i> , 1998
coumestrol	3.5	65	3000	3000	Gutendorf and Westendorf, 2
daidzein	0.2	0.5	2000	1300	De Angelis <i>et al.</i> , 2005
daidzein	0.93	1.06	420	100	Kuiper <i>et al.</i> , 1998
dehydroequol	0.2	0.5	430	12	De Angelis <i>et al.</i> , 2005
equol	0.2	0.5	100	29	De Angelis <i>et al.</i> , 2005
ferutinine	3.2	14.6	33.1	180.5	Ikeda <i>et al.</i> , 2002
genistein	0.2	0.5	29	3.8	De Angelis <i>et al.</i> , 2005
genistein	0.93	1.06	145	8.4	Kuiper <i>et al.</i> , 1998
genistein	3.5	65	35000	2000	Gutendorf and Westendorf, 2
kievitone	0.7	0.72	145	173	Boue <i>et al.</i> , 2011
phaseollin	0.7	0.72	328	134	Boue <i>et al.</i> , 2011
psoralidin	5.76	7.06	1003	24600	Liu <i>et al.</i> , 2014
tschimgine	3.2	14.6	5500	17100	Ikeda <i>et al.</i> , 2002

Supplementary table 2: ER α - and ER β - mediated gene expression induced by E2 and phytoestrogens (expressed as EC50 values from reporter gene assays).

chemical	EC50 E2 (nM)		EC50 phytoestrogen (nM)		reference
	ERalpha	ERbeta	ERalpha	ERbeta	
apigenin	0.0025	0.0053	740	100	Takeuchi <i>et al.</i> , 2009
biochanin A	0.41	0.16	950	180	Dornstauder <i>et al.</i> , 2001
biochanin A	0.0025	0.0053	210	26	Takeuchi <i>et al.</i> , 2009
biochanin A	0.017	0.068	82	6.8	Escande <i>et al.</i> , 2006
chrysin	0.0025	0.0053	5300	3000	Takeuchi <i>et al.</i> , 2009
coumestrol	0.0025	0.0053	0.45	0.24	Takeuchi <i>et al.</i> , 2009
coumestrol	0.017	0.068	16	6.9	Escande <i>et al.</i> , 2006
coumestrol	0.064	0.039	1600	16	Harris <i>et al.</i> , 2005
daidzein	0.41	0.16	10000	960	Dornstauder <i>et al.</i> , 2001
daidzein	0.017	0.068	150	57	Escande <i>et al.</i> , 2006
daidzein	0.021	0.11	250	100	De Angelis <i>et al.</i> , 2005
daidzein	0.11	0.05	631	16	Chrzan and Bradford, 2007
daidzein	0.32	1.5	390	87	Casanova <i>et al.</i> , 1999
daidzein	0.0025	0.0053	24	2.1	Takeuchi <i>et al.</i> , 2009
daidzein	0.0026	0.041	76	14	Islam <i>et al.</i> , 2015
daidzein	0.531	0.585	545	145	Chu <i>et al.</i> , 2009
daidzein	0.45	0.03	15500	13	Chrzan and Bradford, 2007
dehydroequol	0.021	0.11	3200	7.2	De Angelis <i>et al.</i> , 2005
emodin	0.531	0.585	89.5	14.4	Chu <i>et al.</i> , 2009
enterodiol	0.0025	0.0053	7200	3500	Takeuchi <i>et al.</i> , 2009
enterolacton	0.0025	0.0053	1200	450	Takeuchi <i>et al.</i> , 2009
equol	0.0025	0.0053	4.6	1.3	Takeuchi <i>et al.</i> , 2009
equol	0.021	0.11	200	74	De Angelis <i>et al.</i> , 2005
ferutinin	0.017	0.068	0.64	3.9	Tiosano <i>et al.</i> , 2014
formononetin	0.41	0.16	2000	1500	Dornstauder <i>et al.</i> , 2001
formononetin	0.0025	0.0053	260	300	Takeuchi <i>et al.</i> , 2009
genistein	0.4	0.2	5.7	2.2	Rickard <i>et al.</i> (2003)
genistein	0.017	0.068	18.8	6.1	Tiosano <i>et al.</i> , 2014
genistein	0.11	0.05	333	13	Chrzan and Bradford, 2007
genistein	0.021	0.11	20	6	De Angelis <i>et al.</i> , 2005
genistein	0.45	0.03	655	1.7	Chrzan and Bradford, 2007
genistein	0.017	0.068	38	5.8	Escande <i>et al.</i> , 2006
genistein	0.32	1.5	34	4.9	Casanova <i>et al.</i> , 1999
genistein	0.531	0.585	356	11.3	Chu <i>et al.</i> , 2009
genistein	0.0025	0.0053	2.3	0.1	Takeuchi <i>et al.</i> , 2009
genistein	0.41	0.16	900	4.2	Dornstauder <i>et al.</i> , 2001
genistein	0.0026	0.041	16.2	1.9	Islam <i>et al.</i> , 2015
genistein	0.064	0.039	460	3.4	Harris <i>et al.</i> , 2005
glycitein	0.0025	0.0053	590	64	Takeuchi <i>et al.</i> , 2009
hesperetin	0.0025	0.0053	1300	780	Takeuchi <i>et al.</i> , 2009
kaempferol	0.0025	0.0053	3500	580	Takeuchi <i>et al.</i> , 2009
luteolin	0.0025	0.0053	1700	590	Takeuchi <i>et al.</i> , 2009
naringenin	0.0025	0.0053	990	120	Takeuchi <i>et al.</i> , 2009
o-DMA	0.0025	0.0053	24	18	Takeuchi <i>et al.</i> , 2009
phloretin	0.0025	0.0053	310	220	Takeuchi <i>et al.</i> , 2009
3',4',7-THF	0.0025	0.0053	880	320	Takeuchi <i>et al.</i> , 2009