

**Supplementary Table 1:** A set of 469 cis elements extracted from the PLACE database

#	Name	Length	#	Name	Length
1.	-10PEHVPSBD	6	236.	HDZIPIIIAT	11
2.	-141NTG13	21	237.	HEXAMERATH4	6
3.	-284MOTIFZMSBE1	30	238.	HEXAT	8
4.	-300CORE	7	239.	HEXMOTIFTAH3H4	6
5.	-300ELEMENT	8	240.	HSE	14
6.	-300MOTIFZMZEIN	9	241.	HSELIKENTACIDICPR1	15
7.	-314MOTIFZMSBE1	20	242.	HSELIKENTGLN2	10
8.	14BPATERD1	14	243.	HSRENTHSR203J	12
9.	20NTNTNOS	20	244.	HY5AT	12
10.	23BPUASNSCYCB1	23	245.	IBOX	6
11.	23BPZM27KDAZEIN	23	246.	IBOXCORE	5
12.	27BPDRCONSENSUSPS25S	27	247.	IBOXCORENT	7
13.	2SSEEDPROTBANAPA	7	248.	IBOXLSCMCUCUMISIN	13
14.	3AF1BOXPSRBCS3	21	249.	IDE1HVIDS2	18
15.	5256BOXLELAT5256	12	250.	IDE2HVIDS2	27
16.	5659BOXLELAT5659	10	251.	IDRSZMFER1	14
17.	AACACOREOSGLUB1	7	252.	INRNTPSADB	8
18.	AACAOSGLUB1	14	253.	INTRONLOWER	6
19.	AAGACGTAGATACL12	9	254.	INTRONUPPER	9
20.	ABADESI1	10	255.	IRO2OS	7
21.	ABADESI2	11	256.	JASE1ATOPR1	10
22.	ABAREG2	11	257.	JASE2ATOPR1	13
23.	ABASEED1	11	258.	JERECRSTR	24
24.	ABFOS	19	259.	L1BOXATPDF1	8
25.	ABRE2HVA1	12	260.	L1DCPAL1	12
26.	ABRE2HVA22	10	261.	L4DCPAL1	12
27.	ABRE3HVA1	10	262.	LBOXLERBCS	11
28.	ABRE3HVA22	10	263.	LEAFYATAG	7
29.	ABRE3OSRAB16	11	264.	LECPLEACS2	8
30.	ABREA2HVA1	10	265.	LEGUMINBOXLEGA5	28
31.	ABREATCONSENSUS	8	266.	LREBOX2PSRBCS3	15
32.	ABREATRD22	10	267.	LREBOX3PSRBCS3	15
33.	ABREAZMRAB28	10	268.	LREBOXIIPCCHS1	10
34.	ABREBNNAPA	12	269.	LREBOXIPCCHS1	10
35.	ABREBZMRAB28	10	270.	LRENPCABE	8
36.	ABRECE1HVA22	9	271.	LS5ATPR1	10
37.	ABRECE3HVA1	12	272.	LS7ATPR1	10
38.	ABRECE3ZMRAB28	12	273.	LTRE1HVBLT49	6
39.	ABREDISTBBNNAPA	10	274.	LTREATLTI78	7

40.	ABRELATERD1	5	275.	LTRECOREATCOR15	5
41.	ABREMOTIFAOSOSEM	8	276.	MARABOX1	10
42.	ABREMOTIFIIOSRAB16B	10	277.	MARARS	11
43.	ABREMOTIFIOSRAB16B	10	278.	MARCEN3	25
44.	ABREOSRAB21	8	279.	MARTBOX	10
45.	ABRERATCAL	7	280.	MEJARELELOX	17
46.	ABRETAEM	11	281.	MNF1ZMPPC1	8
47.	ABREZMRAB28	8	282.	MREATCHS	12
48.	ACEATCHS	10	283.	MRNA3ENDTAH3	10
49.	ACGTABOX	6	284.	MRNASTA1CRPSBD	12
50.	ACGTABREMOTIFA2OSEM	7	285.	MRNASTA2CRPSBD	7
51.	ACGTABREMOTIFAOSOSEM	8	286.	MSACRCYM	9
52.	ACGTATERD1	4	287.	MYB1AT	6
53.	ACGTCBOX	6	288.	MYB1LEPR	7
54.	ACGTOSGLUB1	7	289.	MYB26PS	8
55.	ACGTROOT1	10	290.	MYB2AT	6
56.	ACGTSEED2	11	291.	MYB2CONSENSUSAT	6
57.	ACGTSEED3	10	292.	MYBATRD22	7
58.	ACGTTBOX	6	293.	MYBCORE	6
59.	ACIIPVPAL2	9	294.	MYBCOREATCYCB1	5
60.	ACIIPVPAL2	12	295.	MYBGAHV	7
61.	ACIPVPAL2	10	296.	MYBPLANT	8
62.	AGAMOUSATCONSENSUS	16	297.	MYBPZM	6
63.	AGATCONSENSUS	15	298.	MYBST1	5
64.	AGCBOXNPGLB	7	299.	MYCATERD1	6
65.	AGL1ATCONSENSUS	18	300.	MYCATRD22	6
66.	AGL2ATCONSENSUS	18	301.	MYCCONSENSUSAT	6
67.	AGL3ATCONSENSUS	16	302.	NAPINMOTIFBN	7
68.	AGMOTIFNTMYB2	8	303.	NDEGMSAUR	30
69.	AGTACSAO	28	304.	NODCON1GM	6
70.	ALF1NTPARC	17	305.	NODCON2GM	5
71.	ALF2NTPARB	18	306.	NONAMERATH4	9
72.	AMMORESIIUDCRNIA1	8	307.	NONAMERMOTIFTAH3H4	9
73.	AMMORESIVDCRNIA1	7	308.	NRRBNEXTA	8
74.	AMMORESVDCRNIA1	9	309.	NTBBF1ARROLB	6
75.	AMYBOX1	7	310.	O2F1BE2S1	10
76.	AMYBOX2	7	311.	O2F2BE2S1	10
77.	ANAERO1CONSENSUS	7	312.	O2F3BE2S1	10
78.	ANAERO2CONSENSUS	6	313.	OBF5ATGST6	26
79.	ANAERO3CONSENSUS	7	314.	OBP1ATGST6	11

80.	ANAERO4CONSENSUS	9	315.	OCETYPEIIINTHISTONE	30
81.	ANAERO5CONSENSUS	9	316.	OCETYPEIINTHISTONE	11
82.	ANAEROBICCISZMGAPC4	20	317.	OCETYPEINTHISTONE	18
83.	ARE1	11	318.	OCSELEMENTAT	20
84.	ARECOREZMGAPC4	10	319.	OCSENHANMOTIFAT	16
85.	ARELIKEGHPGDFR2	17	320.	OCSGMGH24	24
86.	ARFAT	6	321.	OCSGMHSP26A	20
87.	ARR1AT	5	322.	OCTAMERMOTIFTAH3H4	8
88.	AS1CAMV	29	323.	OCTAMOTIF2	8
89.	AS1LIKECSHPRA	15	324.	OPAQUE2ZM22Z	10
90.	ASF1ATNOS	21	325.	OPAQUE2ZMB32	10
91.	ASF1MOTIFCAMV	5	326.	OSE1ROOTNODULE	6
92.	ASF1NTPARA	18	327.	OSE2ROOTNODULE	5
93.	AT1BOX	12	328.	P1BS	8
94.	ATHB1ATCONSENSUS	9	329.	PALBOXAPC	6
95.	ATHB2ATCONSENSUS	9	330.	PALBOXLPC	11
96.	ATHB5ATCORE	9	331.	PALBOXPPC	14
97.	ATHB6COREAT	9	332.	PALINDROMICCBXGM	8
98.	ATRICHPSPETE	31	333.	PASNTPARA	20
99.	AUXREPSIAA4	8	334.	PE1ASPHYA3	22
100.	AUXRETGA1GMGH3	8	335.	PE2FNTRNR1A	8
101.	AUXRETGA2GMGH3	9	336.	PE3ASPHYA3	31
102.	B2GMAUX28	10	337.	PIATGAPB	8
103.	BBOXSITE1STPAT	10	338.	PIIATGAPB	20
104.	BIHD1OS	5	339.	POLASIG1	6
105.	BOX1PSGS2	11	340.	POLASIG2	7
106.	BOX1PVCHS15	14	341.	POLASIG3	6
107.	BOX2PSGS2	11	342.	POLLEN1LELAT52	5
108.	BOX2PVCHS15	14	343.	POLLEN2LELAT52	9
109.	BOX3PVCHS15	14	344.	PR2GCNT	11
110.	BOXBPSAS1	14	345.	PREATPRODH	6
111.	BOXC'PSAS1	18	346.	PRECONSCRHSP70A	24
112.	BOXCPSAS1	7	347.	PREMOTIFNPCABE	12
113.	BOXICHS	16	348.	PROLAMINBOX	15
114.	BOXIINTPATPB	6	349.	PROLAMINBOXOSGLUB1	7
115.	BOXIIPCCHS	7	350.	PROXBBNNA	8
116.	BOXINTPATPB	21	351.	PSREGIONZMZM13	31
117.	BOXLCOREDPCAL	7	352.	PYRIMIDINEBOXHVEPB1	8
118.	BP5OSWX	7	353.	PYRIMIDINEBOXOSRAMY1A	6
119.	BS1EGCCR	6	354.	QARBNEXTA	7

120.	C1GMAUX28	16	355.	QELEMENTZMZM13	6
121.	C1MOTIFZMBZ2	11	356.	RAV1AAT	5
122.	C2GMAUX28	20	357.	RAV1BAT	6
123.	CAATBOX1	4	358.	RBCSBOX2PS	14
124.	CAATBOX2	9	359.	RBCSBOX3PS	12
125.	CACGCAATGMGH3	8	360.	RBCSCONSENSUS	7
126.	CACGTGMOTIF	6	361.	RBCSGBOXPS	11
127.	CACTFTPPCA1	4	362.	RBENTGA3	11
128.	CANBNNAPA	7	363.	RE1ASPHYA3	11
129.	CAREOSREP1	6	364.	REALPHALGLHCB21	6
130.	CARG1ATAP3	18	365.	REBETALGLHCB21	6
131.	CARG2ATAP3	18	366.	REGION1OSOSEM	16
132.	CARG3ATAP3	18	367.	RGATAOS	9
133.	CARGATCONSENSUS	10	368.	RHERPATEXPA7	6
134.	CARGCW8GAT	10	369.	RNFG1OS	11
135.	CARGNCAT	12	370.	RNFG2OS	15
136.	CATATGGMSAUR	6	371.	ROOTMOTIFTAPOX1	5
137.	CBFHV	6	372.	RSEPVGRP1	12
138.	CCA1ATLHCB1	8	373.	RSEPVGRP18	26
139.	CCAATBOX1	5	374.	RSRBNEXTA	17
140.	CCTCGTGTCTCGMGH3	11	375.	RYREPEAT4	13
141.	CDA1ATCAB2	8	376.	RYREPEATBNNAPA	6
142.	CE3OSOSEM	10	377.	RYREPEATGMGY2	7
143.	CELLCYCLESC	8	378.	RYREPEATLEGUMINBOX	7
144.	CEREGLUBOX1PSLEGA	9	379.	RYREPEATVFLEB4	8
145.	CEREGLUBOX2PSLEGA	8	380.	S1FBOXSORPS1L21	6
146.	CEREGLUBOX3PSLEGA	9	381.	S1FSORPL21	8
147.	CGACGOSAMY3	5	382.	S2FSORPL21	9
148.	CGCGBOXAT	6	383.	SARECAMV	21
149.	CGF1ATCAB2	31	384.	SB1NPABC1	16
150.	CGTGTSPHZMC1	16	385.	SB3NPABC1	15
151.	CIACADIANLELHC	10	386.	SBOXATRBCS	8
152.	CMSRE1IBSPOA	7	387.	SE1PVGRP18	24
153.	CONSERVED11NTZMATP1	11	388.	SE2PVGRP1	24
154.	COREOS	28	389.	SEBFCONSSTPR10A	7
155.	CPBCSPOR	6	390.	SEF1MOTIF	9
156.	CPRFPCCHS	10	391.	SEF3MOTIFGM	6
157.	CRTDREHVCBF2	6	392.	SEF4MOTIFGM7S	7
158.	CTRMCAV35S	9	393.	SGBFGMGMAUX28	10
159.	CURECORECR	4	394.	SITE1SORPS1	14

160.	CYTOSITECSHPRA	13	395.	SITE3SORPS1	14
161.	D1GMAUX28	10	396.	SITEIIAOSPCNA	9
162.	D2GMAUX28	12	397.	SITEIIATCYTC	6
163.	D3GMAUX28	11	398.	SITEIIBOSPCNA	9
164.	D4GMAUX28	9	399.	SITEIOSPCNA	8
165.	DE1PSPRA2	12	400.	SORLIP1AT	5
166.	DOFCOREZM	4	401.	SORLIP2AT	5
167.	DPBFCOREDCDC3	7	402.	SORLIP3AT	9
168.	DR5GMGH3	11	403.	SORLIP4AT	9
169.	DRE1COREZMRAB17	7	404.	SORLIP5AT	7
170.	DRE2COREZMRAB17	6	405.	SORLREP2AT	9
171.	DRECRTCOREAT	6	406.	SORLREP3AT	9
172.	DREDR1ATRD29AB	9	407.	SORLREP4AT	9
173.	E2F1OSPCNA	8	408.	SORLREP5AT	10
174.	E2FANTRNR	8	409.	SP8BFIBSP8AIB	8
175.	E2FAT	9	410.	SP8BFIBSP8BIB	7
176.	E2FBNTRNR	8	411.	SPHCOREZMC1	9
177.	E2FCONSENSUS	8	412.	SPHZMC1	11
178.	EBOXBNNAPA	6	413.	SREATMSD	6
179.	ECCRCAH1	7	414.	SRENTTTO1	13
180.	EIN3ATERF1	28	415.	SURE1STPAT21	9
181.	ELEMENT1GMLBC3	24	416.	SURE2STPAT21	9
182.	ELEMENT2GMLBC3	16	417.	SUREAHVISO1	25
183.	ELRE1PCPAL1	17	418.	SURECOREATSULTR11	5
184.	ELRE2PCPAL1	14	419.	SV40COREENHAN	8
185.	ELRECOREPCRP1	6	420.	T/GBOXATPIN2	6
186.	ELRENTCHN50	12	421.	TAAAGSTKST1	5
187.	EMBP1TAEM	8	422.	TACBBFNTEAS4	14
188.	EMHVCHORD	8	423.	TATABOX1	10
189.	EREGCC	11	424.	TATABOX2	7
190.	ERELEE4	8	425.	TATABOX3	7
191.	ESPASGL01	14	426.	TATABOX4	7
192.	EVENINGAT	9	427.	TATABOX5	6
193.	GADOWNAT	7	428.	TATABOXOSPAL	7
194.	GAGA8HVBKN3	16	429.	TATAPVTRNALEU	8
195.	GAGAGMGA1	18	430.	TATCCACHVAL21	7
196.	GARE1OSREP1	7	431.	TATCCAOSAMY	6
197.	GARE2	14	432.	TATCCAYMOTIFOSRAMY3D	7
198.	GARE2OSREP1	7	433.	TBOXATGAPB	6
199.	GARE4HVEPB1	15	434.	TCA1MOTIF	10

200.	GAREAT	7	435.	TDBA12NTCHN50	12
201.	GAREHVAMY1	21	436.	TE2F2NTPCNA	8
202.	GATABOX	4	437.	TEF1BOXATA1	24
203.	GBOX10NT	10	438.	TEFBOXATEEF1AA1	16
204.	GBOXLERBCS	9	439.	TELOBOXATEEF1AA1	9
205.	GBOXPC	10	440.	TGA1ANTPR1A	16
206.	GBOXRELOSAMY3	11	441.	TGACGTVMAMY	6
207.	GBOXSORBCS1	10	442.	TGTCACACMCUCUMISIN	7
208.	GCAACREPEATZMZEIN	10	443.	TL1ATSAR	11
209.	GCBP2ZMGAPC4	9	444.	TOPOISOM	15
210.	GCCCORE	6	445.	TRANSINITDICOTS	8
211.	GCN4OSGLUB1	7	446.	TRANSINITMONOCOTS	8
212.	GGTCCCATGMSAUR	8	447.	TRANSTART	12
213.	GLMHVCHORD	9	448.	UP1ATMSD	9
214.	GLUTAACAOS	12	449.	UP2ATMSD	8
215.	GLUTEBOX1OSGT2	18	450.	UPRE1AT	11
216.	GLUTEBOX1OSGT3	19	451.	UPRE2AT	10
217.	GLUTEBOX2OSGT2	11	452.	UPRMOTIFIAT	8
218.	GLUTEBOX2OSGT3	15	453.	UPRMOTIFIAT	19
219.	GLUTEBP1OS	14	454.	VOZATVPP	15
220.	GLUTEBP2OS	19	455.	VSF1PVGRP18	9
221.	GLUTECOREOS	11	456.	WARBNEXTA	20
222.	GMHDLGMVSPB	10	457.	WBOXPCWRKY1	7
223.	GRAZMRAB17	12	458.	WBOXATNPR1	5
224.	GRAZMRAB28	9	459.	WBOXGACAD1A	14
225.	GREGIONNTPRB1B	24	460.	WBOXHVISO1	5
226.	GT1CONSENSUS	6	461.	WBOXNTCHN48	6
227.	GT1CORE	6	462.	WBOXNTERF3	5
228.	GT1GMSCAM4	6	463.	WINPSTPIIK	10
229.	GT1MOTIFPSRBCS	12	464.	WRECSAA01	10
230.	GT2OSPHYA	9	465.	WRKY71OS	4
231.	GTGANTG10	4	466.	WUSATAg	7
232.	HBOXCONSENSUSPVCHS	15	467.	XYLAT	8
233.	HBOXPVCHS15	20	468.	YREGIONNTPRB1B	26
234.	HDMOTIFPCPR2	11	469.	ZDNAFORMINGATCAB1	8
235.	HDZIP2ATATHB2	9			