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Supplemental Data

A “Copernican” Reassessment of the Human

Mitochondrial DNA Tree from its Root

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Figure S1. Unrooted mtDNA Phylogeny Relating Humans and Neanderthals

The Neanderthal complete mtDNA phylogeny, the first split in the human phylogeny defining haplogroups L0 and L1'2'3'4'5'6, and the arrays of mutations leading to the rCRS are shown.

The array of mutations separating the RSRS and the RNRS is also shown but is not indicative for the phylogenetic occurrence of the mutations.

Figure S2

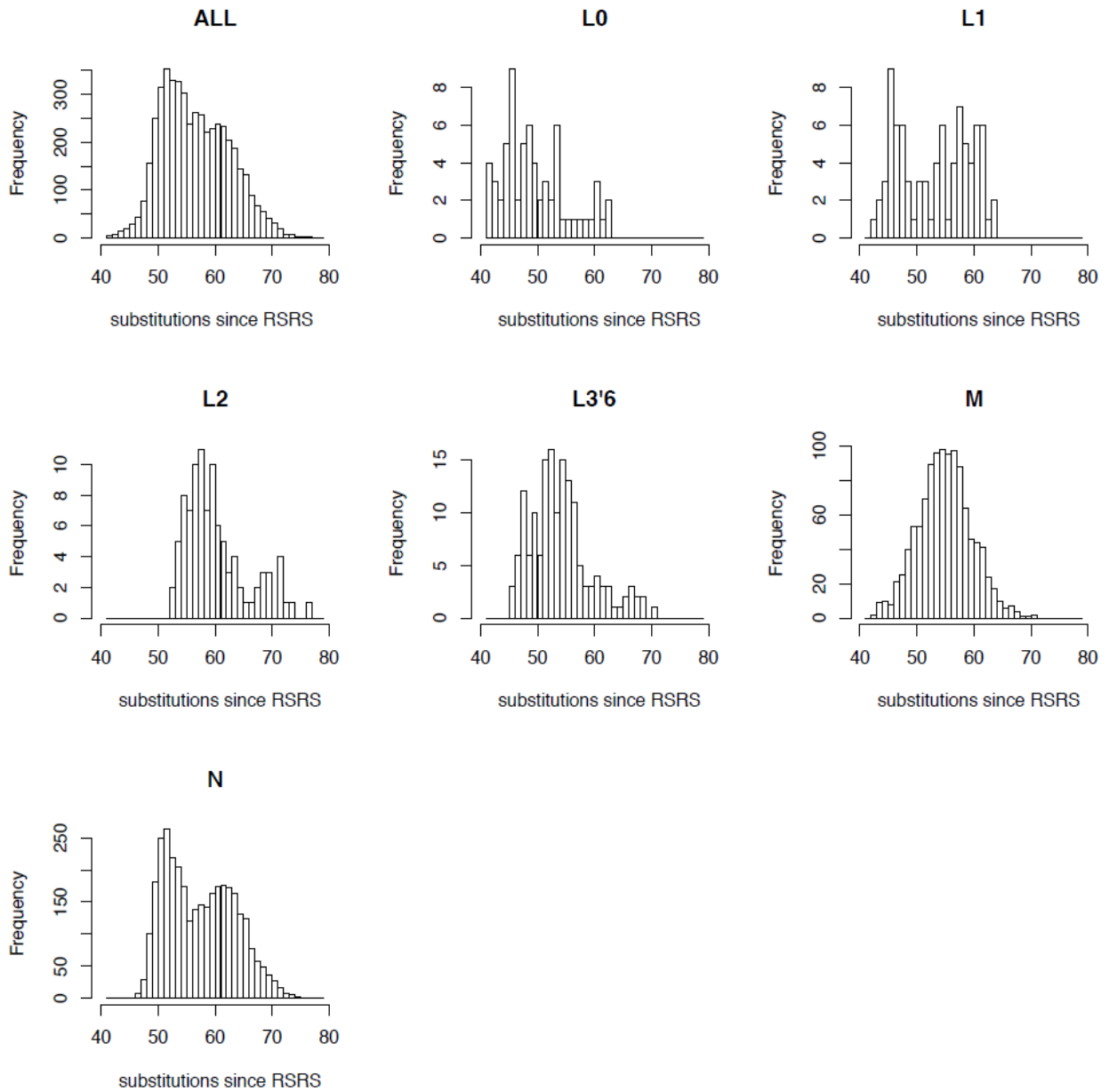


Figure S2. Distances in Substitution Counts from the RSRS to Extant Haplotypes

A histogram representation of substitution counts separating the RSRS from contemporary mitogenomes subdivided according to their haplogroup affiliation. These counts were generated by considering the actual coalescence flow and are therefore larger than the mere number of substitution differences between the RSRS and each haplotype, as multiple substitutions at the same site, including reversions, are counted.

Table S1. Root of the Human mtDNA Tree

	L0	L1'2'3'4'5'6	Neanderthal	Final location
146	C	T	C (5/6)	L1'2'3'4'5'6
182	C	T	C	L1'2'3'4'5'6
263	A	G	G	L0
1048	T	C	C	L0
3516	a	C	C	L0
4312	T	C	T	L1'2'3'4'5'6
5442	C	T	T	L0
6185	C	T	T	L0
9042	T	C	C	L0
9347	G	A	A	L0
10589	A	G	G	L0
10664	T	C	T	L1'2'3'4'5'6
10915	C	T	C	L1'2'3'4'5'6
11914	A	G	A	L1'2'3'4'5'6
12007	A	G	G	L0
12720	G	A	A	L0
13276	G	A	G	L1'2'3'4'5'6
16230	G	A	G	L1'2'3'4'5'6

Table S2. List of Indel Positions Identified in Mitogenomes

Serial	Indel	Comment
1	42.1G	
2	44.1C	
3	54.1C	Prone to various interpretations
4	55.1T	Prone to various interpretations
5	56d	
6	56.1A	Prone to various interpretations
7	56.1C	Prone to various interpretations
8	56.1G	Prone to various interpretations
9	57.1C	Prone to various interpretations
10	57.1G	Prone to various interpretations
11	60.XT	Prone to various interpretations
12	63d	
13	64-65d	
14	65d	
15	65.1T	Prone to various interpretations
16	65.2T	Prone to various interpretations
17	66.1T	Prone to various interpretations
18	70-71d	
19	71d	
20	71.1G	
21	89.1A	

22	93.1T	
23	105-110d	
24	106-111d	
25	115d	
26	132.1A	
27	166.1G	
28	174.1T	
29	186.1C	
30	191-193d	
31	191.1A	
32	194.1A	
33	196d	alone or combined with 191-193d
34	242-244d	
35	247d	
36	249d	
37	249.1A	
38	253-254d	
39	267d	
40	270.1G	
41	270.1T	
42	273-274d	
43	290-291d	
44	291d	

45	291.XA	
46	291.1ACATCATAACAAAAAA	
47	292.XA	combined with 294.1T
48	294.1T	
49	299.1C	
50	299d	
51	306-309d	
52	308-309d	
53	308.1T	
54	309d	
55	309.XC	This polymorphism is usually ignored in analysis
56	310C	This polymorphism creates an irresolvable poly C stretch at position 315.XC
57	310.1T	
58	311.1T	
59	314.1T	
60	315.XC	This polymorphism is usually ignored in analysis
61	337d	
62	356.1C	
63	361.1A	
64	368.1AGAA	
65	374d	
66	377.1T	

67	382.1G	
68	455d	
69	455.XT	
70	459d	
71	459.1C	
72	460C	This polymorphism creates an irresolvable poly C stretch at position 463.XC
73	463.XC	This polymorphism should be inferred from 460C and ignored
74	471-478d	
75	480.1TCCCATACTACCAAT	
76	490.1T	
77	495-503d	
78	498d	
79	498-511d	
80	498.1C	
81	511d	
82	521-522d	
83	522.XCA	
84	522.1AT	
85	565.1T	
86	568.1A	
87	573d	

88	573.XC	This polymorphism notes a usually irresolvable number of poly C stretch
89	574.1A	
90	595.1C	
91	631.1A	
92	745.1T	
93	747.1A	
94	960d	
95	960.XC	This polymorphism notes a usually irresolvable number of poly C stretch
96	961C	This polymorphism creates an irresolvable poly C stretch at position 965.XC
97	965d	
98	965.XC	This polymorphism should be inferred from 961C and ignored
99	998d	
100	1547.1T	
101	1656d	
102	1719.1G	
103	2156.1A	
104	2232.XA	
105	2325.1T	
106	2395d	

107	2405.1C	
108	2887-2888d	
109	3158.1T	
110	3172.1C	
111	3229.1A	
112	3307.1A	
113	4317d	
114	5752d	
115	5752.1A	
116	5786.1T	
117	5813.1A	
118	5892.XT	
119	5899d	
120	5899.XC	This polymorphism notes a usually irresolvable number of poly C stretch
121	7471d	
122	7471.1C	
123	7474d	
124	7519d	
125	7519.1A	
126	7585.1T	
127	8262-8271d	
128	8276d	

129	8276.1C	
130	8277C	This polymorphism creates an irresolvable poly C stretch at position 8278.XC
131	8278.XC	This polymorphism should be inferred from 8277C and ignored
132	8279C	This polymorphism creates an irresolvable poly C stretch at position 8279.XC
133	8279.XC	This polymorphism should be inferred from 8279C and ignored
134	8281-8289d	
135	8285.XC	This polymorphism notes a usually irresolvable number of poly C stretch
136	8286C	This polymorphism creates an irresolvable poly C stretch at position 8287.XC
137	8287.XC	This polymorphism should be inferred from 8287C and ignored
138	8289.1CCCCTCTA	
139	10044.1A	
140	10456d	
141	12241d	
142	12241.1C	
143	12310.1A	
144	13980-13985d	

145	15937d	
146	15944d	
147	15944.1T	
148	16032.1ATTCTCTGTTCTTTC	
149	16038.1A	
150	16076d	
151	16094d	
152	16112d	
153	16166d	
154	16169.1C	
155	16171d	
156	16172.1T	
157	16179d	
158	16180.1T	
159	16181.1T	
160	16182.1C	
161	16183d	Prone to various interpretations
162	16184.1T	
163	16186d	Prone to various interpretations
164	16186.1T	
165	16187.1T	
166	16187.1TC	
167	16188d	

168	16188.1A	
169	16188.1G	
170	16188.XC	
171	16189d	Prone to various interpretations
172	16189C	This polymorphism creates an irresolvable poly C stretch at position 16193.XC
173	16189.1A	
174	16189.1G	
175	16191.1A	
176	16192.1T	
177	16193d	Prone to various interpretations
178	16193.XC	This polymorphism should be inferred from 16189C and ignored
179	16193.1TC	
180	16195d	
181	16222.1A	
182	16224.1T	
183	16238.1A	
184	16247.1T	
185	16248.1A	
186	16257d	
187	16258d	
188	16259.1A	

189	16262.1C	
190	16263d	
191	16263.1A	
192	16264.1C	
193	16282.1T	
194	16285.1A	
195	16289.1T	
196	16292d	
197	16293d	
198	16294.1A	
199	16294.1G	
200	16296d	Prone to various interpretations
201	16296.1C	
202	16298d	
203	16298.1G	
204	16300d	
205	16300.1A	
206	16315.1T	
207	16316.1T	
208	16325d	
209	16407.1T	
210	16469.1A	
211	16474d	

212	16474.1G	
213	16482d	
214	16484.1T	
215	16485.1T	
216	16535.1T	
217	16545d	
218	16551.1G	

Table S3. List of Nomenclature Inconsistencies in the Human mtDNA Phylogeny

Haplogroup	Ancestral (path to) haplogroup with different base-letter
A	N
B	R
C	CZ
CZ	M8 -> M
D	M80'D -> M
E	M9 -> M
F	R9c -> R9 -> R
G	M12'G->M
H	HV
HV	R0 -> R
I	N1e'I -> N1a'e'I -> N1a'd'e'I -> N1a'c'd'e'I -> N1 -> N1'5 -> N
J	JT
JT	R2'JT -> R
K	U8b -> U8 -> U2'3'4'7'8'9 -> U
L3	L3'4 -> L3'4'6 -> L2'3'4'6 -> L2'3'4'5'6 -> L1'2'3'4'5'6 -> RSRS
M	L3
N	L3
O	N
P	R
Q	M29'Q -> M
R	N

S	N
T	JT
U	R
V	HV0a -> HV0 -> HV
W	N2 -> N
X	N
Y	N9 -> N
Z	CZ
Haplogroup	Ancestral haplogroup with different base-number
D1	D4
D2	D4e1
D3	D4b1c
A2	A4
A6	A4
B2	B4b

Table S4. Molecular Clock Tests Results

Haplogroup	Entire mtDNA GLR p-value(s)	Coding region only GLR p-value
All samples	0.018	0.005
M	0.0015,0.0003	0.0003
N	0.049	0.054
L2	0.00005	0.033

Table S5. PAML-Based Age Estimated

Haplogroup	Time estimate (years)	SD (years)
RSRS	176689.4	11339.9
L0	136289.1	11753.6
L0abfk	124793.8	10669.5
L0abf	100105.6	9578.3
L0ab	35971.5	8073.3
L0a	46740.8	6932.3
L0a14	39470.0	8102.0
L0a1	27911.8	7859.5
L0a1a	16795.7	6169.2
L0a1a2	7698.6	4414.7
L0a1b	12782.2	6597.1
L0a1b1	7502.6	3066.8
L0a1b1a	4153.4	2674.5
L0a1b1a1	1261.2	1733.1
L0a1b2	5178.5	3202.3
L0a1c	13854.6	5598.6
L0a1d	5387.4	4265.0
L0a2	29208.0	5063.7
L0a2a	20577.9	5762.7
L0a2a1	15840.0	5748.4
L0a2a1a	6847.2	5491.7

L0a2a2	5921.5	3908.4
L0a2a2a	1602.4	2674.5
L0a2b	3883.9	2731.6
L0a2b1	1286.6	1711.7
L0a2d	24103.9	5356.2
L0f	68987.7	8751.0
L0f1	2369.3	2339.3
L0f2	56827.6	8843.7
L0f2a	45968.6	9842.2
L0f2a1	5377.0	4200.8
L0k	36762.5	9442.8
L0k1	8064.8	4643.0
L0d	48421.7	9406.3
L0d12	67569.0	8722.5
L0d1	46161.4	7338.9
L0d1a	15912.1	7453.0
L0d1a1	5523.4	4086.7
L0d1c	2428.0	2568.5
L0d1c1	5074.1	3031.1
L0d1c1a	2538.6	2382.1
L0d1c1b	2543.7	2346.4
L0d1b	25919.2	6939.5
L0d1b1	14019.3	5919.6

L0d2	46715.8	7980.7
L0d2ab	42817.1	8330.2
L0d2a	6731.2	3608.8
L0d2a1	4620.9	3188.0
L0d2c	11022.9	5334.8
L0d3	26989.2	8422.9
L15	152971.1	10512.6
L1	128520.9	11076.1
L1b	4333.9	3515.3
L1b1	9387.6	2310.8
L1b1a14	5492.0	3180.9
L1b1a2	7306.8	2831.4
L1b1a2a	4194.9	3031.1
L1b1a3	4980.2	2296.5
L1b1a3a	2862.2	1840.1
L1b1a3a1	1057.8	1383.6
L1b1a3b	2492.4	1989.8
L1b1a8	4200.1	2909.9
L1b1a6	3935.7	3309.3
L1b1a7	4896.8	3894.1
L1c	77931.5	6946.6
L1c1246	72161.7	6283.3
L1c1	60112.3	7239.0

L1c1abd	55842.8	7902.3
L1c1a	46641.0	8979.2
L1c1a1	36581.3	8266.0
L1c1a1a	24651.7	6989.4
L1c1a1a1	10467.2	4949.6
L1c1a1a1a	991.8	1405.0
L1c1a1a1b	3222.6	2396.4
L1c1a1a1b1	1144.2	1519.1
L1c1a1a2	4792.6	4093.8
L1c1a2	12329.9	4207.9
L1c1a2a	5512.9	2867.1
L1c1a2a1	3429.0	2424.9
L1c1a2a2	2677.2	2446.3
L1c1a2b	1169.6	1619.0
L1c1a2c	1480.1	2296.5
L1c1bd	51441.0	9870.7
L1c1b	13509.3	5812.6
L1c1d	29914.5	9143.3
L1c1c	35604.5	8116.3
L1c24	67582.1	6461.6
L1c2	37943.3	5213.5
L1c2a	29832.0	5677.1
L1c2a1	26616.5	6119.3

L1c2a2	4652.1	3865.6
L1c2b	35592.5	5070.9
L1c2b1	31327.4	5234.9
L1c2b1a	29466.8	6233.4
L1c2b1b	17588.1	6483.0
L1c2b2	25252.7	6725.5
L1c4	32069.3	7773.9
L1c4a	6173.5	3829.9
L1c4b	18759.9	7652.7
L1c3	50173.7	7624.1
L1c3a	22508.5	4978.2
L1c3a1	20924.1	4785.6
L1c3a1a	16556.4	4885.4
L1c3a1b	17225.0	4971.0
L1c3bc	43693.3	7852.4
L1c3b	12335.4	4807.0
L1c3b1a	2738.8	2931.3
L1c3b1b	8102.0	4072.4
L25	139216.8	9685.3
L5	110805.3	11796.4
L5a	25061.9	6982.3
L5a1	14839.3	5227.8
L5a1a	5021.9	4778.5

L5a1b	10526.4	4635.8
L5c	20260.7	7139.2
L5c1	8107.3	4528.8
L26	111246.6	8130.5
L2	88453.2	7838.1
L2ad	84118.8	7545.7
L2a	79304.6	8308.8
L2a14	45707.4	8472.9
L2a1	23821.9	5584.4
L2a1a	10063.6	2788.6
L2a1a1	3501.3	2646.0
L2a1a2	7942.7	2496.2
L2a1a2a	6573.2	2474.8
L2a1a2a1	4117.1	2210.9
L2a1a3	6936.9	3230.8
L2a1b	5800.9	3972.5
L2a1f	5267.2	2745.8
L2a1f1	4065.2	2403.5
L2a1c	14156.6	3423.4
L2a1c1	7053.1	2881.3
L2a1c1a	5586.2	2703.0
L2a1c3	11591.2	5912.5
L2a1c4	4917.7	3680.1

L2a1c5	6210.2	4978.2
L2a1d	7476.1	3772.8
L2a1e	11824.5	4714.3
L2a1e1	7232.7	4086.7
L2a1h	12183.0	5042.3
L2a1i	9312.7	4129.4
L2a1j	5168.0	4307.7
L2a1k	9312.7	4043.9
L2a1l	9784.3	3544.6
L2a1l1	6236.5	3494.7
L2a1l2	8458.5	3601.7
L2a1l2a	2374.4	2146.7
L2a1l2a1	920.7	1897.1
L2a1m	5272.5	3837.0
L2a234	33475.7	7324.6
L2a23	23167.1	6483.0
L2a2	21003.6	5170.7
L2a2a	10833.9	4429.0
L2a2a1	8043.6	4172.2
L2a2b	15651.7	4992.4
L2a2b1	3336.1	3430.5
L2a4	2564.2	2553.3
L2a5	1317.2	1989.8

L2bcd	5294.2	3742.7
L2bc	56949.3	8344.5
L2b	21259.4	5270.6
L2b1	13399.8	4179.4
L2b1a	10887.9	3195.2
L2b1a2	8906.4	3366.3
L2b1a3	6499.5	4172.2
L2b1b	2589.9	3637.3
L2b3	21259.4	6347.5
L2b3a	9709.2	4921.1
L2c	17761.5	4585.9
L2c2	11131.0	3594.5
L2c2a	5345.6	4015.3
L2c2b	7741.0	3394.8
L2c3	15568.6	4757.1
L2d	17001.9	5883.9
L2d1	15021.4	5634.3
L2d1a	5612.4	3630.2
L36	71383.9	6163.2
L6	22331.2	6154.9
L6a	18282.5	5812.6
L6b	17029.7	6105.0
L34	64401.1	5069.0

L4	78996.2	7353.1
L4a	39811.7	7531.4
L4a1	22977.9	6511.5
L4a1a	16600.9	5727.0
L4a2	29767.1	8408.7
L4b	77142.7	7524.3
L4b2	46740.8	7424.4
L4b2a	43526.5	7224.7
L4b2a1	15093.1	7324.6
L4b2a2	28140.1	5320.5
L4b2a2a	21458.6	5734.2
L4b2a2b	15496.7	5798.3
L3	67262.0	4433.6
L3a	49689.3	8879.4
L3bf	63051.8	10377.1
L3b	21538.3	5349.0
L3b1	17258.5	4578.8
L3b1a	13931.5	3095.3
L3b1a1	8869.0	4564.5
L3b1a1a	4735.4	3944.0
L3b1a2	12422.5	3430.5
L3b1a3	7227.4	4429.0
L3b1a4	8123.3	4250.7

L3b1b	7148.2	3794.2
L3b1b1	5324.7	3295.0
L3b3	3728.7	4179.4
L3f	46304.6	6910.9
L3f1	40013.2	6918.1
L3f1a	24086.7	7246.1
L3f1b	11358.3	3273.6
L3f1b1	2359.1	2467.7
L3f1b2	9066.7	3537.5
L3f1b2a	3847.7	3387.7
L3f1b4	8064.8	3223.7
L3f1b4a	4891.6	2909.9
L3f1b4a1	2477.0	2859.9
L3f2	42379.9	8266.0
L3f2b	25432.2	7239.0
L3f3	5743.3	4878.3
L3f3a	3542.6	3423.4
L3cdj	54573.7	8137.6
L3c	9243.1	5505.9
L3d	25739.3	4029.6
L3d1	23672.4	3651.6
L3d1a	16284.0	4129.4
L3d1a1	13684.6	4001.1

L3d1a1a	3356.7	3309.3
L3d1b	19898.6	4207.9
L3d1b1	15862.2	5170.7
L3d1b2	7783.5	4607.3
L3d1c	12607.7	4471.8
L3d2	13964.4	6732.6
L3d3	18546.3	5798.3
L3d4	18338.6	6968.0
L3eikx	49720.8	5734.2
L3e	36189.0	5612.9
L3e1	14569.3	3038.2
L3e1a	13252.0	3259.3
L3e1a2	951.2	1326.6
L3e1a3	9983.0	4158.0
L3e1b	12232.0	3772.8
L3e1c	8112.7	4108.1
L3e1d	9173.6	4329.1
L3e1e	10779.9	4286.4
L3e1f	14569.3	7702.6
L3e2	19796.9	7146.3
L3e2a	10052.8	5042.3
L3e2a1	8298.8	3530.4
L3e2a1a	1047.7	2439.2

L3e2a1b	5816.6	2710.2
L3e2a1b1	2128.6	1961.3
L3e2a1b2	2815.9	2567.5
L3e2b	11531.6	3252.2
L3e2b1	9098.7	3501.8
L3e2b1a	7354.4	3287.9
L3e2b1a1	5444.9	3993.9
L3e2b2	8975.8	3715.8
L3e2b3	3155.6	3059.6
L3e345	32503.6	5484.5
L3e34	30292.1	5477.4
L3e3	11569.5	4457.5
L3e3a	1663.6	3451.9
L3e3b	3635.6	2118.2
L3e3b1	2436.0	1975.6
L3e3b2	1235.7	1640.4
L3e4	16857.0	5891.1
L3e5	14453.6	6896.7
L3i	41231.1	8658.3
L3i1	13077.1	6910.9
L3i2	1485.2	4749.9
L3k	23983.0	6882.4
L3k1	5105.4	4122.3

L3x	36750.4	5655.7
L3x1	28884.8	6618.5
L3x2	29355.0	5862.5
L3x2a	21840.3	5356.2
L3x2a1	15502.2	4578.8
L3x2a1a	7661.5	3951.1
L3h	59422.4	4899.7
L3h1	47083.8	5933.9
L3h1a	40141.5	6326.1
L3h1a2a	16050.8	6076.5
L3h1a2b	34799.1	7510.0
L3h1b	38289.3	6426.0
L3h1b1	35773.1	6361.8
L3h1b1a	29061.0	6639.9
L3h1b2	12755.0	5527.3
M	49590.1	1824.0
M12051	47641.3	2851.2
M1	23679.9	4377.6
M1a	19183.0	3225.6
M1a1	12910.6	3340.8
M1a1a	1199.6	6019.2
M1a1b	7852.4	3072.0
M1a1b1	5751.4	3369.6

M1a1c	0.0	11692.8
M1a1d	5244.5	4416.0
M1a1e	9813.6	4022.4
M1a2	16732.9	4051.2
M1a2a	4648.1	4531.2
M1a2b	9712.4	4972.8
M1a3	11198.9	4944.0
M1a3a	6592.8	5040.0
M1a3b	8761.9	4800.0
M1a4	9922.0	5049.6
M1a5	4207.5	3475.2
M1b	20323.5	4876.8
M1b1	7566.9	4416.0
M1b1a	2519.8	2515.2
M1b2	12932.6	5644.8
M1b2a	6897.9	4828.8
M51	26435.1	5750.4
M51a	24253.2	5635.2
M51a1	18547.0	5433.6
M51a1a	7381.6	4358.4
M2	36278.4	6086.4
M2a	29633.4	5904.0
M2a1	17213.1	4329.6

M2a1a	13639.5	3552.0
M2a1a1	5617.5	3427.2
M2a1a1a	4200.5	3312.0
M2a1a1a1	980.8	1420.8
M2a1a1b	2416.2	3158.4
M2a1a1b1	932.9	2784.0
M2a1a2	10196.9	5289.6
M2a1a2a	7545.5	4627.2
M2a1a2a1	1549.2	2121.6
M2a1a2a1a	0.0	4992.0
M2a1a3	7360.2	5683.2
M2a1a3a	2997.1	2409.6
M2a1a3a1	1090.2	2140.8
M2a1a3b	3392.6	2774.4
M2a1b	1179.1	1776.0
M2a1c	11111.5	4828.8
M2a2	6741.8	4329.6
M2a2a	1309.2	2534.4
M2a3	14267.6	6182.4
M2a3a	11636.2	6009.6
M2b	14245.4	3926.4
M2b1	12111.3	3734.4
M2b1a	1988.9	1958.4

M2b1b	823.7	1824.0
M2b2	9813.6	8227.2
M3	23904.4	7132.8
M3a	15351.2	5596.8
M3a1	6055.0	6048.0
M3a2	10016.0	4300.8
M3a2a	1343.5	2064.0
M3b	1872.0	2601.6
M3c	21907.1	7228.8
M3c1	13964.4	6057.6
M3c1a	11526.8	6355.2
M3c1b	9114.2	4435.2
M3c1b1	4606.1	3552.0
M3c1b1a	1042.3	1440.0
M3c1b1b	1418.8	2544.0
M3c2	17070.4	7296.0
M467	34529.5	4204.8
M4	12734.3	7315.2
M65	25256.0	6528.0
M65a	17694.4	6172.8
M65b	8711.7	5990.4
M67	1131.2	1584.0
M1838	32198.5	4588.8

M18	18773.9	7094.4
M18a	9799.1	5472.0
M18b	10530.3	5040.0
M38	26724.8	5529.6
M38a	14697.4	6211.2
M38b	8690.1	4262.4
M38c	5237.5	4022.4
M30	17431.1	4012.8
M30a	6699.2	3801.6
M30a1	5328.9	3292.8
M30a2	1693.3	2659.2
M30b	11315.4	4684.8
M30c	11359.1	7401.6
M30c1	11359.1	6249.6
M30c1a	6656.6	4416.0
M30d	9351.8	6940.8
M30d1	5892.5	5030.4
M30e	2630.3	5260.8
M30f	13772.4	4118.4
M37	29269.0	7027.2
M37a	9366.2	5673.6
M37a1	3552.4	3686.4
M37d	3552.4	6355.2

M37e	15641.7	7228.8
M37e2	11337.3	6537.6
M43	25965.9	5654.4
M43a	21538.9	6355.2
M45	28171.0	6624.0
M45a	11701.9	5904.0
M64	12624.2	5289.6
M66	17378.4	7833.6
M5	37067.2	14803.2
M5ad	23347.5	7814.4
M5a	17370.9	4425.6
M5a1	11869.9	4425.6
M5a1b	7246.3	4041.6
M5a2	13536.3	4339.2
M5a2a	11475.7	3532.8
M5a2a1	8740.4	4185.6
M5a2a1a	6267.1	4512.0
M5a2a2	7061.4	4089.6
M5a2a3	1665.8	2352.0
M5a3	7517.0	10924.8
M5a3a	0.0	13574.4
M5a3b	1384.6	7891.2
M5a4	10312.8	4972.8

M5a5	1906.4	10473.6
M5d	13602.6	5664.0
M5bc	37067.2	7459.2
M5b	32062.4	7036.8
M5b1	15731.2	7872.0
M5b2	23208.4	6364.8
M5b2a	16972.9	6432.0
M5b2b	20407.3	6412.8
M5c	31542.9	7430.4
M5c1	17649.3	7401.6
M6	20659.1	6614.4
M6a1	14104.9	5961.6
M7	44926.1	3484.8
M7a	22707.1	5385.6
M7a1	17213.1	4464.0
M7a1a	10139.0	2236.8
M7a1a1	5146.1	3043.2
M7a1a1a	2561.2	2390.4
M7a1a2	4487.1	2649.6
M7a1a3	5061.8	3321.6
M7a1a4	7338.9	2620.8
M7a1a4a	2064.7	2179.2
M7a1a5	6210.5	3532.8

M7a1a6	7025.8	3993.6
M7a1a7	7032.9	4579.2
M7a1a8	7025.8	3705.6
M7a1b	12118.6	4531.2
M7a2	19061.7	5865.6
M7a2a	13838.8	5692.8
M7a2a1	5328.9	4732.8
M7a2a2	8095.4	5299.2
M7bg	42895.5	3811.2
M7bdg	40828.0	4214.4
M7bd	31542.9	5750.4
M7b	23563.9	5366.4
M7b124	16680.5	5404.8
M7b1	13278.4	6892.8
M7b2	7047.2	3004.8
M7b2a	3101.1	3686.4
M7b2b	4102.8	2880.0
M7b2c	3101.1	3292.8
M7b4	7061.4	4819.2
M7b3	10907.9	4396.8
M7b3a	9596.9	4089.6
M7d	2886.3	3859.2
M7g	19281.6	6806.4

M7cef	31064.2	5654.4
M7c	22953.7	4828.8
M7c1	17581.5	4627.2
M7c1a	8260.0	6124.8
M7c1b	8711.7	4214.4
M7c1b1	6720.5	3657.6
M7c1d	6557.4	3840.0
M7c2	19592.9	5308.8
M7c2a	4193.5	5664.0
M7c3	16179.1	6278.4
M7c3b	11249.8	6019.2
M7c3c	10537.5	4608.0
M7c3c1	8345.9	4300.8
M7e	6408.6	5769.6
M8	36473.3	7276.8
M8a	20506.5	7670.4
M8a23	17017.9	6134.4
M8a2	13285.7	6566.4
M8a2a	7588.3	3763.2
M8a2b	3900.5	4176.0
M8a3	14386.1	6038.4
CZ	36473.3	7392.0
C	23912.2	4780.8

C1	18252.3	4233.6
C1a	4837.3	5376.0
C1b	14793.8	3043.2
C1b1	12030.8	3888.0
C1b2	1288.7	1958.4
C1b4	1083.3	1516.8
C1b5	10421.5	3360.0
C1b5a	6316.6	3676.8
C1b5b	7054.3	3177.6
C1b6	1425.7	1987.2
C1c	12873.8	3859.2
C1c1	7274.8	4416.0
C1c1b	4907.4	3590.4
C1c2	2533.6	2419.2
C1c3	2720.2	2284.8
C1c4	6118.6	3830.4
C1d	15500.2	5232.0
C1d1	11381.0	3993.6
C1d1a	6437.0	3993.6
C1d1a1	1275.0	1756.8
C1d1b	6670.8	4176.0
C1d1b1	3949.3	3561.6
C1d1c	6869.5	4790.4

C1d1c1	3191.2	2899.2
C1d2	10755.3	4483.2
C1d2a	4263.4	4128.0
C4	18728.5	5836.8
C4abc	18728.5	3542.4
C4a	17717.0	3427.2
C4a15	16029.7	3638.4
C4a1	11300.8	3907.2
C4a1a	5033.7	2956.8
C4a1c	4270.3	2620.8
C4a1c1	1357.2	2102.4
C4a1d	4319.3	2947.2
C4a5	6890.8	4540.8
C4a234	16396.0	3360.0
C4a2	4123.7	3129.6
C4a3	10617.3	3772.8
C4a3a	6012.6	3734.4
C4a4	10066.6	4224.0
C4a4a	1042.3	1545.6
C4b	6997.4	2620.8
C4b1	2713.3	2246.4
C4b1a	1569.7	1881.6
C4b2	1329.8	1891.2

C4b3	4858.3	2995.2
C4b3a	2464.6	2524.8
C4b5	1720.8	8457.6
C4b6	3087.2	2736.0
C4b7	1329.8	1824.0
C4b8	1995.8	1929.6
C4c	13359.4	3955.2
C4c1	10095.5	4550.4
C4e	3177.4	3148.8
C5	17890.3	7785.6
C5a	8920.0	5404.8
C5a1	1501.1	2131.2
C5a2	2333.4	5088.0
C5b	17890.3	8275.2
C5b1	13646.9	4963.2
C5b1a	7545.5	3542.4
C5b1a1	1768.9	4646.4
C5b1b	2609.6	2736.0
C5c	6933.5	4137.6
C5c1	3837.8	2409.6
C5c1a	2554.3	1968.0
C5d	12396.9	4992.0
C5d1	2803.2	2726.4

C7	20628.6	4502.4
C7a	17702.0	4406.4
C7a1	12426.2	4195.2
C7a1a	9056.6	4896.0
C7a1a2	0.0	10012.8
C7a1c	7495.6	4454.4
Z	21661.6	8380.8
Z1	15962.5	4819.2
Z1a	6316.6	2851.2
Z1a1	4634.1	2678.4
Z1a1a	1049.1	1420.8
Z1a2	4774.2	3062.4
Z2	1576.6	2342.4
Z3	15835.6	4396.8
Z3a	9669.1	4204.8
Z3a1	7509.8	4060.8
Z3a1a	4074.8	3782.4
Z3a2	1015.0	3955.2
Z3b	5758.5	6576.0
Z4	16665.5	4320.0
Z4a	12477.5	4540.8
Z7	1233.9	3264.0
M9	38446.5	8390.4

M9ab	27187.6	8131.2
M9a	17852.6	3494.4
M9a1	15567.2	2928.0
M9a1a	13934.8	2812.8
M9a1a1	12470.2	2678.4
M9a1a1a	5772.6	4185.6
M9a1a1b	7716.7	3484.8
M9a1a1c	9164.5	3379.2
M9a1a1c1	7367.3	3427.2
M9a1a1c1a	4221.4	3456.0
M9a1a1c1b	4019.0	4099.2
M9a1a1d	8102.5	4176.0
M9a1a2	6153.9	5443.2
M9a1b	9416.6	3984.0
M9a1b1	6557.4	2102.4
M9a1b1a	5469.6	2179.2
M9a1b1a1	2037.1	2352.0
M9a1b1b	2305.8	2179.2
M9a1b1c	4942.5	2812.8
M9a1b2	3225.9	3494.4
M9a4	14164.0	5539.2
M9a4a	11840.7	4972.8
M9a4a1	8604.0	4675.2

M9a5	7338.9	5241.6
M9b	2699.5	2688.0
E	23695.4	6902.4
E1	11986.9	4732.8
E1a	8647.1	3312.0
E1a1	7623.9	3216.0
E1a1a	6883.7	2428.8
E1a1a1	5153.1	2947.2
E1a1a2	4277.3	2313.6
E1a2	5575.2	4406.4
E1b	4935.5	2966.4
E1b1	2761.7	2592.0
E2	10131.7	4444.8
E2a	8002.4	3945.6
E2a1	5272.6	5107.2
E2b	6635.4	5673.6
E2b1	3935.4	3628.8
M10	24493.8	7228.8
M10a	15753.6	7804.8
M10a1	9452.7	4012.8
M10a1a	4137.7	3072.0
M10a2	9265.3	6518.4
M11	20987.7	5740.8

M11ab	16209.0	4396.8
M11a	11972.3	3523.2
M11a1	8668.6	4041.6
M11a2	8776.3	3715.2
M11b	12962.0	4819.2
M12G	47305.0	3552.0
M12	31287.5	5731.2
M12a	26020.6	5808.0
M12a1a	18690.7	6067.2
G	31614.8	5193.6
G1	21492.9	5414.4
G1a	18139.1	5462.4
G1a1	11257.1	4032.0
G1a1a	5892.5	2188.8
G1a1a1	2796.3	2476.8
G1a1a2	3608.1	2678.4
G1a1a3	2381.7	1852.8
G1a1a4	2796.3	3283.2
G1a3	6451.1	4521.6
G1b	7246.3	5088.0
G1c	12910.6	6009.6
G2	26787.5	4617.6
G2a	17145.5	5270.4

G2a1	14045.7	4742.4
G2a1b	2181.8	3868.8
G2a1c	4606.1	9638.4
G2a1c1	4606.1	3753.6
G2a1d	7303.3	3657.6
G2a1e	2983.3	2985.6
G2a5	1199.6	1670.4
G2b	22776.4	5059.2
G2b1	16830.4	5616.0
G2b1a	13366.8	5443.2
G2b1b	4662.1	4492.8
G2b2	20476.0	5481.6
G2b2a	15328.9	6057.6
G3	23919.9	6931.2
G3a	18932.9	6998.4
G3a1	3754.2	3100.8
G3a2	1240.7	9225.6
G3b	13271.0	5568.0
G3b1	10958.7	5500.8
G4	9258.1	4732.8
M134661	46675.2	3724.8
M13	43169.4	4944.0
M13a	19266.4	6720.0

M13a1	9539.2	6249.6
M13a1a	2685.6	2841.6
M13a1b	4277.3	3964.8
M13a2	8726.0	4828.8
M13b	31191.8	6873.6
M13b1	22537.6	7123.2
M13b2	5441.4	3888.0
M46	1233.9	4550.4
M61	5483.7	4310.4
M14	41926.2	6172.8
M17	43701.2	5193.6
M17a	18849.6	6624.0
M17c	40317.3	8880.0
M21	45460.7	4617.6
M21a	22822.7	7891.2
M21cd	38561.0	6326.4
M21c	6805.6	4857.6
M21d	8217.0	6624.0
M22	40646.6	5568.0
M22a	29419.5	7891.2
M22b	38282.9	5952.0
M2375	47801.2	2697.6
M23	5970.2	4464.0

M75	28992.1	6499.2
M26	2664.9	8140.8
M27	45335.3	3494.4
M27a	2858.6	2371.2
M27b	973.9	1372.8
M27c	5533.0	6096.0
M28	29023.7	6144.0
M28a	14193.6	5193.6
M28b	22276.0	6105.6
M29Q	46641.6	3830.4
M29	13905.3	6316.8
M29a	1995.8	1968.0
M29b	7381.6	7526.4
Q	37539.8	5635.2
Q12	37539.8	8601.6
Q1	18161.8	7344.0
Q1a	15574.7	4828.8
Q1b	14690.0	4924.8
Q2	28731.3	7296.0
Q2a	15306.6	5904.0
Q3	31024.4	6038.4
Q3a	26435.1	6316.8
M31	35451.2	6451.2

M31a	29982.5	6729.6
M31a1	5906.7	3964.8
M31a1a	0.0	9427.2
M31a1b	4158.6	3216.0
M31a2	4879.4	4636.8
M3256	43618.1	6614.4
M32	38193.0	7814.4
M32a	7452.8	5289.6
M56	21393.3	11270.4
M33	42331.8	9388.8
M33a	29371.9	8217.6
M33a1	29371.9	10790.4
M33a1a	6947.7	5529.6
M33a1b	7388.7	6172.8
M33a2	15753.6	5856.0
M33a2a	6118.6	4224.0
M33a3	23865.7	7843.2
M33b	26991.4	6115.2
M33b1	20209.1	5712.0
M33c	12763.7	6950.4
M33d	5167.2	3926.4
M3457	44967.8	5011.2
M34	26818.9	6787.2

M34a	17235.6	5913.6
M34b	4760.2	4080.0
M57	30220.7	8448.0
M57a	22506.8	7776.0
M57b	14920.0	6537.6
M57b1	5561.1	4896.0
M35	39085.2	9964.8
M35a	16238.9	6249.6
M35a1	11308.1	5030.4
M35a1a	5469.6	4060.8
M35a2	12257.7	6422.4
M35b	24470.5	6643.2
M35b1	5012.7	5510.4
M35b2	16373.5	6182.4
M35c	16351.1	8188.8
M36	32094.4	7017.6
M36c	1343.5	9225.6
M36d	20666.8	9129.6
M36d1	1631.5	5913.6
M3970	37605.1	7920.0
M39	26638.7	5750.4
M39a	12822.4	4905.6
M39a1	9121.4	5040.0

M39a2	2526.7	3283.2
M39b	16291.2	5548.8
M39b1	11315.4	5500.8
M39b2	12426.2	5875.2
M70	1501.1	2400.0
M4062	46473.9	3945.6
M40	31511.0	7910.4
M40a	13462.6	5587.2
M40a1	9071.0	3532.8
M40a1a	4019.0	3254.4
M40a1b	4802.2	3561.6
M62	22352.9	8256.0
M62a	8991.9	5049.6
M62b	20049.2	8169.6
M41	10153.4	4137.6
M41a	8059.6	5404.8
M41b	7623.9	3907.2
M41c	5068.8	3408.0
M4274	49590.1	8064.0
M42	47691.8	7958.4
M42b	40259.7	6998.4
M42b1	23912.2	6844.8
M42b1a	6976.1	6163.2

M74	35078.9	7152.0
M74a	10189.6	6652.8
M74b	25466.4	6374.4
M74b1	2962.5	3014.4
M44	8252.8	6931.2
M44a	2361.0	1939.2
M44a1	919.3	1228.8
M49	30125.4	7305.6
M49ab	7040.0	4790.4
M49c	21324.4	7852.8
M49d	15165.3	6960.0
M50	40811.5	6297.6
M5258	42447.8	8131.2
M52	34658.7	8083.2
M52a	24423.9	7766.4
M52a1	5047.8	6432.0
M53	19904.6	7084.8
M53b	9099.8	5337.6
M60	33498.2	9292.8
M60a	19236.1	8361.6
M60b	1309.2	2361.6
M71	35127.5	6537.6
M71a	31606.8	6451.2

M71a1	18599.9	7497.6
M71b	8927.2	5913.6
M71c	6529.1	4896.0
M72	13219.5	9763.2
M7379	44642.4	4790.4
M73	33192.8	6326.4
M73a	23525.2	7027.2
M73b	9987.0	6412.8
M76	31104.1	7036.8
M76a	1206.5	1920.0
D	38434.1	4738.6
D4	24579.9	1947.5
D1	16792.3	2931.7
D1a	15239.1	3473.1
D1a1	3583.3	2882.5
D1b	1504.1	2235.7
D1c	3659.7	4119.9
D1d	1368.6	1898.3
D1e	8093.8	4675.3
D1f	15217.3	3198.9
D1f1	6825.6	4471.4
D1g	11596.8	4401.1
D4a	14994.1	3374.7

D4a1	7863.5	2242.7
D4a1a	5505.3	2847.4
D4a1a1	3914.7	2636.5
D4a1b	5211.6	3051.3
D4a1b1	2583.1	5835.4
D4a1c	3283.0	3923.1
D4a1d	3283.0	3733.2
D4a1e	4774.7	3220.0
D4a1f	5206.5	2896.6
D4a2	8245.8	4239.4
D4a2a	1208.1	1666.2
D4a3	12991.5	3409.8
D4a3a	11746.5	3852.7
D4a3b	11287.1	3634.8
D4b	23529.9	2137.3
D4b1	18944.6	2748.9
D4b1a	17595.4	3030.2
D4b1a1	5722.0	2896.6
D4b1a1a	2745.1	3269.2
D4b1a2	13773.8	3452.0
D4b1a2a	10754.4	3613.7
D4b1a2a1	7989.1	4007.4
D4b1a2a2	3054.4	4134.0

D4b1b	12212.4	3796.5
D4b1b1	7936.7	4042.6
D4b1b1a	2320.2	2622.4
D4b1b1a1	907.6	1371.0
D4b1b2	9382.1	4070.7
D4b1c	11719.8	4471.4
D3	1268.2	1975.6
D4b2	16567.3	2692.7
D4b2a	14434.6	3100.5
D4b2a1	1579.5	2193.5
D4b2a2	8960.4	3691.0
D4b2a2a	3817.7	3093.4
D4b2a2b	3486.5	3944.1
D4b2b	12932.3	2805.2
D4b2b1	7623.0	3234.1
D4b2b1a	5975.2	3030.2
D4b2b1b	1393.7	1898.3
D4b2b2	9836.6	4281.6
D4b2b3	3608.7	2706.8
D4b2b4	10318.8	3522.3
D4b2b5	11009.9	3480.1
D4b2d	1358.5	2348.2
D4c	20883.7	4098.8

D4c1	15833.8	5012.8
D4c1a	4211.1	2741.9
D4c1a1	2229.3	2249.8
D4c1b	7080.6	3965.2
D4c1b1	2745.1	3367.6
D4c2	12276.7	4429.3
D4c2a	1168.0	1624.1
D4c2b	7435.0	4626.1
D4c2c	3924.9	4830.0
D4e	18606.4	3585.6
D4e13	16457.7	3459.0
D4e1	15043.1	3283.3
D4e1a	8886.7	3037.2
D4e1a1	3222.0	2692.7
D4e1a2	7461.1	3072.4
D4e1a2a	2083.0	2130.3
D2	12003.4	3311.4
D2ab	9181.6	3051.3
D2a	5587.8	2439.6
D2a1	4467.0	2299.0
D2a1a	2897.1	2341.2
D2a1b	1022.7	1462.4
D2a2	2704.6	2362.3

D2b	6716.5	2952.8
D2b1	4032.2	2474.8
D2b1a	2158.6	2432.6
D2b2	2340.4	2798.2
D4e2	5866.7	2910.7
D4e2a	2785.6	3128.6
D4e2b	3598.5	3220.0
D4e2c	2785.6	2474.8
D4e4	9334.6	3937.1
D4e4a	7335.9	3852.7
D4e4a1	1127.9	1567.8
D4e4b	1534.3	2095.1
D4e5	10239.2	4619.1
D4f	17827.0	6278.3
D4f1	4303.2	4021.5
D4g	22879.6	2608.3
D4g1	5975.2	2566.2
D4g1a	2876.9	2284.9
D4g1b	2168.7	2559.1
D4g1c	3649.5	3030.2
D4g2	19800.5	3227.0
D4g2a	16699.0	3979.3
D4g2a1	13093.8	4949.5

D4g2a1a	3394.9	3543.4
D4g2b	17132.9	4126.9
D4h	21500.2	2376.3
D4h1	17320.0	4738.6
D4h1a	8650.0	6369.7
D4h1a1	1479.0	2067.0
D4h1a2	0.0	8823.4
D4h1b	6872.4	6123.6
D4h3	18257.8	2917.7
D4h3a	12953.8	2580.2
D4h3a1	10478.0	2812.2
D4h3a1a	6721.7	3234.1
D4h3a1a1	3135.7	2770.0
D4h3a1a2	3970.9	2981.0
D4h3a2	10361.2	3775.4
D4h3a3	12953.8	5631.5
D4h3a3a	9847.2	5019.8
D4h3a4	1509.2	2102.1
D4h3a5	11436.6	2945.8
D4h4	18152.8	4337.9
D4h4a	7012.9	4387.1
D4i	12303.6	12662.0
D4i1	5732.3	5012.8

D4i2	5577.5	13772.9
D4j	13395.7	2439.6
D4j1	12292.8	2587.2
D4j1a	5330.0	3044.2
D4j1a1	2002.3	2418.5
D4j1b	9456.0	3002.0
D4j1b2	3950.4	3437.9
D4j2	3547.6	2995.0
D4j2a	1956.9	2418.5
D4j3	10233.9	3255.1
D4j3a	8439.9	3360.6
D4j11	5572.3	3536.4
D4j4	2958.0	3873.8
D4j4a	1077.8	2045.9
D4j5	4651.5	3564.5
D4j6	6027.0	4225.4
D4j7	5742.7	3712.1
D4j7a	1193.0	2657.6
D4j8	4032.2	4998.7
D4j9	2083.0	2875.5
D4j10	2083.0	3459.0
D4k	5381.6	5779.1
D4o	13844.1	4591.0

D4o1	7132.7	3480.1
D4o1a	4836.3	3044.2
D4o2	2963.1	2854.4
D4p	3710.7	3578.6
D4l	16962.5	4844.1
D4l1	13563.1	4984.7
D4l1a	7304.6	5139.3
D4l2	13952.3	5097.2
D4m	19438.8	4126.9
D4m1	3782.0	2952.8
D4m2	8949.8	5188.6
D4n	8434.6	5413.5
D4n1	2805.9	3058.3
D4n1a	1042.7	1469.4
D4q	9281.8	5870.5
D4q1	5453.7	3761.4
D4q1a	1157.9	1771.7
D4s	13568.5	5821.3
D5	30731.6	4717.5
D5ab	28716.4	4647.2
D5a	19761.6	4942.5
D5a1	7163.9	3093.4
D5a1a	5722.0	2741.9

D5a1a1	4379.9	2643.5
D5a1a2	2745.1	2657.6
D5a2	13395.7	7157.1
D5a2a	11543.4	3887.9
D5a2a1	9181.6	3227.0
D5a2a1a	3955.6	2144.3
D5a2a1a1	2618.5	2031.8
D5a2a1a2	1298.3	3002.0
D5a2a1b	4836.3	3894.9
D5a2a2	1941.8	2741.9
D5a3	16079.8	6144.7
D5a3a	1338.5	8043.0
D5b	18916.8	4569.9
D5b1	15233.7	4176.2
D5b1a	8676.3	5891.6
D5b1a1	3430.5	4373.0
D5b1b	8797.2	4141.0
D5b1b1	2315.1	2214.6
D5b1c	13773.8	4239.4
D5c	17061.5	6060.3
D5c1	3257.6	5139.3
D6	23354.4	6440.0
D6a	20486.7	6826.7

D6a1	3018.9	4035.5
D6c	10584.3	5315.1
N	58859.9	2352.3
N15	56547.0	4704.7
N1	51642.7	5640.3
N1acdeI	45169.0	6593.5
N1adeI	42531.4	6576.0
N1aeI	38555.4	6383.6
N1a	18117.5	5246.8
N1a1	16501.9	4967.0
N1a1a	13893.9	4634.7
N1a1a1	5736.8	3244.3
N1a1a1a	3662.9	2518.5
N1a1a2	1385.5	3567.8
N1eI	28880.7	6095.1
I	20856.6	3594.1
I1	15230.8	3401.7
I1a	11726.2	3305.5
I1a1	5294.2	2133.7
I1a1a	3327.3	2719.6
I1a1b	2608.0	2973.2
I1a1c	1522.9	3384.2
I1a1d	1892.0	1862.6

I1b	11135.2	4818.3
I1c	8215.6	3786.5
I23	11307.6	4153.7
I2	6386.9	2448.5
I2a	3770.7	2142.5
I2a1	2986.1	1967.6
I2b	1266.9	4538.5
I2c	2268.4	2693.4
I2d	3827.8	3795.2
I2e	2935.6	3454.2
I3	8679.2	3410.4
I3a	6090.5	3261.8
I3a1	5070.2	3016.9
I3b	5595.6	3629.1
I4	14912.6	5955.1
I4a	2124.0	6112.6
I5	18805.9	4005.1
I5a	15115.7	4127.5
I5a1	11062.3	4660.9
N1c	8731.5	5963.9
N1b	19517.3	4800.8
N1b1	14183.4	3148.1
N1b1a	8986.8	4739.6

N1b1b	11599.9	3235.5
N1b1b1	9728.5	3664.0
N1b1b2	4228.1	2877.0
N1b1c	11155.1	4180.0
N1b1d	8437.5	3629.1
N1b1e	5903.9	5509.2
N1b2	1185.8	2037.5
N5	36712.4	8202.5
N5a	6122.7	4249.9
N2	44477.3	7363.0
N2a	23573.8	7914.0
W	17589.0	3375.5
W1	10453.6	2763.3
W1a	3011.4	2912.0
W1b	2853.7	2282.4
W1b1	1635.4	2002.5
W1c	7798.8	3401.7
W1c1	2942.0	2632.2
W1e	1604.2	2798.3
W1f	7188.5	3838.9
W1g	1961.0	2745.8
W3	14419.5	2640.9
W3a	12726.6	2544.7

W3a1	11486.9	2422.3
W3a1a	10539.5	2474.8
W3a1a1	9603.6	2614.7
W3a1b	3194.5	4416.1
W3a1c	9347.4	3183.1
W3a2	5942.5	5106.9
W3b	9078.5	3943.9
W3b1	1516.6	2098.7
W4	11407.2	4311.1
W4a	9590.4	4311.1
W5	11075.5	3725.2
W5a	7052.5	3025.7
W5a1	4189.9	2238.6
W5a1a1	3188.2	2002.5
W5a1a1a	806.1	1093.1
W5b	7486.9	4022.6
W6	10770.9	3594.1
W6a	6444.9	4171.2
W6b	7208.0	3742.7
W6c	8287.4	3436.7
W7	9373.7	5745.3
N3	6109.8	4459.8
N9	45709.7	7931.5

N9a	17520.4	4389.8
N9a13	15007.4	6060.1
N9a1	5730.4	3113.1
N9a1a	4380.9	2920.7
N9a3	8280.9	5124.4
N9a245	15305.4	4022.6
N9a2	10361.1	3419.2
N9a2ab	7961.5	3550.4
N9a2a	2986.1	3069.4
N9a2b	6206.4	4145.0
N9a2c	3567.8	3165.6
N9a2d	5140.6	4389.8
N9a4	5653.3	4118.8
N9a5	6851.9	3917.6
N9a6	11972.5	5491.7
N9a10	12245.8	5937.7
N9b	14885.6	4092.5
N9b1	11859.3	3760.2
N9b1a	10645.2	3690.3
N9b1b	2746.5	2947.0
N9b1c	6987.8	4967.0
N9b1c1	5762.5	3786.5
N9b2	13369.7	4110.0

N9b3	7629.8	6007.6
Y	24576.4	7083.2
Y1	14689.5	5264.3
Y1a	7467.5	5526.7
Y1b	9222.8	4967.0
Y2	7279.3	2894.5
Y2a	4929.5	2789.6
Y2a1	2488.4	2658.4
Y2b	1741.8	3454.2
N10	50443.7	6514.8
N10a	21756.4	6611.0
N11	56272.5	3559.1
N11a	16706.6	6532.3
N11a1	8072.3	4748.4
N11b	6748.4	4591.0
N21	22351.3	9024.5
N22	25157.3	8823.4
A	24208.8	4905.8
A3	6774.3	4573.5
A4	20807.9	3253.0
A4a	12987.6	5404.2
A4a1	7240.4	3524.1
A4a1a	4891.2	3436.7

A4b	12907.3	5150.6
A4c	12032.4	4669.7
A4d	7733.8	4302.4
A2	15644.6	1757.7
A2a	4629.4	4092.5
A2a2	0.0	7634.1
A2b	5936.1	6252.5
A2b1	2809.5	3218.1
A2d	10850.3	3891.4
A2d1	3669.2	3602.8
A2d2	7383.1	4451.1
A2f	949.1	1337.9
A2g	4164.5	3069.4
A2i	14089.1	2378.6
A2i1	2004.9	1923.8
A2j	4923.1	3069.4
A2j1	3137.7	2684.6
A2k	12432.6	3314.2
A2k1	6981.3	5937.7
A2n	11188.2	3016.9
A2r	9439.3	4040.1
A2s	7610.3	4844.6
A2t	9603.6	3646.5

A2v	8613.9	4862.1
A2w	8359.2	3970.1
A2x	13631.6	2457.3
A2y	5025.4	3427.9
A2q	13021.1	5002.0
A2u	7792.3	4958.3
A2z	1117.3	1547.8
A6	11088.8	4774.6
A7	0.0	15749.2
A11	17349.2	4538.5
A11a	6039.0	4678.4
A11b	10262.1	5605.4
A5	16938.8	4757.1
A5a	8026.7	2396.1
A5a1	7078.4	2186.2
A5a1a	6077.6	2002.5
A5a1a1	3599.5	1626.5
A5a1a1a	2419.2	1679.0
A5a1a1b	2419.2	1635.3
A5a1a2	4623.1	2404.8
A5a1b	4801.8	2912.0
A5a2	1804.4	2457.3
A5b	8163.5	4215.0

A5c	3238.8	3191.8
A8	18303.1	6925.8
A10	7779.3	4494.8
O	52053.6	6392.4
O1	16706.6	7966.4
S	53483.4	5526.7
S2	38659.8	9024.5
S3	2168.0	2142.5
X	31718.5	11709.2
X1	19724.9	5211.8
X1a	11161.7	4538.5
X1c	14385.7	5343.0
X3	8091.8	6042.6
X3a	1030.1	5159.4
X2	19233.8	2640.9
X2aj	17075.5	3095.6
X2a	12726.6	3497.9
X2a1	7883.4	2605.9
X2a1a	7071.9	2667.1
X2a1a1	3688.3	2098.7
X2a1b	4336.3	2378.6
X2a1b1	2645.7	2020.0
X2a1b1a	998.9	1320.5

X2a1c	3618.5	2789.6
X2a2	4495.6	3349.2
X2bd	16583.7	3497.9
X2b	9675.9	2466.0
X2b1	4463.7	2763.3
X2b4	5589.2	2597.2
X2b4a	4521.0	2509.7
X2b5	1466.7	2063.8
X2b6	3365.3	2273.6
X2b7	6554.7	3917.6
X2d	10870.2	3497.9
X2d1	5319.9	3314.2
X2d2	7389.6	4171.2
X2c	9505.0	4232.4
X2c1	6722.6	2544.7
X2c1a	1691.7	2492.2
X2c1b	3739.0	2317.3
X2c1c	3017.7	3908.9
X2m	14223.9	5552.9
X2m1	9629.9	4940.8
X2m2	4444.6	3655.3
X2e	13457.0	5133.1
X2e1	10665.1	6838.4

X2e2	9748.2	5150.6
X2e2a	6051.9	5150.6
X2h	1723.0	3183.1
X2f	13967.9	6602.3
X2i	12940.8	6331.2
X2k	8385.3	6418.6
X4	9820.6	5622.9
R	56523.5	2081.2
R0	39960.0	11097.0
R0ab	22428.3	6156.3
R0a1	20766.1	5754.0
R0a1a	12639.7	3218.1
R0a1a1	8941.0	4591.0
R0a1a1a	1873.3	3148.1
R0a1a2	2683.5	2238.6
R0a1a3	4476.4	2894.5
R0a1a4	6651.5	4031.3
R0a1b	1435.4	2037.5
R0a23	17527.3	4022.6
R0a2	14149.8	2387.3
R0a2a	8718.5	4643.4
R0a2a1	1860.7	2536.0
R0a2b	2992.4	5115.7

R0a2c	10546.1	6060.1
R0a2d	7935.5	4206.2
R0a2f	12626.3	3323.0
R0a2f1	3802.4	3384.2
R0a2f1a	1266.9	4853.3
R0a2f1b	2061.3	2789.6
R0a2g	7461.0	5789.0
R0a2h	8209.1	5762.8
R0a2i	2664.6	2798.3
R0a2j	9833.8	3970.1
R0a2k	2689.8	2081.2
R0a2l	4916.7	4057.5
R0a2m	4088.2	5631.6
R0a3	13806.4	4862.1
R0a4	1835.7	2562.2
HV	21905.8	2832.7
HV0	13527.5	3229.0
HV0a	11197.4	2084.2
HV0a1	5105.4	3140.9
HV0a1a	895.3	1254.9
V	9739.5	1357.6
V1	8474.4	1937.4
V1a	6941.4	2531.8

V1a1	5508.6	2164.9
V1a1a	2681.4	3764.7
V1a1b	4451.8	2128.2
V1b	6561.7	2707.9
V2	8003.8	2076.8
V2a	5664.8	2774.0
V2a1	2528.3	2568.5
V2a1a	968.4	1328.3
V2b	3529.5	2818.0
V2b1	1214.1	3493.2
V2c	6237.0	2553.8
V3	6838.3	2370.4
V3a	4965.9	2590.5
V3a1	3582.6	2319.0
V3b	2369.9	2164.9
V3c	4019.3	3096.9
V4	6053.2	3434.5
V5	2903.6	4139.0
V6	4992.7	4021.6
V7	8167.8	2172.2
V7a	6026.2	2414.4
V7a1	1612.4	2150.2
V7b	1917.0	1820.0

V8	2903.6	3449.1
V9	7829.0	2722.6
V9a	4451.8	2590.5
V9a1	2275.0	2069.5
V10	7175.1	3441.8
V10a	1350.2	2627.2
V10b	4853.3	4234.4
V11	4024.6	2935.4
V12	3609.2	3412.4
V13	1559.9	2164.9
V14	4992.7	4006.9
V15	6475.1	3273.0
V15a	3864.7	2994.1
V16	1922.3	2619.9
V17	5643.3	2862.1
V18	6816.6	3280.4
V19	2903.6	3933.5
V20	5030.3	3177.6
V21	1167.0	7470.7
HV0b	5336.5	3140.9
HV0c	3333.0	3170.3
HV0d	5336.5	3397.8
HV0e	3030.7	3229.0

HV0f	3588.0	2685.9
HV1	16829.9	2979.5
HV1a	14981.4	3412.4
HV1a1	8255.3	4036.2
HV1a1a	2649.7	3214.3
HV1a2	12857.9	3816.1
HV1b	14805.5	3691.3
HV1b2	1512.7	4293.1
HV1b3	10613.9	4410.5
HV1c	12723.2	5151.7
HV2	11036.1	3581.2
HV2a	4783.6	2950.1
HV4	15823.7	4469.2
HV4a	15823.7	7588.1
HV4a1	9723.0	5731.4
HV4a2	9728.5	5577.3
HV4b	12000.6	4616.0
HV5	2017.0	14537.8
HV6	5718.7	3008.8
HV6a	1481.2	1467.7
HV7	4740.8	3786.7
HV8	2011.7	2774.0
HV9	8096.7	4718.7

HV9a	5175.3	2693.3
HV9a1	3593.3	2451.1
HV10	2011.7	8608.2
HV11	9392.1	5944.3
HV11a	4799.7	4505.9
HV14	6366.8	3904.1
HV15	8107.6	3375.8
HV16	7670.7	3896.8
HV12	19361.5	3838.1
HV12a	15447.7	5724.1
HV12b	11091.7	5621.4
HV13	18735.9	4549.9
H	12846.0	773.4
H1	9888.6	880.6
H1a	6307.3	1820.0
H1a1	4099.3	1959.4
H1a1a	3274.6	1790.6
H1a1a1	1156.6	1731.9
H1a1b	1324.1	1827.3
H1a2	2908.9	2634.6
H1a3	4960.5	1805.3
H1a3a	3859.4	1621.8
H1a3a1	1276.9	1658.5

H1a3a2	2586.3	4036.2
H1a3b	3157.9	2062.1
H1a3c	2501.9	2781.3
H1a4	1643.9	2186.9
H1a5	1261.2	1680.5
H1a6	1031.1	1423.7
H1b	6237.0	1805.3
H1b1	4955.2	1761.3
H1b1a	2834.8	1658.5
H1b1b	921.4	3214.3
H1b1c	2069.6	1709.9
H1b1h	1271.7	1629.2
H1b1e	1470.8	2010.8
H1b1f	1093.8	1489.7
H1b2	3662.4	2774.0
H1b2a	707.4	4065.6
H1b2a1	0.0	4190.3
H1b3	4339.5	2847.4
H1b4	1638.6	4792.1
H1f	3673.1	3625.3
H1f1	1449.8	1915.4
H1f1a	1449.8	2216.3
H1g	4692.6	2928.1

H1g1	1428.8	1900.7
H1k	2612.8	1996.1
H1k1a	989.3	1306.3
H1y	1775.1	2671.3
H1z	4655.1	2862.1
H1ab	4697.9	3148.3
H1ab1	1428.8	2084.2
H1ad	1775.1	2392.4
H1c	6448.0	1210.9
H1c1	3518.9	1607.2
H1c1a	1208.9	1585.1
H1c1b	2628.6	1519.1
H1c2	4109.9	2275.0
H1c2a	2707.9	1996.1
H1c3	4532.0	1856.7
H1c3a	1449.8	1372.3
H1c3b	1031.1	1482.4
H1c4	4494.5	2597.9
H1c4a	1025.9	1387.0
H1c4b	3073.1	1893.4
H1c4b1	1109.5	1438.4
H1c5	3248.0	4916.9
H1c5a	1827.7	2040.1

H1c6	1664.9	2208.9
H1c7	1664.9	2260.3
H1c8	3041.3	2942.8
H1c9	2914.2	1959.4
H1c9a	1670.1	1511.8
H1c11	1659.6	2260.3
H1c12	1664.9	2208.9
H1c13	2951.2	3192.3
H1c15	2586.3	31856.9
H1c16	3859.4	2678.6
H1c17	1659.6	2223.6
H1c19	1664.9	2495.1
H1c20	4457.1	2164.9
H1e	8501.8	2025.5
H1e1	7229.5	1878.7
H1e1a	6193.7	1878.7
H1e1a1	863.9	3214.3
H1e1a3	3742.2	3463.8
H1e1a4	754.4	1372.3
H1e1b	4772.9	2539.2
H1e1b1	3062.5	2164.9
H1e2	3508.2	2157.5
H1e2a	1938.1	1783.3

H1e2b	1208.9	1577.8
H1e3	1041.5	1665.9
H1e4	2739.6	7147.8
H1e4a	1025.9	7375.3
H1e5	6231.6	2487.8
H1h	7616.2	2788.7
H1h1	4318.1	3852.8
H1i	5675.6	2230.9
H1i1	2734.3	2678.6
H1i2	3593.3	2128.2
H1i2a	1224.6	1864.0
H1an	5831.9	2509.8
H1an1	3870.0	2407.1
H1an1a	1282.2	1687.9
H1bb	4243.4	3522.5
H1j	7774.4	1864.0
H1j1	4596.2	2010.8
H1j1a	2924.8	1761.3
H1j1a1	1072.9	2876.7
H1j1a2	1072.9	1416.4
H1j1b	1413.1	1864.0
H1j1c	1796.1	1673.2
H1j2	3577.3	2531.8

Hlj3	1785.6	2407.1
Hlj4	3264.0	4674.7
Hlj5	2559.9	2304.3
Hlj8	4730.0	2862.1
Hlm	7829.0	2326.3
Hlm1	2951.2	2333.7
Hln	8885.9	1504.4
Hln1	6031.6	2377.7
Hln1a	4590.8	2517.1
Hln1b	1229.8	3639.9
Hln2	4457.1	2774.0
Hln4	4174.0	3449.1
Hlo	2486.0	3251.0
Hlq	6231.6	3082.2
Hlq1	2887.7	4638.0
Hlr	6112.7	3706.0
Hls	1932.8	3096.9
Hlt	8266.3	1959.4
Hlt1	4483.8	2869.4
Hlt1a	2946.0	2355.7
Hlt1a1	2027.5	1812.6
Hlt2	1827.7	2495.1
Hlu	6990.3	2590.5

H1u1	3083.7	2730.0
H1v	5105.4	2913.4
H1v1	2549.4	2502.5
H1w	1932.8	2634.6
H1x	1161.8	2502.5
H1ae	7785.3	2216.3
H1ae1	1790.9	2414.4
H1ae2	5713.3	3074.9
H1ae3	1172.3	1614.5
H1af	4671.1	2634.6
H1af1	3242.7	2333.7
H1af1a	1146.1	1519.1
H1ag	4291.4	2311.7
H1ag1a	994.5	2069.5
H1ag1b	2808.4	2223.6
H1ah	6887.1	2436.4
H1ah1	1696.4	1952.1
H1ai	1570.4	2135.5
H1aj	8178.7	2957.5
H1ak	4115.3	2546.5
H1ak2	1329.3	1893.4
H1am	1932.8	2641.9
H1ao	5460.2	3537.2

H1ao1	3630.5	2619.9
H1ap	1161.8	1607.2
H1aq	6822.0	3060.2
H1aq1	1313.6	5320.5
H1ar	5363.4	3977.5
H1ar1	1146.1	6017.7
H1as	6410.1	3691.3
H1as1	4019.3	2803.3
H1as1a	2655.0	2076.8
H1as2	1659.6	2238.3
H1at	5831.9	3544.5
H1at1	2396.3	2935.4
H1at1a	931.8	1291.6
H1au	7523.5	2964.8
H1au1	5670.2	2774.0
H1au1a	3508.2	2715.3
H1au1b	3508.2	2810.7
H1av	4644.4	5724.1
H1av1	2750.2	1944.7
H1av1a	1025.9	1343.0
H1aw	4275.4	2671.3
H1ax	4949.8	2869.4
H1ay	8737.7	1665.9

H1az	3635.8	3977.5
H1ba	6112.7	3757.4
H1bc	6112.7	5063.6
H1be	1570.4	2142.9
H1bf	5191.4	2803.3
H1bfl	1502.2	2010.8
H1bg	3747.6	3030.8
H1bh	3976.6	3140.9
H1bi	3635.8	4359.1
H1bk	1932.8	2744.6
H1bm	1932.8	2656.6
H1bn	6898.0	3001.5
H1bo	4483.8	2179.6
H1bq	8726.7	1673.2
H1br	6112.7	3808.7
H1bs	7867.2	3537.2
H1bt	1334.5	1820.0
H1bv	1329.3	1827.3
H1bw	6112.7	3698.7
H1bx	1570.4	3816.1
H2	11905.3	1364.4
H2a	10531.8	1628.5
H2a1	7713.4	1754.3

H2a1a	6043.8	1898.9
H2a1a1	851.7	3407.9
H2a1a2	851.7	1251.2
H2a1b	4162.3	3062.1
H2a1c	1784.9	2414.5
H2a1d	1165.1	4407.6
H2a1e	5167.0	2301.3
H2a1e1	3869.9	2238.4
H2a1e1a	2574.7	2150.4
H2a1e1a1	0.0	3810.3
H2a1f	1784.9	2420.7
H2a2	9126.3	1873.7
H2a2a	7037.0	2018.3
H2a2a1	3801.5	2093.8
H2a2a1a	2534.0	2024.6
H2a2a1b	1268.2	2295.0
H2a2a1d	1268.2	1792.0
H2a2a2	3245.9	2747.7
H2a2b	5406.4	2301.3
H2a2b1	4395.7	2087.5
H2a2b1a	3227.8	2062.3
H2a2b1a1	1816.4	1634.8
H2a2b2	1537.5	5382.2

H2a2b3	2647.1	2691.1
H2a2b4	2651.7	2590.5
H2a3	5203.8	3219.3
H2a3b	2583.8	2980.3
H2a4	7228.0	3678.3
H2a5	5337.3	3175.3
H2a5a	2457.1	1735.4
H2a5a1a	945.6	1232.4
H2a5b	1645.4	1609.6
H2a5b1	1645.4	2320.1
H2b	6446.8	3980.1
H2c	6187.3	2930.0
H2c1	2149.9	1886.3
H3	8919.0	1062.6
H3a	5835.7	1974.3
H3a1	4808.4	1905.2
H3a1a	1447.7	1892.6
H3g	6066.9	1628.5
H3g1	3309.6	1748.0
H3g1b	1852.4	1898.9
H3g2	1618.4	2339.0
H3g3	4244.6	2320.1
H3g4	5051.9	1804.6

H3i	2620.0	2068.6
H3i1	990.4	1320.4
H3j	3127.8	5338.2
H3k	4712.0	3099.8
H3k1	1057.5	1540.5
H3b	7961.4	1534.2
H3b1	5420.3	1823.4
H3b1a	3860.8	2081.2
H3b1b	4524.0	1729.1
H3b1b1	3132.3	1483.9
H3b2	1708.4	4577.4
H3b4	3064.2	2754.0
H3c	8134.7	1333.0
H3c1	6841.6	2012.0
H3c2	5960.5	2125.2
H3c2a	4221.8	2118.9
H3c2a1	3318.7	2074.9
H3c2b	3641.9	4659.1
H3c2c	1605.0	2898.6
H3e	1501.6	2024.6
H3h	5674.0	2012.0
H3h1	1569.0	2081.2
H3h2	1569.0	4470.5

H3h3	4189.8	2427.0
H3h3a	1340.0	1760.5
H3h4	815.9	1119.2
H3m	4249.2	2842.0
H3n	2841.9	2169.2
H3p	6377.3	2911.2
H3q	4075.5	2974.1
H3r	3646.5	2917.5
H3r1	1236.8	2269.8
H3s	3232.3	3458.2
H3t	3477.9	3169.0
H3u	7256.0	2144.1
H3u1	2046.2	1999.5
H3v	6641.8	2640.8
H3v1	905.3	2125.2
H3w	3232.3	2313.9
H3x	5983.6	2760.3
H3x1	842.7	1295.3
H3y	1263.7	1716.5
H3z	7321.2	2012.0
H3z1	4505.6	2760.3
H3aa	3477.9	4376.2
H3ab	1501.6	5438.8

H3ac	1870.4	2540.2
H3ad	1870.4	2609.4
H3ae	4757.9	3244.4
H3af	4634.0	3036.9
H3ah	5697.1	3477.1
H3ai	4757.9	4200.1
H3aj	1870.4	2540.2
H3ak	5480.2	2540.2
H3am	4757.9	4753.5
H3ao	5222.2	3753.7
H3ao1	4034.3	3407.9
H3ap	5701.7	3778.9
H3aq	1874.9	4872.9
H3as	1870.4	2540.2
H3at	4139.5	3389.0
H3at1	1335.5	1810.8
H3au	5706.3	3816.6
H3av	932.2	1307.8
H4	10617.3	1471.3
H4a	9277.2	1559.3
H4a1	8636.8	1559.3
H4a1a	7835.0	1647.4
H4a1a1	6600.0	2087.5

H4a1a1a	5891.1	1798.3
H4a1a1a1	2656.2	1880.0
H4a1a1a1a1	704.1	1301.5
H4a1a1a3	3359.6	2320.1
H4a1a1a4	1596.0	2112.6
H4a1a2	2991.6	1936.6
H4a1a2a1	2050.7	1779.4
H4a1a3	4597.3	2621.9
H4a1a3a	2371.2	2408.2
H4a1a4	5544.8	2263.6
H4a1a4a	2687.9	2603.1
H4a1a4b	3482.5	1634.8
H4a1a4b1	2769.4	1590.8
H4a1a4b2	1200.9	1565.6
H4a1c	4817.6	2772.8
H4a1c1	1447.7	1924.0
H4a1d	4528.6	3263.3
H4b	7503.2	4319.6
H4b1	2091.3	2848.3
H4c	2588.3	5696.6
H536	10294.4	3036.9
H5	9877.6	1401.7
H5a	9111.3	1387.0

H5a1	6567.1	1533.8
H5a1a	2977.7	3199.6
H5a1b	1675.4	2275.0
H5a1c	4971.3	1805.3
H5a1c1	1901.3	1724.6
H5a1d	1675.4	2429.1
H5a1e	2977.7	2737.3
H5a1f	2977.7	2634.6
H5a1g	5341.9	2311.7
H5a1g1	2169.6	1651.2
H5a1g1a	598.0	829.3
H5a1g2	1523.2	2135.5
H5a1j	1675.4	2311.7
H5a1k	5234.4	2084.2
H5a1m	1911.8	1908.0
H5a1n	1193.2	1629.2
H5a1p	968.4	1365.0
H5a2	4815.8	4058.2
H5a3	6827.4	2003.4
H5a3a	5848.1	2216.3
H5a3a1	1208.9	6531.4
H5a3a2	2988.3	2436.4
H5a3b	3046.6	2957.5

H5a4	7588.9	1915.4
H5a4a	5051.8	2084.2
H5a5	4703.3	4395.8
H5a6	3566.7	2810.7
H5a7	1518.0	2054.8
H5b	7894.5	2399.7
H5b1	1177.5	1724.6
H5b2	2586.3	2502.5
H5b3	6442.6	2575.8
H5c	6437.2	2891.4
H5c1	4451.8	3162.9
H5d	3630.5	4278.4
H5e	7676.2	3412.4
H5e1	4227.3	3860.1
H5e1a	2232.9	2208.9
H5f	1932.8	2641.9
H5g	5030.3	7279.9
H5h	2924.8	3559.2
H5j	2454.3	1827.3
H5k	1570.4	2333.7
H5m	5707.9	3324.4
H5n	6887.1	3207.0
H5p	1932.8	2700.6

H5q	1549.4	5592.0
H5r	2491.3	2238.3
H5r1	957.9	2583.2
H5r2	957.9	1298.9
H5s	1434.1	5753.5
H5t	2201.3	2810.7
H36	2787.5	2672.2
H6	10945.6	1873.7
H6a	9503.8	1974.3
H6a1	8669.7	1905.2
H6a1a	7139.5	1993.2
H6a1a1	5761.7	2854.6
H6a1a1a	824.8	1138.1
H6a1a2	6159.5	2093.8
H6a1a2a	3979.5	2571.6
H6a1a2b	3273.2	2301.3
H6a1a2b1	1093.4	1477.6
H6a1a3	2950.8	2666.0
H6a1a4	4134.9	4206.4
H6a1a5	1730.9	2320.1
H6a1a6	3118.7	5206.2
H6a1a7	2434.5	2942.6
H6a1a8	2023.7	1898.9

H6a1b	7577.9	1829.7
H6a1b2	4767.1	2188.1
H6a1b2a	1438.7	2024.6
H6a1b2d	1438.7	2760.3
H6a1b3	3769.6	1854.9
H6a1b3a	1542.0	1408.4
H6a1b4	3218.7	2974.1
H6a2	6330.9	3194.1
H6b	8036.3	2930.0
H6b1	5863.4	4854.1
H6c	3082.4	2948.9
H7	8890.8	1685.1
H7a	7381.9	4948.4
H7a1	6483.9	2307.6
H7a1a	5033.6	2207.0
H7a1b	1667.9	5734.3
H7a1c	2959.8	2917.5
H7a2	2484.2	2609.4
H7b	4066.3	1659.9
H7b1	2168.0	1836.0
H7b2	2168.0	2030.9
H7b5	1317.5	3810.3
H7c	7167.4	3062.1

H7c1	3127.8	4099.5
H7c2	1735.4	6570.6
H7c3	2439.0	5137.0
H7d	7601.3	1748.0
H7d1	3423.3	2672.2
H7d2	3819.7	2829.4
H7d2a	1272.7	1704.0
H7d3	5374.2	2559.1
H7d3a	3833.4	2433.3
H7d4	1820.9	1942.9
H7e	1497.1	2307.6
H7f	4748.7	3659.4
H7h	4748.7	3753.7
H8	8341.0	3187.8
H8a	4569.8	3351.3
H8b	4322.4	3885.8
H8c	6400.4	2276.1
H8c2	2538.5	2112.6
H31	3965.8	3439.3
H31a	2127.4	2904.9
H11	8425.5	2816.9
H11a	6122.4	1892.6
H11a1	2928.1	2087.5

H11a2	5406.4	1873.7
H11a2a	3961.2	1603.3
H11a2a1	1299.6	2030.9
H11a2a2	1304.1	1213.5
H11a3	0.0	9387.4
H11a5	2860.1	3068.4
H11b	2683.4	6344.2
H12	4560.6	3584.0
H9	6460.7	3125.0
H9a	2556.6	2269.8
H32	3437.0	3244.4
H46	3236.8	6847.2
H46a	0.0	8004.2
H52	1775.9	6778.1
H69	3236.8	4445.4
H10	8594.5	2263.6
H10a	6048.4	2364.2
H10a1	4831.4	2093.8
H10a1a	2267.3	2502.5
H10a1a1	891.9	1251.2
H10a1b	726.5	1175.8
H10b	4689.1	2666.0
H10b1	3023.4	2194.4

H10c	6548.9	2640.8
H10c1	5084.1	2577.9
H10d	4652.4	4678.0
H10e	4689.1	2263.6
H10e1	2769.4	3169.0
H10e1a	1030.7	1672.5
H10e2	2407.4	2647.1
H10e3	2362.2	2131.5
H10h	1236.8	1691.4
H13	12475.9	867.7
H13a	11785.7	1138.1
H13a1	10090.5	1848.6
H13a1a	8556.9	1748.0
H13a1a1	5886.5	1892.6
H13a1a1a	4496.5	2181.8
H13a1a1b	3605.5	3219.3
H13a1a1d	2064.2	1659.9
H13a1a1e	2796.6	2452.2
H13a1a2	7587.3	1980.6
H13a1a3	5540.2	3112.4
H13a2	10969.4	2219.5
H13a2a	6516.4	3703.4
H13a2b	9324.4	2496.2

H13a2b1	4098.3	3766.3
H13a2c	5743.3	2716.3
H13b	11527.5	1439.9
H13b1	8073.8	4187.6
H13b1a	0.0	10022.5
H13c	11408.1	1666.2
H14	11203.0	1672.5
H14a	9314.9	2188.1
H14a2	7111.5	3080.9
H14b	9319.7	2791.7
H14b1	1142.6	4652.9
H14b2	1798.4	2697.4
H15	8693.2	2710.0
H15a	7433.2	2603.1
H15a1	6136.3	2389.3
H15a1a	2864.6	2728.8
H15b	5507.9	3301.0
H16	5969.7	3992.7
H16a	2046.2	1886.3
H16a1	824.8	1144.4
H16b	2819.3	2628.2
H17	7507.9	2816.9
H17a	6099.3	2691.1

H17a1	4171.5	2798.0
H17b	5024.4	3093.5
H27	3906.5	2364.2
H27a	999.3	1307.8
H27b	999.3	1527.9
H27d	2104.8	1880.0
H18	3309.6	3665.7
H20	10831.4	2301.3
H20a	7363.2	3634.3
H20b	1084.4	1678.8
H23	2064.2	2842.0
H24	5277.4	2999.2
H24a	3696.6	2552.8
H24a1	900.9	2213.2
H24b	1519.6	11443.5
H26	9991.0	2521.3
H26a	5378.8	2948.9
H26a1a	3833.4	2879.7
H26b	6753.3	2779.1
H26c	2941.7	7620.6
H28	9314.9	3590.2
H28a	3546.2	2603.1
H29	5881.9	3728.6

H30	11346.1	1886.3
H30a	4395.7	3263.3
H30b	9702.3	4263.0
H30b1	3414.2	2791.7
H33	7503.2	3659.4
H33a	1766.9	2401.9
H33b	3396.0	2766.6
H34	4675.3	3804.0
H64	4679.9	3521.1
H85	3737.6	3973.8
H35	9168.7	3319.9
H35a	6516.4	4080.7
H39	5120.9	3036.9
H39a	1115.8	1534.2
H39b	2556.6	2471.0
H40	5116.3	5294.2
H40a	5116.3	4363.6
H40b	1115.8	6029.8
H41	4840.5	2955.2
H42	9008.5	3810.3
H42a	4249.2	3477.1
H42a1	1353.4	2659.7
H43	3979.5	3917.2

H44	10512.8	2791.7
H44a	3719.4	2917.5
H44b	6604.6	3659.4
H45	9079.2	4137.3
H45a	1510.6	2992.9
H45b	3851.7	3338.7
H47	8937.9	3036.9
H47a	1263.7	1754.3
H48	3979.5	4231.6
H49	8345.7	2948.9
H49a	4849.7	2810.6
H50	2064.2	5627.4
H51	6925.3	4439.1
H51a	1326.5	1905.2
H53	9145.2	5300.5
H54	8270.6	4596.3
H55	9385.7	3282.1
H55a	5494.0	3338.7
H56	4693.7	2986.6
H57	10664.9	3093.5
H58	9877.3	3200.4
H58a	7461.2	3609.1
H59	5678.6	4175.0

H60	7685.4	3860.6
H61	4689.1	4445.4
H62	7120.8	5432.5
H63	3979.5	3395.3
H65	8162.8	4483.1
H66	1735.4	3112.4
H67	9470.7	3464.5
H67a	3952.1	3093.5
H70	8261.2	4659.1
H71	9796.9	3389.0
H72	2860.1	6941.6
H73	7905.2	4156.1
H73a	1411.8	1741.7
H73a1	610.4	1150.6
H76	5881.9	6017.3
H78	10289.7	2936.3
H79	5480.2	4149.8
H79a	2669.8	2621.9
H80	1735.4	2452.2
H81	8270.6	3998.9
H83	3975.0	5388.5
H86	3979.5	4049.2
H87	5678.6	5583.4

R1	11420.5	3550.4
R1a	8293.9	2605.9
R1a1	7046.0	2334.8
R1a1a	3973.8	2229.9
R1a1a1	2130.3	1976.3
R1a1b	2004.9	1993.8
R2JT	53771.5	5719.0
R2	13719.0	6934.6
JT	46908.3	6549.8
J	34258.3	4886.2
J1	26935.1	5272.9
J1b	16233.1	3466.1
J1b1	13860.3	3269.2
J1b1a	8287.7	3662.9
J1b1a1	6971.3	2341.2
J1b1a1a	4073.0	2713.8
J1b1a1b	1992.2	1856.1
J1b1a1c	5206.5	2671.6
J1b1a3	5407.3	3290.3
J1b1b	11853.5	3388.7
J1b1b1	7826.8	3754.3
J1b2	6166.7	5561.2
J1b3	3181.4	3086.4

J1b4	2851.5	2791.1
J1c	13072.3	1919.3
J1c1	10090.8	2228.7
J1c1a	1173.0	1778.7
J1c1b	8781.4	2313.1
J1c1b1	7555.1	2671.6
J1c1b1a	5052.1	3445.0
J1c1b2	2952.9	2242.7
J1c1b2a	762.6	1061.6
J1c1c	5799.5	3965.2
J1c2	9762.5	2010.7
J1c2a	6836.0	3388.7
J1c2b	6758.1	2692.7
J1c2b1	1077.8	3726.2
J1c2b2	3986.2	3002.0
J1c2c	4543.9	2313.1
J1c2c1	2942.8	2249.8
J1c2c2	2204.0	1792.8
J1c2c2a	872.6	1321.7
J1c2d	1559.4	4851.1
J1c2e	7962.9	2383.4
J1c2e1	1423.8	2017.8
J1c2e2	2598.3	2875.5

J1c2e3	4826.0	2594.3
J1c2f	1926.7	3128.6
J1c2g	2466.7	2748.9
J1c3	8855.1	2242.7
J1c3a	4303.2	2713.8
J1c3a1	1363.6	1806.9
J1c3a2	2264.6	2151.4
J1c3b	4113.9	2467.7
J1c3b1	2093.0	2270.9
J1c3b1a	837.6	2819.3
J1c3b2	1328.4	4443.3
J1c3c	4206.0	2756.0
J1c3c1	1343.5	1785.8
J1c3d	3945.3	3023.1
J1c3e	7299.4	2601.3
J1c3e1	3991.3	2636.5
J1c3e2	4918.5	3016.1
J1c3f	1866.3	2692.7
J1c3g	5675.5	4323.8
J1c4	4073.0	3086.4
J1c4b	2173.8	2601.3
J1c4c	1323.4	1827.9
J1c5	10632.1	2320.1

J1c5a	6898.4	3184.8
J1c5a1	4037.3	3564.5
J1c5b	5227.0	3494.2
J1c5c	5221.9	3691.0
J1c5d	6021.8	3184.8
J1c7	5949.4	3965.2
J1c7a	1982.1	5371.3
J1c12	5660.0	3571.5
J1c13	1087.8	2249.8
J1c14	992.7	2917.7
J1c8	6177.1	3416.9
J1c8a	1243.2	5174.5
J1c9	4001.5	3768.4
J1c10	7774.5	3845.7
J1c11	4733.6	3501.2
J1d	16556.3	4422.2
J1d1	14331.5	4612.0
J1d2	12014.1	5104.2
J2	28259.7	4605.0
J2a	24051.5	4183.2
J2a1	21186.1	4485.5
J2a1a	12986.1	4077.7
J2a1a1	8949.8	3051.3

J2a1a1a	7591.6	2889.6
J2a1a1a1	3960.7	2664.6
J2a1a1a2	3618.9	2973.9
J2a1a1a2a	697.6	1005.4
J2a1a1b	1504.1	6250.2
J2a1a1c	0.0	9203.0
J2a1a2	9778.4	3831.7
J2a2	16052.5	3880.9
J2a2a	12819.3	3944.1
J2a2b	12287.5	5258.9
J2b	13379.5	5055.0
J2b1	9281.8	3107.5
J2b1a	7518.5	2179.5
J2b1a1	6451.7	2355.2
J2b1a1a	2279.8	2214.6
J2b1a2	5031.6	2882.5
J2b1a3	4282.7	3044.2
J2b1a4	2512.3	2559.1
J2b1b	1288.3	2889.6
T	25149.4	4668.3
T1	16309.7	6538.4
T1a	14684.3	4823.0
T1a1	6997.3	2088.1

T1a1a	3649.5	3522.3
T1a1a1	1238.1	4112.9
T1a1b	3863.7	2460.7
T1a1c	2401.0	2559.1
T1a1i	2401.0	2988.0
T1a1j	5221.9	2495.8
T1a1k	4764.4	2938.8
T1a3	4119.0	3592.6
T1a2	12308.9	3887.9
T1a2a	3965.8	3213.0
T1a4	9371.5	4464.4
T1a5	10844.9	5427.6
T1a6	1815.9	9730.3
T1b	6161.5	4801.9
T2	19316.5	2545.1
T2a	17105.4	2868.5
T2a1	15222.8	2741.9
T2a1a	6425.8	2165.4
T2a1a2	2942.8	2720.8
T2a1a3	1042.7	1406.1
T2a1a5	1659.9	2214.6
T2a1a6	3843.3	2868.5
T2a1a7	1659.9	4239.4

T2a1b	13930.7	2685.7
T2a1b1	10946.0	2777.1
T2a1b1a	9498.2	2671.6
T2a1b1a1	8408.4	2664.6
T2a1b1a1a	7054.5	3339.5
T2a1b2	10743.8	3325.5
T2b	10069.6	1610.0
T2b1	3664.8	3480.1
T2b2	6462.1	3515.3
T2b2b	3318.6	2952.8
T2b2b1	832.6	1195.2
T2b3	9202.7	1961.5
T2b3a	3833.1	2847.4
T2b3c	7137.9	2263.8
T2b3d	4482.4	3740.3
T2b3e	3410.2	3142.7
T2b3b	1891.4	11031.0
T2b4	5815.0	4851.1
T2b4a	3573.1	2847.4
T2b4b	1921.7	3613.7
T2b4f	1921.7	2024.8
T2b21	6399.9	3416.9
T2b5	4964.7	3107.5

T2b5a	2199.0	2193.5
T2b5a1	872.6	1434.2
T2b6	5273.4	3437.9
T2b6a	3318.6	3086.4
T2b6b	1198.0	1321.7
T2b7	10069.6	4548.8
T2b7a	6498.4	3880.9
T2b7a1	2289.9	3536.4
T2b7a2	2289.9	2193.5
T2b9	2244.4	2228.7
T2b11	2958.0	2770.0
T2b13	4477.3	2538.0
T2b13a	2330.3	2158.4
T2b13b	2907.3	2601.3
T2b15	0.0	13871.3
T2b16	1936.8	3691.0
T2b17	5716.8	3986.3
T2b17a	1193.0	1638.1
T2b19	6758.1	2917.7
T2b19b	4564.4	2566.2
T2b22	0.0	7958.6
T2b23	8387.4	1996.7
T2b23a	6752.9	2186.5

T2b24	5716.8	3880.9
T2b24a	1193.0	1638.1
T2b25	6856.8	3262.2
T2c	14591.9	3571.5
T2c1	10520.5	3571.5
T2c1a	1856.2	1806.9
T2c2	5882.2	3909.0
T2c3	11084.5	4204.3
T2d	13584.7	3937.1
T2e	11858.8	3234.1
T2e1	9176.4	2896.6
T2e1a	7847.8	2945.8
T2e2	9931.8	3445.0
T2e5	3196.6	3058.3
T2f	11260.4	3670.0
T2f1	3792.2	2524.0
T2f1a	2527.4	2214.6
T2f2	3506.9	4457.4
T2f3	3120.4	3880.9
T2f4	7576.0	4288.6
T2f5	4677.2	3430.9
T2g	15713.6	5301.0
T2g1	3135.7	8057.0

T2g2	5995.9	4162.1
T2g2a	2887.0	3283.3
T2h	15500.8	4569.9
T2j	16457.7	4422.2
R3	12245.8	6768.4
R5	33969.5	9662.9
R5a	30665.3	8552.3
R5a1	16993.4	7013.3
R5a1a	1679.2	2334.8
R5a2	16277.0	5754.0
R5a2a	10698.1	5395.5
R5a2b	8437.5	2973.2
R5a2b1	3390.6	3270.5
R5a2b2	7597.3	2981.9
R5a2b3	5480.1	3629.1
R5a2b4	3390.6	4407.3
R6	43855.2	9645.4
R6a	41310.8	8832.2
R6a1	29883.5	8692.2
R6a1a	2557.6	2658.4
R7	31551.2	5780.3
R7a	16426.9	5981.4
R7a1	9419.6	3515.4

R7a1a	4132.7	3392.9
R7a1b	6309.5	3585.3
R7a1b1	2249.6	2116.2
R7a1b2	1647.9	3148.1
R7b	23926.4	5509.2
R7b1	15020.9	5614.1
R7b1a	9518.1	4381.1
R7b1a1	2595.4	3331.7
R7b2	12599.6	5605.4
R8	32783.3	6890.8
R8a	25618.7	6121.3
R8a1	15943.5	4197.5
R8a1a	13954.5	2894.5
R8a1a1	12092.4	2588.4
R8a1a1a	9754.8	3235.5
R8a1a1b	9327.7	3672.8
R8a1a1c	9327.7	4328.6
R8a1a1d	4897.6	3506.6
R8a1a2	9413.1	3550.4
R8a1a2a	2935.6	2238.6
R8a1a3	11009.2	5019.5
R8a1b	1679.2	2317.3
R8a2	20279.6	6532.3

R8b	14237.4	5343.0
R8b1	10976.1	4241.2
R8b1a	8613.9	4311.1
R8b2	1260.7	6969.5
R9	46709.5	7651.6
R9b	38480.9	8736.0
R9b1	22526.5	6882.1
R9b1a	16972.9	5028.2
R9b1a1	9590.4	4407.3
R9b1a1a	5987.5	4092.5
R9b1a2	8170.0	4459.8
R9b1b	6819.6	5456.7
R9b2	2860.0	3436.7
R9c	46709.5	6296.2
R9c1	8215.6	5150.6
F	42939.3	5561.6
F1	31543.9	7520.5
F1acf	23123.4	5246.8
F1a	18730.0	4424.8
F1a14	16501.9	4416.1
F1a1	10863.5	2990.7
F1a1a	7655.8	3043.2
F1a1a1	5634.1	3043.2

F1a1b	3068.2	3148.1
F1a1c	6303.1	3462.9
F1a1c1	874.5	3900.1
F1a1d	3068.2	3016.9
F1a4	5659.8	3296.8
F1a2	8659.6	5386.7
F1a3	7169.1	5168.1
F1c	18427.0	6051.3
F1f	6910.1	5404.2
F1b	11759.5	4468.5
F1b1a	8235.2	2868.3
F1b1a1	6942.5	2667.1
F1b1a1a	5249.4	2133.7
F1b1a1a1	4132.7	1967.6
F1b1a1a1a	2721.3	2090.0
F1b1a1a2	1516.6	2020.0
F1d	6393.3	5037.0
F1e	23243.0	6270.0
F1e1	1279.4	1783.9
F1e2	5025.4	3926.4
F2	18330.6	6095.1
F2a	9939.1	6812.1
F3	26373.2	6121.3

F3a	20168.6	6532.3
F3b	21421.2	6296.2
F3b1	5897.5	5360.5
F4	35138.7	6497.3
F4a	18234.4	6261.2
F4a1	2343.8	3008.2
F4b	8914.8	6112.6
R11B6	44386.2	7791.5
R11	21344.4	6409.9
R11b	18950.7	6374.9
B6	19019.7	7686.6
B45	49544.7	6619.4
B4	42947.5	5430.6
B4a	24194.5	4520.6
B4a1	21811.9	4667.4
B4a1a	9540.9	2289.6
B4a1a1	7196.9	2304.3
B4a1a1a	5358.0	2275.0
B4a1a1a1	2628.6	3493.2
B4a1a1a2	1146.1	1555.8
B4a1a1a4	3354.2	2443.8
B4a1a1b	4158.0	4072.9
B4a1a2	4168.6	3162.9

B4a1a3	7245.8	3162.9
B4a1a4	2877.1	4021.6
B4a1a5	7251.3	2972.1
B4a1b	6404.7	3750.0
B4a1b1	3965.9	2715.3
B4a1b1a	2127.5	1966.7
B4a1c	19721.5	5093.0
B4a1c1	17352.2	5489.3
B4a1c2	3556.1	3192.3
B4a1c4	14635.3	5247.1
B4a1c3	16818.5	5445.2
B4a1c3a	2080.1	2032.8
B4a2	17674.2	5195.7
B4a2a	12661.5	5188.4
B4a3	7278.5	4850.8
B4g	15163.2	6758.9
B4h	19634.4	7558.8
B4bde	37308.0	5393.9
B4b	28712.2	4821.5
B2	16818.5	2619.9
B2a	12134.9	3162.9
B2a1	8825.5	3405.1
B2a1a	5153.8	3449.1

B2a1a1	1497.0	2891.4
B2a2	9789.2	3684.0
B2b	14255.9	3904.1
B2c	9226.9	5093.0
B2c1	5837.3	3918.8
B2d	2898.3	2847.4
B2g	13510.6	3111.6
B2g1	10969.3	3537.2
B2h	6773.2	4704.0
B2i	5950.6	3595.9
B4b1	25156.8	5049.0
B4b1a	19344.1	5203.1
B4b1a1	3317.0	2201.6
B4b1a1a	1853.9	1952.1
B4b1a2	15237.2	3838.1
B4b1a2a	10736.0	4315.1
B4b1a2b	5089.3	6590.1
B4b1a2c	1680.6	9070.5
B4b1a2d	1135.6	1636.5
B4b1bc	21641.9	5929.6
B4b1b	3502.9	3405.1
B4b1c	16898.7	6913.0
B4d	27021.1	7800.9

B4d123	20589.1	5276.5
B4d1	15544.4	6017.7
B4d3	3200.3	2583.2
B4c	34160.3	6597.4
B4c1	30123.0	6957.0
B4c1ab	27555.4	6590.1
B4c1a	11125.1	6582.7
B4c1a1	8375.8	3126.2
B4c1a1a	5019.6	2832.7
B4c1a2	1885.5	7676.2
B4c1b	22581.8	4858.2
B4c1b1	5934.5	3045.5
B4c1b1a	2401.6	1922.7
B4c1b2	14499.3	4351.8
B4c1b2a	9138.8	4337.1
B4c1b2b	8085.8	4505.9
B4c1c	9960.5	4315.1
B4c1c1	3433.8	3229.0
B4c2	7109.9	3676.6
B4c2a	4821.1	3390.4
B4f	15641.3	5115.0
B4f1	7719.8	4117.0
B5	41561.3	5797.5

B5a	27651.6	5914.9
B5a1	22470.0	5232.4
B5a1a	8737.7	5922.3
B5a1a1	3444.5	3419.8
B5a1b	14272.9	5687.4
B5a2	14459.7	5467.3
B5a2a	9122.3	5100.3
B5b	25556.0	4219.7
B5b1	22546.5	4271.1
B5b1ab	17415.4	5056.3
B5b1a	6502.1	3955.5
B5b1b	2464.9	2531.8
B5b1c	9485.8	4351.8
B5b2	18764.8	4271.1
B5b2ab	15436.3	4322.4
B5b2a	4473.1	4043.6
B5b2b	7327.4	3801.4
B5b2b1	1366.0	2319.0
B5b2c	5336.5	3229.0
B5b3	8025.6	5320.5
R24	17986.9	6847.1
R22	31369.4	7494.2
R30	53576.8	3961.4

R30a	19261.4	6943.3
R30b	50977.0	4713.4
R30b1	14203.7	5281.8
R31	54895.0	3113.1
R31a	10724.6	4591.0
R31a1	1810.6	1775.2
R31b	14176.7	6086.3
P	54801.3	2501.0
P1	32929.4	6165.0
P1d	29673.9	6121.3
P1d1	26458.7	6427.4
P210	50204.3	5141.9
P3	41265.7	5255.6
P3a	25022.6	7153.2
P3b	35514.7	5649.1
P3b1	20926.2	5885.2
P4	52962.1	4407.3
P4a	18633.6	4512.3
P4a1	14399.2	4241.2
P4b	40094.8	7126.9
P4b1	16215.7	6436.1
P6	48157.1	6803.4
U	46531.1	3289.3

U1	31955.4	5352.5
U1ac	24605.0	4779.8
U1a	18462.2	3832.6
U1a1	11153.0	4471.4
U1a2	6240.1	4383.3
U1a3	13652.9	4691.7
U1a4	12460.4	5939.9
U1b	13664.2	5829.7
U1b1	11576.6	4985.4
U5	30248.3	5330.5
U5a	22440.5	4926.6
U5a1	16936.2	2819.4
U5a1a	12124.3	4030.9
U5a1a1	6836.3	3928.1
U5a1a1a	1398.1	1872.3
U5a1a1b	3292.1	2643.2
U5a1a1d	2039.0	2224.7
U5a1a2	10281.1	3590.3
U5a1a2a	2830.9	2533.1
U5a1a2a1	1628.9	1762.1
U5a1a2b	8358.1	3377.4
U5a1a2b1	3090.5	2364.2
U5a1g	7407.4	5044.1

U5a1b	8374.6	2760.7
U5a1b1	6983.0	1967.7
U5a1b1a	5006.0	2525.7
U5a1b1a1	1476.7	2422.9
U5a1b1b	3085.2	5198.3
U5a1b1c	4920.1	2349.5
U5a1b1c1	2487.3	2606.5
U5a1b1c2	2466.1	2210.0
U5a1b1d	4074.6	4339.3
U5a1b1e	5210.1	2613.8
U5a1b1f	3856.0	2929.5
U5a1b2	3377.1	4133.7
U5a1b3	2012.7	1997.1
U5a1b4	4582.4	4420.0
U5a1c	14608.9	4016.2
U5a1c1	4989.9	4552.2
U5a1c2	12932.0	4045.6
U5a1c2a	5888.9	4309.9
U5a1d	15102.8	3223.2
U5a1d1	7587.3	5704.9
U5a1d2	13568.3	3509.6
U5a1d2a	3451.5	2709.3
U5a1d2a1	1434.8	2290.8

U5a1d2b	4234.8	3201.2
U5a1e	6798.3	5389.2
U5a1f	15518.3	3113.1
U5a1f1	10763.7	3920.7
U5a1f1a	6505.4	3590.3
U5a1f1a1	4909.4	3120.4
U5a1h	1015.9	2239.4
U5a2	18416.0	3876.7
U5a2a	12965.7	5917.8
U5a2a1	6094.1	2635.9
U5a2a1a	1235.7	1923.7
U5a2a1b	3021.6	2320.1
U5a2a1b1	1718.2	1945.7
U5a2a1c	2852.1	3105.8
U5a2a1d	2450.3	3105.8
U5a2b	11437.2	3186.5
U5a2b1	10236.8	4464.1
U5a2b1a	8117.2	4155.7
U5a2b1b	6250.9	5609.5
U5a2b2	3440.9	2591.8
U5a2b3	6175.2	3406.8
U5a2b4	8385.5	4552.2
U5a2c	11442.7	3274.6

U5a2c1	3840.0	3583.0
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U5a2c3	9011.4	3340.7
U5a2c4	2012.7	3590.3
U5a2d	16936.2	3847.3
U5a2d1	6407.9	4302.5
U5a2e	2307.8	3392.1
U5b	22794.0	3590.3
U5b1	15529.7	4889.9
U5b1a	8654.3	4478.8
U5b1b	10819.3	4251.1
U5b1b1	7216.8	3994.2
U5b1b1a	3627.0	1916.3
U5b1b1a1	2281.4	1681.4
U5b1b1a1a	1356.2	1644.7
U5b1b1d	4272.2	2290.8
U5b1b1f	3451.5	2929.5
U5b1b1b	0.0	9948.7
U5b1b1e	1912.7	1901.6
U5b1b2	1981.1	2782.7
U5b1c	10380.8	3267.3
U5b1c1	8024.2	3729.9
U5b1c1a	1188.5	2900.2

U5b1c2	6733.2	2804.7
U5b1c2a	2873.3	2408.2
U5b1c2b	2344.7	2797.4
U5b1e	3611.0	2481.7
U5b1e1	2603.5	1872.3
U5b1e1a	984.5	2070.5
U5b1f	1870.6	3494.9
U5b1d	11699.4	4346.6
U5b1d1	9082.9	3788.6
U5b1d1a	4026.6	2643.2
U5b1g	1319.5	2951.6
U5b2	20040.2	3208.6
U5b2a	14938.0	3656.4
U5b2a1	13483.7	4155.7
U5b2a1a	10619.3	3810.6
U5b2a1a1	4325.7	3414.1
U5b2a1a1a	1366.6	1989.7
U5b2a1a1b	4325.7	3098.4
U5b2a1a2	2265.6	2503.7
U5b2a1b	2592.9	2533.1
U5b2a2	10780.4	3333.4
U5b2a2a	4866.5	3157.2
U5b2a2a1	1455.8	2026.5

U5b2a2b	4737.8	2555.1
U5b2a2b1	2423.9	2136.6
U5b2a2c	1387.6	1923.7
U5b2a3	8522.6	5528.7
U5b2a4	5527.6	4618.3
U5b2a4a	2688.1	2599.1
U5b2a5	1089.1	1519.8
U5b2a6	6002.3	5719.6
U5b2b	14676.9	2716.6
U5b2b1	12533.3	3304.0
U5b2b1a	9325.2	3443.5
U5b2b1a1	4871.8	4030.9
U5b2b1a2	6760.3	3304.0
U5b2b1b	3270.9	3421.5
U5b2b2	9882.6	4192.4
U5b2b3	8769.6	2966.3
U5b2b3a	4866.5	2459.6
U5b2b3a1	3541.9	2327.5
U5b2b3a1a	2381.7	1997.1
U5b2b4	1812.8	10800.4
U5b2c	12651.1	5668.2
U5b2c1	4015.9	3898.7
U5b2c2	2836.2	3318.7

U5b3	10508.4	2885.5
U5b3a	9082.9	3061.7
U5b3a1	7641.9	2988.3
U5b3a1a	2524.2	2290.8
U5b3a1b	4331.0	3671.1
U5b3a2	6462.1	3656.4
U5b3b	3722.8	6277.6
U5b3c	3595.1	2856.1
U5b3d	5183.2	3296.7
U5b3e	4208.1	3884.0
U5b3f	1970.6	2760.7
U6	37253.2	5873.8
U6abd	32132.9	5829.7
U6a	25086.7	3744.5
U6a1	20133.4	4941.3
U6a1a	14977.8	5036.8
U6a1a1	3069.3	3201.2
U6a1a2	11058.4	4706.4
U6a1b	17481.9	5374.5
U6a1b1	8336.2	4816.5
U6a2	18092.6	4493.4
U6a2a	13861.8	4801.8
U6a3	16277.4	5646.2

U6a3a	10225.7	5616.8
U6a3a1	6245.5	3986.8
U6a3b	15063.0	5323.1
U6a4	9976.6	5396.5
U6a5	12062.7	4581.5
U6a5a	7931.3	4588.9
U6a6	9965.6	4625.6
U6a7	23218.8	4170.4
U6a7a	2492.5	3318.7
U6b	13997.4	5734.3
U6b1	2915.6	3274.6
U6b1a	1670.9	3443.5
U6d	14365.2	5029.4
U6d1	5678.5	3135.1
U6d1a	1571.2	2246.7
U6c	7592.8	4882.6
U234789	45001.5	3186.5
U2	42805.7	4493.4
U2a	22693.8	8274.7
U2b	29253.5	5815.0
U2b1	22929.6	6365.7
U2b2	5382.2	3421.5
U2cd	39454.7	6042.7

U2c	29944.6	6593.3
U2c1	22117.0	6696.1
U2d	20780.9	5058.8
U2d1	14659.9	5249.7
U2d2	8599.4	5102.8
U2e	19290.4	4097.0
U2e123	17873.5	3392.1
U2e1	14898.3	2790.0
U2e1a	8363.6	3384.8
U2e1a1	6153.6	2591.8
U2e1a1a	4293.6	2973.6
U2e1a1b	3722.8	2746.0
U2e1b	11967.6	3179.2
U2e1b1	3888.0	2966.3
U2e1c	8895.9	4309.9
U2e1d	7630.9	5477.3
U2e1e	6586.7	4434.7
U2e1f	11716.2	3854.7
U2e2	12724.1	3722.5
U2e2a	8736.6	2760.7
U2e2a1	4694.9	3700.5
U2e2a2	5683.8	2768.0
U2e2a3	5608.4	3913.4

U2e2a4	6272.6	3553.6
U2e3	1047.3	4500.8
U3	32702.7	5704.9
U3a	14818.8	4640.3
U3a1	8912.4	3840.0
U3a1a	6847.2	3825.3
U3a1b	0.0	15925.3
U3a1c	3478.1	4882.6
U3a2	11336.8	4721.1
U3b	18959.9	3906.1
U3b1	16993.5	3913.4
U3b1a	14433.1	4023.5
U3b1b	1891.7	2628.5
U3b2	18959.9	6563.9
U3b2a	8720.1	5117.5
U49	37141.0	5763.6
U4	17493.5	3069.1
U4a	14949.4	3348.1
U4a1	7734.6	2628.5
U4a1a	4700.3	4632.9
U4a1a1	4700.3	3223.2
U4a1b	4662.8	2474.3
U4a1b1	3387.7	2547.8

U4a1c	1000.2	1387.7
U4a1d	3255.0	3091.1
U4a2	8802.5	2459.6
U4a2a	4031.9	3781.2
U4a2a1	2666.9	3436.2
U4a2b	1865.4	2709.3
U4a2c	7440.1	2738.7
U4a2c1	1581.7	2085.2
U4a2d	1865.4	2569.8
U4a2e	3776.1	2679.9
U4a2f	4491.4	2503.7
U4a3	4144.0	2782.7
U4b	12589.4	2804.7
U4b1	11520.8	2790.0
U4b1a	10120.5	2694.6
U4b1a1	4652.1	3458.2
U4b1a1a	2809.8	3113.1
U4b1a1a1	733.9	2400.9
U4b1a2	3159.5	1967.7
U4b1a2a	1781.3	1644.7
U4b1a3	4812.8	2819.4
U4b1a3a	3483.4	2437.6
U4b1a4	1345.7	2129.2

U4b1b	8199.3	3663.8
U4b1b1	6353.8	3296.7
U4b1b1a	1120.5	4970.7
U4b2	9143.5	3656.4
U4b2a	7358.4	3516.9
U4b3	9000.4	4030.9
U4c	15199.5	3583.0
U4c1	2281.4	2188.0
U4c2	9452.0	4985.4
U4d	14921.0	3627.1
U4d1	8983.9	3715.2
U4d1a	3132.9	2562.4
U4d1a1	1770.8	1857.6
U4d1b	1875.9	2555.1
U4d2	6310.5	3906.1
U9	23875.3	6483.2
U9a	17292.2	6284.9
U9a1	8281.4	4331.9
U9b	18421.8	5873.8
U9b1	8566.5	5014.7
U7	18052.2	3729.9
U7a	16718.3	3017.7
U7a1	2629.9	2804.7

U7a2	14722.3	4500.8
U7a3	14921.0	3392.1
U7a4	1251.4	1740.1
U7a5	11839.1	4368.6
U7b	10513.9	5073.5
U7b1	1607.9	7900.2
U8	43034.1	3634.4
U8a	18514.2	5168.9
U8a1	8007.8	2929.5
U8a1a	5629.9	2481.7
U8a1a1	4315.0	2378.9
U8a1a2	1178.1	1637.3
U8a1b	3308.1	4787.1
U8a2	6245.5	4603.6
U8b	38433.3	4875.2
U8b1	33070.9	7680.0
U8b1a	28160.1	7158.7
U8b1a1	21659.0	6857.6
U8b1b	15506.9	7819.5
U8b1b1	1839.1	2753.3
K	26681.5	4339.3
K1	22070.0	3333.4
K1a	18433.3	1732.8

K1a1	17010.8	2445.0
K1a1a	9093.9	3539.0
K1a1a2	7042.8	3105.8
K1a1a2a	4812.8	2878.2
K1a1a2a1	2450.3	2202.7
K1a1b	16003.1	2503.7
K1a1b1	14218.0	3017.7
K1a1b1a	4823.6	3575.7
K1a1b1b	7320.3	4471.4
K1a1b1c	1797.0	9001.6
K1a1b1d	1571.2	2210.0
K1a1b1e	5905.0	5697.6
K1a1b2	14750.7	2724.0
K1a1b2a	9071.9	3450.8
K1a1b2a1	4550.3	2467.0
K1a1b2a1a	2947.4	2092.5
K1a1b2b	10452.9	4684.3
K1a1c	5856.5	3825.3
K1a2	13602.1	3164.5
K1a2a	9165.5	3986.8
K1a2a1	2376.4	2276.1
K1a2b	9507.1	4383.3
K1a2c	8786.0	3759.2

K1a3	11141.9	3516.9
K1a3a	9082.9	2760.7
K1a3a1	4464.7	2195.3
K1a3a1b	2899.8	2048.5
K1a3a2	6104.9	2951.6
K1a3a3	7004.7	3171.8
K1a4	15940.3	2342.2
K1a4a	14093.5	2679.9
K1a4a1	9617.5	2327.5
K1a4a1a	6045.5	2650.5
K1a4a1a1	984.5	1402.4
K1a4a1a2	4636.0	2430.3
K1a4a1a2a	2386.9	2180.6
K1a4a1a2b	1807.5	2276.1
K1a4a1b	7570.9	2812.1
K1a4a1b1	4298.9	3487.6
K1a4a1b2	4636.0	2863.5
K1a4a1c	5592.2	3289.3
K1a4a1d	4963.0	3964.8
K1a4a1e	4882.5	4155.7
K1a4a1f	3738.8	3208.6
K1a4a1f1	1534.4	2026.5
K1a4b	12051.5	3524.3

K1a4c	10308.8	4442.0
K1a4c1	3547.2	2760.7
K1a4d	1471.5	2400.9
K1a4f	6413.3	4229.1
K1a4f1	2942.1	3179.2
K1a5	4855.7	4537.5
K1a78	15763.4	5587.4
K1a8	7603.7	4111.6
K1a8a	5597.6	3546.3
K1a9	1691.9	2371.5
K1a10	6413.3	3370.1
K1a10a	2693.4	3531.6
K1a13	3366.5	2665.2
K1a13a	1518.7	1578.6
K1a14	1544.9	2121.9
K1a15	3366.5	4082.3
K1a16	3106.4	3913.4
K1a11	4769.9	2856.1
K1a11a	1849.6	2305.5
K1a11b	2434.5	2672.6
K1a12	15097.1	4353.9
K1a12a	12982.6	3913.4
K1a12a1	11320.1	3957.5

K1a12a1a	9750.0	4104.3
K1a17	12085.1	3854.7
K1a17a	9193.0	3700.5
K1a18	14807.4	3215.9
K1a19	14949.4	4442.0
K1a20	5727.0	3627.1
K1a21	2756.8	2701.9
K1a22	10747.1	5000.1
K1a23	16088.8	3472.9
K1a24	10863.7	6042.7
K1a24a	2297.3	2650.5
K1a25	8572.0	4610.9
K1b	20664.1	3392.1
K1b1	16729.7	3421.5
K1b1a	9971.1	3377.4
K1b1a1	8122.7	3193.9
K1b1a1a	1618.4	5749.0
K1b1a1c	3584.4	3039.7
K1b1b	10924.9	4126.3
K1b1c	4652.1	3818.0
K1b2	10791.5	5462.6
K1b2a	5937.4	3700.5
K1b2a1	4293.6	2459.6

K1b2a1a	3414.3	2298.1
K1b2a1a1	1896.9	2239.4
K1b2a2	3462.1	2217.4
K1b2a2a	2339.5	1857.6
K1b2b	6624.7	4449.4
K1b2b1	3106.4	4045.6
K1c	13935.2	6402.4
K1c1	5215.5	1953.0
K1c1b	2587.6	2224.7
K1c1c	1508.2	1982.4
K1c1d	1618.4	1490.5
K1c1e	4026.6	2180.6
K1c2	3824.0	3759.2
K1c2a	3824.0	3744.5
K1d	4341.7	4618.3
K1e	9628.5	5257.0
K1e1	3701.5	2936.9
K2	21313.2	4618.3
K2a	9104.9	2276.1
K2a2	7658.2	3744.5
K2a2a	1828.6	1938.3
K2a3	6094.1	2584.5
K2a3a	4786.0	2459.6

K2a3a1	3728.1	2276.1
K2a4	3510.0	3942.8
K2a5	6045.5	2848.8
K2a5a	4368.4	2856.1
K2a5a1	1728.7	1696.1
K2a6	1886.4	2562.4
K2a7	4818.2	3942.8
K2a8	1513.5	2173.3
K2a10	1881.2	3201.2
K2b	14438.8	4655.0
K2b1	6961.2	5954.5
K2b1a	4684.2	5704.9
K2b1a1	3403.7	2892.8
K2b2	5075.8	3377.4

Table S6. HVS-I Diagnostic Motifs of Major Haplogroups Relative to the RSRS

Haplogroup	HVS-I as compared to the rCRS/ previous nomenclature scheme	HVS-I as compared to the RSRS/ suggested nomenclature scheme^{a,b}
L0d	16129 16187 16189 16223 16230 16243 16311	T16243C
L0k	16129 16166C 16172 16187 16189 16214 16223 16230 16291G 16311	T16172C A16166c C16214T C16291g
L0f	16169 16187 16189 16223 16230 16278 16311 16327	C16169T T16172C C16327T C16354T T16368C
L0a	16148 16172 16187 16188G 16189 16223 16230 16311 16320	CC16148T T16172C C16188g T16278C C16320T
L1b	16126 16187 16189 16223 16264 16270 16278 16311	T16126C A16129G G16230A C16264T C16270T A16293G
L1c	16129 16187 16189 16223 16278 16294 16311 16360	G16230A C16294T C16360T
L5	16129 16148 16166 16187 16189 16223 16278 16311	C16148T A16166G G16230A
L2	16223 16278 16390	A16129G T16187C C16189T G16230A C16311T G16390A
L6	16048 16223 16278 16224	G16048A A16129G T16187C C16189T T16224C G16230A
L4	16223 16311 16362	A16129G T16187C C16189T G16230A

		T16278C T16362C
L3	16223	A16129G T16187C C16189T G16230A T16278C C16311T
M	16223	A16129G T16187C C16189T G16230A T16278C C16311T
M1	16129 16189 16223 16249 16311	(G16129A!) T16187C (T16189C!) G16230A T16249C T16278C (T16311C!)
C	16223 16298 16327	A16129G T16187C C16189T G16230A T16278C T16298C C16311T C16327T
D	16223 16362	A16129G T16187C C16189T G16230A T16278C C16311T T16362C
E	16223 16227 16362	A16129G T16187C C16189T G16230A T16278C C16311T T16362C
Z	16185 16223 16224 16260 16298	C16185T A16129G T16187C C16189T T16224C G16230A C16260T T16278C T16298C C16311T
N	16223	A16129G T16187C C16189T G16230A T16278C C16311T
N1a	16147A 16172 16223 16248 16355	A16129G C16147a T16172C T16187C C16189T G16230A C16248T T16278C C16311T C16355T
N1c	16223 16265	A16129G T16187C C16189T C16201T G16230A A16265G T16278C C16311T

I	16129 16223 16391	(G16129A!) T16187C C16189T G16230A T16278C C16311T G16391A
N1b	16145 16176G 16223	A16129G G16145A C16176a T16187C C16189T G16230A T16278C C16311T
A	16223 16290 16319	A16129G T16187C C16189T T16223C G16230A T16278C C16290T C16311T G16319A
W	16223 16292	A16129G T16187C C16189T G16230A T16278C C16292T C16311T
X	16189 16223 16278	A16129G T16187C (T16189C!) G16230A (C16278T!) C16311T
R	CRS	A16129G T16187C C16189T T16223C G16230A T16278C C16311T
U	CRS	A16129G T16187C C16189T T16223C G16230A T16278C C16311T
U1	16249	A16129G T16187C C16189T T16223C G16230A T16249C T16278C C16311T
U2	16051 16129C	A16051G G16129c T16187C (T16189C!) T16223C G16230A T16278C C16311T
U3	16343	A16129G T16187C C16189T T16223C G16230A T16278C C16311T A16343G
U4	16356	A16129G T16187C C16189T T16223C G16230A T16278C C16311T T16356C

U5	16270	A16129G T16187C C16189T T16223C G16230A C16270T T16278C C16311T
U6	16172 16219	A16129G T16172C T16187C (T16189C!) A16219G T16223C G16230A T16278C C16311T
U7	16318T	A16129G T16187C C16189T T16223C G16230A T16278C C16311T A16318t
K	16224 16311	A16129G T16187C C16189T T16223C T16224C G16230A T16278C (T16311C!)
R0a	16126 16362	T16126C A16129G T16187C C16189T T16223C G16230A T16278C C16311T T16362C
HV	CRS	A16129G T16187C C16189T T16223C G16230A T16278C C16311T
HV1	16067	C16067T A16129G T16187C C16189T T16223C G16230A T16278C C16311T
H	CRS	A16129G T16187C C16189T T16223C G16230A T16278C C16311T
V	16298	A16129G T16187C C16189T T16223C G16230A T16278C T16298C C16311T
J	16069 16126	C16069T T16126C A16129G T16187C C16189T T16223C G16230A T16278C C16311T

T	16126 16294	T16126C A16129G T16187C C16189T T16223C G16230A T16278C C16294T C16311T
F	16304	A16129G T16187C C16189T T16223C G16230A T16278C T16304C C16311T
B	16189	A16129G T16187C (T16189C!) T16223C G16230A T16278C C16311T

^aMutations noted in brackets represent the phylogenetic hierarchy on their respective path to the RSRS but will not be scored when directly compared to it as they have reverted back to the ancestral state.

^bNote that mutation G16129c represents a sequence of mutational events including an A16129G transition followed by a G16129c transversion.