

**Supplementary Table 1. Summary of WGAC and WSSD duplicated bp content.**

Chr	Size	All WGAC	WGAC (>94% and >10kb)	WGAC (<94%)	WSSD	WGAC (>94% and >10kb) and WSSD	Unique WGAC (>94% and >10kb)	Unique WSSD	Total Duplicated Bases
1	125,616,256	1,082,810	655,060	324,578	1,860,187	609,588	45,472	1,250,599	2,129,008
2	88,410,189	2,747,819	2,615,706	117,727	3,287,954	2,396,294	219,412	891,660	3,360,319
3	94,715,083	315,755	272,411	13,020	592,588	240,556	31,855	352,032	599,337
4	91,483,860	138,200	79,019	40,910	330,479	68,327	10,692	262,152	345,034
5	91,976,430	128,182	66,958	45,711	501,532	66,885	73	434,647	544,221
6	80,642,250	540,246	372,348	156,671	1,209,030	342,243	30,105	866,787	1,289,947
7	83,999,179	208,714	127,658	69,758	328,145	126,738	920	201,407	357,087
8	77,315,194	839,557	631,497	192,208	1,282,758	552,047	79,450	730,711	1,389,991
9	64,418,924	1,395,084	1,297,768	17,619	3,028,039	1,217,453	80,315	1,810,586	3,039,287
10	72,488,556	337,674	287,682	43,072	624,775	272,556	15,126	352,219	643,145
11	77,416,458	1,708,668	1,577,360	47,291	2,580,968	1,472,006	105,354	1,108,962	2,610,197
12	75,515,492	68,436	10,107	52,812	159,670	0	10,107	159,670	212,482
13	66,182,471	269,434	209,593	59,841	415,844	164,454	45,139	251,390	437,608
14	63,938,239	341,931	301,543	15,677	579,240	279,040	22,503	300,200	594,917
15	67,211,953	463,939	285,523	159,914	616,484	229,161	56,362	387,323	767,140
16	62,570,175	1,994,307	1,747,922	159,133	2,766,299	1,725,117	22,805	1,041,182	2,865,522
17	67,347,617	817,099	752,583	28,964	1,265,864	729,473	23,110	536,391	1,285,339
18	58,872,314	1,620,513	1,218,880	304,042	1,655,315	880,648	338,232	774,667	1,838,856
19	56,771,304	358,803	179,267	144,128	310,667	128,095	51,172	182,572	454,795
20	61,280,721	118,917	52,045	37,676	365,444	14,678	37,367	350,766	403,120
21	54,024,781	823,585	465,700	260,620	846,014	379,642	86,058	466,372	987,849
22	64,401,119	108,299	77,194	13,145	231,911	52,148	25,046	179,763	240,753
23	55,389,570	215,099	182,936	0	266,604	137,497	45,439	129,107	266,604
24	50,763,139	177,990	143,751	19,867	449,522	143,751	0	305,771	456,138
25	54,563,659	517,258	348,661	168,597	542,209	256,476	92,185	285,733	647,209
26	42,029,645	2,124,628	1,472,358	598,267	2,303,098	1,403,586	68,772	899,512	2,705,702
27	48,908,698	345,134	182,216	108,416	357,749	94,452	87,764	263,297	446,816
28	44,191,819	86,098	34,239	34,096	266,782	33,471	768	233,311	275,203
29	44,831,629	53,847	39,560	5,131	190,852	39,560	0	151,292	194,595
30	43,206,070	6,205	0	6,205	134,320	0	0	134,320	134,320
31	42,263,495	144,888	76,258	48,640	262,207	76,119	139	186,088	296,835
32	41,731,424	119,700	86,860	24,780	291,736	62,414	24,446	229,322	297,757
33	34,424,479	139,257	82,001	49,096	54,982	10,299	71,702	44,683	93,592
34	45,128,234	286,696	195,972	76,438	285,178	189,798	6,174	95,380	319,039
35	29,542,582	203,861	142,305	15,029	388,707	140,347	1,958	248,360	403,736
36	33,840,356	61,381	20,447	40,934	86,494	20,391	56	66,103	127,428
37	33,915,115	152,115	135,364	9,869	230,613	120,809	14,555	109,804	231,401
38	26,897,727	53,298	12,205	21,810	124,404	0	12,205	124,404	140,901
Un	86,547,043	37,624,017	28,274,257	8,309,224	69,210,704	27,616,968	657,289	41,593,736	69,389,847
X	126,883,977	243,175	90,052	100,868	3,702,511	80,840	9,212	3,621,671	3,774,994
<b>Totals</b>	<b>2,531,657,226</b>	<b>58,982,619</b>	<b>44,803,266</b>	<b>11,941,784</b>	<b>103,987,879</b>	<b>42,373,927</b>	<b>2,429,339</b>	<b>61,613,952</b>	<b>106,598,071</b>

WGAC data is divided into WGAC scores with greater than 94% sequence identity (and greater than 10 kb in length) and scores with less than 94% sequence identity. Following previous studies (Bailey et al. 2002; She et al. 2004, 2008) segmental duplications were defined as the summation of: 1) the intersection of WGAC bases with greater than 94% sequence identity WSSD bases, 2) all other WSSD results, and 3) all WGAC bases with less than 94% sequence identity.

**Supplementary Table 2. Summary of FISH Data.**

Clone	Chr	Start	End	Max. Dup bp	WGAC bp	WGAC %	WSSD bp	WSSD %	FISH results	Duplication Type
CH82-362A12	2	11175898	11354144	55218	74830	0.42	72144	0.4	Duplicated	Interchromosomal (2-3 chrs)
CH82-171F15	2	58075438	58257988	182550	132896	0.73	163775	0.9	Duplicated	Interchromosomal (> 4 chrs)
CH82-222B16	4	38281754	38499877	50649	43158	0.2	25000	0.11	Duplicated	Interchromosomal (2-3 chrs)
CH82-253E05	15	20175825	20385872	139505	37537	0.18	129075	0.61	Duplicated	Interchromosomal (2 chrs)
CH82-67J21	29	44641138	44838568	81568	61631	0.31	73568	0.37	Duplicated	Interchromosomal (2 chrs)
CH82-523G02	1	114,468,270	114,693,278	39,278	14,836	0.07	10,000	0.04	Duplicated	Intrachromosomal
CH82-201C11	13	41278740	41493933	38085	15329	0.07	12390	0.06	Duplicated	Intrachromosomal
CH82-332L08	16	7285905	7500164	214259	182779	0.85	214259	1	Duplicated	Intrachromosomal
CH82-381N09	16	40367842	40547389	28057	22578	0.13	26783	0.15	Duplicated	Intrachromosomal
CH82-300O9	18	59236787	59451501	23501	6552	0.03	18501	0.09	Duplicated	Intrachromosomal
CH82-331L01	18	21446921	21665466	23866	39861	0.18	218545	1	Duplicated	Intrachromosomal
CH82-269J01	2	7289337	7498356	209019	0	0	209019	1	Duplicated	Intrachromosomal
CH82-379G23	21	42791151	42937146	41684	26051	0.18	36991	0.25	Duplicated	Intrachromosomal
CH82-241I12	25	22839010	23019065	176777	141552	0.79	152975	0.85	Duplicated	Intrachromosomal
CH82-331B19	26	28619138	28826083	206945	149826	0.72	96318	0.47	Duplicated	Intrachromosomal
CH82-75N03	7	43401553	43595133	52025	53116	0.27	45273	0.23	Duplicated	Intrachromosomal
CH82-515H11	7	29,789,741	29,963,374	80,998	18,445	0.11	80,998	0.47	Duplicated	Intrachromosomal
CH82-118H15	8	3060117	3258724	34520	13880	0.07	14883	0.07	Duplicated	Intrachromosomal
CH82-144A15	8	76744937	76903912	158975	146350	0.92	102412	0.64	Duplicated	Intrachromosomal
CH82-402O22	Un	11605655	11826520	220865	198111	0.9	220865	1	Duplicated	Centromeric
CH82-116H24	3	34111162	34307119	195957	128740	0.66	152193	0.78	Single	NA
CH82-125C17	14	14120935	14322138	92074	66664	0.33	69009	0.34	Single	NA
CH82-13N14	17	66552630	66771130	51130	59949	0.27	37130	0.17	Single	NA
CH82-180H01	6	41887691	42110533	62533	53350	0.24	42533	0.19	Single	NA
CH82-180P08	34	15154498	15377697	145697	121974	0.55	80115	0.36	Single	NA
CH82-186H06	18	21446921	21674354	32754	39861	0.18	227433	1	Single	NA
CH82-1L19	18	59229240	59451508	23508	6552	0.03	18508	0.08	Single	NA
CH82-208O19	25	22817706	22965797	148091	128206	0.87	129289	0.87	Single	NA
CH82-263N02	4	38288001	38507369	50649	43158	0.2	25000	0.11	Single	NA
CH82-266E20	5	33020127	33204916	42789	14584	0.08	16873	0.09	Single	NA
CH82-28M24	15	20074566	20266815	20815	96860	0.5	114172	0.59	Single	NA
CH82-311I11	7	43402281	43556870	52025	53116	0.34	45273	0.29	Single	NA
CH82-328A13	9	50418453	50611762	27784	6740	0.03	12078	0.06	Single	NA
CH82-411K02	6	14668006	14831284	30977	19488	0.12	47284	0.29	Single	NA
CH82-413H06	16	15691104	15885693	66693	51656	0.27	61693	0.32	Single	NA
CH82-423C01	13	41327064	41530155	38085	15329	0.08	12390	0.06	Single	NA
CH82-447H10	33	3072053	3260994	52691	14268	0.08	27943	0.15	Single	NA
CH82-451A08	8	46932100	47104926	97000	59952	0.35	49000	0.28	Single	NA
CH82-467N09	21	42800447	42987047	72360	39611	0.21	67667	0.36	Single	NA
CH82-499C04	29	44624374	44813436	56436	36499	0.19	48436	0.26	Single	NA
CH82-507P05	17	24459191	24625711	87399	47449	0.28	87399	0.52	Single	NA
CH82-64H12	9	10604345	10748279	86279	71828	0.5	86279	0.6	Single	NA

FISH results are listed for each clone examined. Genomic location and percent WGAC and WSSD duplication content of each clone is listed followed by the FISH results and interpretation.

**Supplementary Table 3. Enriched PANTHER Molecular Function terms in segmental duplications and CNVs.**

<b>Term</b>		
<b>Segmental Duplications</b>	<b>N<sup>a</sup></b>	<b>P-Value<sup>b</sup></b>
Defense/immunity protein	62	<10 <sup>-6</sup>
Molecular function unclassified	800	<10 <sup>-6</sup>
Oxidoreductase	28	5.4 x 10 <sup>-4</sup>
Select regulatory molecule:Other G-protein modulator	23	<10 <sup>-6</sup>
Signaling molecule	36	1.2 x 10 <sup>-4</sup>
Signaling molecule:Interferon	11	<10 <sup>-6</sup>
Transcription factor:KRAB box transcription factor	63	<10 <sup>-6</sup>
<b>CNVs</b>		
Defense/immunity protein	54	<10 <sup>-6</sup>
Select regulatory molecule	23	3.6 x 10 <sup>-5</sup>
Select regulatory molecule:Other G-protein modulator	19	3.1 x 10 <sup>-5</sup>
Signaling molecule	27	8.2 x 10 <sup>-5</sup>
Signaling molecule:Interferon	10	5.2 x 10 <sup>-5</sup>

<sup>a</sup> Number of peptides found in either segmental duplication or CNV regions.

<sup>b</sup> p-values adjusted by Bonferroni correction

**Supplementary Table 4. Summary of Distinct CNV Regions.**

<b>CNV Region</b>	<b>Chr</b>	<b>Start</b>	<b>End</b>	<b>Size</b>	<b>Number of CNVs</b>	<b>Gains</b>	<b>Losses</b>	<b>Peptides</b>	<b>Genes</b>
1	1	7664258	7678814	14556	2	2	0	1	1
2	1	72610352	72624541	14189	1	0	1	0	0
3	1	78070108	78136431	66323	1	1	0	2	1
4	1	78141673	78151806	10133	1	1	0	2	1
5	1	78160227	78171123	10896	1	1	0	0	0
6	1	78219715	78227981	8266	1	1	0	0	0
7	1	78236424	78246568	10144	1	1	0	0	0
8	1	106980904	107144173	163269	1	0	1	4	2
9	1	107164760	107437965	273205	1	0	1	8	5
10	1	108112502	108121036	8534	2	0	2	0	0
11	1	108159205	108167475	8270	3	0	3	1	1
12	1	108886700	108914537	27837	1	1	0	11	2
13	1	110885346	110936958	51612	1	0	1	0	0
14	1	114690541	114713134	22593	3	3	0	1	1
15	1	115418502	115465928	47426	17	0	17	0	0
16	2	7237277	7265972	28695	1	0	1	1	1
17	2	7283811	7339319	55508	10	0	10	2	2
18	2	7482453	7553252	70799	11	1	11	3	2
19	2	7555428	7625158	69730	4	4	1	2	2
20	2	7627163	7953160	325997	11	7	11	3	3
21	2	7964911	7996934	32023	5	2	3	0	0
22	2	8073467	8337211	263744	11	1	16	3	3
23	2	8349554	8357828	8274	2	1	1	0	0
24	2	8366495	8390861	24366	2	2	0	0	0
25	2	8393772	8617358	223586	11	1	18	1	1
26	2	8628818	8666097	37279	6	0	6	1	1
27	2	8695906	8892258	196352	10	7	8	1	1
28	2	9200149	9210457	10308	2	0	2	2	1
29	2	9255664	9265777	10113	2	0	2	0	0
30	2	9294634	9336117	41483	6	0	6	0	0
31	2	9356123	9371512	15389	2	1	1	1	1
32	2	9379776	9400955	21179	3	3	0	0	0
33	2	9404145	9657460	253315	10	1	13	4	4
34	2	16350945	16376035	25090	6	0	6	0	0
35	2	16615037	16677417	62380	6	0	12	1	1
36	2	20398148	20435022	36874	5	1	4	1	1
37	2	20740044	20760084	20040	7	1	6	0	0
38	2	21069053	21221596	152543	15	2	13	1	1
39	2	21246857	21257108	10251	6	0	6	0	0
40	2	26027172	26094460	67288	11	13	1	5	3
41	2	38753049	38776432	23383	2	2	0	3	3
42	2	39089100	39102277	13177	2	1	1	1	1
43	2	60307292	60327603	20311	1	0	1	1	1
44	2	60345871	60391836	45965	1	0	1	2	1
45	2	60393989	60419493	25504	1	0	1	0	0

46	2	60753726	60765490	11764	1	0	1	0	0
47	2	68153519	68181928	28409	1	0	1	0	0
48	2	85849001	85866057	17056	1	1	0	0	0
49	2	86694359	86711448	17089	10	0	10	0	0
50	2	86817008	86921689	104681	10	6	6	1	1
51	3	3040595	3049185	8590	1	0	1	0	0
52	3	11496027	11507259	11232	1	0	1	0	0
53	3	34152139	34196885	44746	5	1	6	2	2
54	3	34214040	34304448	90408	2	2	0	2	2
55	3	34315592	34327763	12171	1	1	0	0	0
56	3	34358825	34396403	37578	1	1	0	4	2
57	3	34426425	34441102	14677	9	9	0	0	0
58	3	38575956	38595036	19080	4	4	0	0	0
59	3	71433351	71456276	22925	12	0	12	0	0
60	4	30532847	30583277	50430	1	1	0	0	0
61	4	61446171	61458512	12341	3	2	1	2	2
62	5	3005316	3068693	63377	5	0	5	4	2
63	5	33066557	33078734	12177	1	0	1	0	0
64	6	12741643	12766611	24968	1	0	1	1	1
65	6	12792094	12850099	58005	10	0	16	2	2
66	6	15060023	15088875	28852	5	1	4	2	1
67	6	19839036	19851104	12068	1	0	1	1	1
68	6	19865708	19889972	24264	1	0	1	1	1
69	6	29130009	29150013	20004	1	1	0	0	0
70	6	40881217	40969223	88006	1	1	0	2	1
71	6	43557234	43577804	20570	1	0	1	1	1
72	6	43702732	43741444	38712	2	0	2	3	2
73	6	43744090	43797557	53467	2	0	2	4	3
74	6	46122570	46141986	19416	3	1	2	1	1
75	6	48259041	48274087	15046	7	0	7	0	0
76	6	48548088	48577093	29005	9	0	9	0	0
77	6	48814001	48832083	18082	7	0	7	0	0
78	6	48887041	48905088	18047	5	0	5	0	0
79	6	49227049	49243137	16088	6	0	6	0	0
80	6	49257027	49276076	19049	8	0	8	0	0
81	6	49903020	49927329	24309	8	0	8	0	0
82	6	49996040	50017058	21018	4	0	4	0	0
83	6	50067075	50088558	21483	9	0	9	1	1
84	6	50125017	50147061	22044	8	0	8	0	0
85	7	43721579	43769166	47587	3	1	2	0	0
86	7	83961919	83987106	25187	10	0	10	0	0
87	8	3058358	3089061	30703	10	0	10	0	0
88	8	5244689	5434539	189850	4	6	0	10	9
89	8	47189102	47229422	40320	7	7	0	1	1
90	8	59113084	59131671	18587	13	0	13	0	0
91	8	76094443	76151150	56707	4	5	0	0	0
92	8	76227274	76264535	37261	4	4	0	0	0
93	8	76367315	76467801	100486	15	19	0	1	1
94	8	76581052	76644640	63588	15	15	0	4	4

95	8	76674197	76694540	20343	12	12	0	0	0
96	8	76715004	76759616	44612	15	15	0	2	2
97	8	76770775	76859468	88693	15	18	0	2	2
98	8	76892039	77122974	230935	15	53	0	11	7
99	8	77147089	77241999	94910	14	18	0	5	3
100	9	10414074	10429161	15087	11	3	8	0	0
101	9	10480818	10544330	63512	16	5	13	0	0
102	9	10729760	11002077	272317	14	11	12	0	0
103	9	11621390	11942236	320846	19	17	29	0	0
104	9	11954868	12057245	102377	8	6	6	1	1
105	9	13350206	13421806	71600	13	7	10	3	3
106	9	13464877	13511710	46833	11	11	0	3	2
107	9	19778694	21163725	1385031	16	18	35	3	2
108	9	21234054	21356447	122393	17	9	31	2	2
109	9	21428834	21486984	58150	15	3	15	0	0
110	9	21497991	21506411	8420	1	0	1	1	1
111	9	23165606	23219386	53780	7	7	0	0	0
112	9	24819667	24833892	14225	6	0	6	0	0
113	9	24875146	24887465	12319	15	1	14	2	2
114	9	34888060	34914000	25940	1	1	0	0	0
115	9	50635089	50652754	17665	5	5	0	3	2
116	10	19064933	19091725	26792	4	1	3	1	1
117	10	19144391	19154541	10150	1	1	0	2	1
118	10	19184667	19195257	10590	1	1	0	0	0
119	10	19488878	19497132	8254	1	0	1	0	0
120	10	19507139	19529648	22509	2	0	2	1	1
121	10	25999697	26020593	20896	15	0	15	0	0
122	10	28980544	28994462	13918	6	6	0	2	2
123	11	12165840	12371453	205613	8	0	12	0	0
124	11	12489835	12606952	117117	12	0	19	0	0
125	11	13935449	13972387	36938	10	0	10	0	0
126	11	14069249	14422490	353241	11	0	17	1	1
127	11	43768087	43798409	30322	7	3	4	5	5
128	11	55477168	55487340	10172	2	0	2	1	1
129	12	3003761	3022097	18336	2	0	2	0	0
130	12	57047042	57062335	15293	4	4	0	0	0
131	13	19106042	19118224	12182	2	2	0	0	0
132	13	43294192	43308680	14488	3	1	2	1	1
133	13	61826098	61841475	15377	1	1	0	1	1
134	13	61852461	61965024	112563	15	24	0	4	3
135	13	62433125	62464200	31075	2	1	1	0	0
136	13	62736390	62748659	12269	1	1	0	0	0
137	13	66073148	66139454	66306	1	0	1	0	0
138	14	3022565	3036528	13963	10	10	0	0	0
139	14	3073011	3085294	12283	2	2	0	0	0
140	14	3150487	3322175	171688	12	0	17	0	0
141	14	3466140	3483090	16950	11	2	9	0	0
142	14	3674038	3694049	20011	13	13	0	1	1
143	14	5505315	5525495	20180	1	0	1	0	0

144	14	5532615	5542820	10205	8	8	0	0	0
145	14	14574225	14611196	36971	10	0	13	1	1
146	14	20444399	20456882	12483	3	0	3	0	0
147	14	25264206	25274511	10305	3	0	3	1	1
148	14	48088061	48103630	15569	1	1	0	0	0
149	14	61274056	61317155	43099	8	0	8	0	0
150	15	3042952	3059622	16670	2	0	2	0	0
151	15	3125718	3138191	12473	1	1	0	0	0
152	15	3185301	3194098	8797	1	1	0	0	0
153	15	3213083	3227669	14586	1	1	0	0	0
154	15	20165880	20182994	17114	2	0	2	0	0
155	15	20191522	20206154	14632	1	1	0	0	0
156	15	32836087	32846381	10294	10	2	8	0	0
157	15	65430993	65453339	22346	5	5	0	1	1
158	15	65492191	65514381	22190	4	4	0	1	1
159	15	65655595	65668900	13305	6	6	0	0	0
160	15	65715728	65731028	15300	4	4	0	0	0
161	15	67194170	67204912	10742	2	0	2	0	0
162	16	3006293	3066927	60634	5	0	5	0	0
163	16	3171749	3190481	18732	1	1	0	1	1
164	16	4127072	4137266	10194	1	1	0	1	1
165	16	4223224	4297478	74254	3	1	2	0	0
166	16	4305763	4355649	49886	3	2	1	0	0
167	16	4684713	4707364	22651	2	1	1	0	0
168	16	4735203	4751572	16369	1	1	0	0	0
169	16	10238028	10254656	16628	3	1	2	1	1
170	16	13529829	13575105	45276	2	1	1	0	0
171	16	16541455	16553791	12336	3	3	0	0	0
172	16	16839495	16866743	27248	2	1	1	0	0
173	16	16890233	16921420	31187	5	1	4	0	0
174	16	41557146	41571790	14644	3	1	2	0	0
175	16	42941240	42952231	10991	2	1	1	0	0
176	16	43007825	43024093	16268	2	1	1	0	0
177	16	44338838	44364228	25390	3	1	2	1	1
178	16	50507370	50522100	14730	1	1	0	1	1
179	16	53623086	53803291	180205	15	25	1	0	0
180	16	53830039	53852099	22060	7	7	0	0	0
181	16	53988726	53999312	10586	2	2	0	0	0
182	16	54604783	54623045	18262	2	2	0	0	0
183	16	55240004	55248122	8118	1	1	0	0	0
184	16	56995747	57102014	106267	15	14	5	3	3
185	16	57871534	57921159	49625	16	14	9	0	0
186	16	61961098	62098430	137332	16	12	14	3	2
187	16	62196518	62380994	184476	17	30	18	1	1
188	16	62407316	62569296	161980	17	20	5	2	2
189	17	24435613	24794917	359304	17	18	34	13	13
190	17	40744453	40752749	8296	4	0	4	1	1
191	17	40778397	40796995	18598	4	0	4	2	1
192	17	42389425	42422753	33328	3	2	1	0	0

193	17	59706615	59716776	10161	4	0	4	0	0
194	17	59722864	59763864	41000	9	0	9	2	2
195	17	59787027	59917864	130837	9	0	9	4	4
196	17	60456246	60485652	29406	8	0	8	1	1
197	17	60502325	60524106	21781	7	0	7	1	1
198	17	60554745	60571685	16940	5	0	5	1	1
199	17	64667082	64688562	21480	7	7	0	0	0
200	18	5574059	5587288	13229	2	2	0	0	0
201	18	14246032	14260858	14826	3	3	0	0	0
202	18	14303066	14430292	127226	14	14	0	2	1
203	18	14486178	14505793	19615	6	6	0	0	0
204	18	21343918	21415061	71143	16	2	16	1	1
205	18	21453014	21566771	113757	16	14	8	0	0
206	18	21586014	21830568	244554	11	5	7	0	0
207	18	22164071	22184060	19989	1	1	0	0	0
208	18	28306691	28319899	13208	2	0	2	0	0
209	18	28447219	28457365	10146	1	1	0	3	2
210	18	33250026	33280097	30071	7	3	4	0	0
211	18	40410081	40477496	67415	1	1	0	3	3
212	18	42338258	42392202	53944	1	0	1	3	3
213	18	43331509	43354113	22604	1	0	1	5	1
214	18	43366575	43387347	20772	2	0	2	2	2
215	18	43436181	43490874	54693	1	0	1	6	3
216	18	43497817	43524058	26241	2	0	2	3	3
217	18	43743063	43768874	25811	2	1	1	3	1
218	18	43799587	43968229	168642	18	1	31	17	6
219	18	43974750	43992014	17264	1	0	1	0	0
220	18	44203785	44246560	42775	12	12	0	3	3
221	18	44253085	44263268	10183	1	1	0	4	1
222	18	44271503	44288316	16813	1	1	0	4	2
223	18	44366215	44396872	30657	17	17	0	2	2
224	18	52101032	52176224	75192	9	4	5	4	3
225	18	57303991	57366216	62225	10	0	15	0	0
226	18	57691098	57710650	19552	7	7	0	2	2
227	18	58784890	58793133	8243	3	3	0	0	0
228	18	58805884	58850275	44391	4	5	0	2	2
229	18	58852472	58869555	17083	1	0	1	0	0
230	19	9711001	9723916	12915	1	1	0	0	0
231	19	22218031	22230939	12908	3	3	0	1	1
232	19	22308497	22324887	16390	1	1	0	1	1
233	19	22405293	22418508	13215	7	7	0	0	0
234	19	22440119	22505098	64979	7	7	0	0	0
235	19	22840008	22858355	18347	7	7	0	0	0
236	19	22889981	23016866	126885	8	8	0	1	1
237	19	23108981	23148128	39147	9	9	0	0	0
238	19	23239124	23267756	28632	9	9	0	0	0
239	19	24465564	24477427	11863	1	0	1	0	0
240	19	55900167	55924662	24495	2	2	0	1	1
241	20	56255024	56299307	44283	12	12	0	2	2

242	20	57148407	57177686	29279	2	2	0	3	3
243	21	3002898	3029595	26697	10	0	10	0	0
244	21	30165320	30175764	10444	4	0	4	0	0
245	21	30191025	30318483	127458	13	1	20	3	3
246	21	30342946	30353280	10334	3	0	3	1	1
247	21	31086051	31157768	71717	6	2	4	3	3
248	21	31239283	31283324	44041	3	2	1	1	1
249	21	31554665	31604430	49765	9	1	8	4	4
250	21	31720773	31728999	8226	1	1	0	2	1
251	21	31949078	31977244	28166	1	1	0	3	3
252	21	32299229	32347238	48009	3	1	2	2	2
253	21	33272908	33293267	20359	10	0	10	3	3
254	21	40754346	40769394	15048	1	0	1	1	1
255	21	43821051	43837413	16362	5	2	3	1	1
256	21	43858119	43894969	36850	5	1	4	3	2
257	21	49798030	49821831	23801	6	6	0	0	0
258	22	56695076	56734245	39169	8	0	8	0	0
259	22	64380529	64389499	8970	1	0	1	0	0
260	23	18169879	18210940	41061	7	1	6	1	1
261	23	37344596	37352850	8254	1	1	0	2	1
262	24	3001041	3017534	16493	1	0	1	0	0
263	24	13222761	13239178	16417	1	1	0	0	0
264	24	22230078	22379453	149375	13	8	9	6	3
265	24	48123012	48140840	17828	1	1	0	0	0
266	25	3001041	3046488	45447	9	0	9	1	1
267	25	22702599	22742936	40337	1	1	0	0	0
268	25	22805112	22868921	63809	7	0	12	1	1
269	25	48056062	48113154	57092	13	1	12	3	3
270	25	53005035	53015342	10307	7	0	7	4	2
271	25	53119029	53135059	16030	2	2	0	1	1
272	25	53157213	53196829	39616	6	3	3	2	2
273	25	53266470	53288387	21917	1	1	0	2	2
274	26	12445280	12474237	28957	1	0	1	1	1
275	26	20028228	20064894	36666	1	1	0	2	1
276	26	21956766	21966940	10174	1	1	0	1	1
277	26	21969100	21978682	9582	1	0	1	0	0
278	26	21984899	21995083	10184	6	6	0	0	0
279	26	28067007	28466000	398993	12	17	9	9	8
280	26	28479061	28822424	343363	10	13	14	9	8
281	26	28832700	28849656	16956	2	2	0	0	0
282	26	28857934	28984356	126422	6	4	5	2	2
283	26	28994395	29027572	33177	3	2	1	1	1
284	26	29031916	29091517	59601	5	3	2	1	1
285	26	29148411	29282576	134165	6	4	6	3	3
286	26	29301987	29314460	12473	1	1	0	0	0
287	26	29319685	29338395	18710	2	2	0	0	0
288	26	29355078	29377975	22897	1	1	0	0	0
289	26	29452147	29486818	34671	1	1	0	0	0
290	26	29516268	29532788	16520	1	1	0	2	2

291	26	29540905	29616741	75836	5	1	4	0	0
292	26	29633536	29642853	9317	1	1	0	0	0
293	26	29657459	29693290	35831	1	1	0	2	2
294	26	29707812	29726810	18998	1	1	0	0	0
295	26	29789023	29825103	36080	3	0	3	0	0
296	26	29845689	29854218	8529	1	1	0	0	0
297	26	29895733	29914689	18956	2	2	0	2	2
298	26	30374046	30603765	229719	8	9	6	5	5
299	26	30606837	30627001	20164	2	1	1	1	1
300	26	30676363	30687525	11162	1	1	0	1	1
301	26	31895098	31981553	86455	14	15	2	3	2
302	26	34295018	34477549	182531	14	18	2	1	1
303	27	8939072	8958399	19327	2	2	0	1	1
304	27	8993491	9003754	10263	1	1	0	1	1
305	27	9032592	9046764	14172	1	1	0	6	2
306	27	16141865	16207653	65788	9	3	6	7	7
307	27	28699444	28708618	9174	2	0	2	0	0
308	27	28746577	28759945	13368	7	7	0	0	0
309	27	28915510	28926842	11332	6	6	0	0	0
310	27	38326522	38379340	52818	7	0	7	1	1
311	27	38398067	38409452	11385	3	0	3	0	0
312	27	38438606	38449192	10586	1	0	1	0	0
313	27	38460065	38475859	15794	3	0	3	0	0
314	27	40740022	40752615	12593	1	0	1	0	0
315	28	16085013	16109951	24938	4	0	4	1	1
316	28	35223069	35268034	44965	10	3	8	3	1
317	28	35283039	35292247	9208	1	1	0	2	1
318	29	44768817	44783743	14926	3	0	3	1	1
319	29	44785954	44822901	36947	1	0	1	1	1
320	30	40469105	40487810	18705	2	2	0	2	2
321	30	40787873	40798370	10497	1	1	0	1	1
322	30	40813018	40825747	12729	5	5	0	4	2
323	31	33437272	33475555	38283	5	5	0	2	2
324	31	40623054	40657249	34195	8	5	3	2	2
325	32	41389081	41441749	52668	6	6	0	0	0
326	32	41451134	41459581	8447	1	1	0	0	0
327	32	41598347	41658027	59680	5	5	0	1	1
328	33	5285295	5296393	11098	7	0	7	0	0
329	33	8122844	8130976	8132	1	1	0	0	0
330	34	30586558	30594847	8289	2	2	0	0	0
331	34	32856387	32864649	8262	1	1	0	0	0
332	34	45099216	45109344	10128	2	0	2	0	0
333	35	16540000	16554732	14732	1	1	0	0	0
334	37	3640260	3666648	26388	3	0	3	0	0
335	38	24089004	24116103	27099	5	5	0	2	2
336	38	26215871	26251030	35159	7	6	1	8	4
337	Un	2623285	2651096	27811	7	4	3	0	0
338	Un	2814951	2851957	37006	1	1	0	0	0
339	Un	2983588	3003579	19991	1	1	0	0	0

340	Un	3015164	3062154	46990	1	1	0	0	0
341	Un	3351488	3421545	70057	3	2	1	0	0
342	Un	3809712	3835964	26252	2	1	1	0	0
343	Un	3884514	3903814	19300	2	1	1	0	0
344	Un	4020682	4045312	24630	1	0	1	0	0
345	Un	4311111	4330856	19745	2	1	1	0	0
346	Un	4362601	4383041	20440	2	1	1	0	0
347	Un	5423140	5463013	39873	2	1	1	0	0
348	Un	5861166	5889856	28690	1	0	1	0	0
349	Un	6990615	6999475	8860	4	4	0	0	0
350	Un	7061244	7083699	22455	1	0	1	0	0
351	Un	7253373	7287306	33933	2	1	1	0	0
352	Un	8779774	8799891	20117	6	6	0	0	0
353	Un	8865924	8904099	38175	6	6	0	1	1
354	Un	8959918	8990625	30707	5	5	0	2	2
355	Un	8996877	9006617	9740	2	2	0	2	1
356	Un	9010654	9023103	12449	4	4	0	2	1
357	Un	9027634	9094047	66413	6	6	0	2	2
358	Un	9109251	9123197	13946	5	5	0	0	0
359	Un	9143760	9183205	39445	6	7	0	0	0
360	Un	9191482	9310964	119482	6	16	0	0	0
361	Un	9327911	9365923	38012	6	8	0	0	0
362	Un	9367810	9483777	115967	7	9	0	1	1
363	Un	9486125	9494383	8258	6	6	0	0	0
364	Un	9496383	9567289	70906	5	6	0	1	1
365	Un	9588039	9600370	12331	6	6	0	1	1
366	Un	9952731	9970431	17700	1	0	1	0	0
367	Un	10134838	10157730	22892	1	0	1	0	0
368	Un	10652265	10679355	27090	2	1	1	0	0
369	Un	12315729	12407491	91762	2	2	0	0	0
370	Un	12438381	12474626	36245	1	1	0	0	0
371	Un	12634561	12694728	60167	2	1	1	0	0
372	Un	12728514	12757794	29280	2	1	1	0	0
373	Un	13499203	13531673	32470	2	1	1	0	0
374	Un	13696813	13722767	25954	2	1	1	0	0
375	Un	14879034	14891034	12000	3	3	0	0	0
376	Un	16561551	16581141	19590	1	0	1	0	0
377	Un	18075658	18086818	11160	3	3	0	0	0
378	Un	18339932	18361396	21464	1	0	1	3	1
379	Un	19265758	19276758	11000	1	0	1	0	0
380	Un	19341594	19359434	17840	2	1	1	0	0
381	Un	19422075	19437440	15365	2	1	1	0	0
382	Un	20000391	20022616	22225	2	1	1	0	0
383	Un	20253170	20276050	22880	1	1	0	0	0
384	Un	20748993	20775248	26255	2	1	1	0	0
385	Un	21317112	21366993	49881	2	1	1	0	0
386	Un	22871683	22897163	25480	6	6	0	0	0
387	Un	23573542	23603017	29475	2	1	1	0	0
388	Un	23611388	23664332	52944	3	2	1	0	0

389	Un	23784116	23807726	23610	2	1	1	0	0
390	Un	23944495	23961570	17075	1	1	0	0	0
391	Un	24032758	24053083	20325	1	1	0	0	0
392	Un	24234909	24246674	11765	1	0	1	0	0
393	Un	24331065	24360208	29143	10	0	10	0	0
394	Un	24361188	24375417	14229	7	0	7	0	0
395	Un	24845508	24865793	20285	1	1	0	0	0
396	Un	25021978	25050246	28268	1	1	0	0	0
397	Un	25054877	25074000	19123	10	10	0	0	0
398	Un	25159423	25198743	39320	1	1	0	0	0
399	Un	25451000	25486697	35697	3	2	1	0	0
400	Un	26354401	26376840	22439	2	0	2	0	0
401	Un	26720070	26730241	10171	10	10	0	0	0
402	Un	27517311	27586152	68841	1	1	0	0	0
403	Un	27600942	27672712	71770	1	1	0	0	0
404	Un	27695633	27714652	19019	1	1	0	0	0
405	Un	28917206	28929776	12570	2	2	0	0	0
406	Un	29009817	29045091	35274	11	11	0	0	0
407	Un	29072064	29090726	18662	8	8	0	0	0
408	Un	29109184	29119481	10297	10	10	0	0	0
409	Un	29122193	29153266	31073	11	11	0	0	0
410	Un	29206765	29279253	72488	17	19	6	1	1
411	Un	29280683	29301597	20914	10	10	0	0	0
412	Un	29302897	29315186	12289	11	11	0	0	0
413	Un	29322033	29332298	10265	9	8	1	0	0
414	Un	29333766	29342157	8391	1	1	0	0	0
415	Un	29357830	29368113	10283	3	3	0	0	0
416	Un	29372057	29382324	10267	9	9	0	0	0
417	Un	29563025	29583910	20885	1	1	0	0	0
418	Un	29842423	29858521	16098	1	1	0	0	0
419	Un	29859833	29882153	22320	2	1	1	0	0
420	Un	30224934	30235210	10276	1	1	0	0	0
421	Un	30381365	30414105	32740	2	1	1	0	0
422	Un	30601580	30618880	17300	4	0	4	0	0
423	Un	30622926	30647721	24795	1	0	1	0	0
424	Un	31038328	31050834	12506	1	0	1	0	0
425	Un	31223055	31262492	39437	2	1	1	0	0
426	Un	31458270	31488590	30320	1	0	1	0	0
427	Un	31553665	31568059	14394	3	0	3	0	0
428	Un	31578498	31588175	9677	1	0	1	0	0
429	Un	31636032	31648239	12207	2	0	2	0	0
430	Un	31650245	31667199	16954	1	0	1	0	0
431	Un	31736651	31745356	8705	4	0	4	0	0
432	Un	31966360	31985080	18720	9	5	4	0	0
433	Un	31988958	32005345	16387	12	6	6	0	0
434	Un	32021900	32045536	23636	11	3	8	0	0
435	Un	32655307	32670493	15186	6	6	0	0	0
436	Un	32855425	32869345	13920	2	1	1	0	0
437	Un	33225486	33241707	16221	2	1	1	0	0

438	Un	34642856	34704213	61357	2	1	1	0	0
439	Un	34810071	34820638	10567	7	0	7	1	1
440	Un	34856916	34865326	8410	7	0	7	0	0
441	Un	35171506	35181658	10152	6	0	6	0	0
442	Un	35268525	35348388	79863	9	0	10	3	2
443	Un	35561289	35569519	8230	4	0	4	0	0
444	Un	35581139	35593334	12195	4	0	4	1	1
445	Un	36650899	36677727	26828	5	5	0	0	0
446	Un	36737888	36757749	19861	1	0	1	0	0
447	Un	37022505	37036870	14365	11	3	8	0	0
448	Un	37062671	37085179	22508	14	2	12	0	0
449	Un	37104896	37113019	8123	7	0	7	0	0
450	Un	37114616	37124762	10146	8	0	8	0	0
451	Un	37150696	37197494	46798	8	0	8	1	1
452	Un	37537959	37551158	13199	1	0	1	0	0
453	Un	37701081	37716606	15525	8	8	0	0	0
454	Un	37810372	37836632	26260	2	1	1	0	0
455	Un	37917977	37935677	17700	1	1	0	0	0
456	Un	38257362	38273904	16542	7	0	7	0	0
457	Un	38276225	38284362	8137	7	0	7	0	0
458	Un	38317134	38325224	8090	8	0	8	0	0
459	Un	38914868	38938535	23667	4	0	4	0	0
460	Un	38939679	38959412	19733	1	0	1	0	0
461	Un	39116876	39137313	20437	5	0	5	0	0
462	Un	39832115	39860925	28810	6	0	6	0	0
463	Un	39966816	39982292	15476	4	1	3	0	0
464	Un	40269674	40282154	12480	4	0	4	0	0
465	Un	40283184	40295798	12614	4	0	4	0	0
466	Un	40331816	40341956	10140	5	0	5	1	1
467	Un	40557536	40577076	19540	6	0	6	0	0
468	Un	40603322	40623364	20042	4	0	4	0	0
469	Un	40761261	40769662	8401	2	2	0	0	0
470	Un	40884191	40892742	8551	2	1	1	0	0
471	Un	40962211	40976422	14211	2	1	1	0	0
472	Un	41290958	41313412	22454	3	1	2	0	0
473	Un	41319092	41328662	9570	1	1	0	0	0
474	Un	41407540	41415927	8387	12	0	12	1	1
475	Un	41685601	41694167	8566	2	1	1	1	1
476	Un	41711292	41725512	14220	2	1	1	1	1
477	Un	41807150	41819583	12433	6	0	6	0	0
478	Un	41832481	41840772	8291	7	0	7	0	0
479	Un	41853838	41864424	10586	7	0	7	0	0
480	Un	41866269	41884839	18570	9	0	9	0	0
481	Un	41888927	41904121	15194	11	0	11	0	0
482	Un	42066381	42117263	50882	14	22	0	1	1
483	Un	42141919	42163664	21745	1	0	1	0	0
484	Un	42306820	42317377	10557	5	0	5	0	0
485	Un	42339861	42350582	10721	5	0	5	0	0
486	Un	42468731	42479892	11161	4	0	4	0	0

487	Un	42519322	42560647	41325	7	0	7	0	0
488	Un	42952609	42987844	35235	2	1	1	0	0
489	Un	43479465	43488043	8578	11	11	0	0	0
490	Un	43505407	43522268	16861	1	0	1	0	0
491	Un	43642738	43659550	16812	7	0	7	1	1
492	Un	43870979	43881399	10420	7	0	7	1	1
493	Un	43910869	43921129	10260	8	0	8	0	0
494	Un	43923337	43966552	43215	6	0	7	3	3
495	Un	43979455	44002616	23161	4	0	4	0	0
496	Un	44134785	44151750	16965	7	0	7	2	1
497	Un	44157978	44166226	8248	6	0	6	0	0
498	Un	44167118	44179590	12472	6	0	6	2	1
499	Un	44432542	44453019	20477	1	0	1	0	0
500	Un	44499990	44512757	12767	4	0	4	0	0
501	Un	44668084	44677372	9288	1	1	0	1	1
502	Un	44757277	44765678	8401	3	0	3	2	1
503	Un	44887789	44896035	8246	1	0	1	0	0
504	Un	44903139	44913437	10298	1	0	1	0	0
505	Un	45080608	45091068	10460	4	0	4	0	0
506	Un	45574959	45587555	12596	11	4	7	0	0
507	Un	45618592	45631349	12757	10	3	7	1	1
508	Un	45633695	45642251	8556	7	2	5	0	0
509	Un	45710106	45720542	10436	4	0	4	0	0
510	Un	45721422	45734609	13187	4	0	4	0	0
511	Un	45917945	45954187	36242	2	2	0	0	0
512	Un	46144702	46163387	18685	4	4	0	0	0
513	Un	46186459	46211992	25533	6	0	6	0	0
514	Un	46274204	46291133	16929	5	0	5	0	0
515	Un	46297536	46307981	10445	3	0	3	2	1
516	Un	46357975	46396559	38584	9	0	12	0	0
517	Un	46452266	46481517	29251	4	0	4	5	2
518	Un	46693804	46730915	37111	4	1	3	2	2
519	Un	46913211	46921511	8300	5	0	5	0	0
520	Un	47113999	47134721	20722	1	0	1	0	0
521	Un	47241617	47250015	8398	3	3	0	0	0
522	Un	47256957	47270747	13790	1	0	1	0	0
523	Un	47333709	47348237	14528	6	6	0	1	1
524	Un	47423161	47457974	34813	2	0	2	3	2
525	Un	47659663	47672458	12795	1	1	0	0	0
526	Un	47772042	47788900	16858	9	0	9	0	0
527	Un	47791760	47799896	8136	9	0	9	0	0
528	Un	47897332	47909789	12457	7	0	7	0	0
529	Un	47944455	47961452	16997	7	0	7	0	0
530	Un	48141933	48164575	22642	10	10	0	0	0
531	Un	48168947	48177323	8376	5	1	4	3	1
532	Un	48227503	48244024	16521	7	2	5	1	1
533	Un	48305375	48315943	10568	4	3	1	1	1
534	Un	48456321	48466609	10288	5	0	5	0	0
535	Un	48851246	48868790	17544	5	2	3	0	0

536	Un	49069915	49081816	11901	1	0	1	0	0
537	Un	49693572	49723548	29976	13	0	13	1	1
538	Un	49830717	49841170	10453	5	5	0	0	0
539	Un	50099812	50120681	20869	5	0	5	3	1
540	Un	50338866	50356267	17401	5	1	4	0	0
541	Un	50432247	50450624	18377	15	15	0	2	1
542	Un	50579679	50608550	28871	4	3	1	1	1
543	Un	50641882	50658289	16407	6	0	6	1	1
544	Un	50893927	50904205	10278	1	0	1	0	0
545	Un	51033127	51053711	20584	4	1	3	1	1
546	Un	51387691	51397998	10307	5	0	5	0	0
547	Un	51488033	51504686	16653	9	0	9	1	1
548	Un	51545016	51553287	8271	8	0	8	0	0
549	Un	51555025	51571569	16544	6	0	6	0	0
550	Un	51794845	51811820	16975	1	0	1	0	0
551	Un	51820221	51839255	19034	1	0	1	1	1
552	Un	52355593	52382999	27406	1	0	1	0	0
553	Un	52438685	52453452	14767	9	5	4	0	0
554	Un	52556997	52569722	12725	5	1	4	1	1
555	Un	52608889	52617017	8128	3	0	3	0	0
556	Un	52973534	52991549	18015	1	0	1	0	0
557	Un	53071432	53091562	20130	1	1	0	0	0
558	Un	53319883	53330453	10570	6	6	0	0	0
559	Un	53365127	53380647	15520	2	0	2	0	0
560	Un	53546381	53572317	25936	3	0	3	0	0
561	Un	53624641	53645563	20922	12	0	12	1	1
562	Un	53653650	53678035	24385	1	0	1	0	0
563	Un	53741538	53759779	18241	6	6	0	1	1
564	Un	53818101	53826506	8405	1	0	1	0	0
565	Un	54138421	54156834	18413	4	1	3	1	1
566	Un	54224966	54241678	16712	15	15	0	1	1
567	Un	54593724	54601968	8244	5	0	5	0	0
568	Un	55043349	55051445	8096	4	0	4	1	1
569	Un	55073507	55091906	18399	14	6	8	1	1
570	Un	55181823	55198316	16493	4	4	0	2	1
571	Un	55277953	55290096	12143	1	1	0	0	0
572	Un	55356276	55365278	9002	5	0	5	0	0
573	Un	55450228	55458636	8408	5	0	5	0	0
574	Un	55540127	55550293	10166	5	2	3	1	1
575	Un	56031391	56041557	10166	7	5	2	1	1
576	Un	56208586	56216701	8115	10	6	4	0	0
577	Un	56264724	56279218	14494	7	0	7	1	1
578	Un	56783350	56791742	8392	3	3	0	1	1
579	Un	56843900	56852619	8719	3	0	3	0	0
580	Un	56867954	56880568	12614	5	0	5	0	0
581	Un	56974692	56985001	10309	5	2	3	2	2
582	Un	57001651	57016031	14380	11	6	5	0	0
583	Un	57414010	57434291	20281	5	5	0	0	0
584	Un	57436936	57456810	19874	12	1	11	0	0

585	Un	57489256	57501571	12315	6	2	4	0	0
586	Un	57625880	57646170	20290	9	0	9	1	1
587	Un	57750865	57763300	12435	9	0	9	1	1
588	Un	57973129	57981671	8542	1	0	1	0	0
589	Un	58185216	58195800	10584	6	6	0	0	0
590	Un	58237313	58250756	13443	3	0	3	0	0
591	Un	58253117	58268199	15082	5	0	5	0	0
592	Un	58331093	58350095	19002	9	9	0	0	0
593	Un	58396198	58407545	11347	7	7	0	0	0
594	Un	58691267	58709826	18559	11	1	10	0	0
595	Un	59136711	59145565	8854	3	0	3	0	0
596	Un	59344737	59361249	16512	6	2	4	0	0
597	Un	59587745	59600383	12638	7	0	7	1	1
598	Un	59630258	59648968	18710	10	3	7	5	5
599	Un	59717812	59728111	10299	11	11	0	0	0
600	Un	59846790	59865497	18707	8	8	0	0	0
601	Un	59990654	60009372	18718	6	0	6	0	0
602	Un	60058055	60074472	16417	1	0	1	1	1
603	Un	60472088	60480364	8276	4	1	3	0	0
604	Un	60728903	60737473	8570	4	0	4	0	0
605	Un	61174356	61184776	10420	7	0	7	0	0
606	Un	61302008	61314190	12182	9	3	6	1	1
607	Un	61547947	61558349	10402	3	2	1	0	0
608	Un	61883042	61896652	13610	2	1	1	0	0
609	Un	61948729	61960887	12158	3	3	0	1	1
610	Un	62260582	62275254	14672	2	0	2	0	0
611	Un	62279434	62296000	16566	8	8	0	0	0
612	Un	62480415	62496826	16411	4	1	3	1	1
613	Un	62701703	62714459	12756	8	4	4	0	0
614	Un	63038402	63048687	10285	1	1	0	0	0
615	Un	63155585	63164106	8521	1	0	1	0	0
616	Un	63193990	63208947	14957	4	0	4	0	0
617	Un	63412512	63424666	12154	4	0	4	2	1
618	Un	63484571	63499027	14456	3	1	2	2	2
619	Un	63604841	63613135	8294	12	0	12	0	0
620	Un	63727518	63737703	10185	13	6	7	0	0
621	Un	64074242	64082473	8231	4	4	0	0	0
622	Un	64742224	64750448	8224	6	6	0	0	0
623	Un	64882089	64894895	12806	3	1	2	0	0
624	Un	65320010	65328272	8262	10	10	0	0	0
625	Un	65334358	65342494	8136	5	0	5	0	0
626	Un	65372966	65381061	8095	12	1	11	0	0
627	Un	65651065	65659318	8253	6	6	0	0	0
628	Un	65996349	66005377	9028	11	0	11	0	0
629	Un	66504002	66514319	10317	6	0	6	0	0
630	Un	66667300	66679890	12590	1	0	1	0	0
631	Un	66682097	66694278	12181	7	0	7	1	1
632	Un	66763578	66774720	11142	9	0	9	0	0
633	Un	66876971	66885102	8131	5	0	5	1	1

634	Un	66919570	66931899	12329	3	2	1	0	0
635	Un	67258893	67269165	10272	11	11	0	0	0
636	Un	67391570	67404176	12606	2	1	1	1	1
637	Un	67519467	67527855	8388	10	0	10	1	1
638	Un	67913985	67923882	9897	7	0	7	0	0
639	Un	68072195	68082471	10276	8	0	8	0	0
640	Un	68116004	68124233	8229	6	0	6	0	0
641	Un	68374978	68385379	10401	7	0	7	0	0
642	Un	68402070	68412348	10278	5	5	0	0	0
643	Un	68991515	69001627	10112	1	1	0	1	1
644	Un	69378378	69388777	10399	2	0	2	0	0
645	Un	69549176	69560469	11293	5	0	5	0	0
646	Un	69785219	69795394	10175	9	3	6	0	0
647	Un	69976752	69986943	10191	1	0	1	1	1
648	Un	70378156	70388568	10412	3	0	3	0	0
649	Un	70403970	70412204	8234	6	2	4	1	1
650	Un	70476585	70486763	10178	4	1	3	0	0
651	Un	70899231	70909413	10182	13	0	13	4	1
652	Un	71214609	71224936	10327	6	0	6	1	1
653	Un	71250143	71260441	10298	13	6	7	0	0
654	Un	71273949	71282607	8658	3	3	0	0	0
655	Un	71402248	71412408	10160	6	3	3	2	2
656	Un	72171010	72179421	8411	3	0	3	0	0
657	Un	73144566	73153398	8832	9	0	9	0	0
658	Un	73177312	73185459	8147	10	3	7	0	0
659	Un	73287392	73296092	8700	4	3	1	0	0
660	Un	73374676	73383095	8419	13	1	12	0	0
661	Un	73515157	73523736	8579	8	1	7	0	0
662	Un	73831100	73839237	8137	13	6	7	0	0
663	Un	73873324	73881587	8263	11	3	8	0	0
664	Un	74201185	74209592	8407	7	0	7	0	0
665	Un	74460976	74469136	8160	4	1	3	1	1
666	X	2852960	2879932	26972	11	6	5	0	0
667	X	22327024	22355000	27976	5	4	1	0	0
668	X	32238083	32255890	17807	2	0	2	1	1
669	X	48004038	48023955	19917	10	3	7	0	0
670	X	52593853	52650539	56686	14	8	6	0	0
671	X	91518010	91538124	20114	3	3	0	0	0
672	X	108624949	108661052	36103	5	2	3	0	0
673	X	108859824	108878232	18408	2	1	1	0	0
674	X	109203969	109234237	30268	3	0	3	1	1
675	X	109284995	109309530	24535	2	1	1	0	0
676	X	120865995	120888659	22664	3	0	3	0	0
677	X	123950544	124153951	203407	13	0	23	5	4
678	X	125731811	125755307	23496	9	3	6	1	1

**Supplementary Table 5. Genes located in CNV regions.**

<b>Ensembl Gene ID</b>	<b>Chr</b>	<b>Transcript Start</b>	<b>Transcript End</b>	<b>Entrez ID</b>	<b>Gene Symbol</b>
ENSCAFG00000000022	1	7424055	7838197	476164	ZNF407
ENSCAFG00000001389	1	78091851	78145290	607728	SLC28A3
ENSCAFG000000024118	1	106981248	106989399	NA	NA
ENSCAFG000000024114	1	107075882	107127578	NA	NA
ENSCAFG000000024107	1	107193592	107194858	NA	NA
ENSCAFG000000013623	1	107225498	107315429	NA	NA
ENSCAFG000000024098	1	107303368	107313680	NA	NA
ENSCAFG000000024097	1	107339760	107340508	NA	NA
ENSCAFG000000024094	1	107421528	107426911	NA	NA
ENSCAFG000000024014	1	108154078	108161943	NA	NA
ENSCAFG000000014981	1	108884744	108889505	480822	KLK15
ENSCAFG000000002914	1	108891030	108910210	403942	KLK1
ENSCAFG000000004993	1	114661595	114709228	484473	CEACAM21
ENSCAFG000000007550	2	7250074	7293906	NA	NA
ENSCAFG000000014758	2	7311149	7312021	607134	LOC607134
ENSCAFG000000007545	2	7490803	7493684	NA	NA
ENSCAFG000000023601	2	7525767	7567866	NA	NA
ENSCAFG000000023536	2	7587686	7602666	NA	NA
ENSCAFG000000023478	2	7663111	7689692	477962	LOC477962
ENSCAFG000000023337	2	7738783	7751246	607487	LOC607487
ENSCAFG000000003862	2	7874347	7947117	607539	LOC607539
ENSCAFG000000023255	2	8126412	8128552	NA	NA
ENSCAFG000000024891	2	8142526	8149140	NA	NA
ENSCAFG000000024834	2	8239904	8278556	607597	LOC607597
ENSCAFG000000024687	2	8592427	8651505	NA	NA
ENSCAFG000000003859	2	8835308	8898676	487079	MKX
ENSCAFG000000014021	2	9187711	9220542	NA	NA
ENSCAFG000000014858	2	9360327	9373127	608294	LOC608294
ENSCAFG000000023488	2	9476137	9478277	NA	NA
ENSCAFG000000023375	2	9507777	9514409	610159	LOC610159
ENSCAFG000000010683	2	9571572	9574365	NA	NA
ENSCAFG000000023313	2	9595253	9656097	607949	LOC607949
ENSCAFG000000004114	2	16653186	16655290	NA	NA
ENSCAFG000000003936	2	20396431	20478917	NA	NA
ENSCAFG000000023202	2	21075524	21205012	607089	LOC607089
ENSCAFG000000004747	2	26024092	26039131	NA	NA
ENSCAFG000000023441	2	26045830	26061786	NA	NA
ENSCAFG000000023349	2	26073819	26091243	478001	PHYH
ENSCAFG000000023432	2	38760144	38762555	487164	PCDHA1
ENSCAFG000000023373	2	38767492	38769978	607185	PCDHA3
ENSCAFG000000023326	2	38774766	38777243	608515	LOC608515
ENSCAFG000000023812	2	39101168	39104797	487178	PCDHB15
ENSCAFG000000014828	2	60321510	60323214	NA	NA
ENSCAFG000000000553	2	60379043	60380313	NA	NA
ENSCAFG000000023814	2	86798575	86920414	607956	LOC607956

ENSCAFG00000009539	3	34166579	34167996	NA	NA
ENSCAFG00000023611	3	34176390	34177594	NA	Q70ZA2_CANFA
ENSCAFG00000013461	3	34238597	34239532	NA	NA
ENSCAFG00000024039	3	34283244	34284200	NA	NA
ENSCAFG00000023545	3	34357980	34359768	NA	NA
ENSCAFG00000023442	3	34378834	34379958	488680	LOC488680
ENSCAFG00000017962	4	61438724	61446723	NA	NA
ENSCAFG00000023257	4	61451695	61452807	NA	NA
ENSCAFG00000006337	5	3020591	3022788	491534	cOR9R4
ENSCAFG00000014930	5	3053361	3055530	NA	NA
ENSCAFG00000014990	6	12729482	12762606	NA	NA
ENSCAFG00000014942	6	12784233	12821910	489851	LOC489851
ENSCAFG00000014877	6	12843366	12875841	479740	LOC479740
ENSCAFG00000023447	6	15071860	15075449	609183	LOC609183
ENSCAFG00000014315	6	19816721	19841725	NA	Q9TS65_CANFA
ENSCAFG00000014312	6	19868550	19893993	607096	ITGAD
ENSCAFG00000019302	6	40885513	40887246	490037	cOR2C1
ENSCAFG00000019731	6	43556461	43600676	NA	NA
ENSCAFG00000024348	6	43706215	43789689	611681	LOC611681
ENSCAFG00000024344	6	43706782	43715498	611675	LOC611675
ENSCAFG00000019741	6	43768891	43778856	403552	PGC
ENSCAFG00000019743	6	43790646	43801777	611691	LOC611691
ENSCAFG00000023319	6	46136850	46141974	NA	NA
ENSCAFG00000019972	6	50072550	50098045	490136	RNPC3
ENSCAFG00000024623	8	5271087	5271547	NA	NA
ENSCAFG00000014977	8	5293209	5293735	491543	LOC491543
ENSCAFG00000011079	8	5309562	5309726	NA	NA
ENSCAFG00000014973	8	5341015	5386570	607674	LOC607674
ENSCAFG00000024424	8	5357087	5357550	NA	NA
ENSCAFG00000024337	8	5400103	5400561	NA	NA
ENSCAFG00000024141	8	5403216	5403676	NA	NA
ENSCAFG00000024136	8	5408106	5408620	607750	LOC607750
ENSCAFG00000015134	8	5414400	5414904	NA	NA
ENSCAFG00000004195	8	47197325	47220741	611727	LOC611727
ENSCAFG00000023292	8	76451203	76451655	607021	LOC607021
ENSCAFG00000023225	8	76580167	76580977	607113	LOC607113
ENSCAFG00000025035	8	76604486	76604957	NA	NA
ENSCAFG00000025034	8	76624152	76624605	607145	LOC607145
ENSCAFG00000025032	8	76640074	76640527	607155	LOC607155
ENSCAFG00000024842	8	76729000	76729374	490891	LOC490891
ENSCAFG00000024841	8	76735925	76736396	NA	NA
ENSCAFG00000024827	8	76814496	76815137	NA	NA
ENSCAFG00000024798	8	76822680	76823133	607270	LOC607270
ENSCAFG00000018473	8	76940652	76941155	490893	LOC490893
ENSCAFG00000024757	8	77012619	77013055	490894	LOC490894
ENSCAFG00000024755	8	77036818	77037332	607491	LOC607491
ENSCAFG00000024752	8	77042302	77042597	607304	LOC607304
ENSCAFG00000024750	8	77052618	77053112	607479	LOC607479
ENSCAFG00000024699	8	77086537	77086830	NA	NA

ENSCAFG00000018486	8	77093333	77093784	NA	NA
ENSCAFG00000024423	8	77196970	77197486	NA	NA
ENSCAFG00000024285	8	77208511	77209191	607553	LOC607553
ENSCAFG00000023944	8	77227023	77227547	490895	LOC490895
ENSCAFG00000015160	9	12036372	12047341	480794	RDM1
ENSCAFG00000013406	9	13349476	13353820	480492	LYZL6
ENSCAFG00000015156	9	13360567	13361247	NA	NA
ENSCAFG00000013403	9	13369428	13403672	611161	LOC611161
ENSCAFG00000013764	9	13426017	13465347	490925	PLEKHM1
ENSCAFG00000024783	9	13477031	13479000	NA	NA
ENSCAFG00000015299	9	21012607	21012891	NA	NA
ENSCAFG00000016397	9	21079541	21164823	478225	LOC478225
ENSCAFG00000013742	9	21275131	21312511	611161	LOC611161
ENSCAFG00000002198	9	21342078	21346373	NA	NA
ENSCAFG00000013770	9	21503301	21511554	NA	ARHGAP27
ENSCAFG00000023561	9	24879369	24933507	NA	NA
ENSCAFG00000023560	9	24879717	24906230	NA	NA
ENSCAFG00000019325	9	50634647	50636140	491216	LOC491216
ENSCAFG00000023121	9	50643904	50645101	491217	DTMT
ENSCAFG00000000545	10	19088642	19090526	NA	NA
ENSCAFG00000023465	10	19145656	19148463	NA	NA
ENSCAFG00000000552	10	19509969	19511726	NA	NA
ENSCAFG00000001361	10	28978945	28980650	481248	APOBEC3H
ENSCAFG00000023589	10	28984892	28986270	NA	NA
ENSCAFG00000014293	11	14409283	14421305	NA	NA
ENSCAFG00000023723	11	43772595	43773260	NA	NA
ENSCAFG00000024020	11	43776356	43776919	NA	NA
ENSCAFG00000024016	11	43780013	43780576	474181	IFNA7
ENSCAFG00000001659	11	43792444	43793007	474181	IFNA7
ENSCAFG00000001661	11	43796086	43796649	474181	IFNA7
ENSCAFG00000024628	11	55478287	55479246	611974	LOC611974
ENSCAFG00000024933	13	43296087	43301204	482125	LOC482125
ENSCAFG00000025101	13	61818167	61839400	NA	NA
ENSCAFG00000014300	13	61866342	61872410	608737	LOC608737
ENSCAFG00000014306	13	61889001	61902940	608760	LOC608760
ENSCAFG00000025306	13	61933924	61947589	442984	UGT2B31
ENSCAFG00000001161	14	3626410	3730046	607251	LOC607251
ENSCAFG00000001762	14	14596580	14597209	NA	NA
ENSCAFG00000023700	14	25271496	25273004	NA	NA
ENSCAFG00000008936	15	65415838	65636715	NA	SPOCK3
ENSCAFG00000014734	16	3127044	3196069	NA	PKD1L1
ENSCAFG00000012249	16	4062172	4139745	610703	LOC610703
ENSCAFG00000003872	16	10242386	10245086	NA	NA
ENSCAFG00000007135	16	44323280	44342638	482899	FRG1
ENSCAFG00000008123	16	50403913	50587454	475637	ODZ3
ENSCAFG00000025286	16	57009414	57012362	607715	LOC607715
ENSCAFG00000014646	16	57043829	57045421	609287	LOC609287
ENSCAFG00000025123	16	57052988	57055900	NA	NA
ENSCAFG00000008552	16	61955983	61964521	NA	Q30KU7_CANFA

ENSCAFG00000024791	16	61969130	61970801	NA	Q30KU8_CANFA
ENSCAFG00000008548	16	62238331	62239923	611292	LOC611292
ENSCAFG00000024422	16	62422121	62424424	NA	NA
ENSCAFG00000024393	16	62455232	62457524	NA	NA
ENSCAFG00000005150	17	24414058	24439094	475705	GCKR
ENSCAFG00000023402	17	24442671	24448263	NA	NA
ENSCAFG00000023393	17	24538224	24547396	NA	NA
ENSCAFG00000023357	17	24560180	24563196	608765	LOC608765
ENSCAFG00000023355	17	24590651	24608714	NA	NA
ENSCAFG00000014496	17	24609166	24640801	608897	LOC608897
ENSCAFG00000024084	17	24647124	24647912	NA	NA
ENSCAFG00000005160	17	24649301	24667835	608308	LOC608308
ENSCAFG00000024027	17	24670387	24681479	608365	LOC608365
ENSCAFG00000023911	17	24737529	24749996	611140	LOC611140
ENSCAFG00000023878	17	24762266	24777008	607762	LOC607762
ENSCAFG00000023791	17	24779556	24790704	608365	LOC608365
ENSCAFG00000005180	17	24793005	24819517	608928	LOC608928
ENSCAFG00000007351	17	40750263	40751402	611902	LOC611902
ENSCAFG00000010063	17	59723038	59750507	610301	LOC610301
ENSCAFG00000010096	17	59753671	59772147	607923	HMGCS2
ENSCAFG00000014467	17	59801980	59811920	491520	LOC491520
ENSCAFG00000013829	17	59845302	59847426	NA	NA
ENSCAFG00000023328	17	59882102	59909414	610301	LOC610301
ENSCAFG00000023048	17	59914116	59914325	NA	NA
ENSCAFG00000010843	17	60460486	60485711	610301	LOC610301
ENSCAFG00000010847	17	60521825	60524005	NA	NA
ENSCAFG00000010851	17	60557243	60565677	475818	LOC475818
ENSCAFG00000003638	18	14371282	14396780	609288	LOC609288
ENSCAFG00000025072	18	21407754	21440010	NA	NA
ENSCAFG00000006480	18	28441098	28449822	475936	LOC475936
ENSCAFG00000006481	18	28451454	28484364	483397	IFITM2
ENSCAFG00000024177	18	40418587	40419525	483457	OR04E07
ENSCAFG00000014279	18	40452692	40453651	491481	LOC491481
ENSCAFG00000025357	18	40468669	40469731	609788	LOC609788
ENSCAFG00000008010	18	42338640	42340686	NA	NA
ENSCAFG00000008014	18	42360536	42361514	483510	cOR9G1
ENSCAFG00000008015	18	42391377	42393060	NA	NA
ENSCAFG00000025561	18	43341294	43342324	483566	LOC483566
ENSCAFG00000024081	18	43366349	43367272	NA	NA
ENSCAFG00000025517	18	43376165	43377128	NA	NA
ENSCAFG00000024077	18	43437674	43438606	NA	NA
ENSCAFG00000024073	18	43447646	43448578	NA	NA
ENSCAFG00000014894	18	43471567	43528567	483573	LOC483573
ENSCAFG00000008161	18	43502454	43503365	NA	NA
ENSCAFG00000025449	18	43511288	43512251	NA	NA
ENSCAFG00000025275	18	43758975	43760664	NA	NA
ENSCAFG00000025234	18	43809519	43811461	NA	NA
ENSCAFG00000024612	18	43828926	43829852	610904	LOC610904
ENSCAFG00000025139	18	43842411	43844776	NA	NA

ENSCAFG00000025068	18	43863499	43865360	610437	LOC610437
ENSCAFG00000025066	18	43869215	43873843	491529	LOC491529
ENSCAFG00000025027	18	43889221	43891796	483581	cOR4C30
ENSCAFG00000024604	18	44222592	44223491	483595	OR08D06
ENSCAFG00000008239	18	44237579	44239193	483596	LOC483596
ENSCAFG00000008240	18	44242417	44243536	NA	NA
ENSCAFG00000008241	18	44262008	44263593	NA	Q70ZB1_CANFA
ENSCAFG00000025236	18	44274736	44275687	483599	LOC483599
ENSCAFG00000008242	18	44281537	44283508	483600	cOR4C3
ENSCAFG00000024601	18	44374680	44375156	NA	Q70ZI8_CANFA
ENSCAFG00000024597	18	44391318	44392214	611068	LOC611068
ENSCAFG00000010745	18	52089556	52116658	483686	IGHMBP2
ENSCAFG00000010753	18	52116768	52130127	476000	MRPL21
ENSCAFG00000010757	18	52174268	52213762	403583	CPT1A
ENSCAFG00000015963	18	57562838	57700974	476062	FADS3
ENSCAFG00000025083	18	57688806	57700062	612278	LOC612278
ENSCAFG00000016467	18	58808406	58814946	476070	MAD2L1
ENSCAFG00000016471	18	58832797	58847993	NA	NA
ENSCAFG00000004179	19	22202568	22336032	483850	PRDM5
ENSCAFG00000024224	19	22933616	22939081	NA	NA
ENSCAFG00000005717	19	55776626	55835604	609277	LOC609277
ENSCAFG00000023356	20	56248351	56268013	611660	LOC611660
ENSCAFG00000018568	20	56287227	56322401	611665	EMR4
ENSCAFG00000018757	20	57153055	57154107	449024	FUT6
ENSCAFG00000023228	20	57156832	57160264	NA	NA
ENSCAFG00000023189	20	57172802	57176185	NA	NA
ENSCAFG00000025251	21	30249754	30252720	NA	NA
ENSCAFG00000025190	21	30290769	30292079	NA	NA
ENSCAFG00000025189	21	30298586	30301548	NA	NA
ENSCAFG00000015140	21	30352161	30353202	NA	NA
ENSCAFG00000024015	21	31086570	31087520	491623	cOR52A10
ENSCAFG00000024011	21	31104842	31105792	491622	cOR52A8
ENSCAFG00000024009	21	31143710	31144660	485246	cOR52A12
ENSCAFG00000006139	21	31267129	31268179	491511	LOC491511
ENSCAFG00000023989	21	31560787	31561725	485270	LOC485270
ENSCAFG00000023987	21	31574467	31575417	610513	LOC610513
ENSCAFG00000023985	21	31585229	31586167	610522	LOC610522
ENSCAFG00000024590	21	31598912	31599862	485271	LOC485271
ENSCAFG00000006220	21	31721780	31722804	NA	NA
ENSCAFG00000006283	21	31949944	31951459	485288	LOC485288
ENSCAFG00000006284	21	31961745	31963247	NA	NA
ENSCAFG00000006286	21	31974110	31975144	485290	LOC485290
ENSCAFG00000025519	21	32324973	32326706	NA	NA
ENSCAFG00000006343	21	32344570	32345229	485313	cOR56A9
ENSCAFG00000025001	21	33272501	33273643	NA	NA
ENSCAFG00000024404	21	33282351	33283301	485341	cOR2AG1
ENSCAFG00000024394	21	33291646	33292596	611042	LOC611042
ENSCAFG00000008504	21	40744607	40769697	612993	LOC612993
ENSCAFG00000009135	21	43752479	43857779	403585	SAA

ENSCAFG00000015205	21	43872042	43876389	476879	SAA2
ENSCAFG00000015206	21	43891271	43895484	480749	SAA1
ENSCAFG00000005464	23	17504061	18195478	485630	RBMS3
ENSCAFG00000007496	23	37340946	37380286	611021	LOC611021
ENSCAFG00000025463	24	22237376	22251822	NA	NA
ENSCAFG00000025454	24	22295964	22304851	609461	LOC609461
ENSCAFG00000025429	24	22343174	22346613	609481	LOC609481
ENSCAFG00000003970	25	3002110	3003377	NA	NA
ENSCAFG00000025297	25	22822949	22836613	477353	LOC477353
ENSCAFG00000024008	25	48056073	48057047	NA	NA
ENSCAFG00000011875	25	48074971	48075918	NA	NA
ENSCAFG00000015350	25	48104656	48183981	610352	LOC610352
ENSCAFG00000012596	25	53004888	53006388	NA	Q70ZB2_CANFA
ENSCAFG00000024416	25	53012149	53013627	608598	LOC608598
ENSCAFG00000025563	25	53131256	53132244	608334	LOC608334
ENSCAFG00000012616	25	53164254	53164880	NA	NA
ENSCAFG00000012617	25	53185197	53186918	486194	LOC486194
ENSCAFG00000025305	25	53266091	53267372	608434	LOC608434
ENSCAFG00000025303	25	53284780	53286687	NA	NA
ENSCAFG00000008764	26	12464071	12466989	NA	NA
ENSCAFG00000010566	26	20062821	20072109	486307	PIWIL3
ENSCAFG00000023361	26	21946103	21960466	NA	NA
ENSCAFG00000023285	26	28099819	28100265	612066	LOC612066
ENSCAFG00000023274	26	28138552	28139946	612037	LOC612037
ENSCAFG00000023190	26	28182366	28183166	612050	LOC612050
ENSCAFG00000023160	26	28204948	28205425	NA	NA
ENSCAFG00000023149	26	28269915	28270350	612097	LOC612097
ENSCAFG00000023148	26	28325976	28326406	NA	NA
ENSCAFG00000023146	26	28370239	28370778	612081	LOC612081
ENSCAFG00000023114	26	28454058	28455950	NA	NA
ENSCAFG00000023104	26	28526774	28527289	612106	LOC612106
ENSCAFG00000023082	26	28581810	28582832	NA	NA
ENSCAFG00000024721	26	28625746	28626209	612122	LOC612122
ENSCAFG00000024720	26	28648719	28649488	NA	NA
ENSCAFG00000024685	26	28722851	28723297	612135	LOC612135
ENSCAFG00000024649	26	28731434	28741605	NA	NA
ENSCAFG00000024580	26	28755210	28759724	NA	NA
ENSCAFG00000013527	26	28759227	28759622	NA	NA
ENSCAFG00000013526	26	28868782	28869078	NA	NA
ENSCAFG00000023957	26	28940141	28941401	491364	LOC491364
ENSCAFG00000023921	26	28995454	29057147	NA	NA
ENSCAFG00000023964	26	29217416	29217748	NA	NA
ENSCAFG00000023920	26	29240126	29240575	491494	LOC491494
ENSCAFG00000014294	26	29254731	29254982	NA	NA
ENSCAFG00000015393	26	29516688	29517288	486384	LOC486384
ENSCAFG00000023695	26	29525621	29527305	NA	NA
ENSCAFG00000023670	26	29660319	29661183	NA	NA
ENSCAFG00000013542	26	29692439	29693474	NA	NA
ENSCAFG00000024600	26	29900119	29900436	NA	NA

ENSCAFG00000024396	26	29907070	29907369	NA	NA
ENSCAFG00000014859	26	30396329	30396619	607497	LOC607497
ENSCAFG00000023103	26	30419592	30420537	NA	NA
ENSCAFG00000014432	26	30523128	30523576	NA	NA
ENSCAFG00000024391	26	30533961	30534290	NA	NA
ENSCAFG00000015176	26	30589031	30589330	NA	NA
ENSCAFG00000024539	26	30611827	30667949	NA	NA
ENSCAFG00000023953	26	30671546	30680915	NA	NA
ENSCAFG00000024382	26	31899074	31899608	486411	LOC486411
ENSCAFG00000014142	26	31911936	31914946	NA	NA
ENSCAFG00000015511	26	34452473	34466631	NA	NA
ENSCAFG00000015277	27	8944683	8946928	NA	NA
ENSCAFG00000008964	27	8993577	8994873	486569	cOR8S16
ENSCAFG00000008971	27	9031739	9033043	486571	cOR8S15
ENSCAFG00000008982	27	9042997	9045216	486573	cOR8S9
ENSCAFG00000025338	27	16156330	16159559	NA	NA
ENSCAFG00000025337	27	16159563	16162805	NA	NA
ENSCAFG00000025316	27	16166057	16169301	NA	MUCSM_CANFA
ENSCAFG00000025315	27	16172553	16174744	NA	NA
ENSCAFG00000025309	27	16175801	16177992	NA	NA
ENSCAFG00000025307	27	16179049	16182281	NA	MUCSM_CANFA
ENSCAFG00000025302	27	16182285	16184476	NA	NA
ENSCAFG00000013453	27	38338657	38341448	NA	NA
ENSCAFG00000009663	28	16109419	16121672	486839	SCD
ENSCAFG00000012561	28	35214568	35287499	NA	NA
ENSCAFG00000009499	29	44778068	44780503	NA	NA
ENSCAFG00000013642	29	44811145	44812077	NA	NA
ENSCAFG00000017833	30	40387840	40470193	NA	CCDC33
ENSCAFG00000017888	30	40472851	40484807	478365	LOC478365
ENSCAFG00000017937	30	40791794	40794404	NA	CP1A1_CANFA
ENSCAFG00000017940	30	40813085	40815042	NA	LYL1
ENSCAFG00000017941	30	40815981	40821668	494010	CYP1A2
ENSCAFG00000023660	31	33435163	33439648	610164	CBR1
ENSCAFG00000009630	31	33458066	33470782	480785	LOC480785
ENSCAFG00000011010	31	40599783	40623133	611461	LOC611461
ENSCAFG00000015153	31	40650277	40651194	NA	NA
ENSCAFG00000012482	32	41604689	41623514	609459	LOC609459
ENSCAFG00000012992	38	23968088	24199878	478983	SDHC
ENSCAFG00000025399	38	24062382	24095901	NA	NA
ENSCAFG00000024918	38	26218055	26219103	610616	LOC610616
ENSCAFG00000011575	38	26231178	26232497	NA	NA
ENSCAFG00000024086	38	26242372	26243953	610621	LOC610621
ENSCAFG00000023913	38	26249694	26251419	488612	LOC488612
ENSCAFG00000025619	Un	8865070	9013649	NA	NA
ENSCAFG00000025615	Un	8974638	8988436	NA	NA
ENSCAFG00000025614	Un	9046915	9067210	NA	NA
ENSCAFG00000025612	Un	9071767	9077239	NA	NA
ENSCAFG00000013199	Un	9404852	9408463	NA	NA
ENSCAFG00000025609	Un	9533121	9545929	NA	NA

ENSCAFG00000025608	Un	9593128	9595541	NA	NA
ENSCAFG00000025468	Un	18347639	18350370	NA	NA
ENSCAFG00000025010	Un	29243686	29246632	NA	NA
ENSCAFG00000025603	Un	34801849	34833456	NA	NA
ENSCAFG00000014243	Un	35272587	35273616	NA	NA
ENSCAFG00000014031	Un	35297498	35305306	NA	NXF3
ENSCAFG00000024355	Un	35589071	35590027	610039	LOC610039
ENSCAFG00000024255	Un	37175979	37176724	607305	LOC607305
ENSCAFG00000025496	Un	40328983	40334632	608693	LOC608693
ENSCAFG00000014532	Un	41408638	41422577	NA	NA
ENSCAFG00000025427	Un	41687425	41689464	NA	NA
ENSCAFG00000008200	Un	41710712	41711822	483579	cOR4C29
ENSCAFG00000023661	Un	42071027	42096826	610669	LOC610669
ENSCAFG00000025143	Un	43649071	43671036	NA	NA
ENSCAFG00000025545	Un	43880909	43882042	NA	NA
ENSCAFG00000025411	Un	43931600	43933770	492206	LOC492206
ENSCAFG00000019106	Un	43940601	43943008	NA	NA
ENSCAFG00000018456	Un	43958726	43959699	NA	NA
ENSCAFG00000025606	Un	44141817	44143045	611931	LOC611931
ENSCAFG00000025605	Un	44175882	44179298	NA	NA
ENSCAFG00000000187	Un	44673621	44675452	483989	TAAR5
ENSCAFG00000024802	Un	44760243	44770689	608365	LOC608365
ENSCAFG00000025500	Un	45614459	45623455	608905	LOC608905
ENSCAFG00000006760	Un	46299867	46308758	609123	LOC609123
ENSCAFG00000006127	Un	46467063	46468113	609167	LOC609167
ENSCAFG00000025430	Un	46474399	46475859	609179	LOC609179
ENSCAFG00000023862	Un	46697783	46704934	607276	LOC607276
ENSCAFG00000023590	Un	46712637	46719826	607460	LOC607460
ENSCAFG00000025249	Un	47335138	47348487	NA	NA
ENSCAFG00000025050	Un	47422908	47423963	609676	LOC609676
ENSCAFG00000025036	Un	47439459	47441335	609676	LOC609676
ENSCAFG00000024312	Un	48172429	48175985	609831	LOC609831
ENSCAFG00000014988	Un	48241717	48242454	610282	LOC610282
ENSCAFG00000023942	Un	48312645	48315885	NA	NA
ENSCAFG00000025495	Un	49699819	49702045	612472	LOC612472
ENSCAFG00000006770	Un	50108236	50117120	610177	LOC610177
ENSCAFG00000015211	Un	50441364	50462963	NA	NA
ENSCAFG00000025557	Un	50602441	50604237	NA	NA
ENSCAFG00000025537	Un	50646302	50665892	608854	LOC608854
ENSCAFG00000025584	Un	51044318	51044764	610355	LOC610355
ENSCAFG00000024273	Un	51504417	51506857	NA	NA
ENSCAFG00000008165	Un	51830738	51831670	NA	NA
ENSCAFG00000025591	Un	52561281	52561805	NA	NA
ENSCAFG00000003863	Un	53627210	53640678	610975	LOC610975
ENSCAFG00000016660	Un	53741389	53753356	NA	NA
ENSCAFG00000025240	Un	54148733	54149230	612083	LOC612083
ENSCAFG00000002831	Un	54216454	54227893	NA	Q9TR24_CANFA
ENSCAFG00000025283	Un	55034240	55058008	NA	NA
ENSCAFG00000023841	Un	55080231	55083791	NA	Q30KU6_CANFA

ENSCAFG00000015261	Un	55179840	55185426	NA	NA
ENSCAFG00000025590	Un	55547986	55550600	607536	LOC607536
ENSCAFG00000006118	Un	56029048	56031594	607723	LOC607723
ENSCAFG00000015373	Un	56272378	56273114	607996	LOC607996
ENSCAFG00000025592	Un	56783947	56785660	NA	NA
ENSCAFG00000025425	Un	56977281	56977820	612081	LOC612081
ENSCAFG00000015582	Un	56984449	56984754	NA	NA
ENSCAFG00000025011	Un	57641582	57643253	NA	Q30KU8_CANFA
ENSCAFG00000024831	Un	57755912	57764953	NA	NA
ENSCAFG00000014939	Un	59586965	59599963	415129	CYP3A12
ENSCAFG00000024145	Un	59632129	59632692	474181	IFNA7
ENSCAFG00000024142	Un	59635794	59636357	474181	IFNA7
ENSCAFG00000024095	Un	59639445	59640008	474181	IFNA7
ENSCAFG00000024083	Un	59643102	59643665	474181	IFNA7
ENSCAFG00000024631	Un	59646771	59647334	474181	IFNA7
ENSCAFG00000025415	Un	60057262	60065478	609558	LOC609558
ENSCAFG00000024291	Un	61302053	61307410	491544	LOC491544
ENSCAFG00000025572	Un	61945454	61953831	NA	NA
ENSCAFG00000025313	Un	62489081	62496069	607460	LOC607460
ENSCAFG00000025622	Un	63417852	63421440	609183	LOC609183
ENSCAFG00000025246	Un	63483671	63485221	607362	LOC607362
ENSCAFG00000015245	Un	63497415	63498699	491435	LOC491435
ENSCAFG00000025369	Un	66684219	66687215	608304	LOC608304
ENSCAFG00000025569	Un	66876743	66878742	608379	LOC608379
ENSCAFG00000024389	Un	67400275	67401387	NA	NA
ENSCAFG00000024690	Un	67527207	67529004	NA	NA
ENSCAFG00000024961	Un	68998591	69000845	NA	NA
ENSCAFG00000025331	Un	69977686	69979161	NA	NA
ENSCAFG00000023718	Un	70409284	70409678	NA	NA
ENSCAFG00000023765	Un	70907595	70908621	NA	NA
ENSCAFG00000025214	Un	71219649	71220601	491686	LOC491686
ENSCAFG00000025157	Un	71402766	71406010	NA	NA
ENSCAFG00000009896	Un	71409242	71411525	NA	NA
ENSCAFG00000025173	Un	74462808	74468818	607460	LOC607460
ENSCAFG00000023374	X	32243586	32244170	612277	LOC612277
ENSCAFG00000014436	X	109220932	109223989	NA	NA
ENSCAFG00000019180	X	123955219	123956634	NA	NA
ENSCAFG00000023819	X	124076154	124085114	NA	NA
ENSCAFG00000023684	X	124104353	124112248	NA	NA
ENSCAFG00000023624	X	124136324	124138530	612484	LOC612484
ENSCAFG00000023025	X	125748575	125750340	NA	NA

Note, Ensembl predicts 429 distinct genes that map within our CNV regions. However, several Ensembl gene IDs map to the same Entrez Gene ID through NCBI. All of our analyses are based on Ensembl predictions, but the corresponding Entrez Gene ID and symbols are provided to facilitate subsequent analyses and to highlight the possibility of some redundancy among the set of 429 genes in CNV regions.

**Supplementary Table 6. CNV status of *GCKR* in dogs with reported risks of developing Diabetes Mellitus.**

<b>Sample</b>	<b>CNV Status</b>	<b>Diabetes Risk</b>	<b>Odds Ratios (95% CI)<sup>a</sup></b>	<b>Odds Ratios (95% CI)<sup>b</sup></b>
Tasha (Boxer)	No change	Low	0.00 (Reference)	0.07 (0.03-0.16)
German Shorthaired Pointer	Gain	Low	None Reported	0.14 (0.06-0.33)
German Shepherd	Gain	Low	0.13 (0.05–0.34)	0.16 (0.12-0.21)
Doberman Pinscher	Gain	Low	None Reported	0.51 (0.40-0.66)
Shetland Sheepdog	Loss	Low	None Reported	0.23 (0.15-0.35)
Labrador Retriever	Loss	Low	0.89 (0.69–1.16)	0.58 (0.49-0.69)
Golden Retriever	Both <sup>d</sup>	Low	0.23 (0.12–0.47)	0.31 (0.25-0.40)
Siberian Husky	Both <sup>d</sup>	High	None Reported	1.53 (1.06-2.22)
Pug <sup>c</sup>	Loss	High	None Reported	None Reported
West Highland White Terrier	Loss	High	1.51 (1.05–2.16)	None Reported
Yorkshire Terrier	Loss	High	3.69 (2.55–5.35)	None Reported

<sup>a</sup> Catchpole et al. 2005.

<sup>b</sup> Guptill et al. 2003.

<sup>c</sup> Supplementary reference Hess et al. 2000.

<sup>d</sup> Golden Retriever gains in copy number coordinates: chr17:24439788-24452113, 24500099-24514908, and 24518956-24548550. Golden Retriever loss in copy number coordinate: chr17:24634983-24655432. Siberian Husky gain in copy number coordinate: chr17:24439788-24548550. Siberian Husky losses in copy number coordinates: chr17: 24551738-24564063 and 24628712-24693128.

Note, Supplementary Table 6 only includes samples from breeds that have been studied for diabetes mellitus risk.

## Supplementary Note 1.

We used the R package DNACopy (Venkatraman and Olshen 2007) that implements a circular binary segmentation algorithm to analyze the aCGH data to assess the robustness of the set of CNVs identified with RJaCGH. The normalized  $\log_2$  ratios were analyzed as described in the main text, by first averaging  $\log_2$  ratios across non-overlapping 2 kb windows. In addition, the chrUn data was separated into contigs and each contig was analyzed separately as was done with RJaCGH. Consistency of CNVs identified by these two methods was compared in two ways. First, we determined how many of the 678 distinct CNV regions identified by RJaCGH overlapped with the segmentation calls. As shown in Supplementary Table 7, 430 out of the 678 (63.4%) distinct CNV regions are identified in the segmentation analysis. The percentage overlap is greater on the named chromosomes relative to chrUn (69.9% versus 56.5% Supplementary Table 7). Given the unique assembly of chrUn, where clones are randomly ordered, it was necessary to analyze clones separately. Thus, the power of segmentation analysis is likely reduced as the size of individual clones limits the ability to identify change points in  $\log_2$  signal intensity, suggesting the comparison of RJaCGH and DNACopy among the named chromosomes provides a more accurate assessment of overlap. It is also interesting to note that of the 248 RJaCGH CNV regions not supported by segmentation, 161 (64.9%) are singletons (i.e., defined by a CNV from a single sample). Conversely, 31 of the 430 (7.2%) regions called by both RJaCGH and DNACopy are singletons.

Next, we performed a more fine-scale analysis and asked how many of the specific CNV calls made by RJaCGH in each breed were also found in the segmentation analysis. As shown in Supplementary Table 8, the average overlap across all samples (excluding the self-self hybridization) was 52.5%. Again, the overlap was higher on named chromosomes (61.8%)

versus chrUn (41.8%). Thus, the CNV calls from RJaCGH and DNACopy are reasonably concordant, particularly since the latter has been shown to underperform compared to the more sophisticated HMM algorithms implemented in RJaCGH (Rueda and Diaz-Uriarte 2007). As expected the amount of overlap increases if the conservative thresholds used to define thresholds in the RJaCGH analysis are relaxed (data not shown), suggesting that some of the discrepancy in calls are simply a function of undercalling real CNVs. However, given the inherent noise in array based analyses and potential complications such as sequence divergence of breeds relative to the reference genome we have elected to be more conservative in defining CNVs.

**Supplementary Table 7. Number of distinct CNV regions identified by RJaCGH with overlapping DNACopy calls.**

<b>Genomic Region</b>	<b>RJaCGH (singletons)<sup>a</sup></b>	<b>DNACopy (singletons)<sup>a</sup></b>	<b>Intersection (singletons)<sup>a</sup></b>	<b>Proportion</b>
Total	678 (218)	1030 (398)	430 (31)	0.634
Named Chromosomes	349 (98)	222 (78)	244 (16)	0.699
ChrUn	329 (120)	808 (320)	186 (15)	0.565

<sup>a</sup>Singleton denotes CNV regions with support from only one sample.

**Supplementary Table 8. Number of RJaCGH CNVs supported by DNACopy Across Samples.**

Sample	All CNV Calls			
	DNACopy (CBS)	RJaCGH (HMM)	Intersection	Proportion
Afghan Hound	341	154	110	0.71
Basenji	489	298	154	0.52
Belgian Shepherd Dog Tervuren	142	185	77	0.42
Doberman Pinscher	278	220	135	0.61
German Shepherd	248	284	130	0.46
German Shorthaired Pointer	213	118	56	0.47
Golden Retriever	341	145	114	0.79
Labrador Retriever	388	249	150	0.60
Pug	310	131	64	0.49
Rottweiler	292	132	94	0.71
Self	184	1	0	0.00
Shetland Sheepdog	270	259	137	0.53
Siberian Husky	182	277	103	0.37
Standard Poodle	184	219	91	0.42
Tasha	130	169	55	0.33
West Highland White Terrier	281	191	102	0.53
Whippet	263	125	64	0.51
Wolf	178	251	110	0.44
Yorkshire Terrier	279	175	94	0.54
Named Chromosomes				
Afghan Hound	86	77	70	0.91
Basenji	108	192	92	0.48
Belgian Shepherd Dog Tervuren	69	144	61	0.42
Doberman Pinscher	88	159	92	0.58
German Shepherd	82	196	90	0.46
German Shorthaired Pointer	49	62	30	0.48
Golden Retriever	122	113	86	0.76
Labrador Retriever	106	137	97	0.71
Pug	113	40	35	0.88
Rottweiler	98	79	58	0.73
Self	2	1	0	0.00
Shetland Sheepdog	120	183	105	0.57
Siberian Husky	86	182	83	0.46
Standard Poodle	79	147	76	0.52
Tasha	46	95	39	0.41
West Highland White Terrier	102	134	81	0.60
Whippet	122	41	40	0.98
Wolf	116	189	103	0.54
Yorkshire Terrier	86	130	83	0.64
ChrUn				
Afghan Hound	255	77	40	0.52
Basenji	381	106	62	0.58
Belgian Shepherd Dog Tervuren	73	41	16	0.39

Doberman Pinscher	190	61	43	0.70
German Shepherd	166	88	40	0.45
German Shorthaired Pointer	164	56	26	0.46
Golden Retriever	219	32	28	0.88
Labrador Retriever	282	112	53	0.47
Pug	197	91	29	0.32
Rottweiler	194	53	36	0.68
Self	0	0	0	0.00
Shetland Sheepdog	150	76	32	0.42
Siberian Husky	96	95	20	0.21
Standard Poodle	105	72	15	0.21
Tasha	84	74	16	0.22
West Highland White Terrier	179	57	21	0.37
Whippet	141	84	24	0.29
Wolf	62	62	7	0.11
Yorkshire Terrier	193	45	11	0.24

---

**Supplementary Table 9. Summary statistics of aCGH experiments.**

<b>Breed</b>	<b>Mean log<sub>2</sub></b>	<b>SD log<sub>2</sub></b>
Afghan Hound	0.00928	0.57720
Basenji	-0.13224	0.37259
Belgian Shepherd Dog Tervuren	-0.00885	0.34585
Boxer (Tasha)	-0.10905	0.37347
Doberman Pinscher	-0.02040	0.30527
German Shepherd	-0.02575	0.43649
German Shorthaired Pointer	-0.05373	0.29658
Golden Retriever	-0.27663	0.54508
Labrador Retriever	-0.07187	0.38445
Pug	-0.01261	0.51806
Rottweiler	-0.22316	0.64427
Self	-0.21831	0.05959
Shetland Sheepdog	-0.06780	0.37938
Siberian Husky	-0.10731	0.35286
Standard Poodle	-0.08154	0.28834
West Highland White Terrier	-0.02855	0.57194
Whippet	0.18182	0.60538
Wolf	-0.20721	0.35325
Yorkshire Terrier	-0.24060	0.29354

### Supplementary References

- Bailey, J.A., Z. Gu, R.A. Clark, K. Reinert, R.V. Samonte, S. Schwartz, M.D. Adams, E.W. Myers, P.W. Li, and E.E. Eichler. 2002. Recent segmental duplications in the human genome. *Science* **297**: 1003-1007.
- Catchpole, B., J.M. Ristic, L.M. Fleeman, and L.J. Davison. 2005. Canine diabetes mellitus: can old dogs teach us new tricks? *Diabetologia* **48**: 1948-1956.
- Guptill, L., L. Glickman, and N. Glickman. 2003. Time trends and risk factors for diabetes mellitus in dogs: analysis of veterinary medical data base records (1970-1999). *Vet J* **165**: 240-247.
- Hess, R.S., P.H. Kass, and C.R. Ward. 2000. Breed distribution of dogs with diabetes mellitus admitted to a tertiary care facility. *J Am Vet Med Assoc* **216**: 1414-1417.
- Rueda, O.M. and R. Diaz-Uriarte. 2007. Flexible and accurate detection of genomic copy-number changes from aCGH. *PLoS Comput Biol* **3**: e122.
- She, X., Z. Cheng, S. Zollner, D.M. Church, and E.E. Eichler. 2008. Mouse segmental duplication and copy number variation. *Nat Genet* **40**: 909-914.
- She, X., Z. Jiang, R.A. Clark, G. Liu, Z. Cheng, E. Tuzun, D.M. Church, G. Sutton, A.L. Halpern, and E.E. Eichler. 2004. Shotgun sequence assembly and recent segmental duplications within the human genome. *Nature* **431**: 927-930.
- Venkatraman, E.S. and A.B. Olshen. 2007. A faster circular binary segmentation algorithm for the analysis of array CGH data. *Bioinformatics* **23**: 657-663.