

Differences Between Man and Beast

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Chimpanzee Genome ([Pan troglodytes genome assembly NHGRI_mPanTro3-v2.0_pri - NCBI - NLM](#))

Chromosome	GenBank	RefSeq	Size (bp)	GC content (%)	Unlocalized count
1	CM054434.2	NC_072398.2	231,299,448	42	0
2	CM068905.1	NC_086015.1	201,579,334	39.5	0
3	CM054437.2	NC_072401.2	191,670,129	38.5	0
4	CM054438.2	NC_072402.2	178,964,043	39.5	0
5	CM054439.2	NC_072403.2	183,320,697	39.5	0
6	CM054440.2	NC_072404.2	174,648,847	40.5	0
7	CM054441.2	NC_072405.2	155,691,389	40	0
8	CM054442.2	NC_072406.2	146,288,486	41	0
9	CM054443.2	NC_072407.2	136,991,367	41.5	0
10	CM054444.2	NC_072408.2	140,160,335	40.5	0
11	CM054445.2	NC_072409.2	118,863,153	41.5	0
12	CM054446.2	NC_072410.2	122,853,238	40.5	0
13	CM054447.2	NC_072411.2	144,476,839	39	0
14	CM054448.2	NC_072412.2	120,149,342	38.5	0
15	CM054449.2	NC_072413.2	104,701,121	39.5	0

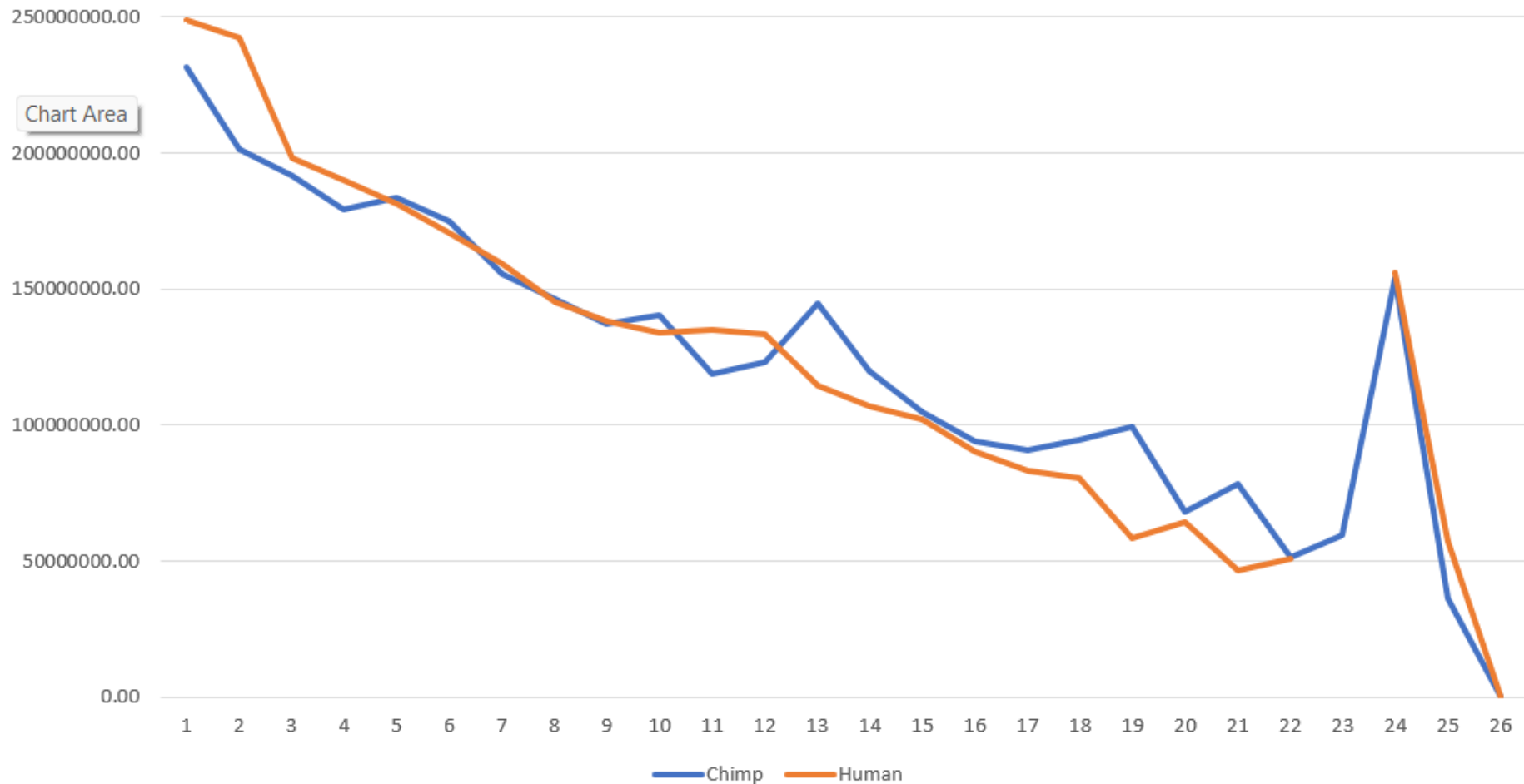
Chromosome	GenBank	RefSeq	Size (bp)	GC content (%)	Unlocalized count
16	CM054450.2	NC_072414.2	93,846,347	41.5	0
17	CM054451.2	NC_072415.2	90,695,042	39.5	0
18	CM054452.2	NC_072416.2	94,528,409	44	0
19	CM054453.2	NC_072417.2	99,595,324	44	0
20	CM054454.2	NC_072418.2	68,087,067	46	0
21	CM054455.2	NC_072419.2	78,115,444	42.5	0
22	CM054456.2	NC_072420.2	51,350,302	39.5	0
23	CM068906.1	NC_086016.1	59,520,411	42.5	0
X	CM054457.2	NC_072421.2	153,896,354	39.5	0
Y	CM054458.2	NC_072422.2	36,447,294	41.5	0
MT	D38113.1	NC_001643.1	16,554	43.5	0

Human Genome ([Homo sapiens genome assembly GRCh38.p14 - NCBI - NLM](#))

Chromosome	GenBank	RefSeq	Size (bp)	GC content (%)	Unlocalized count
1	CM000663.2	NC_000001.11	248,956,422	41.5	9
2	CM000664.2	NC_000002.12	242,193,529	40.5	2
3	CM000665.2	NC_000003.12	198,295,559	40	1
4	CM000666.2	NC_000004.12	190,214,555	38.5	1
5	CM000667.2	NC_000005.10	181,538,259	39.5	1
6	CM000668.2	NC_000006.12	170,805,979	39.5	0
7	CM000669.2	NC_000007.14	159,345,973	41	0
8	CM000670.2	NC_000008.11	145,138,636	40	0
9	CM000671.2	NC_000009.12	138,394,717	41.5	4
10	CM000672.2	NC_000010.11	133,797,422	41.5	0
11	CM000673.2	NC_000011.10	135,086,622	41.5	0
12	CM000674.2	NC_000012.12	133,275,309	41	0
13	CM000675.2	NC_000013.11	114,364,328	38.5	0
14	CM000676.2	NC_000014.9	107,043,718	41	8
15	CM000677.2	NC_000015.10	101,991,189	42	1

Chromosome	GenBank	RefSeq	Size (bp)	GC content (%)	Unlocalized count
16	CM000678.2	NC_000016.10	90,338,345	44.5	1
17	CM000679.2	NC_000017.11	83,257,441	45.5	3
18	CM000680.2	NC_000018.10	80,373,285	39.5	0
19	CM000681.2	NC_000019.10	58,617,616	48	0
20	CM000682.2	NC_000020.11	64,444,167	44	0
21	CM000683.2	NC_000021.9	46,709,983	41	0
22	CM000684.2	NC_000022.11	50,818,468	47	8
X	CM000685.2	NC_000023.11	156,040,895	39.5	0
Y	CM000686.2	NC_000024.10	57,227,415	40	1
MT	J01415.2	NC_012920.1	16,569	44.5	0

Chimp vs Human : Differences in number of Nucleotides



You can see that the Chimp genome has a different nucleotide count from the human genome for chromosomes 1, 2, 3, 4, 11, 12, 13, 14, 17, 18, 19, 21, 23. So there are quite a large number of changes. Chromosomes 1-4 are much larger in humans, so possibly relate to more advanced cognition. Chromosomes 13-23 are much larger in chimpanzees, so possibly relate to special abilities of apes. The X and Y chromosomes are similar in size.

Chr	Chimp	Human	Difference	Percent
1	231299448.00	248956422.00	17656974.00	7.09
2	201579334.00	242193529.00	40614195.00	16.77
3	191670129.00	198295559.00	6625430.00	3.34
4	178964043.00	190214555.00	11250512.00	5.91
5	183320697.00	181538259.00	-1782438.00	-0.98
6	174648847.00	170805979.00	-3842868.00	-2.25
7	155691389.00	159345973.00	3654584.00	2.29
8	146288486.00	145138636.00	-1149850.00	-0.79
9	136991367.00	138394717.00	1403350.00	1.01
10	140160335.00	133797422.00	-6362913.00	-4.76
11	118863153.00	135086622.00	16223469.00	12.01
12	122853238.00	133275309.00	10422071.00	7.82
13	144476839.00	114364328.00	-30112511.00	-26.33
14	120149342.00	107043718.00	-13105624.00	-12.24
15	104701121.00	101991189.00	-2709932.00	-2.66
16	93846347.00	90338345.00	-3508002.00	-3.88
17	90695042.00	83257441.00	-7437601.00	-8.93
18	94528409.00	80373285.00	-14155124.00	-17.61
19	99595324.00	58617616.00	-40977708.00	-69.91
20	68087067.00	64444167.00	-3642900.00	-5.65
21	78115444.00	46709983.00	-31405461.00	-67.24
22	51350302.00	50818468.00	-531834.00	-1.05
23	59520411.00		-59520411.00	100.00
X	153896354.00	156040895.00	2144541.00	1.37
Y	36447294.00	57227415.00	20780121.00	36.31
MT	16554.00	16569.00	15.00	0.09

As you can see, large differences include –

Chromosome 23	100%
chromosomes 19	69%
chromosome 21	67 %
chromosome Y	36%
chromosome 13	26%
chromosome 18	17%
chromosome 2	16%
chromosome 11	12%

These changes are very large – in some cases amounting to 30-40 million base pairs - so it would be reasonable to argue that humans are distinct from our nearest beastly relatives.

In the next section I will take a closer look at each chromosome by counting the frequency of each of the 64 codons within each chromosome. In this way we will see the extent to which chimp chromosomes vary from human chromosomes based on the frequency of each codon.

