Supplementary material: Gene-dense autosomal chromosomes show evidence for increased selection

M. Reza Jabalameli, Clare Horscroft, Alejandra Vergara Lope, *Reuben J. Pengelly, *Andrew Collins

*Contributed equally

Supplementary Table 1: Number of SNPs used in LDU map construction by population

Chromosome	Wellderly	Ethiopia	Zulu	Baganda
1	557873	1097822	1118373	1055438
2	593868	1183401	1220123	1139730
3	509066	1008464	1023841	975075
4	504243	1013830	1046827	985643
5	459987	913305	933217	887187
6	472261	903271	919776	872316
7	415335	822286	839044	802132
8	400025	795075	818877	780359
9	311320	605025	623917	582606
10	367619	711933	703875	671952
11	351378	698268	716867	670444
12	345765	659882	679337	646565
13	261818	503470	512552	490190
14	239704	465741	472127	442402
15	207177	413527	428946	402244
16	229203	444727	460119	430997
17	195607	386786	389757	371164
18	208014	403919	412631	394313
19	163978	318734	329827	313363
20	166816	320876	325305	309093
21	99550	197627	202296	190638
22	102366	197052	196211	184354
Total	7162973	14065021	14373845	13598205

Supplementary Table 2: Chromosome physical, genetic and LDU lengths

Chromosome	Chromosome length (Mb) (Golden path hg19)	Genetic map (cM) Kong	Genetic map (cM) Bherer	Genetic map (cM) Hinch	LDU map Wellderly	LDU map Ethiopia	LDU map Baganda	LDU map Zulu
1	249.25	270.27	261.90	285.88	5078.92	8453.55	10166.92	10232.35
2	243.20	257.48	249.34	271.08	4736.82	8379.45	10222.70	10550.32
3	198.02	218.17	217.27	226.73	4138.09	7133.60	8652.03	8592.47
4	191.15	202.8	200.50	211.98	3936.59	7033.83	8581.00	8784.09
5	180.92	205.69	196.41	205.46	3785.07	6448.32	7811.35	7825.82
6	171.12	189.60	183.89	195.29	3604.75	6268.16	7698.63	7717.59
7	159.14	179.34	176.55	187.35	3460.39	5979.92	7272.00	7284.13
8	146.36	158.94	160.13	171.70	3101.18	5584.68	7040.27	6991.71
9	141.21	157.73	154.35	161.14	2953.02	4824.72	5825.25	5852.42
10	135.53	176.01	166.10	178.03	3140.77	5413.39	6418.79	6409.52
11	135.01	152.45	153.76	161.53	2943.56	4970.81	6040.50	6184.26
12	133.85	171.09	162.77	171.32	2990.16	5060.85	6157.24	6203.88
13	115.17	128.60	125.30	130.30	2309.50	3882.26	4734.58	4629.56
14	107.35	118.49	116.50	116.27	2158.42	3618.30	4242.93	4375.81
15	102.53	128.76	118.28	122.23	2151.48	3564.66	4304.27	4304.06
16	90.36	128.86	125.04	128.88	2562.56	3733.21	4548.90	4607.21
17	81.20	135.04	125.26	132.29	2287.03	3472.50	4215.68	4080.27
18	78.08	120.59	116.51	120.67	2079.02	3420.51	4222.90	4102.97
19	59.13	109.73	103.58	103.09	1869.27	3017.19	3541.08	3561.55
20	63.03	98.35	107.16	107.57	1846.33	2941.58	3528.43	3467.01
21	48.13	61.86	61.55	65.66	1110.60	1849.53	2131.71	2131.18
22	51.30	65.86	68.78	68.95	1184.17	1950.29	2282.84	2267.67
Totals	2881.04	3435.71	3350.93	3523.40	63427.70	107001.31	129640.00	130155.85

Supplementary Table 3. Generations since an effective bottleneck for four populations defined using alternative linkage maps

Chromosome	Wellderly (Kong map)	Wellderly (Bherer map)	Wellderly (Hinch map)	Ethiopia (Kong map)	Ethiopia (Bherer map)	Ethiopia (Hinch map)	Zulu (Kong map)	Zulu (Bherer map)	Zulu (Hinch map)	Baganda (Kong map)	Baganda (Bherer map)	Baganda (Hinch map)
1	1879	1939	1777	3128	3228	2957	3786	3907	3579	3762	3882	3556
2	1840	1900	1747	3254	3361	3091	4098	4231	3892	3970	4100	3771
3	1897	1905	1825	3270	3283	3146	3938	3954	3790	3966	3982	3816
4	1941	1963	1857	3468	3508	3318	4331	4381	4144	4231	4280	4048
5	1840	1927	1842	3135	3283	3138	3805	3984	3809	3798	3977	3802
6	1901	1960	1846	3306	3409	3210	4070	4197	3952	4060	4187	3942
7	1930	1960	1847	3334	3387	3192	4062	4125	3888	4055	4119	3882
8	1951	1937	1806	3514	3488	3253	4399	4366	4072	4430	4397	4100
9	1872	1913	1833	3059	3126	2994	3710	3792	3632	3693	3774	3615
10	1784	1891	1764	3076	3259	3041	3642	3858	3600	3647	3864	3605
11	1931	1914	1822	3261	3233	3077	4057	4022	3829	3962	3929	3740
12	1748	1837	1745	2958	3109	2954	3626	3811	3621	3599	3783	3594
13	1796	1843	1772	3000	3098	2979	3600	3695	3553	3682	3779	3634
14	1822	1853	1856	3054	3106	3112	3693	3756	3763	3834	3642	3649
15	1671	1819	1760	2768	3014	2916	3343	3639	3521	3343	3639	3521
16	1989	2049	1988	2897	2986	2897	3575	3685	3575	3530	3638	3530
17	1694	1826	1728	2571	2772	2625	3022	3257	3084	3122	3366	3187
18	1724	1784	1723	2836	2936	2835	3402	3522	3400	3502	3624	3500
19	1704	1805	1813	2750	2913	2927	3246	3438	3455	3227	3419	3435
20	1877	1723	1716	2991	2745	2735	3525	3235	3223	3588	3293	3280
21	1795	1804	1691	2990	3005	2817	3445	3463	3246	3446	3463	3247
22	1798	1722	1717	2961	2836	2829	3443	3297	3289	3466	3319	3311
Mean/SD /95% CI	1836/90 /1800-1870	1876/82 /1840-1910	1794/68 /1770-1820	3073/236 /2970-3170	3140/224 /3050-3230	3002/175 /2930-3080	3719/351 /3570-3870	3801/343 /3660-3940	3633/280 /3520-3750	3712/324 /3580-3850	3793/313 /3660-3920	3626/249 /3520-3730

Supplementary Table 4. Gene densities in genes/ Mb

Chromosome	Mayer et al (2005)	All genes (Spataro et al, 2017) (N=18584**)**	NDNE genes (N=12341)	CNM genes (N=2287)	CM genes (N=196)	MNC genes (N=677)	END genes (N=1529)
1	9.3	8.10	5.50	0.92	0.08	0.31	0.55
2	6.1	5.03	3.12	0.83	0.06	0.22	0.49
3	5.9	5.31	3.48	0.77	0.05	0.23	0.45
4	4.5	3.89	2.68	0.43	0.04	0.10	0.37
5	5.4	4.76	3.16	0.70	0.05	0.20	0.37
6	6.7	5.94	3.51	1.10	0.07	0.20	0.43
7	7.0	5.61	3.59	0.74	0.08	0.18	0.53
8	5.4	4.53	2.97	0.61	0.04	0.17	0.31
9	6.6	5.38	3.60	0.52	0.06	0.22	0.43
10	6.4	5.31	3.36	0.83	0.09	0.15	0.41
11	10.6	9.50	6.38	1.19	0.10	0.37	0.67
12	8.3	7.51	5.13	0.85	0.11	0.31	0.70
13	3.5	2.80	1.83	0.37	0.03	0.10	0.23
14	6.9	5.57	3.87	0.55	0.04	0.17	0.49
15	7.6	5.69	3.54	0.83	0.04	0.20	0.49
16	10.8	9.11	6.46	0.77	0.03	0.39	0.71
17	16	14.29	9.32	1.06	0.10	0.58	1.49
18	4.2	3.47	2.19	0.50	0.06	0.08	0.32
19	23	23.56	17.72	1.89	0.19	0.52	1.61
20	10.1	8.44	5.46	1.27	0.11	0.29	0.76
21	5.8	4.80	2.80	0.44	0.10	0.19	0.48
22	11.1	8.42	5.69	0.86	0.10	0.31	0.72

Supplementary Table 5. Pearson correlations (P value) between EBTs and gene density using alternative linkage maps (P *< 0.05, ** <0.01)

	Mayer et al (2005) genes/Mb	Spataro et al (2017) all genes/Mb	NDNE genes/Mb	CNM genes/Mb	CM genes/Mb	MNC genes/Mb	END genes/Mb
Wellderly, Kong map	-0.318 (0.1489)	-0.316 (0.1519)	-0.303 (0.1703)	-0.194 (0.3880)	-0.394 (0.0699)	-0.206 (0.3578)	-0.394 (0.0700)
Wellderly, Hinch map	0.000 (0.9995)	0.023 (0.9198)	0.0588 (0.7949)	-0.0329 (0.8845)	-0.399 (0.0656)	0.0248 (0.9127)	-0.0949 (0.6743)
Ethiopia, Kong map	**-0.550 (0.008 **)**	**-0.510 (0.0154 *)**	**-0.490 (0.0207 *)**	-0.299 (0.1768)	-0.392 (0.0706)	**-0.528 (0.0115*)**	**-0.604 (0.0029 **)**
Ethiopia, Hinch map	**-0.465 (0.0294 *)**	-0.399 (0.0657)	-0.361 (0.0992)	-0.254 (0.2547)	**-0.441 (0.0400*)**	**-0.516 (0.0140*)**	**-0.534 (0.0104 *)**
Zulu, Kong map	**-0.524 (0.0123 *)**	**-0.483 (0.0229 *)**	**-0.462 (0.0306 *)**	-0.276 (0.2135)	**-0.439 (0.0412*)**	**-0.480 (0.0241*)**	**-0.576 (0.0050 **)**
Zulu, Hinch map	**-0.450 (0.0358 *)**	-0.390 (0.0729**)**	-0.355 (0.1049)	-0.236 (0.2902)	**-0.480 (0.0237*)**	**-0.454 (0.0340*)**	**-0.512 (0.0149 *)**
Baganda, Kong map	**-0.560 (0.0068**)**	**-0.518 (0.0136 *)**	**-0.500 (0.0179 *)**	-0.302 (0.1550)	**-0.452 (0.0346*)**	**-0.510 (0.0152*)**	**-0.602 (0.0031 **)**
Baganda, Hinch map	**-0.495 (0.0191 *)**	**-0.432 (0.0446 *)**	-0.400 (0.0655)	-0.270 (0.2239)	**-0.511 (0.0150*)**	**-0.498 (0.0183*)**	**-0.546 (0.0085 **)**

Supplementary Figure 1. Sub-Saharan African samples represented along prinicpal components 1 and 2