

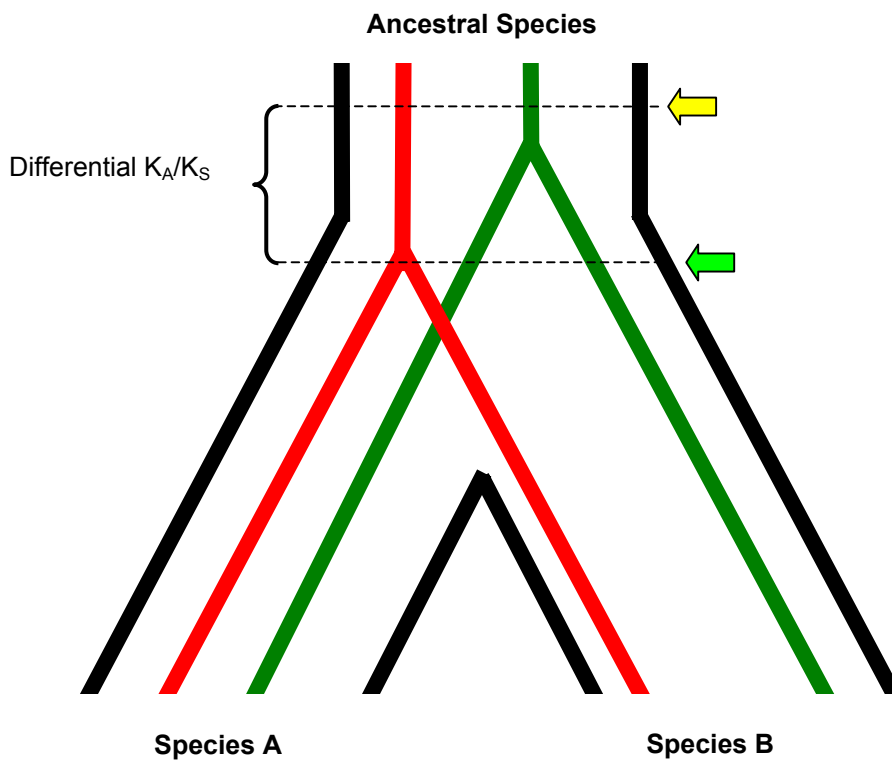
**Figure S1.** An ancestral species splits in two according to the model discussed in Navarro and Barton (Evolution. In press. 2003). A rearrangement in chromosome 1 was involved in the process. From the moment at which the rearrangement establishes a barrier in parapatry until complete reproductive isolation has been achieved, positively selected changes that are incompatible between populations will accumulate preferentially if linked to the rearrangement. If speciation was recent, a comparison of  $K_A/K_S$  ratios between species A and B could disclose higher  $K_A/K_S$  values in chromosome 1 than in chromosome 2.

← A rearrangement is established as a barrier in parapatry. The accumulation of incompatibilities starts.

← Complete reproductive isolation is achieved. Divergence proceeds evenly in all chromosomes.

█ Chrom 1. Rearranged

█ Chrom 2. Colinear



**Table S1.**  $K_A$  and  $K_S$  values in coding genes between human and chimpanzees, and their map position in the human genome.

Locus	Ref.	Length (in bp)	Map pos (in humans)	Rearranged Chrom.	$K_A$	$K_S$	$K_A / K_S$
β-nerve growth factor	1	720	1p13.1	Yes	0.39	2.49	0.16
Glucocerebrosidase (GBA)	1	1611	1p21	Yes	0.31	1.36	0.23
Urate oxidase	2	162	1p22	Yes	0.95	0.00	-
IFI44 - p44	1	1335	1p31.1	Yes	1.01	1.54	0.66
Rhesus-like protein	3	1254	1p34-36	Yes	4.18	1.83	2.28
Brain natriuretic protein	2	1140	1p36.2	Yes	1.51	0.73	2.07
Apolipoprotein All	1	300	1q21-q23	Yes	1.31	1.24	1.06
Involucrin	3	1.635	1q21	Yes	2.90	3.99	0.73
RHBG	1	1377	1q21.3	Yes	0.54	0.79	0.68
L-selectin	3	1.119	1q23-25	Yes	0.14	1.35	0.10
Complement receptor CR1	3	5733	1q32	Yes	0.68	2.72	0.25
Decay Accelerating Factor DAF CD55	1	1044	1q32	Yes	0.83	1.40	0.59
REN (Renin)	1	1221	1q32	Yes	0.00	2.91	0.00
Angiotensinogen	1	1458	1q42-43	Yes	0.41	2.89	0.14
Muscarine Acetylcholine Receptor M3	1	1773	1q43-44	Yes	0.18	1.03	0.17
Mismatch Repair Gene MSH2	1	162	2p22-21	Yes	0.96	0.00	-
Histamine N-Methyltransferase	1	354	2q14-21	Yes	0.45	0.00	-
Chemokine receptor-4	1	1059	2q21	Yes	0.29	1.19	0.24
β-1,3-galactosyltransferase 1	1	981	2q24-31	Yes	0.00	2.10	0.00
Interleukin-8 receptor type A	1	1089	2q35	Yes	0.57	0.26	2.19
Interleukin-8 receptor type B	1	1056	2q35	Yes	0.27	1.59	0.17
5-hydroxy-tryptamine receptor 1F	1	1116	3p12	No	0.00	0.28	0.00
CC chemokine receptor 5	1	1056	3p21	No	0.29	1.35	0.21
G protein-coupled receptor STRL33	1	1029	3p21	No	0.30	0.00	-
G protein-coupled receptor gpr15	1	1083	3q11.2-13.1	No	0.00	0.87	0.00
Zinc finger protein 80	1	822	3q12-qter	No	1.46	2.06	0.71
AGTR1	1	1080	3q21-25	No	0.12	0.44	0.27
α-2-HS-glycoprotein (AHSG)	1	1104	3q27	No	0.82	0.72	1.14
α-fetoprotein precursor	3	1830	4q11-13	Yes	0.49	1.04	0.47
Glycophorin-A	3	366	4q28.2-31.1	Yes	5.14	1.72	2.99
5-hydroxy-tryptamine receptor 1A	2	1260	5q11.2-q13	Yes	0.22	0.34	0.65
Guanine nucleotide-binding regulatory protein-coupled receptor Interleukin-3	1	1269	5q11.2-13	Yes	0.29	0.45	0.64
Interleukin-3	3	432	5q31.1	Yes	0.74	0.63	1.17
Neuropeptide Y receptor Y6	1	465	5q31.2	Yes	1.03	0.61	1.69
Histamine H2 receptor	1	1080	5q35	Yes	0.00	0.78	0.00
AB0 Transporter Protein TAP2	1	1272	6p21.3	No	0.23	1.04	0.22
Complement C2	1	2259	6p21.3	No	0.26	0.63	0.41
Stress-activated protein kinase 2A (CSBP)	1	1083	6p21.3-21.2	No	0.00	1.19	0.00
RhAG (Rh50 glycoprotein)	1	1230	6p21.1-p11	No	0.76	0.48	1.58
Stress-activated protein kinase 4	1	1056	6p21.1	No	0.15	0.91	0.16
T-cell receptor gv10	1	357	7p15-p14	No	1.30	0.83	1.57
T-cell receptor g	1	150	7p15-14	No	1.51	0.00	-
GASZ	1	1428	7q21.3	No	0.33	0.67	0.49
Blue opsin	3	1044	7q31.3-q32	No	0.00	1.15	0.00
Leptin	2	431	7q31.3	No	0.75	1.71	0.44
Muscarine Acetylcholine Receptor M2	1	1323	7q31-32	No	0.00	0.45	0.00
Mitogen-activated protein kinase kinase (MAP2K1)	1	1182	7q32	No	0.50	2.94	0.17
Lipoprotein Lipase (LPL)	1	998	8p22	No	0.00	1.15	0.00
DEFB1 (β-defensin 1)	1	207	8p23.2-23.1	No	0.00	1.38	0.00

DEFB2 ( $\beta$ -defensin 2)	1	195	8p23.1-22	No	0.79	1.51	0.52
c-Myc	3	1.320	8q24.12-q24.13	No	0.20	0.21	0.95
ABO Transferase	1	816	9q34.1-34.2	Yes	0.68	2.49	0.27
$\alpha$ - $\gamma$ -globin	1	444	11p15.5	No	0.00	1.29	0.00
CD81	1	711	11p15.5	No	0.00	2.06	0.00
Dopamine D4 receptor	1	285	11p15.5	No	1.44	2.00	0.72
$\epsilon$ -globin	1	444	11p15.5	No	0.00	0.65	0.00
$\gamma$ -globin	2	888	11p15.5	No	0.00	1.85	0.00
NUDR	1	1698	11p15.5	No	0.44	8.98	0.05
Preproinsulin	3	333	11p15.5	No	0.86	4.08	0.21
CD4	3	1377	12p12	Yes	0.53	1.46	0.36
Atrophin-related protein DRPLA	2	858	12p13.31	Yes	0.00	1.13	0.00
CD94	1	540	12p13.2-p12.3	Yes	0.38	0.18	2.11
Dombrock Glycoprotein (ADP-ribosyltransferase 4)	1	945	12p13-p12	Yes	0.33	0.29	1.14
NKG2A (Killer Cell Lectin-like receptor)	1	702	12p13.2-p12.3	Yes	0.77	1.23	0.63
NKG2E (Killer Cell Lectin-like receptor)	1	723	12p13.2-p12.3	Yes	1.46	7.97	0.18
NKG2F (Killer Cell Lectin-like receptor)	1	477	12p13.2-p12.3	Yes	1.32	0.29	4.55
Triosephosphate isomerase	3	750	12p13	Yes	0.00	2.77	0.00
Interferon $\gamma$	1	429	12q13.13	Yes	0.26	2.06	0.13
Lysozyme	1	447	12q13.2	Yes	0.00	2.85	0.00
Voltage-gated Na channel $\alpha$ subunit	1	1092	12q13	Yes	0.00	0.51	0.00
Melanin-concentrating hormone	3	186	12q23-24	Yes	0.87	0.00	-
5-hydroxy-tryptamine receptor 2A	1	732	13q14-q21	No	0.21	3.21	0.07
Angiogenin (RNase 5)	1	441	14q11.1-11.2	No	0.30	1.21	0.25
RNase k6	1	453	14q11.1	No	0.34	1.28	0.27
RNASE1	1	471	14q11.1	No	1.26	2.44	0.52
Homeobox protein OTX 2	2	342	14q21-q22	No	0.00	0.91	0.00
OPTX2	1	496	14q22.3-23	No	0.00	1.13	0.00
Eosinophil cationic protein	1	483	14q24-31	No	0.91	0.57	1.60
Eosinophil-derived neurotoxin	1	486	14q24-q31	No	0.24	2.65	0.09
EPI-1	3	456	14q24.3	No	0.00	0.65	0.00
Ig $\alpha$ heavy chain constant region	2	1059	14q32.33	No	2.87	3.03	0.95
Connexin-36	1	709	15q13.1	Yes	0.00	2.15	0.00
$\beta$ 2-microglobulin	2	369	15q21-q22.2	Yes	0.70	0.78	0.90
Interleukin-16	3	1.893	15q26.1	Yes	0.44	1.17	0.38
LCR16a	1	383	16p13.1	Yes	0.14	0.05	2.92
Protamine P1	2	156	16p13.3	Yes	9.84	0.00	-
Protamine P2	1	309	16p13.3	Yes	3.64	2.37	1.54
TNP2	1	400	16p13.3	Yes	2.45	1.48	1.66
Cytochrome oxidase subunit 4	1	435	16q11	Yes	0.00	2.69	0.00
Haptoglobin	3	438	16q22.1	Yes	2.62	2.98	0.88
Melanocortin-1 receptor	1	954	16q24.3	Yes	1.61	2.57	0.63
Elac2	1	2481	17p11.2	Yes	0.59	0.91	0.65
Olfactory receptor 93	2	987	17p13.3	Yes	1.56	1.17	1.33
BRCA 1	1	3423	17q21	Yes	1.04	0.24	4.33
Apolipoprotein H precursor (APO-H)	1	1038	17q23	Yes	0.39	1.26	0.31
DCP1	1	4114	17q23	Yes	0.38	2.40	0.16
HGH (Human Growth Hormone)	1	654	17q24.2	Yes	0.49	1.70	0.29
SoX9	1	1530	17q24.3-25.1	Yes	0.08	0.19	0.42
Melanocortin-5 receptor	1	978	18p11.2	Yes	0.64	1.81	0.35
CD209	1	1215	19p13.3	No	1.02	1.59	0.64
Fut1- $\alpha$ (1,2)fucosyltransferase	1	1101	19p13.3	No	0.65	0.76	0.86
Fut3- $\alpha$ (1,3)fucosyltransferase	1	1086	19p13.3	No	0.69	3.54	0.19
Fut5- $\alpha$ (1,3)fucosyltransferase	1	1125	19p13.3	No	1.02	3.11	0.33
Fut6- $\alpha$ (1,3)fucosyltransferase	1	1080	19p13.3	No	1.57	3.07	0.51

Apolipoprotein E	1	954	19q13.2	No	1.51	2.12	0.71
Complement C5 $\alpha$ receptor	1	1023	19q13.3-13.4	No	0.43	0.53	0.81
Fut2- $\alpha$ (1,2)fucosyltransferase	1	1047	19q13.3	No	0.54	1.58	0.34
ILP2	1	771	19q13.3-13.4	No	0.82	2.49	0.33
ILT4	1	1800	19q13.4	No	0.09	0.16	0.58
Low-affinity N-formyl peptide receptor	1	1047	19q13.3-13.4	No	0.39	1.36	0.29
N-formyl peptide receptor	1	1038	19q13.3-13.4	No	0.42	1.68	0.25
N-formyl peptide receptorlike 2	1	1047	19q13.3-13.4	No	0.52	1.12	0.46
UPAR, PLAUR Plasminogen activator urokinase receptor	1	1008	19q13	No	0.43	1.48	0.29
Prion protein	3	762	20p12	No	0.35	1.68	0.21
$\alpha$ -A-crystallin	3	123	21q22.3	No	0.00	2.31	0.00

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1 Gene Bank

2 Chen and Li. *Am. J. Hum Genet.* **68**, 444-156 (2001)  
Chen *et. al.* *The Journal of Heredity* 92, 481-498 (2001)

3 Eyre-Walker and Keightley *Nature* **397**, 344-347(1999)

**Table S2.** Approximate cytological positions of the breakpoints of the chromosomal rearrangements differentiating humans and chimpanzees according to J.J.Yunis and O. Prakash (Science 215:1525-1530, 1982).

<b>Chromosomes</b>	<b>p breakpoint</b>	<b>q breakpoint</b>
<b>1</b>	p11	q11
<b>2</b>	tandem fusion	
<b>4</b>	p14	q21
<b>5</b>	p13	q13
<b>9</b>	p13	q22
<b>12</b>	p12	q15
<b>15</b>	-	q13
<b>16</b>	p11	q12
<b>17</b>	p12	q22
<b>18</b>	-	q11