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Comparative map for mice and humans

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This report summarizes the status of the comparative map for genes and anonymous loci that have been mapped in mice and humans. Table 1 provides a listing of loci that compose the comparative map together with references documenting homology, chromosomal assignment, and genetic linkage. Criteria proposed by the Comparative Mapping Committee (Davisson et al., *Cytogenet Cell Genet 58:* 1152–1189, 1992) were used to identify homologous genes and anonymous loci. A matrix (Fig. 1) provides a guide for identifying homologous segments in the mouse and human genomes. Finally, a map illustrates the location of each mouse locus and its homolog on humans (Fig. 2).

Two major changes have been made in the representation of comparative mapping information. The first change is that *conserved syntenies* (conservation of synteny regardless of gene order) are now highlighted; previous maps highlighted conserved linkages (conservation of gene order and synteny). The second change involves brackets around candidate *conserved linkages*. Because of ambiguity in the manner in which conserved linkages are identified when specific chromosomal localizations of human genes are considered, several alternatives are often possible. For example, *Pep-3* on mouse Chr 1 has a human homolog on Chr 1q25. The loci that immediately flank *Pep-3* have homologs on human Chr 1q32 and 1q31-41. If we assume that these linkage and cytogenetic assignments in mice and humans are correct, two alternative conserved linkages are possible—one involving *Pep-3* and the proximal locus, and another involving *Pep-3* and distal loci. Brackets highlight this ambiguity. These changes represent part of our effort to develop algorithms for identifying conserved syntenies and conserved linkages.

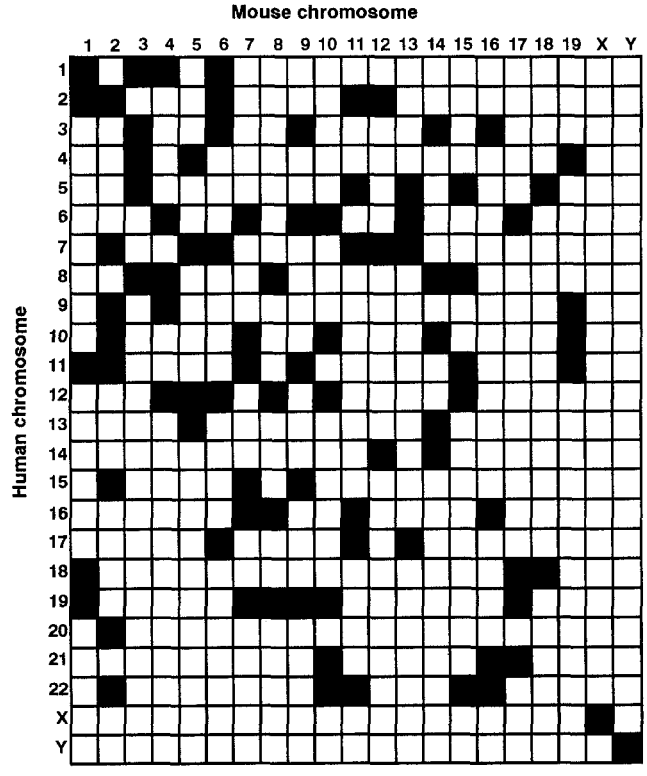

Fig. 1. Chromosomal location of loci that have been mapped in both mice and humans. Each blackened cell in the matrix signifies at least one locus that has been mapped to the respective chromosomes in mice and humans. For example, loci on mouse Chr 1 have homologs on human Chrs 1, 2, 11, 18, and 19.

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Table 1. Listing of homologous genes and anonymous loci in mice and humans together with chromosomal assignment and references documenting homology and chromosomal assignment, and recombination distances. This listing was prepared from information in GBASE—The Genomic Database of the Mouse, HMDP—Homology Database and Programs, GDB—the Human Genome Database, mouse chromosome committee reports, and the primary literature.

Mouse Gene	Chr	References	Human Gene	Chr	References
Aat	12	120 591 1352 1446	*PI*	14	2 124 341 392 743 807 1062 1211
Abl	2	546 1365 1468	*ABL1*	9	92 352 602 702 823
Abll	1	1026 1319 1320	*ABL2*	1	796
Aco-1	4	1047	*ACO1*	9	180 293 1194 1549
Acp-1	12	493	*ACP1*	2	111 452 582 583
Acp-2	2	808	*ACP2*	11	539 541 542 1135
Acr	15	794	*ACR*	22	5
Acra	2	1365 1453	*CHRNA1*	2	100
Acra-3	9	427	*CHRNA3*	15	427
Acra-5	9	427	*CHRNA5*	15	427
Acrb	11	600 1453	*CHRNB1*	17	100
Acrb-4	9	427	*CHRNB4*	15	427
Acrd	1	600 1453	*CHRND*	2	100 283
Acrg	1	600 1000 1453	*CHRNG*	2	282 283
Actb	5	320	*ACTB*	7	1095
Actc-1	2	313 320 600	*ACTC*	15	574
Actg	6	751	*ACTG1*	17	431
Acts	3	319 320	*ACTA1*	1	574
Acy-1	9	35 1043 1077	*ACY1*	3	763 991 992 1077
Ada	2	811 1348	*ADA*	20	123 637 701 1014 1015 1175 1179 1471
Adh-1	3	137 631	*ADH1*	4	1373 1489
Adh-3	3	132 629 630 1028	*ADH3*	4	1040 1336 1373 1489
Adh-5	3	534	*ADH5*	4	212 1489
Adk	14	850	*ADK*	10	768
Adprp	1	669	*PPOL*	1	268 669 949
Adra-1	11	188 1115 1617	*ADRA1A*	5	1617
Adra-2	19	1115 1617	*ADRA2*	10	1617
Adrb-1	19	1115 1617	*ADRB1*	10	1617
Adrb-2	18	705 1115 1414 1617	*ADRB2*	5	1617
Adrb-3	8	1056	*ADRB3*	8	1056
Afp	5	259 380 521 591	*AFP*	4	259 592 1282 1336 1497
Ags	X	389 785 1035 1149	*GLA*	X	482 495
Ah	12	1185	*AHHR*	2	1121
Ahd-2	19	1469 1470	*ALDH1*	9	658 1215
Ahd-4	11	633	*ALDH3*	17	1287
Ak-1	2	480 493	*AK1*	9	23 293 410 411 441 823 1194
Ak-2	4	812	*AK2*	1	217 1342
Akp-3	1	1562	*ALPI*	2	1374
Akt	12	274	*AKT1*	14	1402
Alas-2	X	1302	*ALAS2*	X	53 121
Alb-1	5	259 380 1107	*ALB*	4	259 592 730 1040 1336 1497 1543
Amel	X	242	*AMELX*	X	1057
Amh	10	755	*AMH*	19	285
Ampd-1	3	757 1025	*AMPD1*	1	1025
Amy-1	3	132 137 535 619 819 1109	*AMY1A*	1	1031 1483 1629
Amy-2	3	185 619 757 1025 1026 1028 1109 1319	*AMY2A*	1	1031 1483 1629
Ang	14	1404	*ANG*	14	1546
Ank-1	8	1553	*ANK1*	8	477 885
Apnh	4	925	*APNH*	1	868 925 936 937
Apoa-1	9	35 418 1623	*APOA1*	11	39 734 833 982 1306
Apoa-2	1	882 883 981 1026 1319	*APOA2*	1	193 770 804 876 981 1018 1252
Apoa-4	9	501	*APOA4*	11	982 1455
Apob	12	884	*APOB*	2	111 834
Apoe	7	195 884 1291 1292	*APOE*	19	161 176 881
App	16	260 680 878 892 1225 1232	*APP*	21	127 128 260 561 780 878 1160 1225 1401 1444
Aprt	8	226 785 1133 1144 1472	*APRT*	16	204 504 718 746 829 909 1472
Araf	X	57 158 660	*ARAF1*	X	158 660 762
Arnt	3	162	*ARNT*	1	162
As-1s	13	338	*ARSB*	5	458 482
As-2	15	496	*ARSA*	22	496 497
Asl	5	815	*ASL*	7	1080 1473 1474
Ass-1	2	689 690 1065 1365	*ASS*	9	216 1112
At-3	1	1026 1319 1322	*AT3*	1	193 194 731 945
Atp1a1	3	349 757 1026 1319 1612	*ATP1A1*	1	349 1612
Atp1a2	1	349 759 1026 1291 1319 1612	*ATP1A2*	1	349 1612
Atp1a3	7	225 349 1292 1612	*ATP1A3*	19	349 589 1162 1612
Atp1b1	1	349 1026 1319 1612	*ATP1B1*	1	349 1612
Atp1b2	11	349 646 899	*ATP1B2*	17	349 646
b	4	472 628	*TYRP*	9	271
B2m	2	907 977 978 1246 1363 1504	*B2M*	15	438 551 1332
Bcl-2	1	1000 1001 1002	*BCL2*	18	1092 1357
Bcm-1	1	1584	*CD48*	1	87
Bcr	10	725	*BCR*	22	189 365
Bdnf	2	1141	*BDNF*	11	897 1141
Bf	17	1070 1071	*BF*	6	22 26 218 578
Bgl	9	113 150 239 240 1043 1077 1149	*GLB1*	3	181 1077
Blvr	2	1166 1514	*BLVR*	7	969 1153 1166
Bmp1	14	227 228	*BMP1*	8	1433
Bmp2a	2	386 1504	*BMP2*	20	1433
Bmp3	5	386	*BMP3*	4	1433
Bpa	X	27 610 1180	*CDPX2*	X	27
C2	17	554 1033	*C2*	6	26 218 351
C3	17	322 506 890 1050 1069 1264	*C3*	19	68 161 176 506 668 729 862 1331 1556
C4	17	1283	*C4*	6	218 1127 1158 1460
C4bp	1	1026 1440	*C4BPB*	1	618 1251
C6	15	598 1129 1130	*C6*	5	700 1557
C7	15	1129 1130	*C7*	5	700
C8b	4	1443	*C8B*	1	738 1376
Cacy	3	394 757 1026 1319	*CACY*	1	394 453
Calb	4	472 1111	*CALB1*	8	1155 1156 1157
Calc	7	607 816 1084 1291 1292	*CALCA*	11	541 607 638 902 1223
Camk4	18	1353	*CAMK4*	5	1354
Capl	3	394 1508	*CAPL*	1	394 1508
Car-1	3	119 417	*CA1*	8	199 348 742
Car-2	3	417 1026 1028	*CA2*	8	1059 1510 1587
Car-3	3	99	*CA3*	8	99 348 742
Cas-1	2	449 620 1365 1504	*CAT*	11	296 345 526 527 541 542 642 692 722 976 1067 1204
Cbl-2	9	1233	*CBL2*	11	820 1294
Cbs	17	1038 1410	*CBS*	21	1038 1225 1410
Ccg-1	X	374	*CCG1*	X	1317
Cchl1a2	14	270	*CCHL1A2*	3	270
Cck	9	505 756	*CCK*	3	1437
Cd14	18	455	*CD14*	5	558
Cd18	10	891 894	*CD18*	21	18 894 1174 1225 1379 1406
Cd28	1	590 643	*CD28*	2	590 806
Cdc2a	10	725	*CDC2*	10	1089 1393 1396
Cf-5	1	1319 1530	*F5*	1	324 945 1239 1521 1530
Cf-8	X	159 389 610 1034 1035	*F8C*	X	43 461
Cf-9	X	56 389 610 1034 1035 1036	*F9*	X	56 147 205 235 921 1101 1161 1208 1309
Cfh	1	382 1026 1319 1322	*HF*	1	618 1250
Ckmm	7	225 1290 1291 1292	*CKM*	19	176 781 1311
Col2a-1	15	252	*COL2A1*	12	32 65 1439
Col3a-1	1	1307	*COL3A1*	2	316 1488
Col6a-1	10	725 891 894	*COL6A1*	21	315 499 894 955 1225 1536 1537
Col6a-2	10	725 891 894	*COL6A2*	21	315 499 894 1225 1536 1537
Col6a-3	1	1307	*COL6A3*	2	1307 1536 1537

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Table 1. *Continued.*

Mouse Gene	Chr	References	Human Gene	Chr	References
Cola-1	11	184 1030	*COL1A1*	17	184 277 564 842 1037 1202 1263 1346 1378 1412 1486 1487 1593
Cola-2	6	679 1413	*COL1A2*	7	140 149 163 564 566 822 1202 1346 1413 1486
Cp	9	70 71 1467	*CP*	3	70 71 1087 1239 1262 1467 1539 1602
Cpa	6	634	*CPA1*	7	635
Cr-2	1	801	*CR2*	1	193 1538
Crbp	9	372	*RBP1*	3	287 372 1248
Crbp-2	9	372	*RBP2*	3	372
Crp	1	759 1625	*CRP*	1	474 1625
Crya-1	17	741 1370 1410	*CRYA1*	21	1206 1225 1410
Cryg-1	1	1000 1368 1369 1371 1634 1635	*CRYG1*	2	1634
Cs	10	301	*CS*	12	306 1507
Csfg	11	183 184	*CSF3*	17	184 728 837 1592
Csfgm	11	183 184 556 848 1037 1534	*CSF2*	5	508 664 1037
Csfm	3	185 535	*CSF1*	5	184 968 1020 1177
Csfmr	18	626 705 1377	*CSF1R*	5	567 568 1099 1501
Ctla-1	14	227 228 312 323 594 926	*CTLA1*	14	323 594 695 767 869
Ctla-3	13	528 724 926 1115	*CTLA3*	5	528 695
Ctla-4	1	590 643 926	*CTLA4*	2	175 340 590 806
Ctrb	8	634 1524 1525	*CTRB*	16	204 636 718 1073 1275 1551
Cybb	X	158 244 1036	*CYBB*	X	158 484
Cyp11a	9	1623	*CYP11A*	15	276
Cyp17	19	1624	*CYP17*	10	941
Cyp19	9	1623	*CYP19*	15	255
Cyp1a1	9	614 1490 1623	*CYP1A1*	15	613 1398
Cyp21	17	1033	*CYP21*	6	52 586 1158
Cyp2a	7	754 988 1291	*CYP2A*	19	66 161 176 346 444 1520
Cyp2b	7	880 988 1291 1292 1360 1586	*CYP2B*	19	990 1181
Cyp2c	19	965 1115	*CYP2C*	10	964 1240 1397
Cyp2d	15	550 1582	*CYP2D*	22	413
Cyp2e1	7	549 988	*CYP2E*	10	1496
Cyp2f	7	1105	*CYP2F1*	19	1105
Cyp3	5	1361	*CYP3A*	7	163 1240 1397
Cyp4a	4	753 989	*CYP4B1*	1	1104
D11Bay1	11	845	*MDCR*	17	845
D19F11S1h	7	1291	*D19F11S1*	19	1303
D19S19h	7	1290 1291 1292	*D19S19*	19	1162
D19S51h	7	225	*D19S51*	19	344 708
D21S16h	16	260 680 1225	*D21S16*	21	260 1225
D21S52h	16	260 1225	*D21S52*	21	260 1225
D21S56h	17	260	*D21S56*	21	260 1225
D21S58h	16	260	*D21S58*	21	260 1174 1225
D3F15S2h	9	1078	*D3F15S2*	3	1082
D3S92h	9	813	*D3S92*	3	813
D3S93h	9	813	*D3S93*	3	813
D4S43h	5	259	*D4S43*	4	259
D4S62h	5	259	*D4S62*	4	259
D4S76h	5	259 521	*D4S76*	4	259
D4S80h	5	259	*D4S80*	4	259
Defcr	8	1132	*DEF1*	8	1382
Des	1	865	*DES*	2	1205
Dhfr	13	724 750 1115	*DHFR*	5	29 512
Dia-1	15	496 1436	*DIA1*	22	469 497 641 723
Dmdl	10	187	*DMDL*	6	187
DXPas8	X	601 610	*DXS52*	X	117 1145
DXS120h	X	996	*DXS120*	X	621
DXS144Eh	X	56 611	*DXS144E*	X	56 1116
DXS253Eh	X	56 159 462 610	*DXS253E*	X	56 462
DXS32h	X	57	*DXS32*	X	358
Egf	3	185 198 1026 1028 1627	*EGF*	4	154 1023 1040 1336 1627
Egr-2	10	251	*EGR2*	10	714
Ela-1	15	634	*ELA1*	12	635 636
En-1	1	616 716 911	*EN1*	2	874
En-2	5	716 911	*EN2*	7	874 1186
Eno-1	4	333 472 812	*ENO1*	1	161 217 450 532 966 1342
Eph-1	1	886 1434	*EPHX*	1	1366
Epo	5	805 956	*EPO*	7	830
Epor	9	191	*EPOR*	19	191
Erba	11	183 184 1037 1115 1274 1628	*THRA1*	17	842 1037 1188 1399 1593 1628
Erbb	11	184 1037 1115 1356 1628	*EGFR*	7	184 1037 1395 1399
Erbb-2	11	183 184 1115	*ERBB2*	17	184 479 1191 1592 1593
Ercc-2	7	1290 1291 1292	*ERCC2*	19	1016 1372
Es-10	14	312 1170 1285 1579	*ESD*	13	141 142 143 256 406 577 1506 1523
Es-17	9	35 137 1131	*ESA4*	11	798 1339
Es-6	8	1169	*ESB3*	16	54
Estr	10	725	*ESR*	6	555 1639
Ets-1	9	756 1531	*ETS1*	11	103 250 359 385 1293 1359 1531
Ets-2	16	260 680 892 1225 1226 1228 1531	*ETS2*	21	45 260 1225 1268 1269 1531
Evi-2	11	183 184	*EVI2A*	17	1120
Evx-2	2	94	*EVX2*	2	377
Fabpi	3	1425	*FABP2*	4	1385
Fabpl	6	1425	*FABP1*	2	1385
Fcer1a	1	759 1026 1319	*FCER1A*	1	1462
Fes	7	131 591 1291 1292	*FES*	15	326 593 602 702
Fgf-6	6	355	*FGF6*	12	908
Fgg	3	132	*FGG*	4	217 608 1336
Fgr	4	229	*FGR*	1	400 401
Fim-1	13	724	*FIM1*	6	1501
Fim-3	3	535 1377 1467	*FIM3*	3	1467 1501
Flt-3	5	1256	*FLT3*	13	1256
Fn-1	1	1369 1634 1635	*FN1*	2	776 1634
Fos	12	120 378 864	*FOS*	14	72 864
Fpgs	2	480	*FPGS*	9	709
Fshb	2	1365 1504	*FSHB*	11	538 539 541 542 642 1204 1528
Fth	19	544 1596	*FTH1*	11	1588
Fuca	4	808	*FUCA1*	1	192 215 217 400 481 1493
Fyn	10	725	*FYN*	6	1190
G6pd	X	159 248 906 912 920 1035 1165	*G6PD*	X	43 912 1148 1161 1426
Gaa	11	914	*GAA*	17	576 913 1286 1333 1593
Gabra-3	X	76 375 610	*GABRA3*	X	186
Gabrb-3	7	1515	*GABRB3*	15	1516
Gad-1	2	152	*GAD1*	2	1381
Galt	4	1047	*GALT*	9	15 180 823 1012 1013 1549
Gap43	16	680 1225 1230 1231	*GAP43*	3	1225 1231
Gapd	6	107 178 1198	*GAPD*	12	107 179 609 832
Gba	3	1026 1126 1319	*GBA*	1	1126
Gc	5	1600	*GC*	4	294 1336 1600
Gcg	2	816 1365	*GCG*	2	1305 1482
Gdc-1	15	8 581 625 670 789 790 975	*GPD1*	12	748
Gf-1	X	249	*GF1*	X	1636
Gfap	11	115	*GFAP*	17	172
Ggc	6	182 1491	*GCTG*	7	122
Ggtb	4	472 1327 1428	*GGTB2*	9	405 1328 1428
Gh	11	424 688	*GH1*	17	842 1263 1412 1487 1592
Ghr	15	84 415	*GHR*	5	37 84
Gja-1	10	650	*GJA1*	6	650
Gjb-1	X	650	*GJB1*	X	650
Gjb-2	14	650	*GJB2*	13	650
Gli	10	725 786	*GLI*	12	760
Glk	11	787 948 995 1037	*GALK*	17	426 1037 1592 1593
Glo-1	17	395 973 994 1050 1264	*GLO1*	6	106 126 578 1540
Glra2	X	375	*GLRA2*	X	407 562 1350
Gls	1	999	*GLS*	2	999 1008
Glud	14	1330 1494	*GLUD*	10	585
Glut-1	4	472 623	*GLUT1*	1	192 400 1344 1428
Glut-2	3	623	*GLUT2*	3	510
Glut-3	6	623	*GLUT3*	12	739

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Table 1. *Continued.*

Mouse Gene	Chr	References	Human Gene	Chr	References
Glut-4	11	623	*GLUT4*	17	442
Gnai-2	9	756	*GNAI2B*	3	130 148 1380
Gnas	2	46 130	*GNAS1*	20	130 553 859 860 1380
Gnat-1	9	46 130 329 783	*GNAT1*	3	130 1380
Gnb-1	4	130 783	*GNB1*	1	130 858 1380
Gnb-2	5	130 783	*GNB2*	7	130
Gnb-3	8	783	*GNB3*	12	858 1006
Gnrh	14	1565	*LHRH*	8	1613
Gntl	1	989	*UGT1*	2	587 588
Got-1	19	246 367 1296	*GOT1*	10	266 267 309 603 1340
Got-2	8	367	*GOT2*	16	697 1476
Gpi-1	7	366 674 1291	*GPI*	19	160 161 668 881
Gpt-1	15	257 419	*GPT*	8	275 696 749 970 1249 1561
Gr-1	8	1108	*GSR*	8	353
Grl-1	18	490 548 705 1115	*GRL*	5	520 536 1466
Grmp	1	1530	*GRMP*	1	1530
Gst3	1	989	*GST3*	11	134 1419
Gsta	9	321 737 756 989 1324	*GST2*	6	133 134 737
Gus-s	5	521 1149	*GUSB*	7	21 109 234 263 337 483 571 809 1310
H-2	17	765 766	*HLA*	6	20 126 578 817 1463
Hal	10	1447	*HAL*	12	1447 1454
Hba	11	1266 1356	*HBA1*	16	746 1037
Hbb	7	674 1266 1291	*HBB*	11	232 387 447 507 526 527 539 642 692 831 843 902 976 1027
Hc	2	120 291 382 1072 1365	*C5*	9	698 699 854
Hck-1	2	1363	*HCK*	20	1207
Hexa	9	1324	*HEXA*	15	265 1058 1060
Hexb	13	724 750	*HEXB*	5	328 482
His-1	2	51	*HIS1*	2	51
Hk-1	10	814	*HK1*	10	1340
Hmg14	16	1159	*HMG14*	21	1159 1173 1174
Hmgcr	13	1416	*HMGCR*	5	1011
Hox-1	6	182 390 451 958 1209	*HOX1*	7	3 182 210 451 1209
Hox-2	11	184 390 597 715 1029 1037 1210	*HOX2*	17	3 184 210 439 479 576 715 842 875 1037 1210 1263 1592 1593
Hox-3	15	1209	*HOX3*	12	3 210 727
Hox-4	2	448 1409	*HOX4*	2	3 210
Hox-7	5	617	*HOX7*	4	206 685
Hp	8	95 96 226	*HP*	16	504 718 746 896 1073 1247 1358
Hprt	X	56 57 243 248 494 889 920 1035 1036	*HPRT*	X	56 495 1148
Hras-1	7	1197 1271 1274 1291 1292	*HRAS*	11	232 447 526 527 539 542 642 692 902 976 1027 1118 1192
Hrc	7	622	*HRC*	19	622
Hsp70	17	518	*HSPA1*	6	545 596 1288 1591
Hstf-1	7	1167	*HSTF1*	11	575 663
Htr-2	14	645 1383	*HTR2*	13	645 1383
Htr1a	13	1115 1416	*HTR1A*	5	443
Hya	Y	960 1245	*HY*	Y	825
Hyp	X	416	*HYP*	X	1224 1465
Icam-1	9	69 1324	*ICAM1*	19	563
Ide	19	14	*IDE*	10	14 428
Idh-1	1	330 674 1369	*IDH1*	2	485 582 583
Idh-2	7	155 814	*IDH2*	15	177 572
Ifa	4	202 229 261 335 336 368 472 877 1045 1428 1505	*IFNA*	9	385 1136 1137 1428 1480
Ifb	4	335 1045 1428 1505	*IFNB1*	9	963 1136 1137 1428 1480
Ifg	10	725 786 1081	*IFNG*	12	1085 1480
Ifgr	10	786 826	*IFNGR1*	6	720 821 826 841
Ifrc	16	299	*IFNAR*	21	238 821 1010 1442 1632
Igf-1	10	725 1448	*IGF1*	12	1301
Igf1r	7	1290 1291 1292 1415	*IGF1R*	15	498
Igf2r	17	826	*IGF2R*	6	826
Igh	12	719 1446	*IGH*	14	471 1062
Igj	5	1597	*IGJ*	4	942
Igk	6	182 533 1243 1422	*IGK*	2	9 105 898 952
Igl-1	16	379 429 430 488 680 1225 1226	*IGLC1*	22	354 432
Ii	18	350 1237 1598	*DHLAG*	5	278 523
Il-1a	2	139 381 1355 1363	*IL1A*	2	1007
Il-1b	2	139 381 1355	*IL1B*	2	1532
Il-2	3	463	*IL2*	4	1040 1316 1336 1338
Il-3	11	75 183 184 675 848 998 1115 1534	*IL3*	5	184 508
Il-4	11	847 1534	*IL4*	5	236 1417 1441
Il-5	11	847 1534 1569	*IL5*	5	236 1441
Il-6	5	1004	*IL6*	7	1417 1430
Il-9	13	1003	*IL9*	5	1003 1008
Il4r	7	1199 1420	*IL4R*	16	1199
Inha	1	89 90	*INHA*	2	89
Inhba	13	89 90 724	*INHBA*	7	89 90
Inhbb	1	89 90	*INHBB*	2	89 90
Ins-2	7	810	*INS*	11	232 447 539 542 595 642 692 843 902 976 1135
Insr	8	226 826 1522	*INSR*	19	161 421 799 826 1064 1616
Int-2	7	1133 1168	*INT2*	11	67 220
Int-4	11	184	*WNT3*	17	1241
Itp	2	811 1348 1456	*ITPA*	20	637 967 1014
Jun	4	229 938 1329	*JUN*	1	41 579 938
Junb	8	938 1329	*JUNB*	19	938
Jund	8	938 1329	*JUND*	19	938
Kal	7	917 1291	*KLK1*	19	435 1304
Kit	5	230 522 1614	*KIT*	4	922 1614 1619
Kras-2	6	201 524 1243 1271 1274	*KRAS2*	12	65 953 1118 1276 1277 1280
Krt-1	11	975 1044	*KRT1*	17	1253 1255
Krt-2	15	292	*KRT2*	12	1253 1254
Llcam	X	241 610 933	*L1CAM*	X	241 933
Lama	17	740	*LAMA*	18	931 1055
Lamb1-1	12	423 1318	*LAMB1*	7	1005 1182
Lamb2	1	423 740 1026 1319	*LAMB2*	1	193 939 940 1110 1345
Lcat	8	1298	*LCAT*	16	61 1073 1298
Lck	4	229 472 1428	*LCK*	1	910 1428
Ldh-1	7	156 814 1117	*LDHA*	11	491 525 539 542 642 798 843 1339 1606
Ldh-2	6	156 1163	*LDHB*	12	258 609 710 711 797 832
Ldh-3	7	1281	*LDHC*	11	408 409 732 863
Ldlr	9	501 756 1314 1324 1522	*LDLR*	19	161 486 729 1064 1314 1331 1449
Lef-1	3	987	*LEF1*	4	987
Lhb	7	1076 1084 1291 1292	*LHB*	19	1076
Lif	11	778	*LIF*	22	190 365 1418
Lip-1	19	773	*LIPA*	10	773 775 1103
Lmyc-1	4	207 229 472 1428	*MYCL1*	1	400 1428 1631
Lpc-1	19	640	*ANX1*	9	661 662
Lpl	8	473 761	*LPL*	8	1387 1389
Ltf	9	1461	*LTF*	3	1083 1461
Lv	4	472 673 674 1045	*ALAD*	9	28 98 410 441 1193
Ly-1	19	4 659	*CD5*	11	530 659
Ly-11	2	974	*S13*	22	165
Ly-15	7	295 632	*CD11A*	16	295
Ly-17	1	671 759 1026 1319	*FCGR2A*	1	570
Ly-2	6	182 684	*CD8A*	2	145 1411
Ly-24	2	632	*CD44*	11	19
Ly-3	6	533 703	*CD8B*	2	703 1394
Ly-37	3	757 1026 1319 1326	*CD2*	1	166
Ly-38	3	1021	*CD1A*	1	203 1021

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Table 1. *Continued.*

Mouse Gene	Chr	References	Human Gene	Chr	References
Ly-4	6	459 959 1375	*CD4*	12	682
Ly-42	1	1222	*FCER2*	19	1545
Ly-44	19	1458 1459	*CD20*	11	250 1457
Ly-48	7	63	*CD43*	16	1150 1151
Ly-5	1	1026 1319 1322 1334	*CD45*	1	17 18
Ly-6	15	625 670 844 975	*CD59*	11	478
Lyn	4	229	*LYN*	8	1599
Mag	7	79 80 1291 1292	*MAG*	19	79 80 1284
Maoa	X	376	*MAOA*	X	818 861 1142 1143
Maob	X	376	*MAOB*	X	818
Mbp	18	548 705 777 1115 1242 1351	*MBP*	18	726 1295 1384
Mcf-2	X	933	*MCF2*	X	933 1101 1484
mdx	X	196 224 245 436 1165	*DMD*	X	254 1041
Met	6	361	*MET*	7	140 362 403 445 822 1075 1391 1518 1554
Mgsa	5	1273 1321	*GRO1*	4	1238
Mlvi-2	15	10 11 580 581	*MLVI2*	5	30 31
Mlvi-4	15	1485	*MLVI4*	8	1485
Mo	X	222 560	*MNK*	X	733
Mod-1	9	35 137 674 737 1343	*ME1*	6	258 737
Mod-2	7	247 1343	*ME2*	6	779
Mor-1	5	1343	*MDH2*	7	109 306 1337 1506
Mos	4	229 334 1201 1423 1428 1468	*MOS*	8	223 1091 1195 1428 1464
Mpi-1	9	1106	*MPI*	15	264 265 797 1506
Mpo	11	184	*MPO*	17	184 237 676 824 838 1263 1592 1630
Mt-1	8	226 304 473 537 1133 1313	*MT1*	16	735 836 1299 1547
Mt-2	8	1133 1313	*MT2*	16	735 836 1299 1547
Mx-1	16	680 1225 1230 1403	*MX1*	21	639 1174
Myb	10	725 786 1271 1274	*MYB*	6	326 593 953 1280
Myc	15	7 11 311 580 581 670 905 1272 1274 1526 1527	*MYC*	8	325 905 1272 1280 1438 1445
Myhc-a	14	1552	*MYH6*	14	919 1270
Myhc-b	14	1552	*MYH7*	14	1203 1270
Myhs	11	184 319 851 1037 1552	*MYH1*	17	1037
Myla	11	184 1244	*MYLA*	17	184 281 1315
Mylc	9	81	*MYL3*	3	281 342
Mylf	1	318 1000 1244 1261	*MYL1*	2	280 1261 1325
Myod-1	7	225 1291 1312	*MYOD1*	11	529 1312
Myog	1	1124	*MYOG*	1	1124
Ncam	9	383 1324	*NCAM*	11	103 250 1100 1293 1626
Ncf-2	1	492	*NCF2*	1	492
Neu-1	17	460 764 1283 1580 1581	*NEU*	6	586
Nfh	11	932	*NEFH*	22	923
Nfl	14	867	*NFL*	8	672
Ngfb	3	185 757 1627	*NGFB*	1	339 398 400 489 980 1031 1119 1627
Ngfr	11	184	*NGFR*	17	184 439 576 666 842 1263 1593
Nmyc-1	12	207	*MYCN*	2	1308
Np-1	14	312 594 1285 1579	*NP*	14	487 594 1234 1236
Nras	3	185 361 979 1028 1267	*NRAS*	1	347 356 357 364 398 953 979 1031 1119 1178 1187 1212
Ntf-3	6	1141	*NTF3*	12	897 1141
Oat	7	1122 1123	*OAT*	10	997 1096 1122 1123 1220 1589
Odc	12	305 1511	*ODC1*	2	1213 1574
Orm-1	4	96 97 1045 1428	*ORM1*	9	23 410 411 441 823 1428 1533
Orm-2	4	96 97 1045	*ORM2*	9	1533
Osbp	19	652 857	*OSBP*	11	652 857
Otc	X	158 370 393 920 1035 1036	*OTC*	X	158 253 802 871
Otf-1	1	654 655 1364	*OTF1*	1	654 655
Otf-2	7	1291 1364	*OTF2*	19	771
Pah	10	136 725	*PAH*	12	1585
Pdea	18	331 705	*PDEA*	5	1184
Pdeb	5	146	*PDEB*	4	1535
Pdgfb	15	7 11 581 670 788 975	*PDGFB*	22	93 327 365 702 717
Pdgfra	5	653	*PDGFRA*	4	569 653
Pdgfrb	18	705 1115 1414	*PDGFRB*	5	772 1618
Pdha-1	X	167	*PDHA1*	X	168 169 1427
Pdhal	19	167	*PDHA2*	4	169
Pep-1	18	493 853	*PEPA*	18	309 944
Pep-2	10	493 1578	*PEPB*	12	258 583 609 710 711
Pep-3	1	247 1000	*PEPC*	1	161 1098 1265 1342
Pep-4	7	814 1144 1367	*PEPD*	19	68 161 170 346 729 881 913 946 947
Pep-7	5	814 1144 1172	*PEPS*	4	135 170 1300 1341
Pfc	X	436 828	*PFC*	X	557
Pfk-4	15	47 48	*PFKX*	12	47 48
Pgam-1	19	513	*PGAM1*	10	721
Pgd	4	812	*PGD*	1	217 966 1541 1550
Pgk-1	X	12 248 389 791	*PGK1*	X	802
Pgk-2	17	12 414 1509	*PGK2*	19	515 516
Pgm-1	5	259 674	*PGM2*	4	135 1386 1560
Pgm-2	4	247 812	*PGM1*	1	161 192 259 297 398 400 966 1098 1119 1265 1342
Pgm-3	9	706 737 1048	*PGM3*	6	712 737 817
Pgr	9	1079	*PGR*	11	250 927 928 1258
Pgy-1	5	915	*PGY1*	7	288 971 1481
Phka	X	77	*PHK*	X	984
Pim-1	17	40 615 1049	*PIM1*	6	317 1054
Pk-3	9	704 1164 1171	*PKM2*	15	264 265 797 1189 1506
Pkca	11	184 1615	*PRKCA*	17	184 298 824 842 1412
Pkcc	7	225 1291 1292 1615	*PRKCG*	19	298 707
Pl-1	13	688	*CSH1*	17	1592
Pl-2	13	688	*CSH2*	17	1592
Plat	8	226 473 1219	*PLAT*	8	108 1513 1611
Plau	14	227 228 1219	*PLAU*	10	1218
Plg	17	42 363	*PLG*	6	402 500 1039 1542
Plp	X	343 920	*PLP*	X	1563 1564 1603
Pnd	4	229 1428 1609	*PND*	1	192 1119 1428 1608 1609
Pola	X	6	*POLA*	X	1583
Polb	8	950	*POLB*	8	208 209 954
Pomc-1	12	1495	*POMC*	2	1138 1629
Por	6	1361	*POR*	7	1335
Prgs	16	300	*PRGS*	21	231 302 303
Prl	13	688	*PRL*	6	433 434
Prm-1	16	599 680 1225 1226 1229	*PRM1*	16	793 1225 1227 1229
Prn-p	2	213 1365 1388 1548	*PRNP*	20	1388 1390
Prp	6	58 60	*PRH1*	12	59 65 752
Psph	5	811	*PSP*	7	337 774
Pth	7	816 1291	*PTH*	11	507 607 692 843 902 976 1477
Pthlh	6	604 605 1429	*PTHLH*	12	901 1429
Ptpt	18	1279	*PTPN2*	18	1279
Pva	15	8 581 1637 1638	*PVALB*	22	110
Pvs	9	1324	*PVS*	19	729 1304 1349
Pvt-1	15	10 11 581 1512	*PVT1*	8	559
Pygb	2	544	*PYGB*	20	1094
Pygl	12	544	*PYGL*	14	1093
Pygm	19	544	*PYGM*	11	214
Pyp	10	814	*PP*	10	262 470 946 1102
Qdpr	5	259	*QDPR*	4	259 893
Raf-1	6	784 1243 1467	*RAF1*	3	138 1467

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Table 1. *Continued.*

Mouse Gene	Chr	References	Human Gene	Chr	References
Rara	11	935	*RARA*	17	934 935
Rarb	14	227 228 935	*RARB*	3	924 935
Rarg	15	935	*RARG*	12	935
Rasa	13	649 656 657	*RASA*	5	649 656 657
Rb-1	14	312 651 1408	*RB1*	13	129 141 144 406 577 612 651 1297 1500 1523 1559
Rbp-3	14	332 783	*RBP3*	10	446 687
Rbp-5	9	1498	*RBP5*	15	573 1499
rds	17	369	*RDS*	6	1479
Rel	11	171 183 184	*REL*	2	171 173 184
Ren-1	1	273 1000 1322 1570	*REN*	1	193 272 286 514 565 980 1119
Rho	6	425 783	*RHO*	3	1068
Rmrpr	4	647 648	*RMRPR*	9	647
Rnu1b-1	3	132	*RNU1*	1	1037 1088
Ros-1	10	725	*ROS1*	6	1053 1621
Rpn-1	6	82	*RPN1*	3	82
Rpn-2	2	82 1183	*RPN2*	20	82 873
Rpo2-1	11	188 1037 1196	*POLR2*	17	211 576 842
Rps14	18	705	*RPS14*	5	1061
Rps4x	X	1633	*RPS4X*	X	465
Rras	7	879 1291	*RRAS*	19	879
Rrm1	7	153	*RRM1*	11	153
Rrm2	12	1604 1605	*RRM2*	2	1604 1605
Rsvp	X	610 1034 1035	*GCP*	X	1161
Ryr	7	225	*RYR1*	19	895
S100b	10	725 891 894	*S100B*	21	24 25 404 894 1225
Saa-1	7	1452	*SAA*	11	542 769
Sag	1	330 783	*SAG*	2	1097
Sap	1	758 759 916 1022 1026 1319 1555	*APCS*	1	474 475 678
Scg-1	2	694 1200	*SCG1*	20	308
Scl	4	102	*SCL*	1	101
Scn2a	2	900	*SCN2A*	2	872
Sdh-1	2	33	*SORD*	15	391
Sey	2	540 624 1504	*AN2*	11	345 540
Sfpi-1	2	1019 1502	*SPI1*	11	1502
Sftp-1	14	543	*SFTP1*	10	468
Sftp-2	14	543	*SFTP2*	8	466 467
Sgne-1	2	930	*SGNE1*	15	930
Shbg	11	713	*SHBG*	17	116
sla	X	440	*ASB*	X	384
Smst	16	680 816 1084 1225 1226 1231	*SST*	3	45 1231 1629
Snrp70	7	1291	*SNRP70*	19	86 1304
Sod-1	16	178 260 299 494 680 892 1226	*SOD1*	21	55 260 303 561 1225 1362 1442 1590
Sod-2	17	464 1432	*SOD2*	6	310
Sparc	11	75 597 918 1037	*SPARC*	5	1037 1424
Spna-1	1	120 667 758 759 1026 1319 1323	*SPTA1*	1	193 667 678 945 1119 1214
Spna-2	2	91 120 1365	*SPTAN1*	9	91 855 961
Spnb-1	12	120 827	*SPTB*	14	511 1529
Spp-1	5	456 457	*SPP1*	4	1622
Src	2	78 131 591 1271 1274 1363	*SRC*	20	839 840 1154 1278 1280
Srd5a-1	13	693	*SRD5A1*	5	693
Sts	X	517 744 745 1052	*STS*	X	314 1017 1575 1576
Surf	2	1409	*SURF*	9	1620
Syb-1	6	36	*SYB1*	12	36
Syb-2	11	36	*SYB2*	17	36
Syn-1	X	158 1036 1607	*SYN1*	X	158 762 1607
Syp	X	1139 1140	*SYP*	X	1139 1140
T3d	9	856 993	*CD3D*	11	437 856 993 1293 1400 1503 1626
T3e	9	547 856 993	*CD3E*	11	250 437 547 856 993 1293 1626
T3g	9	547 756 795 856	*CD3G*	11	250 437 547 795 856
T3z	1	1026 1319	*CD3Z*	1	1009
Ta	X	56	*EDA*	X	56 279 584
Tapa-1	7	34	*TAPA1*	11	34
Tat	8	473 1032 1133 1176	*TAT*	16	88 204 1073 1074 1551
Tcf-1	5	62 549 800 1128	*TCF1*	12	62 800
Tcf-2	11	986	*TCF2*	17	1 986
Tcn-2	11	502 503	*TCN2*	22	44 412
Tcp-1	17	890 1567 1568	*TCP1*	6	125 284 476 1566 1568
Tcp-10a	17	197	*TCP10*	6	118
Tcp-10b	17	118	*TCP10*	6	118
Tcp-10c	17	118	*TCP10*	6	118
Tcra	14	227 228 269 312 371 594 792	*TCRA*	14	73 290 594 695 1400 1405
Tcrb	6	182 200 849	*TCRB*	7	74 140 200 289 822 835 1024 1400 1517
Tcrd	14	269	*TCRD*	14	422
Tcrg	13	627 724 792 1134	*TCRG*	7	627 1024 1042 1400
Tcte-1	17	118 1289	*TCTE1*	6	118 803
Tdt	19	1610	*DNTT*	10	1610
Tdy	Y	960 1147 1245	*TDF*	Y	1147
Tfm	X	887	*AR*	X	164 983 985 1558
Tgfb-1	7	83 225 386 509 1291	*TGFB1*	19	83 161 509
Tgfb-2	1	83 386	*TGFB2*	1	83
Tgfb-3	12	83 386	*TGFB3*	14	83
Tgn	15	8 581 1451	*TG*	8	112 114 157 1587
Th	7	151 1291	*TH*	11	542 692 1027 1125 1594 1595
Thbs-1	2	691	*THBS1*	15	691 1577
Thy-1	9	396 756 1324	*THY1*	11	250 519 1235 1293 1626
Timp	X	686 1034 1035 1036	*TIMP*	X	665
Tk-1	11	644 787 914 948 1037	*TK1*	17	576 798 842 1037 1063 1593
Tnfa	17	1033 1090	*TNFA*	6	219 677 1216 1217 1392
Tnfb	17	1090	*TNFB*	6	219 677 1216 1217 1392
Tnfr-1	4	552	*TNFR1*	12	64 373
Tnfr-2	6	552	*TNFR2*	1	64 747
Tph	7	1407	*TPH*	11	307 846 1407
Tpi-1	6	852 994 1198	*TPI1*	12	609 710 711 797 832
Tpo	12	683	*TPO*	2	360
Tpx-1	17	736	*TPX1*	6	736
Trf	9	70 240 756 1043 1324	*TF*	3	70 943 1539 1601
Trp53	11	183 184 1037 1257	*TP53*	17	104 184 576 681 951 1037 1593
Try-1	6	634	*TRY1*	7	635 636
Tse-1	11	1037 1176	*TSE1*	17	1037 1176
Tsha	4	229 782 1076 1084	*CGA*	6	957 1076
Tshb	3	757 782 1026 1086 1319	*TSHB*	1	397 398 399 400 1086 1475
Tshr	12	16	*TSHR*	14	16 866 1259
Tyr	7	85 1291 1292	*TYR*	11	85 250
Um	8	420 473 904	*UVO*	16	903 904 1073
Umph-2	11	1037 1144 1421 1572 1573	*UMPH2*	17	1037 1478 1571 1593
Upg-1	17	1431	*PGC*	6	1152 1221 1435
Ups	9	35	*PBGD*	11	250 531 972 1066
Vcl	14	1544	*VCL*	10	1544
Vil	1	1000 1260 1261	*VIL1*	2	1260 1261
Vim	2	929	*VIM*	10	454 1205
Wnt-1	15	7 11 581 975 1114 1168	*WNT1*	12	38 1113 1492
Wnt-2	6	233 962	*WNT2*	7	1519
Xce	X	27 221	*XIC*	X	27
Xpa	4	870	*XPA*	9	606
Xrcc-1	7	1291	*XRCC1*	19	1016 1347
Xt	13	888	*GCPS*	7	174
Zfp-3	11	49 50 1046	*ZFP3*	17	50
Zfp-36	7	1450	*ZFP36*	19	1450
Zfx	X	388	*ZFX*	X	388 1146 1147
Zfy-1	Y	1051 1147	*ZFY*	Y	13 1147

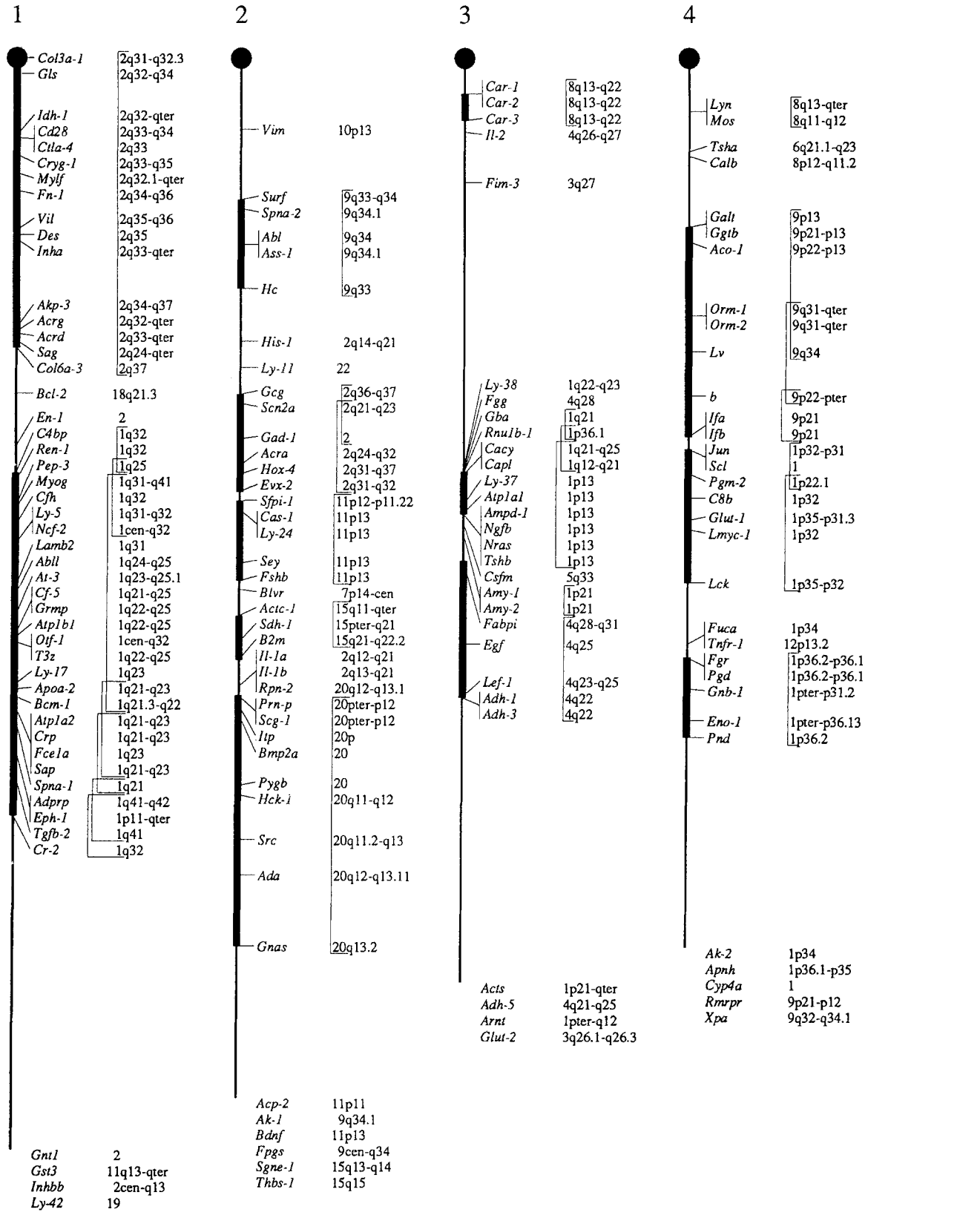

Fig. 2. Comparative map showing the chromosomal location of genes and anonymous loci that have been mapped in both mice and humans. The mouse map is used as the reference map. The chromosomal assignment for the human homolog is listed to the right of each mouse symbol. Recombination distances were obtained from GBASE, mouse chromosome committee reports, and the primary literature.

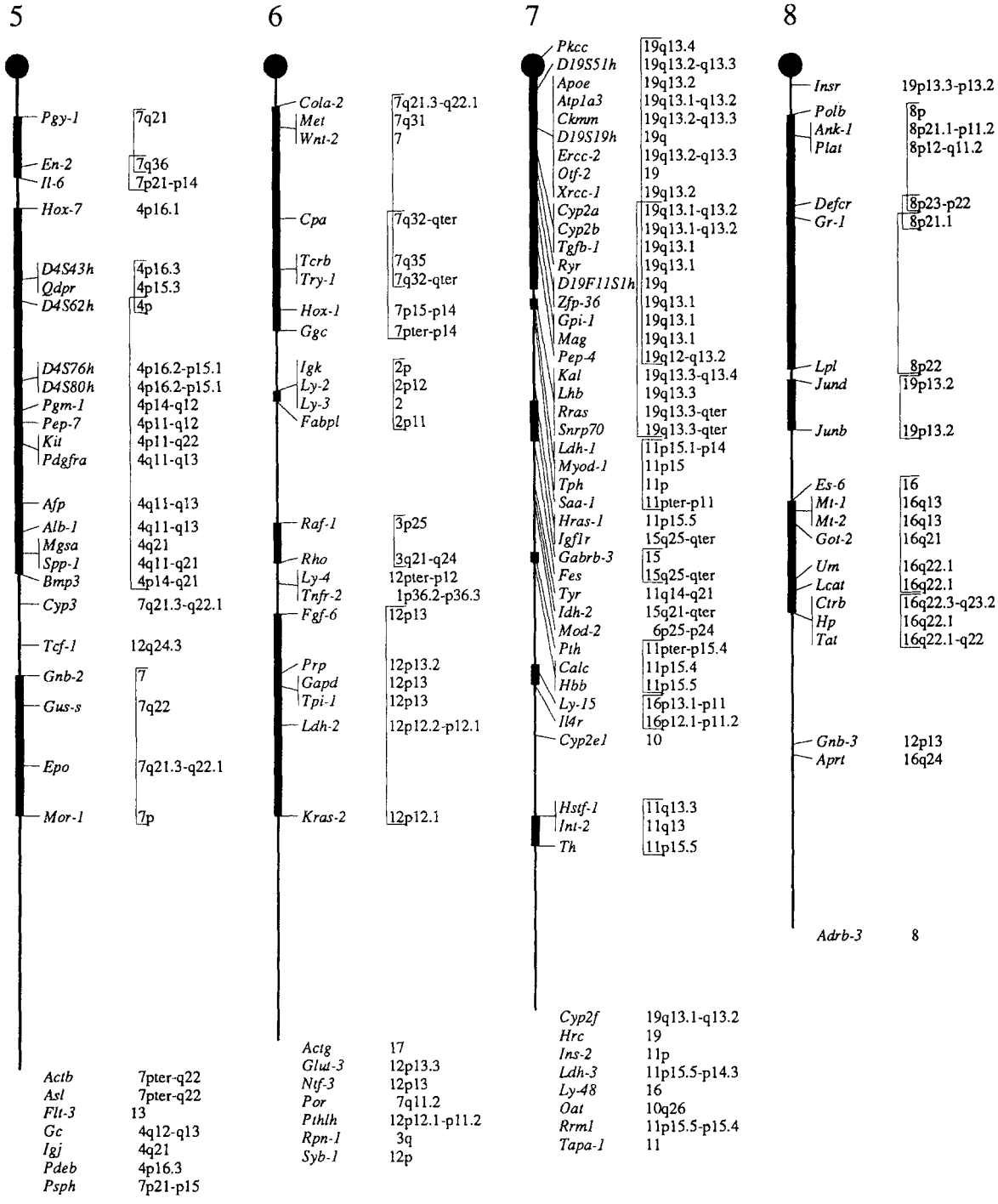

Fig. 2. *Continued.*

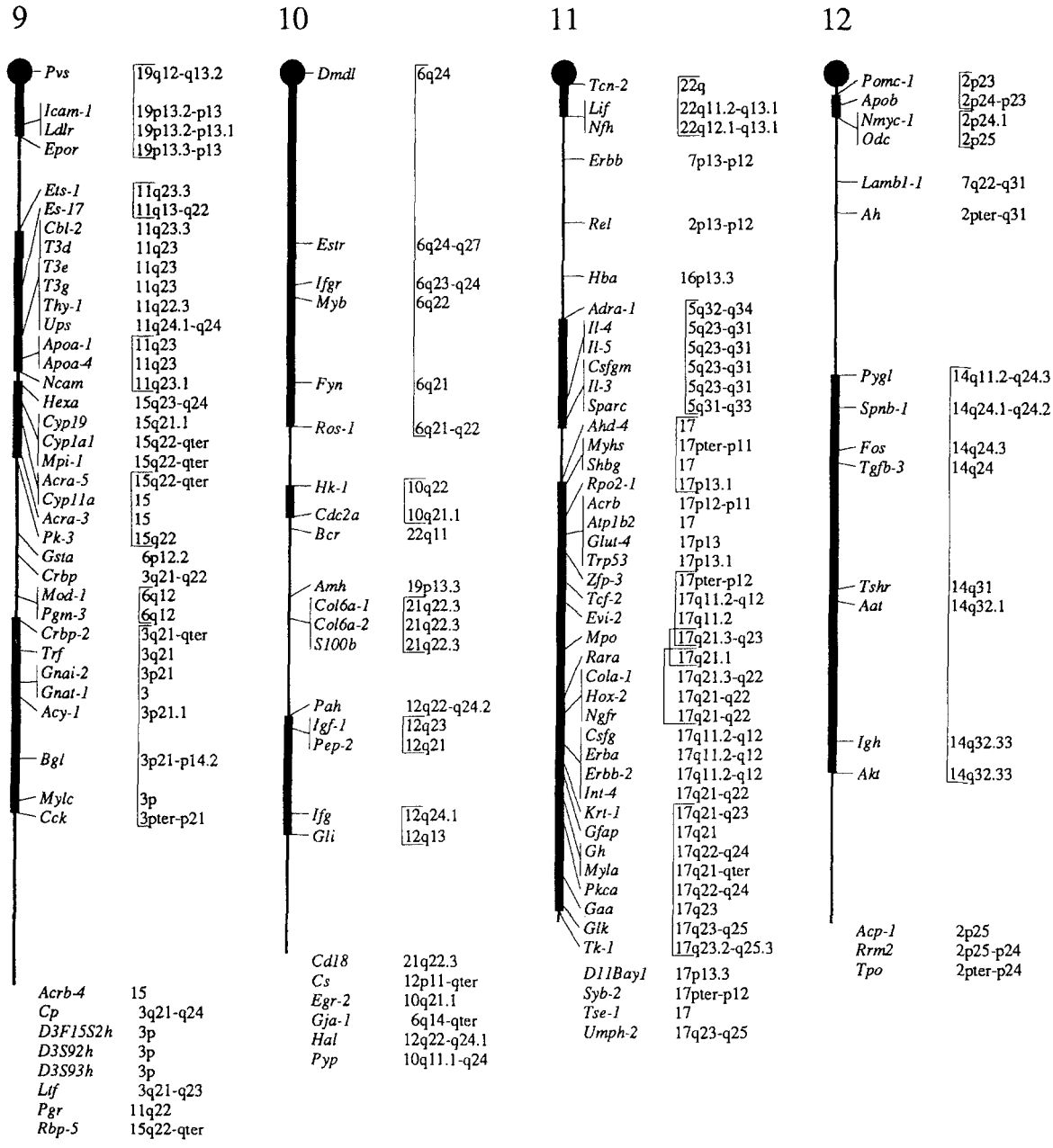

Fig. 2. *Continued.*

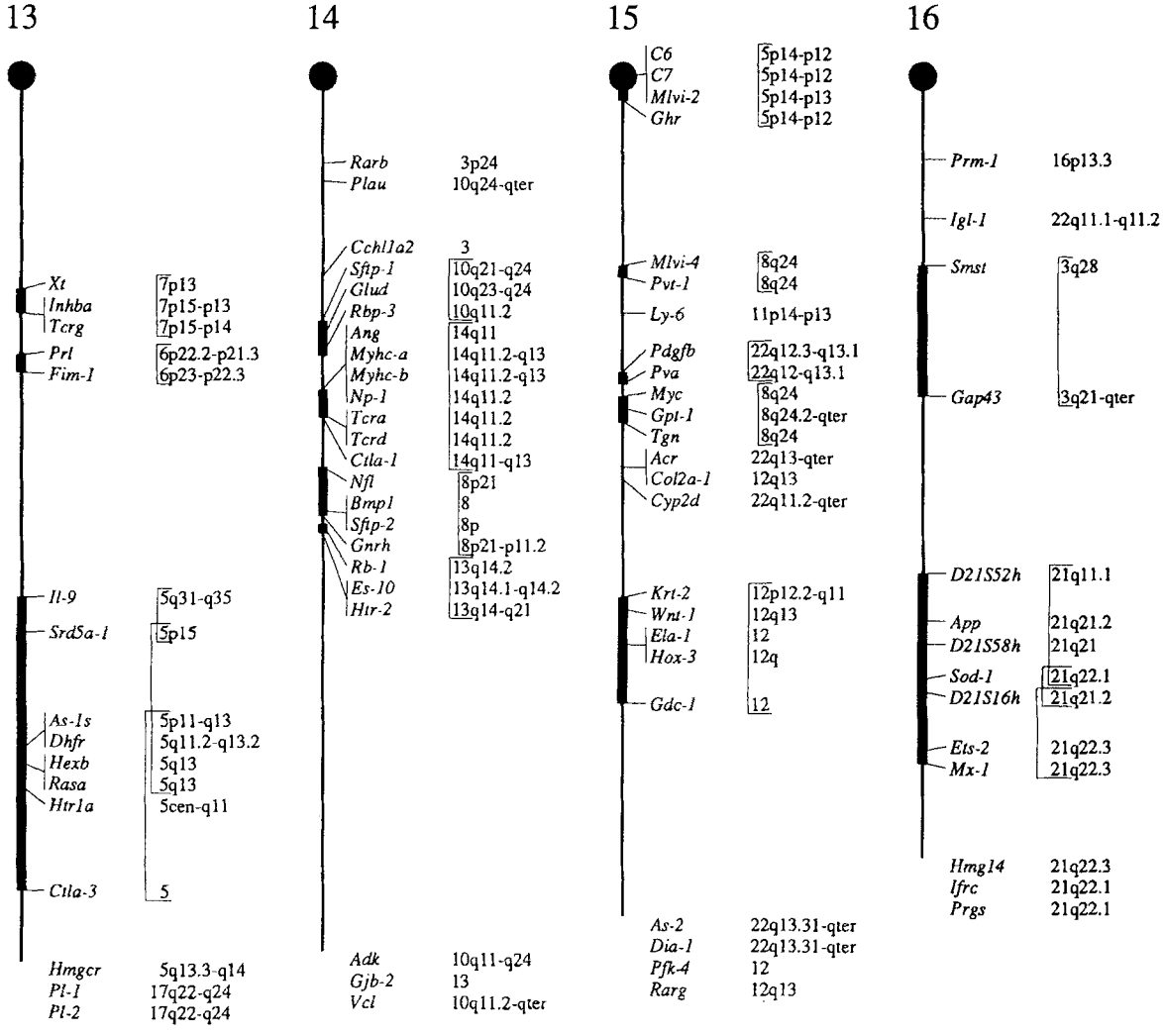

Fig. 2. *Continued.*

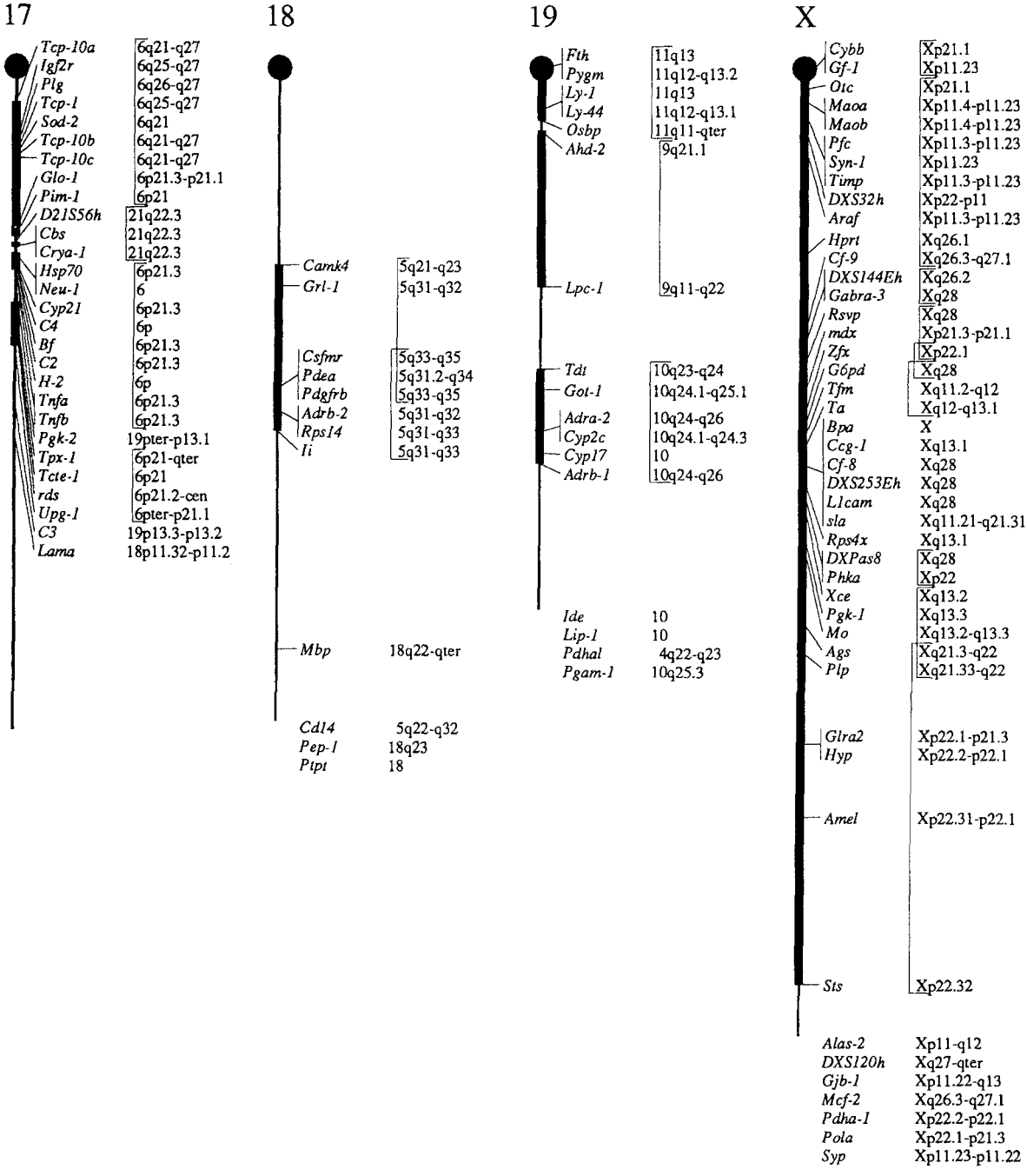

Fig. 2. *Continued.*

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