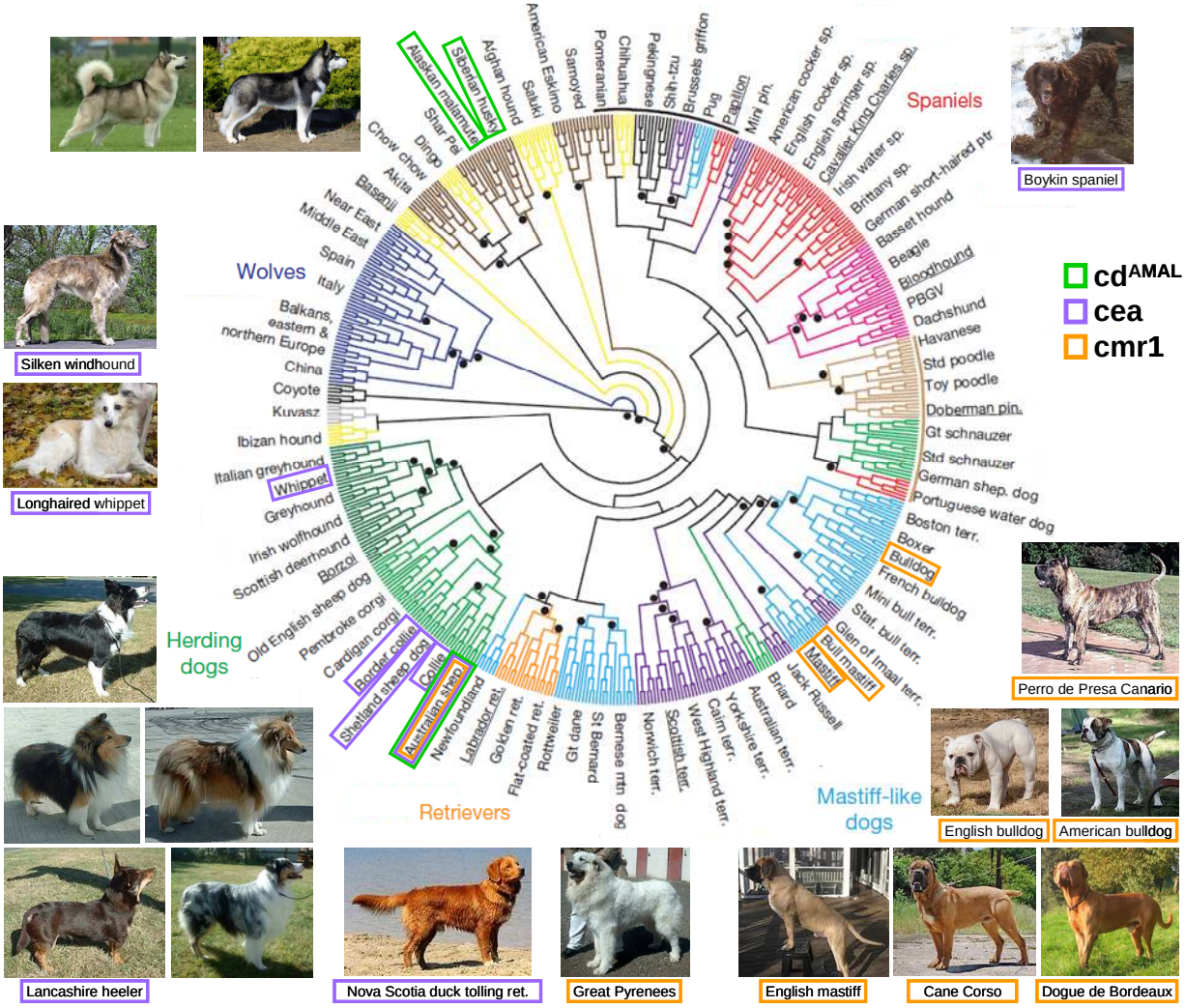
Supplementary Fig. 1 Genetic diversity of AKC breeds affected with of cd^{AMAL}, cea, and cmr1 shown in a neighbor-joining tree of domestic dogs and gray wolves (reprinted and modified with permission from Vonholdt et al. 2010). The names of breeds that were included in the study by Vonholdt et al. (2010) are outlined. For other breeds, images are placed at a hypothetical position based on breed history and previously reported structural analysis of canine breeds (Parker et al. 2004). Dog images are from Wikipedia (http://en.wikipedia.org/) and not to scale (PDF 430 kb)

References

Parker HG, Kim LV, Sutter NB, Carlson S, Lorentzen TD, Malek TB, Johnson GS, DeFrance HB, Ostrander EA, Kruglyak L (2004) Genetic structure of the purebred domestic dog. Science 304:1160–1164

Vonholdt BM, Pollinger JP, Lohmueller KE, Han E, Parker HG, Quignon P, Degenhardt JD, Boyko AR, Earl DA, Auton A, Reynolds A, Bryc K, Brisbin A, Knowles JC, Mosher DS, Spady TC, Elkahloun A, Geffen E, Pilot M, Jedrzejewski W, Greco C, Randi E, Bannasch D, Wilton A, Shearman J, Musiani M, Cargill M, Jones PG, Qian Z, Huang W, Ding ZL, Zhang YP, Bustamante CD, Ostrander EA, Novembre J, Wayne RK (2010) Genome-wide SNP and haplotype analyses reveal a rich history underlying dog domestication. Nature 464:898–902



Supplementary Figure 1

Supplementary Table 1. Genes associated with human retinal diseases

Genes that have been associated with each diverse form of inherited retinal diseases in man. Those genes also found in canine retinal diseases are outlined if the mutation results in the same disease category, and underlined if otherwise. Modified and reprinted from RetNet, http://www.sph.uth.tmc.edu/RetNet, with permission (Stephen P. Daiger, PhD, and the Univ. of Texas Health Science Center at Houston)."

Disease Category	Defective Genes
Bardet-Biedl syndrome, AR	*ARL6, BBS1, BBS2, BBS4, BBS5, BBS7, BBS9, BBS10, BBS12, CEP290, INPP5E, MKKS, MKS1, TRIM32, TTC8*
Chorioretinal atrophy or degeneration, AD	*RGR, TEAD1*
Cone or cone-rod dystrophy, AD	*AIPL1, CRX, GUCA1A, GUCY2D, PITPNM3, PROM1, PRPH2, RIMS1, SEMA4A, UNC119*
Cone or cone-rod dystrophy, AR	*ABCA4, **ADAM9**, CACNA2D4, CDHR1, CERKL, **CNGB3**, KCNV2, PDE6C, RAX2, RDH5, **RPGRIP1***
Cone or cone-rod dystrophy, XL	*CACNA1F, **RPGR***
Congenital stationary night blindness, AD	*GNAT1, **PDE6B**, **RHO***
Congenital stationary night blindness, AR	*CABP4, GRK1, GRM6, RDH5, SAG, SLC24A1, TRPM1*
Congenital stationary night blindness, XL	*CACNA1F, NYX*
Deafness alone or syndromic, AD	*WFS1*
Deafness alone or syndromic, AR	*CDH23, DFNB31, MYO7A, PCDH15, PDZD7, USH1C*
Leber congenital amaurosis, AD	*CRX, IMPDH1, OTX2*
Leber congenital amaurosis, AR	*AIPL1, CABP4, CEP290, CRB1, CRX, GUCY2D, IQCB1, LCA5, LRAT, RD3, RDH12, **RPE65**, **RPGRIP1**, SPATA7, TULP1*
Macular degeneration, AD	***BEST1**, C1QTNF5, EFEMP1, ELOVL4, FSCN2, GUCA1B, HMCN1, PROM1, PRPH2, RP1L1, TIMP3*
Macular degeneration, AR	*ABCA4, CFH*
Macular degeneration, XL	***RPGR***
Ocular-retinal developmental disease, AD	*VCAN*
Optic atrophy, AD	*OPA1*
Optic atrophy, AR	*TMEM126A*
Optic atrophy, XL	*TIMM8A*
Retinitis pigmentosa, AD	***BEST1**, CA4, CRX, FSCN2, GUCA1B, IMPDH1, KLHL7, NR2E3, NRL, PRPF3, PRPF6, PRPF8, PRPF31, PRPH2, RDH12, **RHO**, ROM1, RP1, RP9, SEMA4A, SNRNP200, TOPORS*
Retinitis pigmentosa, AR	*ABCA4, **BEST1**, C2ORF71, CERKL, CLRN1, CNGA1, CNGB1, CRB1, DHDDS, EYS, FAM161A, IDH3B, IMPG2, LRAT, MERTK, NR2E3, NRL, **PDE6A**, **PDE6B**, PDE6G, **PRCD**, PROM1, RBP3, RGR, **RHO**, RLBP1, RP1, **RPE65**, SAG, SPATA7, TTC8, TULP1, USH2A, ZNF513*
Retinitis pigmentosa, XL	*RP2, **RPGR***
Syndromic/systemic diseases with retinopathy, AD	*ABCC6, ATXN7, COL11A1, COL2A1, JAG1, KCNJ13, PAX2, TREX1, VCAN*
Syndromic/systemic diseases with retinopathy, AR	*ABCC6, AHI1, ALMS1, CC2D2A, CEP290, CLN3, COL9A1, FLVCR1, INPP5E, INVS, IQCB1, LRP5, MKS1, MTTP, NPHP1, NPHP3, **NPHP4**, OPA3, PANK2, PEX1, PEX7, PHYH, PXMP3, RPGRIP1L, SDCCAG8, TTPA, WFS1*
Syndromic/systemic diseases with retinopathy, XL	*OFD1, TIMM8A*
Usher syndrome, AR	*CDH23, CLRN1, DFNB31, GPR98, MYO7A, PCDH15, USH1C, USH1G, USH2A*
Other retinopathy, AD	***BEST1**, CRB1, FZD4, LRP5, OPN1SW, RB1, TSPAN12*
Other retinopathy, AR	***BEST1**, CDH3, CNGA3, **CNGB3**, CNNM4, CYP4V2, GNAT2, LRP5, MFRP, NR2E3, OAT, PROM1, RBP4, RGS9, RGS9BP, RLBP1*
Other retinopathy, mitochondrial	*KSS, LHON, MT-ATP6, MT-TH, MT-TL1, MT-TP, MT-TS2*
Other retinopathy, XL	*CACNA1F, CHM, DMD, NDP, OPN1LW, OPN1MW, PGK1, RS1*

Supplementary Table 2. **Age at diagnosis based on ERG, ophthalmoscopy, or clinical signs in selected breeds with retinal degeneration**

Breed	Disease	Age of diagnosis	
		ERG	Ophthalmoscopy (Clinical sign)
Irish setter	rcd1	6 wks	16 wks
Collie	rcd2	16 days	6 ms
Norwegian elkhound	erd	6 wks	6-8 ms
Norwegian elkhound	rd	6 wks	1-1.5 yrs
Siberian husky, Samoyed	XLPRA1	6-12 ms	1.5-2 yrs
Mongrel	XLPRA2	6 wks	2-3 yrs
English mastiff, Bullmastiff	ADPRA	1-1.5 yrs	6 ms-3 yrs
Poodle (toy, miniature)	prcd	1.5 yrs	3-5 yrs
American cocker spaniel	prcd	1.5 yrs	3-5 yrs
Portuguese water dog	prcd	1.5 yrs	3-5 yrs
Labrador retriever	prcd	1.5 yrs	4-6 yrs
English cocker spaniel	prcd	>2.5 yrs	8-12 yrs
Golden retriever	GR_PRA1	-	4-7 yrs
American Staffordshire terrier	crd1	<8 wks	3-6 ms
American pit bull terrier	crd2	<8 wks	3-6 ms
Glen of Imaal	crd3	1.2 yrs	3-5 yrs
Miniature longhaired dachshund	cord1 (crd4)	6 wks (cone) /14 wks (rod)	6 ms
Standard wirehaired dachshund	CRD^{SWHD}	5 wks (cone)	10 ms-3 yrs
Schapendoes	$gPRA^{SPD}$	-	2-5 yrs
Golden retriever	prcd	-	5-6 yrs
Alaskan malamute	cd^{AMAL}	6-12 wks	(8-12 wks)