









UK-92	ID-c IIIAa	C G C T C G G A C C C C G T A C C A ID43.11 T G C T C G G C C T C C G T A C C A IIIA146.7	C G - G A C G C C T C C G C C C C G G G C A + C G C T T G G A G C G T C A G C G - G T C G C C T C G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
UK-93	ICa ICa	T G C T C G G A C C C C G T A C C A IC31.5 T G C T C G G A C C C C G T A C C A IC32.12	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G	
UK-94	ID-c ID-a	C G C T C G G A C C C C G T A C C A ID42.8 C G C T C G G A C C C C G T A C C A ID43.9	C G - G A C G C C T C C G C C C C G G G C A + C G C T T G G A G C G T C A G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G	This allele is not seen again. Phase was determined from the other allele 7 other ID43.9 have the ID-a haplotype. None are on ID-c
UK-95	ICa IIIAa	T G C T C G G A C C C C G T A C C A IC33.4 T G C T C G G C C T C C G T A C C A IIIA152.2	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
UK-96	ID+b IIIAa	C G C T C G G A C C C C G T A C C A ID39.6 T G C T C G G C C T C C G T A C C A IIIA147.10	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G A A G C G T C G G C G - G T C G C C T G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
UK-97	ICa ID-a	T G C T C G G A C C C C G T A C C A IC31.5 C G C T C G G A C C C C G T A C C A ID43.9	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G	
UK-98	ID-d IIIAa	C G C T C G G C C C C C G T A C C A ID43.9 T G C T C G G C C T C C G T A C C A IIIA148.18	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G C G - G T C G C C T G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
UK-99	ID+b IIIBa	C G C T C G G A C C C C G T A C C A ID40.2 C G C T C G G C C C C C G T A C C A IIIB142.3	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G A A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G	
UK-100	ICa ID+b	T G C T C G G A C C C C G T A C C A IC32.6 C G C T C G G A C C C C G T A C C A ID40.2	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G A A G C G T C G G	
UK-101	ICa IIIAa	T G C T C G G A C C C C G T A C C A IC30.1 T G C T C G G C C T C C G T A C C A IIIA159.2	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
UK-102	ID+a ID-a	C G C T C G G A C C C C G T A C C A ID40.2 C G C T C G G A C C C C G T A C C A ID44.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G	ID+ minisatellite alleles generally lack a 3' ABA motif ID- minisatellite alleles generally have a 3' ABA motif
UK-103	IIIBa IIIAa	C G C T C G G C C C C C G T A C C A IIIB144.1 T G C T C G G C C T C C G T A C C A IIIA147.2	C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G C G - G T C G C C T G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
KZ-1	ID+a IIIAa	C G C T C G G A C C C C G T A C C A ID40.6 T G C T C G G C C T C C G T A C C A IIIA150.14	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
KZ-2	ICa ICa	T G C T C G G A C C C C G T A C C A IC33.9 T G C T C G G A C C C C G T A C C A IC34.2	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G	
KZ-3	IIIBa IIIAa	C G C T C G G C C C C C G T A C C A IIIB145.1 T G C T C G G C C T C C G T A C C A IIIA149.15	C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G C G - G T C G C C T G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
KZ-4	ICa ID-a	T G C T C G G A C C C C G T A C C A IC32.11 C G C T C G G A C C C C G T A C C A ID40.5	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G	
KZ-5	ICa ID+a	T G C T C G G A C C C C G T A C C A IC33.1 C G C T C G G A C C C C G T A C C A ID40.4	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G	
KZ-6	ICa IIIAa	T G C T C G G A C C C C G T A C C A IC33.7 T G C T C G G C C T C C G T A C C A IIIA147.11	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
KZ-7	ICa ID-b	T G C T C G G A C C C C G T A C C A IC32.11 T G C T C G G A C C C C G T A C C A ID42.4	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G	
KZ-8	ID-a IIIBb	C G C T C G G A C C C C G T A C C A ID40.5 C G C T C G G C C C C C G T A C C A IIIB145.5	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G C G - G T C G C C T C T G C C A C G G G C A + C G C T C G G A G C G T C G G	
KZ-9	ICa ID+a	T G C T C G G A C C C C G T A C C A IC36.2 C G C T C G G A C C C C G T A C C A ID41.5	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G	
KZ-11	ID-a IIIAa	C G C T C G G A C C C C G T A C C A ID44.1 T G C T C G G C C T C C G T A C C A IIIA147.7	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G C G - G T C G C C T G C G C T A T T A G C A + C G C T C G G A G C G T C G G	
KZ-12	ICc ID-a	C G C T C G G A C C C C G T A C C A IC38.3 C G C T C G G A C C C C G T A C C A ID40.5	C G - G A T G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G	
KZ-13	ICa ID-a	T G C T C G G A C C C C G T A C C A IC33.8 C G C T C G G A C C C C G T A C C A ID44.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G	
KZ-14	ICa ID+a	T G C T C G G A C C C C G T A C C A IC27.1 C G C T C G G A C C C C G T A C C A ID41.5	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G	
KZ-15	ICa	T G C T C G G A C C C C G T A C C A IC32.6	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G	







	Sa	T G C T C G G C C C C C G T A C C A S115.1	C G - G T C G C C T G C G C C A C T A G C A + C G C T C G G A G C G T C G G	
IC-6	Ja Wa	T G C T T G C C C C C C G T A C C A J43.1 T G C T C G G C C C C C G T A C C C W145.6	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T C G G	
IC-7	ICa Na	T G C T C G G A C C C C C G T A C C A IC42.1 T G C T C G G C C C C C G T G C T A N81.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C A C C T G C G C C A C G G G C C A + G G C C C G G A G T G C C G G	
<b>IC-8</b>	IEb Kd	T G C T <b>C G C</b> C C C C C G T A C C A IE40.1 T G C T <b>T G G</b> C T C C C G T A C C C K44.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-9	La Va	T G C T C G C C C C C C G T A C C C L52.1 C G C T C G G C C C C C G T A C C A V209.1	G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-10	ID+a Yb	C G C T C G G A C C C C C G T A C C A ID41.5 C G C T C G G C C C C C G T A C C A Y406.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G	
IC-11	ICa Ja	T G C T C G G A C C C C C G T A C C A IC31.9 T G C T T G C C C C C C G T A C C A J43.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G	
IC-12	Ma Xa	C G C T C G C C C C C C G T A C C C M86.1 T G T T C G G C C C C C G T A C C A X146.1	C G + G T C G T C T G C G T C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G	
IC-13	ID+a Qa	C G C T C G G A C C C C C G T A C C A ID40.2 T G C T C G G C C C C C G T A C C A Q87.3	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - A T C G C C T G C G C C A C G G G C A + C G C T C G G G G C T C G G	
IC-14	Ka Kb	T G C C C G G C T C C C G T A C C C K45.1 T G C T C G G C T C C C G T A C C C K45.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-15	ID+a ID+b	C G C T C G G A C C C C C G T A C C A <b>ID38.5</b> C G C T C G G A C C C C C G T A C C A <b>ID41.5</b>	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G	One ID38.5 from the UK is on the ID+b haplotype 8 other ID41.5 have the ID+a haplotype. None are on ID+b
IC-16	Kb Ke	T G C T C G G C T C C C G T A C C C <b>K43.1</b> T G C C C G G C T C C C G T A C C C <b>K44.1</b>	G G - G T C G C C T G C G C C A C G G <b>G C A</b> + <b>C G C T</b> C G G A G <b>C G T</b> C G G G G - G T C G C C T G C G C C A C G G <b>C C A</b> + <b>G G C C</b> C G G A G <b>T G C</b> C G G	
IC-17	Na Sa	T G C T C G G C C C C C G T G C T A N82.5 T G C T C G G C C C C C G T A C C A S111.1	C G - G T C A C C T G C G C C A C G G G C A + G G C C C G G A G T G C C G G C G - G T C G C C T G C G C C A C T A G C A + C G C T C G G A G C G T C G G	
IC-19	Ka IIIAe	T G C C C G G C T C C C G T A C C C K44.2 T G C T C G G C C C C C G T A C C A IIIA215.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C C T A C T A G C A + C G C T C G G A G C G T C G G	
IC-20	Ja La	T G C T T G C C C C C C G T A C C A J43.1 T G C T C G G C C C C C G T A C C C L52.2	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T C G G	
IC-21	ICb Wa	C G C T C G G A C C C C C G T A C C A IC34.8 T G C T C G G C C C C C G T A C C C W148.1	C G + G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C A + G G C C C G G A G T G C T C G G	
IC-22	ICa La	T G C T C G G A C C C C C G T A C C A IC31.8 T G C T C G G C C C C C G T A C C C L52.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T C G G	
IC-23	Ka IIIAf	T G C C C G G C T C C C G T A C C C K43.2 T G C T C G G C C C C C G T A C C A IIIA145.6	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G G	
IC-24	ID+a Ka	C G C T C G G A C C C C C G T A C C A ID41.5 T G C C C G G C T C C C G T A C C C K44.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-25	Ka IIIAf	T G C C C G G C T C C C G T A C C C K44.2 T G C T C G G C C C C C G T A C C A IIIA145.7	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G G	
IC-26	Qb IIIBa	C G C T C G G C C C C C G T A C C A Q88.3 C G C T C G G C C C C C G T A C C A IIIB142.4	C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G	
IC-27	Na IIIAg	T G C T C G G C C C C C G T G C T A N83.1 T G C T C G G C C C C C G T A C C A IIIA140.1	C G - G T C A C C T G C G C C A C G G G C A + G G C C C G G A G T G C C G G C G - G T C G C C T G C G C T A C G G G C A + C G C T C G G A G C G T C G G	
IC-28	Wa Oa	T G C T C G C C C C C C G T A C C C W146.1 C G C T C G G C C C C C G T A C C A O188.1	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-29	Ja Tb	T G C T T G C C C C C C G T A C C A J43.1 T G C T C G G C C C T C G T A C C C T112.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C A + G G C C C G G A G T G C T C G G	
IC-30	Wa Wb	T G C T C G C C C C C C G T A C C C <b>W145.4</b> T G C T C G C C C C C C G T A C C C <b>W153.1</b>	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T C G G G G + G T C G T C T G C G C C A C G G G C A + C G C C C G G A G T G C T C G G	Wa minisatellite alleles generally lack a 5' BoE motif Wb minisatellite alleles generally have a 5' BoE motif
IC-31	ICa ID+a	T G C T C G G A C C C C C G T A C C A IC33.6 C G C T C G G A C C C C C G T A C C A ID40.2	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G	

IC-32	Wa IIIAe	T G C T C G C C C C C C G T A C C C W176.3 T G C T C G G C C C C C G T A C C A IIA213.1	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G A	
IC-33	ICa Wb	T G C T C G G A C C C C G T A C C A IC31.8 T G C T C G G C C C C C G T A C C C W139.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + C G C C C G G A G T G C T G G	
IC-34	ID+a ID-b	C G C T C G G A C C C C G T A C C A ID41.5 T G C T C G G A C C C C G T A C C A ID44.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G	ID+ minisatellite alleles generally lack a 3' ABA motif ID- minisatellite alleles generally have a 3' ABA motif
IC-35	Ka La	T G C C C G G C T C C C G T A C C C K45.1 T G C T C G C C C C C C G T A C C C L52.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
IC-36	La Wa	T G C T C G C C C C C C G T A C C C L52.1 T G C T C G C C C C C C G T A C C C W146.2	G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
IC-37	ICa Wb	T G C T C G G A C C C C G T A C C A IC32.9 T G C T C G C C C C C C G T A C C C W151.3	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + C G C C C G G A G T G C T G G	
IC-38	Ka Wb	T G C C C G G C T C C C G T A C C C K44.2 T G C T C G C C C C C C G T A C C C W152.2	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + C G C C C G G A G T G C T G G	
IC-39	Ka La	T G C C C G G C T C C C G T A C C C K45.1 T G C T C G C C C C C C G T A C C C L52.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
IC-40	Sa IIIAe	T G C T C G G C C C C C G T A C C A S110.2 T G C T C G G C C C C C G T A C C A IIA184.1	C G - G T C G C C T G C G C C A C T A G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G A	
IC-41	ICa Qa	T G C T C G G A C C C C G T A C C A IC34.6 T G C T C G G C C C C C G T A C C A Q86.3	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G C C T C G G	
IC-42	Ga ICa	T G C T C A G C C C C C G T G C C A G29.1 T G C T C G G A C C C C G T A C C A IC31.8	C G - G T C G C C T G C G C C A C G G G T A + C G C T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G	
IC-43	Jc IIIAe	T G C T T G C C C C C C G T A C C A J45.1 T G C T C G G C C C C C G T A C C A IIA143.5	C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G A	Most other J alleles show these alleles at the disputed positions All other IIIA alleles show these alleles at the disputed positions
IC-44	Kb Na	T G C T C G G C T C C C G T A C C C K44.4 T G C T C G G C C C C C G T G C T A N81.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C A C C T G C G C C A C G G C C A + G G C C C G G A G T G C C C G G	
IC-45	Ka Sa	T G C C C G G C T C C C G T A C C C K44.2 T G C T C G G C C C C C G T A C C A S111.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C C A C T A G C A + C G C T C G G A G C G T C G G	
IC-46	ID-a Ma	C G C T C G G A C C C C G T A C C A ID43.9 C G C T C G G C C C C C G T A C C C M85.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G C G + G T C G T C T G C G T C A C G G G C A + C G C T C G G A G C G T C G G	
IC-47	Ka Sb	T G C C C G G C T C C C G T A C C C K44.1 T G C T C G G C C C C C G T A C C A S108.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C C T A C T A G C A + C G C T C G G A G C G T C G G	
IC-48	ID-b Vc	T G C T C G G A C C C C G T A C C A ID44.1 T G C T C G G C C C C C G T A C C A V129.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G C G - G T C G T C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-49	ICg Ja	T G C T C G G A C C C C G T A C C A IC42.1 T G C T T G C C C C C C G T A C C A J43.1	C G - G A C G C C T C C G C C C C G G G C T - G G C T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G	
IC-50	Ja Ka	T G C T T G C C C C C C G T A C C A J43.1 T G C C C G G C T C C C G T A C C C K44.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-51	Ja La	T G C T T G C C C C C C G T A C C A J42.1 T G C T C G G C C C C C G T A C C C L51.3	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
IC-52	Ma Ma	C G C T C G C C C C C C G T A C C C M86.1 C G C T C G C C C C C C G T A C C C M86.1	C G + G T C G T C T G C G T C A C G G G C A + C G C T C G G A G C G T C G G C G + G T C G T C T G C G T C A C G G G C A + C G C T C G G A G C G T C G G	
IC-53	Ka Ka	T G C C C G G C T C C C G T A C C C K44.1 T G C C C G G C T C C C G T A C C C K45.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-54	ID-a Wa	C G C T C G G A C C C C G T A C C A ID43.9 T G C T C G G C C C C C G T A C C C W148.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
IC-55	Kb La	T G C T C G G C T C C C G T A C C C K45.1 T G C T C G C C C C C C G T A C C C L52.2	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
IC-56	Ka Kb	T G C C C G G C T C C C G T A C C C K45.1 T G C T C G G C T C C C G T A C C C K45.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-57	ID+c IIIBa	C G C T C G G A C C C C G T A C C A ID41.5 C G C T C G G C C C C C G T A C C A IIB144.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G	

IC-58	Kf Oa	T G C T C G G C T C C C G T A C C C K43.1 C G C T C G G C C C C C G T A C C A O160.1	G G - G T C G C T T G C G C C A C G G G C A + G G C C C G G A G T G C T G G C G - G T C G T C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	3 other K alleles are G at INUK-51. Other positions are consistent Each polymorphism is consistent with all other O alleles
IC-60	La Oa	T G C T C G C C C C C C G T A C C C L52.2 C G C T C G G C C C C C G T A C C A O152.1	G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G C G - G T C G T C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-61	Xa IIIAh	T G T T C G G C C C C C G T A C C A X142.2 T G C T C G G C C C C C G T A C C A IIIA145.4	C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-62	Ja Ka	T G C T T G C C C C C C G T A C C A J43.1 T G C C C G G C T C C C G T A C C C K45.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-63	Ja IIIBa	T G C T T G C C C C C C G T A C C A J43.1 C G C T C G G C C C C C G T A C C A IIIB141.2	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G	
IC-64	Kb Wb	T G C T C G G C T C C C G T A C C C K43.1 T G C T C G G C C C C C G T A C C C W151.2	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C A + C G C C C G G A G T G C T G G	
IC-66	Ja Kb	T G C T T G C C C C C C G T A C C A J43.1 T G C T C G G C T C C C G T A C C C K45.2	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-67	La Ma	T G C T C G C C C C C C G T A C C C L52.2 C G C T C G C C C C C C G T A C C C M86.1	G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G C G + G T C G T C T G C G T C A C G G G C A + C G C T C G G A G C G T C G G	
IC-68	Ga ID+a	T G C T C A G C C C C C G T G C C A G30.1 C G C T C G G A C C C C G T A C C A ID41.5	C G - G T C G C C T G C G C C A C G G G T A + C G C T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G	
IC-69	Wa Wb	T G C T C G C C C C C C G T A C C C W142.1 T G C T C G C C C C C C G T A C C C W152.3	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G T C T G C G C C A C G G G C A + C G C C C G G A G T G C T G G	Wa minisatellite alleles generally lack a 5' BoE motif Wb minisatellite alleles generally have a 5' BoE motif
IC-70	La Wb	T G C T C G C C C C C C G T A C C C L52.1 T G C T C G G C C C C C G T A C C C W152.4	G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G T C T G C G C C A C G G G C A + C G C C C G G A G T G C T G G	
IC-71	Ja Ja	T G C T T G C C C C C C G T A C C A J42.1 T G C T T G C C C C C C G T A C C A J43.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G	
IC-72	Kb IIIBc	T G C T C G G C T C C C G T A C C C K44.5 T G C T C G G C C C C C G T A C C A IIIB144.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G	
IC-73	ICb Wc	C G C T C G G A C C C C G T A C C A IC34.8 T G C T C G G C C C C C G T A C C C W152.2	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + C G C C C G G A G T G C T G G	
IC-74	Wa Wa	T G C T C G C C C C C C G T A C C C W145.5 T G C T C G C C C C C C G T A C C C W148.2	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
IC-75	Xa Oa	T G T T C G G C C C C C G T A C C A X142.3 C G C T C G G C C C C C G T A C C A O151.1	C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G C G - G T C G T C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-76	Ja Wa	T G C T T G C C C C C C G T A C C A J43.1 T G C T C G C C C C C C G T A C C C W144.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
IC-77	Kb Wa	T G C T C G G C T C C C G T A C C C K42.1 T G C T C G C C C C C C G T A C C C W148.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
IC-78	ICa IIIBa	T G C T C G G A C C C C G T A C C A IC31.4 C G C T C G G C C C C C G T A C C A IIIB143.4	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G	
IC-79	ICa Ja	T G C T C G G A C C C C G T A C C A IC34.3 T G C T T G C C C C C C G T A C C A J43.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G	
IC-80	ID+a Kb	C G C T C G G A C C C C G T A C C A ID41.5 T G C T C G G C T C C C G T A C C C K42.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
IC-81	Kb Sa	T G C T C G G C T C C C G T A C C C K45.1 T G C T C G G C C C C C G T A C C A S108.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C C A C T A G C A + C G C T C G G A G C G T C G G	
IC-82	Ka IIIAg	T G C C C G G C T C C C G T A C C C K45.1 T G C T C G G C C C C C G T A C C A IIIA145.8	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-1	ID+a Pa	C G C T C G G A C C C C G T A C C A ID40.2 T G C T C G G C C C C C G T A C C C P79.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G	
Z-2	Na Wa	T G C T C G G C C C C C G T G C T A N79.1 T G C T C G C C C C C C G T A C C C W176.1	C G - G T C A C C T G C G C C A C G G G C A + G G C C C G G A G T G C C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-3	Kb	T G C T C G G C T C C C G T A C C C K43.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	

	IIIBa	C G C T C G G C C C C C G T A C C A IIIB142.2	C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G	
Z-4	Qa Xa	T G C T C G G C C C C C G T A C C A Q87.1 T G T T C G G C C C C C G T A C C A X142.1	C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G	
Z-7	ID+a Yb	C G C T C G G A C C C C G T A C C A ID41.5 C G C T C G G C C C C C G A A C C A Y630.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G	
Z-9	Kb Wa	T G C T C G G C T C C C G T A C C C K43.1 T G C T C G C C C C C G T A C C C W146.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-10	Fa ICa	T G C T C G G C C C C C G T A T C A F17.1 T G C T C G G A C C C C G T A C C A IC35.8	C G - G T C G T C C G C C C A C G G G T A + G G C T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G	This is the only F haplotype All other IC35.8 have the ICa haplotype
Z-11	ICa Ja	T G C T C G G A C C C C G T A C C A IC35.8 T G C T T G C C C C C C G T A C C A J43.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G	
Z-12	Na Xa	T G C T C G G C C C C C G T G C T A N81.1 T G T T C G G C C C C C G T A C C A X146.1	C G - G T C A C C T G C G C C A C G G G C A + G G C C C G G A G T G C C G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G	
Z-13	Ka Qa	T G C C C G G C T C C C G T A C C C K44.1 T G C T C G G C C C C C G T A C C A Q88.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - A T C G C T C T G C G C C A C G G G C T - G G A T C G G A G C G T C G G	
Z-14	Na Ua	T G C T C G G C C C C C G T G C T A N82.2 T G C T C G C C C C C C G T A C C A U119.1	C G - G T C A C C T G C G C C A C G G G C A + G G C C C G G A G T G C C G G C A - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G	
Z-15	Qa Xa	T G C T C G G C C C C C G T A C C A Q86.1 T G T T C G G C C C C C G T A C C A X144.1	C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G	
Z-16	Ta Ya	T G C T C G G C C C T C G T A C C C T107.1 C G C T C G G C C C C C G A A C C A Y422.1	G G + G T C G C C T G C G C C A C G G G C A + G G C C C A G A A T G C T G G C G - G T C G C C T T C T A C C A C G G G C T - G G A T C G G A G C G T C G G	
Z-17	ID+a Na	C G C T C G G A C C C C G T A C C A ID40.2 T G C T C G G C C C C C G T G C T A N82.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G T C A C C T G C G C C A C G G G C A + G G C C C G G A G T G C C G G	
Z-18	Kd La	T G C T T G G C T C C C G T A C C C K43.1 T G C T C G C C C C C C G T A C C C L51.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	Some other K alleles are probably T at INUK-5 All other L alleles are C at INUK-5
Z-20	Ga Ka	T G C T C A G C C C C C G T G C C A G30.1 T G C C C G G C T C C C G T A C C C K44.1	C G - G T C G C C T G C G C C A C G G G T A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-21	Ja Wa	T G C T T G C C C C C C G T A C C A J43.1 T G C T C G C C C C C C G T A C C C W145.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-22	Xc IIIAe	T G T T C G G C C C C C G T A C C A X140.1 T G C T C G G C C C C C G T A C C A IIIA207.1	C G - G T C G C C T C T G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G A	These sites are consistent with all X lineage alleles These alleles are markers for a new IIIA lineage based on minisatellite structure
Z-23	ID+a Pa	C G C T C G G A C C C C G T A C C A ID41.5 T G C T C G G C C C C C G T A C C C P79.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G	
Z-24	Wa Wa	T G C T C G C C C C C C G T A C C C W146.1 T G C T C G C C C C C C G T A C C C W146.1	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-25	Kb Kb	T G C T C G G C T C C C G T A C C C K45.1 T G C T C G G C T C C C G T A C C C K52.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-26	La Wa	T G C T C G C C C C C C G T A C C C L52.1 T G C T C G C C C C C C G T A C C C W176.1	G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-27	La Ya	T G C T C G C C C C C C G T A C C C L50.1 C G C T C G G C C C C C G A A C C A Y421.1	C G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G C G - G T C G C T T C T A C C A C G G G C T - G G A T C G G A G C G T C G G	
Z-28	ICa Ka	T G C T C G G A C C C C G T A C C A IC35.7 T G C C C G G C T C C C G T A C C C K44.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-29	ID-a Ke	C G C T C G G A C C C C G T A C C A ID43.9 T G C C C G G C C C C C G T A C C C K44.2	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G G G - G T C G C C T G C G C C A C G G G C A + G G C C C G G A G T G C C G G	
Z-31	ICa IEa	T G C T C G G A C C C C G T A C C A IC31.8 T G C T C G G A C C C C A T A C C A IE39.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G	
Z-33	ICa Kb	T G C T C G G A C C C C G T A C C A IC34.7 T G C T C G G C T C C C G T A C C C K43.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-34	Ja Ka	T G C T T G C C C C C C G T A C C A J42.4 T G C C C G G C T C C C G T A C C C K45.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	

Z-35	Ja Ka	T G C T T G C C C C C C G T A C C A J43.4 T G C C C G G C T C C C G T A C C C K43.2	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-36	Ha Kb	T G C T C G G C C C C T G T A C C A H29.1 T G C T C G G C T C C C G T A C C C K43.1	C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-37	Ka Kh	T G C C C G G C T C C C G T A C C C K44.2 T G C C C G G C C C C G T A C C C K44.2	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-38	Ta Tb	T G C T C G G C C C T C G T A C C C T107.1 T G C T C G G C C C T C G T A C C C T112.1	G G + G T C G C C T G C G C C A C G G G C A + G G C C C A G A A T G C T G G G G + G T C G C C T G C G C C A C G G G C A + G G C C C G G A A T G C T G G	All T107.1 are A at INUK-56 All T112.1 are G at INUK-56
Z-39	Ja Wa	T G C T T G C C C C C C G T A C C A J42.2 T G C T C G G C C C C C G T A C C C W175.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-42	Wa Wb	T G C T C G C C C C C C G T A C C C W146.1 T G C T C G C C C C C C G T A C C C W151.1	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	Wa minisatellite alleles <b>generally</b> lack a 5' BoE motif Wb minisatellite alleles <b>generally</b> have a 5' BoE motif
Z-43	Ja Tb	T G C T T G C C C C C C G T A C C A J42.1 T G C T C G G C C C C T C G T A C C C T112.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C A + G G C C C G G A A T G C T G G	
Z-44	Wa Wa	T G C T C G C C C C C C G T A C C C W145.2 T G C T C G C C C C C C G T A C C C W175.2	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-46	La Kb	T G C T C G C C C C C C G T A C C C L51.1 T G C T C G G C T C C C G T A C C C K52.2	G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-47	ICa Nb	T G C T C G G A C C C C G T A C C A IC34.6 T G C T C G G C C C C C G T A C C A N82.4	C G - G A C C C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C A C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G	
Z-49	La Ta	T G C T C G C C C C C C G T A C C C L52.1 T G C T C G G C C C T C G T A C C C T107.1	G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G C C T G C G C C A C G G G C A + G G C C C A G A A T G C T G G	
Z-50	ID+a Xa	C G C T C G G A C C C C G T A C C A ID40.2 T G T T C G G C C C C C G T A C C A X145.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G	
Z-51	IIIb Wa	C G C T C G G C C C C C G T A C C A IIIb142.2 T G C T C G C C C C C C G T A C C C W148.1	C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-53	ICb Ja	C G C T C G G A C C C C G T A C C A IC36.9 T G C T T G C C C C C C G T A C C A J42.3	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G	
Z-54	ICa Fb	T G C T C G G A C C C C G T A C C A IC36.9 G C C T C G G C C C C C G T A C C C P79.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G	
Z-55	ICa Ya	T G C T C G G A C C C C G T A C C A IC35.7 C G C T C G G C C C C C G A A C C A Y422.2	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C T T C T A C C A C G G G C T - G G A T C G G A G C G T C G G	
Z-56	Ja Ka	T G C T T G C C C C C C G T A C C A J42.2 T G C C C G G C T C C C G T A C C C K44.2	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-57	Ja Qa	T G C T T G C C C C C C G T A C C A J42.2 T G C T C G G C C C C C G T A C C A Q88.2	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G C C T C G G	
Z-58	Ma Vb	C G C T C G C C C C C C G T A C C C M86.1 T G C T C G G C T C C C G T A C C A V216.1	C G + G T C G T C T G C G T C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G	
Z-59	ID+a Fb	C G C T C G G A C C C C G T A C C A ID41.5 C G C T C G G C C C C C G T A C C C P79.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G	
Z-61	Na Wa	T G C T C G G C C C C C G T A C C A N82.1 T G C T C G C C C C C C G T A C C C W152.1	C G - G T C A C C T G C G C C A C G G G C A + G G C C C G G A G T G C C C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-62	ICa La	T G C T C G G A C C C C G T A C C A IC35.7 T G C T C G C C C C C C G T A C C C L51.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-63	Ka Wa	T G C C C G G C T C C C G T A C C C K44.2 T G C T C G C C C C C C G T A C C C W147.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-64	ICa Na	T G C T C G G A C C C C G T A C C A IC35.8 T G C T C G G C C C C C G T A C C A N82.3	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C A C C T G C G C C A C G G G C A + G G C C C G G A G T G C C C G G	
Z-65	Ka Wa	T G C C C G G C T C C C G T A C C C K44.1 T G C T C G G C C C C C G T A C C C W176.2	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G	
Z-67	Ka Za	T G C C C G G C T C C C G T A C C C K44.2 C A C T C G C C C C C C G T A C C A Z191.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C C G G	All other K44.2 have the Ka haplotype This is the only Z haplotype

Z-68	ICa Ja	T G C T C G G A C C C C G T A C C A IC35.7 T G C T T G C C C C C C G T A C C A J42.2	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G
Z-72	Wa Xa	T G C T C G C C C C C C G T A C C C W175.3 T G T T C G G C C C C C G T A C C A X146.1	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G
Z-73	Kb Qa	T G C T C G G C T C C C G T A C C C K45.1 T G C T C G G C C C C C G T A C C A Q87.2	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G
Z-74	ID-a Na	C G C T C G G A C C C C G T A C C A ID43.9 C G T C T G C C C C C C G T A C C A N81.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G C G - G T C A C C T G C G C C A C G G G C A + G G C C C G G A G T G C C G G
Z-75	Kb Qa	T G C T C G G C T C C C G T A C C C K52.1 T G C T C G G C C C C C G T A C C A Q87.2	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G
Z-79	Ua Wa	T G C T C G C C C C C C G T A C C A U119.2 T G C T C G C C C C C C G T A C C C W175.4	C A - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G
Z-82	Ta Ya	T G C T C G G C C C T C G T A C C C T107.1 C G C T C G G C C C C C G A A C C A Y422.3	G G + G T C G C C T G C G C C A C G G G C A + G G C C C A G A A T G C T G G C G - G T C G C C T T C T A C C A C G G G C T - G G A T C G G A G C G T C G G
Z-83	ID+a Ka	C G C T C G G A C C C C G T A C C A ID40.2 T G C C C G G C T C C C G T A C C C K44.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
Z-84	Ja Sa	T G C T T G C C C C C C G T A C C A J42.1 T G C T C G G C C C C C G T A C C A S111.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G C G - G T C G C C T G C G C C A C T A G C A + C G C T C G G A G C G T C G G
Z-85	Ha Qa	T G C T C G G C C C C T G T A C C A H29.1 T G C T C G G C C C C C G T A C C A Q88.1	C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G
Z-86	ICa IEa	T G C T C G G A C C C C G T A C C A IC31.8 T G C T C G G A C C C C A T A C C A IE39.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G
Z-88	Ka Qa	T G C C C G G C T C C C G T A C C C K44.1 T G C T C G G C C C C C G T A C C A Q94.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G
Z-89	III Af Wb	T G C T C G G C C C C C G T A C C A III Af154.1 T G C T C G G C C C C C G T A C C C W172.1	C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + C G C C C G G A G T G C T G G
Z-90	ICa La	T G C T C G G A C C C C G T A C C A IC34.6 T G C T C G C C C C C C G T A C C C L51.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G
Z-91	ICa Vb	T G C T C G G A C C C C G T A C C A IC35.7 T G C T C G G C T C C C G T A C C A V216.1	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-10	Sa IIIBa	T G C T C G G C C C C C G T A C C A S111.1 C G C T C G G C C C C C G T A C C A IIIB142.2	C G - G T C G C C T G C G C C A C T A G C A + C G C T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G A A T C G G A G C G T C G G
K-1Q	Ma Qa	C G C T C G C C C C C C G T A C C C M86.1 T G C T C G G C C C C C G T A C C A Q86.1	C G + G T C G T C T G C G T C A C G G G C A + C G C T C G G A G C G T C G G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G
K-2F	Ka Wa	T G C C C G G C T C C C G T A C C C K44.1 T G C T C G C C C C C C G T A C C C W145.3	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G
K-2I	ID-a Qa	C G C T C G G A C C C C G T A C C A ID41.3 T G C T C G G C C C C C G T A C C A Q87.2	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G
K-2J	Qa Wb	T G C T C G G C C C C C G T A C C A Q94.1 T G C T C G C C C C C C G T A C C C W154.1	C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G G G + G T C G T C T G C G C C A C G G G C A + C G C C C G G A G T G C T G G
K-2P	ICa Wa	T G C T C G G A C C C C G T A C C A IC32.4 T G C T C G G C C C C C G T A C C C W147.2	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G
K-2R	Ka Lb	T G C C C G G C T C C C G T A C C C K44.3 T G C T C G G A C C C C G T A C C A L52.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G
K-2U	Ka Xa	T G C C C G G C T C C C G T A C C C K44.1 T G T T C G G C C C C C G T A C C A X142.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G
K-2X	Kb Ma	T G C T C G G C T C C C G T A C C C K43.1 C G C T C G C C C C C C G T A C C C M86.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G + G T C G T C T G C G T C A C G G G C A + C G C T C G G A G C G T C G G
K-3A	ICf La	C G C T C G G A C C C C G T A C C A IC37.5 T G C T C G C C C C C C G T A C C C L51.2	C G - G A C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G
K-3F	ID-b	T G C T C G G A C C C C G T A C C A ID40.2	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C A G

One ID41.3 from Kazakhstan is on the IUK-a haplotype  
The other two Q87.2 are on the Qa haplotype

	Ka	T G C C C G G C T C C C G T A C C C K44.2	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-3G	Hb Vb	T G C T C G G C C C C T G T A C C A H29.2 T G C T C G G C T C C C G T A C C A V216.2	C G - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-3I	Hb Sa	T G C T C G G C C C C T G T A C C A H29.1 T G C T C G G C C C C G T A C C A S110.1	C G - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G C G - G T C G C C T G C G C C A C T A G C A + C G C T C G G A G C G T C G G
K-3K	ID-b Wa	T G C T C G G A C C C C G T A C C A ID40.2 T G C T C G G C C C C G T A C C C W146.1	C G - G A C G C C T C C G C C C G G G C T - G G A T C G G A G C G T C A G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G
K-3L	ID+c Ja	C G C T C G G A C C C C G T A C C A ID40.2 T G C T T G C C C C C C G T A C C A J43.1	C G - G A C G C C T C C G C C C G G G C T - G G A T C G G A G C G T C G G G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G
<b>K-3M</b>	ID-f IIIAk	C G C T C G G A C C C C G T A C C A ID43.10 T G C T C G G C C C C G T A C C A IIIA148.15	C G - G A C G C C T C C G C C C G G G C A + <b>G G C C</b> C G G A G <b>C G T C</b> A G C G - G T C G C C T G C G C T A C G G G C A + <b>C G C T</b> C G G A G <b>T G C T</b> G G
K-3P	Kb Qa	T G C T C G G C T C C C G T A C C C K43.1 T G C T C G G C C C C G T A C C A Q88.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G
K-3Q	Qa Va	T G C T C G G C C C C G T A C C A Q86.2 C G C T C G G C C C C G T A C C A V207.1	C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-3R	Ka Kb	T G C C C G G C T C C C G T A C C C K44.2 T G C T C G G C C C C G T A C C C K44.2	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-3T	Je Jb	T G C T C G <b>C C</b> C C C G T A C C <b>A J43.1</b> T G C T C G <b>G C T</b> C C C G T A C C <b>C J43.2</b>	G G <b>+</b> G T C G C C T G C G C C A C G G G C <b>T - G A A</b> T C G G A G C G T C G G G G <b>-</b> G T C G C C T G C G C C A C G G G C <b>A + C G C</b> T C G G A G C G T C G G
K-3U	Ka Wa	T G C C C G G C T C C C G T A C C C K44.1 T G C T C G G C C C C G T A C C C W176.3	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G
K-4B	Ja IIIAf	T G C T T G C C C C C G T A C C A J42.2 T G C T C G G C C C C G T A C C A IIIA143.3	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G G
K-4C	Qa Ta	T G C T C G G C C C C G T A C C A Q87.1 T G C T C G G C C C C T C G T A C C C T107.1	C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G G G + G T C G C C T G C G C C A C G G G C A + G G C C C A G A A T G C T G G
K-4F	IIIAf IIIAg	T G C T C G G C C C C G T A C C A <b>IIIA114.1</b> T G C T C G G C C C C G T A C C A <b>IIIA146.6</b>	C G - G T C G C C T G C G C T A C <b>T A</b> G C A + C G C T C G G A G C G T C G G C G - G T C G C C T G C G C T A C <b>G G</b> G C A + C G C T C G G A G C G T C G G
K-4G	Pa Qa	T G C T C G G C C C C G T A C C C P79.1 T G C T C G G C C C C G T A C C A Q87.1	C G - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G
K-4J	Ka Kb	T G C <b>C</b> C G G C T C C C G T A C C C <b>K44.1</b> T G C <b>T</b> C G G C T C C C G T A C C C <b>K44.2</b>	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-4N	La Sa	T G C T C G C C C C C G T A C C C L51.2 T G C T C G G C C C C G T A C C A S111.1	G G - G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G C G - G T C G C C T G C G C C A C T A G C A + C G C T C G G A G C G T C G G
K-4P	Ja Va	T G C T T G C C C C C G T A C C A J43.1 C G C T C G G C C C C G T A C C A V207.2	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
<b>K-4S</b>	Kg Wd	T G C T <b>T</b> G C C C C C G T A C C <b>A K43.1</b> T G C T <b>C</b> G C C C C C G T A C C <b>C W143.1</b>	G G + G T C G <b>C</b> C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G + G T C G <b>T</b> C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G
K-4U	Ha ID-b	T G C T C G G C C C C T G T A C C A H29.1 T G C T C G G A C C C C G T A C C A ID44.1	C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G A C G C C T C C G C C C G G G C A + C G C T C G G A G C G T C A G
K-4V	ID+c Kb	C G C T C G G A C C C C G T A C C A ID40.2 T G C T C G G C T C C C G T A C C C K43.1	C G - G A C G C C T C C G C C C G G G C T - G G A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-4W	ID+c ID-b	<b>C</b> G C T C G G A C C C C G T A C C A <b>ID40.2</b> <b>T</b> G C T C G G A C C C C G T A C C A <b>ID42.3</b>	C G - G A C G C C T C C G C C C G G G C T - G G A T C G G A G C G T C <b>G G</b> C G - G A C G C C T C C G C C C G G G C A + C G C T C G G A G C G T C <b>A G</b>
K-4X	Ja Kb	T G C T T G C C C C C G T A C C A J43.2 T G C T C G G C T C C C G T A C C C K43.1	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-4Y	Ja Jb	T G C T T G C C C C C G T A C C A J43.3 T G C T C G G C T C C C G T A C C C J43.3	G G + G T C G C C T G C G C C A C G G G C T - G A A T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-5A	Kc Kc	T G T T C G G C T C C C G T A C C C K42.1 T G T T C G G C T C C C G T A C C C K42.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-5B	Pa IIIAe	T G C T C G G C C C C G T A C C C P79.1 T G C T C G G C C C C G T A C C A IIIA211.1	C G - G T C G C C T G C G C C A C G G G C A + G G C T C G G A G C G T C G G C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G A

ID+ minisatellite alleles generally lack a 3' ABA motif and have C at INUK-1  
ID- minisatellite alleles generally have a 3' ABA motif. Most are T at INUK-1

K-5C	IIIBd IIIBe	C G C T C G G C C C C C G A A C C A IIIB145.4 C G C T C G G C C C C C G T A C C A IIIB145.4	C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - G G A T C G G A G C G T C G G
K-5D	Qa Va	T G C T C G G C C C C C G T A C C A Q87.1 C G C T C G G C C C C C G T A C C A V207.2	C G - A T C G T C T G C G C C A C G G G C A + C G C T C G G G G C C T C G G C G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G
K-5E	ID+a Ma	C G C T C G G A C C C C G T A C C A ID39.7 C G C T C G C C C C C C G T A C C C M86.1	C G - G A C G C C T C C G C C C C G G G C A + C G C T C G G A G C G T C G G C G + G T C G T C T G C G T C A C G G G C A + C G C T C G G A G C G T C G G
K-5F	Kb Xb	T G C T C G G C T C C C G T A C C C K44.1 T G C T C G G C C C C C G T A C C A X157.1	G G - G T C G C C T G C G C C A C G G G C A + C G C T C G G A G C G T C G G C G - G T C G C C T C T G C C A C G G G C T - C G A T C G G A G C G T C G G
K-5I	Wa Wa	T G C T C G C C C C C C G T A C C C W146.1 T G C T C G C C C C C C G T A C C C W146.1	G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G G G + G T C G T C T G C G C C A C G G G C A + G G C C C G G A G T G C T G G
<u>K-5J</u>	ICa IIIAj	T G C <u>T</u> C G G A <u>C</u> C C C G T A C C A IC32.9 T G C <u>C</u> C G G C <u>T</u> C C C G T A C C A IIIA148.16	C G - G A C G C C T C C G C C C C G G G C T - G G A T C G G A G C G T C G G C G - G T C G C C T G C G C T A C T A G C A + C G C T C G G A G C G T C G G