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Polymorphism of the *LCORL* gene in the reindeer

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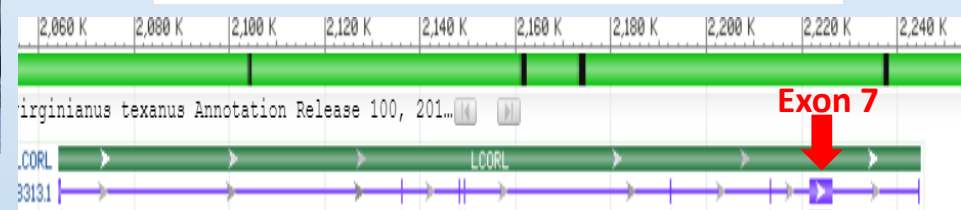
Evenkiyskaya breed



Nenets breed

DNA of domestic Nenets and Evenk reindeer, as well as wild reindeer was tested

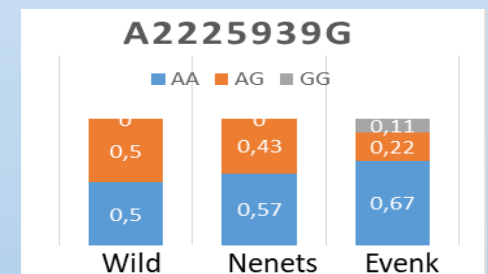
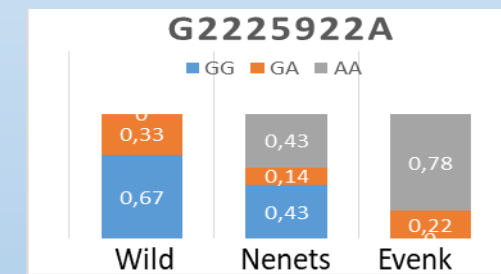
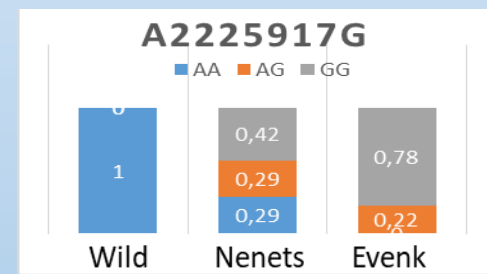
The longest region of the *LCORL* gene (exon 7) was sequenced (6.134 kb)



The structure of the *LCORL* gene

According to researchers *LCORL* (ligand dependent nuclear receptor corepressor like, transcript) plays an essential role in the formation of the growth and size of the skeleton of mammals, in the formation of muscle mass and in reducing the thickness of subcutaneous adipose tissue.

Locus of exon 7	SNP	Position	Amino acid substitution
LCORL-9	A/G	2225917	Lys (K) – Glu (E)
LCORL-9	A/G	2225918	Lys (K) – Arg (R)
LCORL-9	G/A	2225922	Glu (E) synonymous
LCORL-9	A/G	2225938	Ser (S) – Gly (G)
LCORL-9	A/G	2225939	Ser (S) – Asn (N)
LCORL-9	T/C	2225950	Phe (F) – Leu (L)
LCORL-10	T/A	2226355	Trp (W) – Arg (R)



Six of the seven identified single-nucleotide polymorphisms are nonsynonymous. The difference in the frequencies of wild-type and mutant alleles between individuals of wild and two breeds of domesticated reindeer indicates the presence of selection pressure on the region of the *LCORL* gene and indirectly confirms the influence of genetic variability of this locus on the phenotypic variability of growth and body size in reindeer. Given the analogies with studies of the influence of the *LCORL* gene region on size traits in other animal species, it can be assumed that some polymorphisms in the studied area may be true causal quantitative trait loci (QTL) in domestic reindeer.