

Chapter 4: Potential of Unknown Gene

4.1 The White Winning GI

In Hanshin Juvenile Fillies (GI) held on December 13 of last year, the most favorite was Sodashi and she won this race. She was undefeated at that time gaining three consecutive victories including Sapporo Nisai Stakes (GIII) and Artemis Stakes (GIII) and eventually gained the GI title, which is the first case where the “white” horse wins GI as far as I know.

In addition, it is not forgettable that the 4th place of this race was Meikei Yell of the same dam lineage as of Sodashi. Even though Meikei Yell is not the white, the profound story with these fillies is detailed below.

In 1979, surprisingly a pure white colt was born by the brown sire, Long Ace, out of the chestnut dam, Homare Bull, and named “Haku Taiyu.” This surprising breeding was reported even in the ordinary news programs at that time and I heard that the breeding circles doubted if there was mix-up of sires; which I think is a matter of course and it can be imagined that considerable confusion was excited.

After that, a pure white filly was born in 1983 by the brown sire, Kaburaya O, out of the chestnut dam, Kurenai Oza, and named “Kamino White.” Under the prevailing laws of heredity, the white will never come out in case where both parents are bay, brown, chestnut or grey and consequently the said white colt and filly were considered developed by the mutated gene.

Furthermore, in 1996, another pure white filly was born by the brown sire, Sunday Silence, out of the bay dam, Wave Wind, and named “Shirayukihime.” The meaning in Japanese of Shirayukihime is “Snow White”!

Seeing the maternal lineage of Shirayukihime, it is truly remarkable that three descendants won the grade races; that is to say, a grandfoal “Hayayakko” winning GIII, a grandfoal “Sodashi” mentioned above, and a great-grandfoal “Meikei Yell” winning two of GIII. Considering it, I am wondering if the mutated gene possessed by Shirayukihime has a close relationship with “something” relevant to the excellent athletic ability...

4.2 Gene of Dominant White

As already mentioned, I set up a hypothesis arguing that the importance of maternal lineage has a close relationship with the mitochondrial genes which are inherited “maternally,” while the aforesaid gene developing the white exists on an autosome (i.e. chromosome 3) to be inherited both paternally and maternally. Accordingly, the mutated gene developing the white in the offspring of Shirayukihime is not necessarily inherited in line with her maternal lineage, so that if one of her descendants becomes a sire, the white will come out of its crops.

It is reported that there are some types of equine genes developing the white, but the aforesaid gene arising out of mutation is commonly referred to as the “dominant white,” that is, it acts as the dominant allele (Please see the above section “2.1 ‘Dominant’ and ‘Recessive’”).

Referring to the human ABO blood group, the blood type of the person who has the gene A and the gene O (i.e. genotype: AO) is “A,” because the gene A inhibits the development of the gene O’s character; in which the gene A is “dominant” while the gene O is “recessive.”

If the father’s blood type is A but the genotype is AO, while the mother’s blood type is O the genotype of which is OO accordingly, the expected blood type (and genotype) of their child is at a ratio of A (AO) to O (OO) is 1:1 (50% each) under the “Mendel’s law of segregation.”

At this time, please imagine that the human gene A is replaced with the equine dominant white; that is to say, if Shirayukihime is mated to a non-white sire, the expected color of the foal is at a ratio of white to non-white is 1:1.