Table S1. Detailed information for the primers in the PCR reaction system.

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| Primers | Sequence(5'→3') | Position |
| HBA-1F (forward) | 5'-CCTCGCCAAGTCCAC-3' | Hg38 chr16: 171885-171899 |
| HBA-1R (reverse) | 5'-ACCAGGAAGGGCCGG-3' | Hg38 chr16: 173669-173683 |
| HBA-2F (forward) | 5'-CCTCGCCAAGTCCAC-3' | Hg38 chr16: 171885-171899 |
| HBA-2R (reverse) | 5'-AGCACTCTAGGGTCCAG-3' | Hg38 chr16: 177701-177717 |
| HBA-3F (forward) | 5'-TTTACCCATGTGGTGCC-3' | Hg38 chr16: 169270-169286 |
| HBA-3R (reverse) | 5'-CGTTGGATCTTCTCATTTC-3' | Hg38 chr16: 175122-175140 |
| HBA-4F (forward) | 5'-ATCTGGGCTCTGTGTTC-3' | Hg38 chr16: 165259-165275 |
| HBA-4R (reverse) | 5'-CCCACGTTGTGTTCATG-3' | Hg38 chr16: 185891-185907 |
| HBA-5F (forward) | 5'-ACCTCCATTCTCCAACC-3' | Hg38 chr16: 175510-175526 |
| HBA-5R (reverse) | 5'-AGGGCCCGTTGGGAG-3' | Hg38 chr16: 173639-173653 |
| HBA-6F (forward) | 5'-TTGCACCGGCCCTTCC-3' | Hg38 chr16: 173664-173679 |
| HBA-6R (reverse) | 5'-ACTGGCTGAAAGGGATG-3' | Hg38 chr16: 171097-171113 |
| HBA-7F (forward) | 5'-AGGCTATGGTGGGCAA-3' | Hg38 chr16: 150202-150217 |
| HBA-7R (reverse) | 5'-AACCTTTATCTGCCACATGTA-3' | Hg38 chr16: 182640-182660 |
| HBA-8F (forward) | 5'-CCATTCCTCAGCGTGGG-3' | Hg38 chr16: 148731-148747 |
| HBA-8R (reverse) | 5'-GAGTGCAAATTCCCCTG-3' | Hg38 chr16: 183428-183444 |

Note: HBA-1F/HBA-1R：The primers for αCS, αQS, and αWS; HBA-2F/HBA-2R：The primers for -α3.7; HBA-3F/HBA-3R：The primers for -α4.2; HBA-4F/HBA-4R：The primers for –SEA; HBA-5F/HBA-5R：The primers for αααanti3.7; HBA-6F/HBA-6R：The primers for αααanti4.2; HBA-7F/HBA-7R：The primers for –FIL; HBA-8F/HBA-8R：The primers for –THAI.

The amplification is divided into two tubes. Group A includes the following genotypes: --SEA, -α3.7, -α4.2, αCS, αQS, and αWS; Group B includes the following genotypes: --FIL, --THAI, αααanti3.7, and αααanti4.2.