CLAIMS

1. A method for developing an assay for identification of a human race from a sample comprising the steps of:

(a.) shortlisting ten SNPs representative of at least four race types via analyzing SNP allele frequencies and corresponding ethnicities via at least one correspondence database, the ten SNPs comprise loci rs12913832 (Region: HERC2 gene), rs1426654 (Region: SLC24A5 gene), rs28777 (Region: SLC45A2 gene), rs3827760 (Region: EDAR gene), rs1015869 (Region: intergenic region of Chr 6), rs1800414 (Region: OCA2 gene), rs3935223 (Region: intergenic region of Chr 2), rs6569733 (Region: AKAP7 gene), rs6429644 (Region: SLC6A9 gene), and rs3176383 (Region: MPG gene);

(b.) configuring, via the use of a microarray, probes and primers associated with each of the ten SNPs, the configuration comprises a step of introducing mismatches to the microarray in order to strengthen or reduce binding to specific DNA strands corresponding to the shortlisted SNPs;

(c.) detecting whether a plurality of probe signals are present and if present, sending the detected probe signals to a first ML/AI engine; and

(d.) distinguishing between probe signals by the first ML/AI engine to provide at least one SNP call; wherein the first ML/AI engine generates at least one SNP combination having a predetermined number of characters; and

(e.) sending the at least one SNP combination to a second ML/AI engine for a prediction of human race; wherein the prediction of human race may include a step of training the second ML/AI engine, the step of training the second ML/AI engine includes a step of calculating model parameters based on a Mahalanobis distance calculation method.

2. The method of claim 1, wherein the identification of a human race requires the combination of all of the ten SNP sequences.

3. The method of claim 1, wherein the SNP allele frequencies for each human race

were first arranged according to a highest frequency to a lowest frequency based on predetermined threshold.

4. The method of claim 3, wherein the predetermined threshold may include a higher allele frequency of 0.9 and a lower allele frequency of 0.1.

5. The method of claim 4, wherein the SNPs with the highest and lowest frequencies were selected and compared across the different human races.

6. A system for developing an assay for identification of a human race from a sample comprising:

a LOC device configured to receive the sample, the LOC device comprises at least one microarray;

a processor configured to: (a.) shortlist ten SNPs representative of a plurality of race types by analyzing SNP allele frequencies and corresponding ethnicities via at least one correspondence database that comprises of loci rs12913832 (Region: HERC2 gene), rs1426654 (Region: SLC24A5 gene), rs28777 (Region: SLC45A2 gene), rs3827760 (Region: EDAR gene), rs1015869 (Region: intergenic region of Chr 6), rs1800414 (Region: OCA2 gene), rs3935223 (Region: intergenic region of Chr 2), rs6569733 (Region: AKAP7 gene), rs6429644 (Region: SLC6A9 gene), and rs3176383 (Region: MPG gene); (b.) configure, via the use of the microarray, probes and primers associated with each of the ten SNPs, the configuration comprises a step of introducing mismatches to the microarray in order to strengthen or reduce binding to specific DNA strands corresponding to the shortlisted SNPs; (c.) detect whether a plurality of probe signals are present;

a first ML/AI engine to receive the plurality of probe signals and if present, send the detected probe signals to a first ML/AI engine to distinguish between probe signals to provide at least one SNP call; wherein the first ML/AI engine generates at least one SNP combination having a predetermined number of characters; and

a second ML/AI engine to receive the at least one SNP combination to determine or predict a human race type associated with the at least one SNP

combination, the second ML/AI engine implements a Mahalanobis distance calculation method.

7. A non-transitory computer readable medium having stored thereon software instructions that, when executed by a processor, cause the processor to execute the steps of claims 1 to 5.