Abstract 15

VALIDATION OF SNP TYPING USING HIGH THROUGHPUT INSTRUMENTATION AND WGA TO ACHIEVE FORENSIC ANALYSIS OF LOW YIELD SAMPLES

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A panel of 128 SNPs were selected for universal genetic evaluation using VeriSNP™ typing in dogs, cats, cattle and horses. These SNPs included diseases and traits such as color to achieve physical characteristics as well as SNPs for identity and parentage across breeds. Though more than 128 SNPs were selected per species, for validation we utilized 128 and 64 respectively per assay at 24 and 48 samples per assay. Up to 3072 SNPs can be used per assay. The Biotrove™ Open Array System was used to process the assays. DNA was extracted and quantified using a Nanodrop™ spectrophotometer. The whole genome amplification reaction was then mixed with the PCR mastermix and DNA. The mixture was robotically loaded into the open array assay. The assay was then sealed and placed in an MJ Research thermocycler with a tower alpha unit. Upon the completion of amplification, the assay was scanned using the Biotrove Open Array Scanner for approximately 12 minutes and the results were delivered via the Biotrove™ software. The results were then imported into custom software for automated parent verification if necessary as well as attachment to a detailed sample information page. In summary, several thousand samples per day can be analyzed using this system. Since the entire array is sealed prior to amplification, cross contamination is not an issue with this system, even using the WGA kit. Though not all forensic samples (for instance complex mixtures) can be analyzed with this system, with sequenced genomes at our fingertips, not only can identity be achieved with this system, but also physical and health related characteristics of evidentiary samples can be obtained. This is a valuable tool since sometimes there is no description of a suspect from a crime scene. Though this study was conducted on animal species, it is just as easy to validate this system for human use.