NORMALIZATION AND DIRECT AMPLIFICATION OF CASEWORK SAMPLES

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Purification of DNA from swabs often results in loss of precious sample, particularly in those swabs with low-levels of cellular material. The prototype Casework Direct Kit provides a method for the rapid generation of lysates from casework swabs and fabric cuttings. The DNA may be evaluated with the PowerQuant® System to quantify the abundance of human DNA, determine the male/female DNA ratio, predict PCR inhibition, and assess degradation of the DNA. Based on information gained by the PowerQuant® System, samples prepared with the prototype Casework Direct Kit facilitate the generation of high quality laboratory results by directing workflow decisions and minimizing repeat assays and/or sampling. This information allows normalization of human DNA for STR amplification and aids in selection of the appropriate PowerPlex® Systems (autosomal versus Y-STR analysis) to use. Samples flagged as inhibited by the PowerQuant® System would benefit from DNA purification to eliminate PCR inhibitors. The analyst may choose to stop processing samples flagged as highly degraded. In about 2 hours, multiple samples submitted from a single case can be screened with both the prototype Casework Direct Kit (less than an hour) and PowerQuant® System (about an hour) to identify which samples would generate the most informative STR profiles. Thus, integration of the prototype Casework Direct Kit into a laboratory workflow scheme provides a rapid, cost effective means to generate high quality STR profiles from precious, low-abundance samples with minimal hands on time. We present data from touch DNA samples and mock casework applications.

Key Words: PowerQuant®, PowerPlex®, casework, direct amplification, inhibitors, low template