VALIDATION OF QIAGEN'S INVESTIGATOR QUANTIPLEX KIT FOR DNA CASEWORK

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This study compared four human DNA quantification protocols including Quantifiler Human on the ABI PRISM 7000 SDS with v1.2.3 software, Quantifiler Duo on the 7500 Real-Time PCR System with HID Real-Time PCR Analysis Software v1.1, Quantifiler Human on the 7500 Real-Time PCR System with HID Real-Time PCR Analysis Software v1.1, and Investigator Quantiplex on the 7500 Real-Time PCR System with HID Real-Time PCR Analysis Software v1.1.

Mock casework samples and NIST SRM components were tested with each protocol. Serial dilutions of NIST SRM 2372 components B and C and quantification reaction plates were prepared using the QIAgility. DNA samples were added manually using Rainin LTS pipettes and tips. A mathematical correction factor was applied to Quantifiler Human and Quantifiler Duo results. No correction factor was needed for the Quantiplex results.

There were notable differences between the data generated with the Quantifiler Human Kit on different runs, depending on the instrument (ABI PRISM® 7000 SDS versus Applied Biosystems 7500 Real-Time PCR System).

Investigator Quantiplex produced more accurate quantification values than the JPSO DNA quantification protocol in place at the time of this study. Quantiplex runs in less than one hour on the Applied Biosystems 7500 Real-Time PCR System with HID Real-Time PCR Analysis Software v1.1 and no mathematical correction factor is needed to generate accurate results.

Using Investigator Quantiplex saves at least two hours in analysis time and produced extraordinarily accurate results for serial dilutions of NIST SRM components B and C. This accuracy at low concentrations of DNA provides needed certainty for decision making about the continuation of analysis beyond the quantification step. Quantification helps to determine whether PCR amplification will be conducted. You need accurate quantification to apply alternative methods to establish the stochastic threshold (i.e., mass). At the JPSO DNA Lab, we amplify all contact DNA samples from guns, rifles, vehicles, etc. with quantification value greater than or equal to 0.007 ng/µl. If the quant value is less than 0.007 ng/µl it is up to the analyst whether to amplify the sample. The JPSO stochastic threshold is 70 picograms. ⌘