Detection and Quantitation of dsDNA

Sensitivity 0.05 pg of dsDNA using PicoGreen®

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Detecting and quantitating small amounts of DNA is very important in many biological applications. Creatv's Signalyte™-II spectrofluorometer can be applied for testing DNA using a variety of fluorescent labels. PicoGreen®, an ultra sensitive fluorescent stain reagent, has a multitude of applications, including quantitation of double-stranded DNA (dsDNA) in solution. Quant-iT™ PicoGreen® dsDNA reagent (Invitrogen) is used in the evaluation of sensitivity of Signalyte™-II versus plate readers.

Creatv's Signalyte™-II uses 35 μL of sample placed in a glass waveguide cuvette. The sample is excited with a 470 nm light source. A lens at the end of the cuvette gathers the fluorescence signal efficiently. The signal passes through a set of lenses and optical filters and is detected by a spectrometer. Fluorescence emission intensity was plotted against DNA concentration, as shown in Figure 1. The threshold detection limit was calculated using the negative control plus three standard deviations. The tested detection range spanned six orders of magnitude in DNA concentration—from 1 pg/mL to 1 μg/mL. Using Creatv's Signalyte™-II spectrofluorometer, the limit of detection was approximately 1 pg/mL (0.035 pg in a 35 μL volume). This is more than two orders of magnitude more sensitive than using fluorescent plate readers, as reported by Invitrogen, where the limit of detection is 250 pg/mL (50 pg in a 200 μL volume) (Invitrogen).

Signalyte™-II is an ultra sensitive fluorescence detection platform for proteins, biomarkers, DNA, RNA, as well as cells, bacteria and viruses.

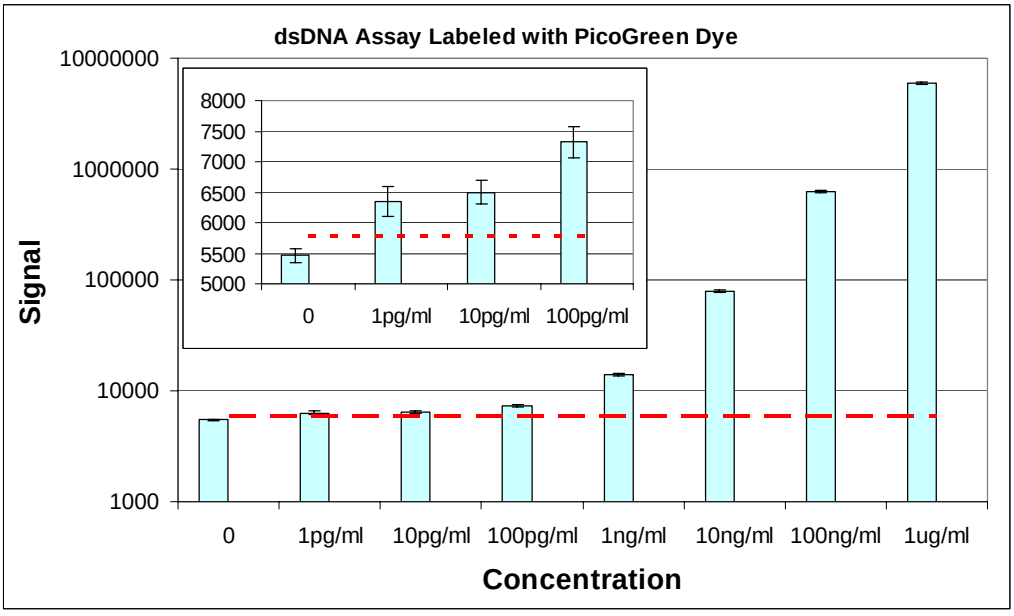

Figure 1. Relationships of fluorescence intensity and dsDNA concentration. Each concentration was tested in triplicate.

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