

Performance DATA

Reproducibility Studies

The precision or reproducibility studies of the Malcom's e-Spect ES-2 was conducted measuring 10 individual aliquots of 7 concentrations of dsDNA samples. The DNA drop was removed between each measurement with a dry lab wipe, and fresh aliquot of dsDNA sample was measured.

Table Results of 10 measurements on the e-Spect ES-2 using 7 different concentrations of ssDNA sample

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
Measurement 1	22.8	52.6	258.0	560.6	1748.6	3619.5	5131.0
Measurement 2	20.6	52.0	259.3	552.5	1756.0	3622.3	5185.6
Measurement 3	20.6	51.6	262.0	563.4	1753.8	3617.4	5184.0
Measurement 4	20.0	52.4	261.6	557.1	1755.3	3644.7	5127.7
Measurement 5	20.6	52.3	259.4	561.5	1754.5	3631.3	5198.9
Measurement 6	19.7	51.5	259.4	561.4	1763.6	3607.0	5109.5
Measurement 7	21.3	50.2	259.7	563.3	1738.9	3635.8	5182.2
Measurement 8	21.5	50.9	261.2	557.0	1744.3	3655.6	5139.7
Measurement 9	21.2	50.8	261.0	556.1	1769.9	3634.7	5193.5
Measurement 10	22.5	51.4	259.2	556.1	1736.6	3600.0	5188.4
Average (ng/uL)	21.1	51.6	260.1	558.9	1752.1	3626.8	5164.0
St Dev (ng/uL)	1.0	0.8	1.3	3.7	10.4	17.0	33.1
% CV	4.8	1.5	0.5	0.7	0.6	0.5	0.6

Reproducibility

Range	Accuracy
2~100ng/uL	SD: ±2ng/uL
100~3750ng/uL	%CV: ±2%



Performance DATA

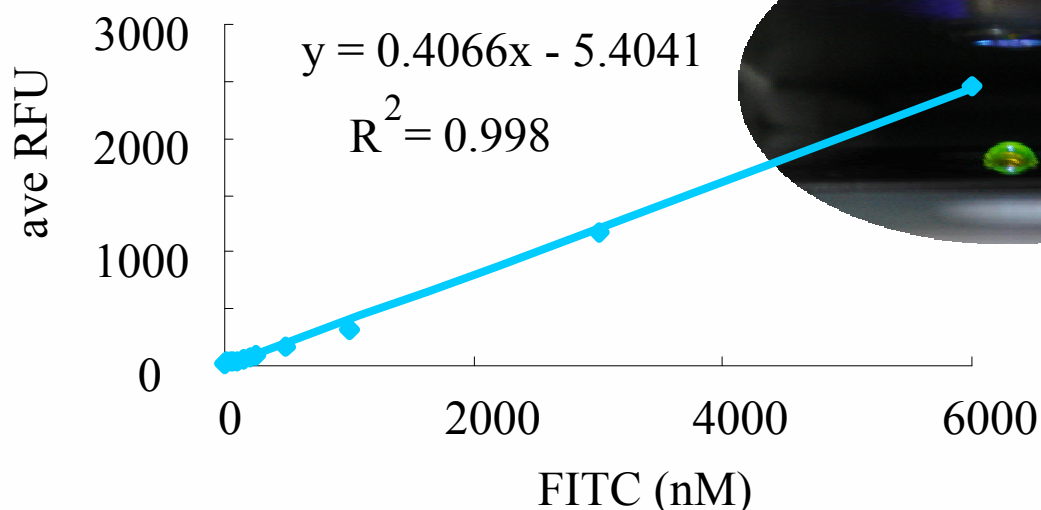
FITC Linearity, Reproducibility and Sensitivity

Introduction

The fluorescein is one of the generally used for biological studies and diagnostics as fluorescence probes e.g. hybridization probe and immuno-probe. Fluorescein has excitation and emission wavelengths of approximately 470 nm/515 nm. By using LED excitation lamp, the e-Spect ES-2 covers various fluorophores measurement (365 ± 10 nm, 430-700 nm) in addition to UV-Vis measurement mode. The Malcom's micro UV-VIS/fluorescence spectrophotometer requires as little as 1 uL of samples for measurement, while traditional cuvette type fluorescence photometer needs much more volume (10-100 uL of sample). It is well concerned that the instability of the width of sample stage is cause of data instability. Unlike other cuvette less micro photometers, the e-Spect is equipped with tinny solid quartz cell. The distance of the solid quartz cell is perpetually stable. These unique system satisfies the researchers with stable and precision results in the measurement not only UV-Vis but also quality check for various fluorophores.

Method

Serially diluted fluorescein (NIST1392) measurement was conducted and the linearity and reproducibility was assessed.



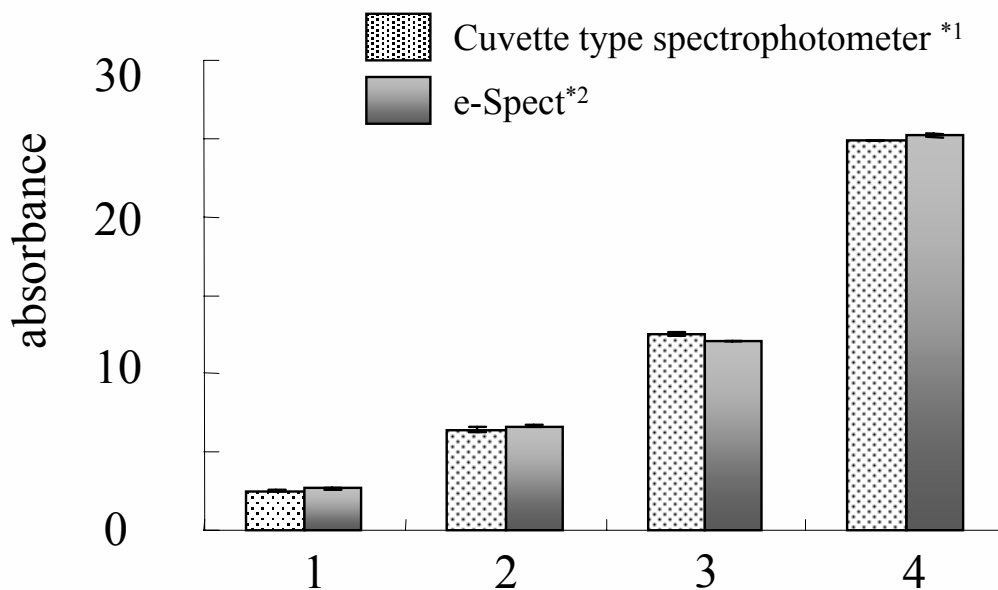
Various concentration FITC samples (5nM - 6000nM) were measured with respect Fluorescence measurement mode repeatedly (n=3).

Performance DATA

Comparison between e-Spect and conventional cuvette-based spectrophotometer

Introduction

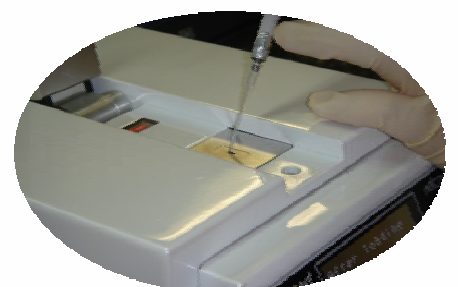
Reproducibility and accuracy studies of the e-Spect ES-2 was assessed in comparison to the traditional cuvette type spectrophotometer. Malcom's e-spect achieves precise results with reproducibility equal to cuvette type spectrophotometer without dilution from low concentration sample to high concentration sample.



*1 Upper 3.0 ABS samples were diluted with water

*2 No dilution

(n=5)



Performance DATA

PicoGreen dsDNA Quantitation

Introduction

PicoGreen dsDNA Quantitation Reagent is an ultra-sensitive and specific fluorescent nucleic acid stain for quantitating double-stranded DNA (dsDNA). Using the Malcom Micro UV-Vis • Fluorescence spectrophotometer e-spect ES-2, the PicoGreen Assay provides a specific and sensitive quantification of double-strand DNA (dsDNA) with minimal consumption of reagent and your precious sample.

The most commonly used technique for measuring nucleic acid concentration is the determination of absorbance at 260 nm (A₂₆₀). The major disadvantages of the absorbance method are the large relative contribution to the signal of nucleotides, single-stranded nucleic acids (ssDNA) and other contaminants such as proteins and extraction buffers. The interference caused by contaminants commonly found in nucleic acid preparations, the inability to distinguish between DNA and RNA.

The Malcom's e-spect micro UV-Vis • Fluorescence Spectrophotometer used in conjunction with Invitrogens' PicoGreen dsDNA Quantitation Reagent enables researchers to quantitate as little as 1 ng/mL (pg/uL) of dsDNA. The linear detection range of the PicoGreen assay in the Malcom's e-spect ES-2 extends four orders of magnitude in DNA concentration - from 1 ng/mL (pg/uL) to 1000 ng/mL with a single dye concentration (see Figures). This linearity is maintained in the presence of several compounds commonly found to contaminate nucleic acid preparations, including salts, urea, ethanol, chloroform, detergents, proteins and agarose. The assay protocol has been developed to minimize the fluorescence contribution of RNA and single-stranded DNA (ssDNA). Using the PicoGreen dsDNA Quantitation Reagent and the e-spect ES-2, researchers can quantitate dsDNA in the presence of equimolar concentrations of ssDNA and RNA with minimal effect on the quantitation results.

λDNA (pg/μL)	Ave RFU (n=5)	Stdev
1	7.8	4.3
50	11.2	7.8
500	30.6	4.5
750	43.0	6.2
1000	56.2	4.4

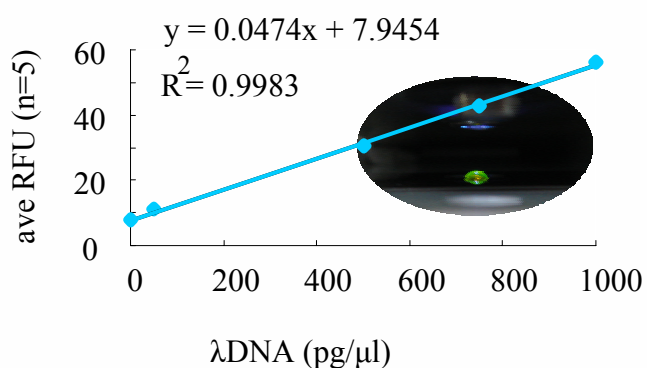


Figure shows the picogreen assay measurement using fluorescence measurement mode of ES-2. Low-concentration DNA samples (1 pg/uL-) were measured with e-spect fluorescence measurement mode repeatedly (n=5).