Hellma™ TrayCell Application of SpectroArt 200

MATERAL

- Calf Thymus DNA Solution 10 mg/ml (Invitrogen, Carlsbad, CA, USA)
- Hellma™ TrayCell with 1 mm cap and 0.2 mm cap (Hellma, Müllheim, Germany)
- ddH_20 for washing.
- Cotton buds for cleaning of TrayCell.

PROCEDURE

- Dilute the Calf Thymus DNA Solution by ddH_20.
  The serious dilution range is from 1 to 1/32 dilution and each sample will be measured for 5 times.
- Put the TrayCell into the cuvette chamber correctly. The placement of the TrayCell has to steady.
- Pipette 3 µl dilution sample for 1 mm cap or 1 µl dilution sample for 0.2 mm cap onto the surface of the measuring window of TrayCell.
- Carefully fit the 1 mm cap or 0.2 mm cap. Start the measurement.
- Take off the cap, clean the sample by cotton buds and rinse the surface of the measuring window by ddH_20. Wipe to dry.
- Repeat the measuring step until finish the whole dilution samples.

RESULTS

In order to be user-friendly, the flashing has been optimized at single flash setting. Depending on the nature and the experiment condition, the flash setting can be further increased manually to optimize up to 8 if it is required. Again this is depending on the conducted experiments.

	Sample Specific Factor	1 mm Cap (Virtual Dilution Factor 10) [ng/µl] *	0.2 mm Cap (Virtual Dilution Factor 50) [ng/µl] *	Total Detection Range [ng/µl] *
dsDNA	50	25 - 850	125 - 4,250	25 - 4,250
ssDNA	37	18 - 630	90 - 3,150	18 - 3,150
ssRNA	40	20 - 680	100 - 3,400	20 - 3,400
Oligo	30	15 - 510	75 - 2,550	15 - 2,550

Figure 1. *The average dynamic range of the Hellma™ TrayCell relating to the concentration.*

** characteristic concentration values as obtained with an average spectrophotometer. This information is provided by Hellma website.*

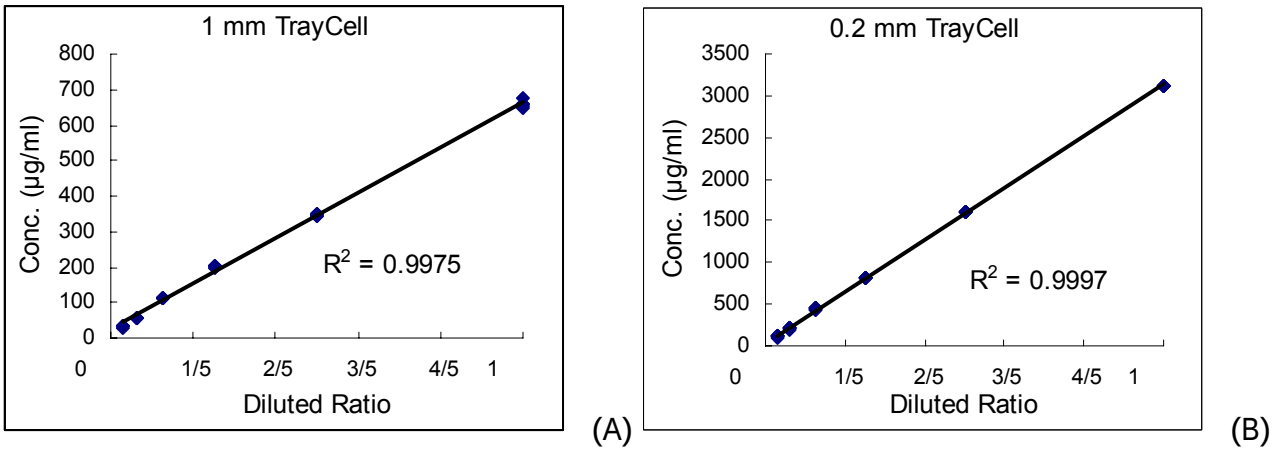

Figure 2. *Linearity of the dilution samples. The X axis is the diluted ratio from low to high, 1/32, 1/16, 1/8, 1/4, 1/2 to 1. The Y axis is the measuring value of the sample concentration. (A) The data performed by 1 mm cap TrayCell with 1 flash and 10 averages setting. (B) The data performed by 0.2 mm cap TrayCell with 5 flashes and 30 averages setting.*

No.	Diluted Ratio of 1 mm Cap					
	1/32	1/16	1/8	1/4	1/2	1
1	29.866	56.061	110.481	198.843	342.657	646.623
2	31.508	57.708	111.908	201.231	346.06	656.162
3	31.398	58.494	111.908	203.968	351.746	659.437
4	31.765	58.411	112.652	201.791	350.628	678.752
5	31.948	58.785	113.025	200.591	350.947	658.779
CV (%)	2.37 %	1.70 %	0.78 %	0.83 %	1.00 %	1.59 %

(A)

No.	Diluted Ratio of 0.2 mm Cap					
	1/32	1/16	1/8	1/4	1/2	1
1	104.059	202.719	433.499	809.624	1606.41	3126.29
2	111.652	213.694	444.768	812.648	1608.46	3121.2
3	108.996	217.275	448.604	816.439	1610.67	3128.2
4	116.784	221.35	450.012	817.579	1606.1	3124.38
5	116.266	224.869	429.822	816.743	1606.26	3120.56
CV (%)	4.25 %	3.53 %	1.85 %	0.37 %	0.11 %	0.09 %

(B)

Figure 3. *Reproducibility of Calf Thymus DNA. The CV, coefficient of variation, can represent the repeatability of the measurement.*

REMARKS

Users can find the information of Figure 1 on the Hellma website. It is very important that because the TrayCell has its limitation, users need to beware of the sample concentration. The range is defined by an average spectrophotometer so it might be able to extend a little bit while using an excellent spectrophotometer. However, it would be secure to follow the instruction. For 1 mm cap testing, SpectroArt 200 can measure the sample in default setting; however, for 0.2 mm cap testing, the setting is 5 flashes and 30 averages (Figure 2). It is because that 0.2 mm cap is used to test higher concentration and higher concentration sample needs more light intensity and lower the signal to noise ratio. Therefore, users can adjust the flash and average settings depending on their sample in order to get a good result. Figure 2 show that SpectroArt 200 has a good linearity while using TrayCell. The CV value also indicates a good reproducibility less than 5 % (Figure 3).

Although 0.2 mm cap TrayCell can perform low concentration sample, such as 125 µg/ml, it's not recommend. The design is better while using high concentration sample, because there will be a dilution factor, 50, to affect the final concentration calculation. If the original sample concentration is too low, the absorbance will not be significant. TrayCell provides the users an alternative other than cuvette testing in order to do the micro litter measurement but if the sample amount is enough for cuvette testing, there is no need to use the TrayCell.

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