

## iQuant™ Broad Range dsDNA Quantitation Kit (2 – 1000 ng)

Catalog Number: N012, N013

**Table 1. Kit Components and Storage**

Material	Amount	Concentration	Storage	Stability	
<b>iQuant™ Broad Range dsDNA Quantitation Reagent (Cat. No. N012)</b>					
iQuant™ BR dsDNA Reagent	1 mL	200X in DMSO	2-8 °C Protect from light	The product is stable for at least 6 months when stored as directed.	
<b>iQuant™ Broad Range dsDNA Quantitation Kit (Cat. No. N013)</b>					
iQuant™ BR dsDNA Reagent (Component A)	1 mL	200X in DMSO	2-8 °C Protect from light		
iQuant™ BR dsDNA Buffer (Component B)	30 mL	10X			
iQuant™ BR dsDNA Standard #1 (Component C)	1 mL	0 ng/μL in TE buffer			
iQuant™ BR dsDNA Standard #2 (Component D)	1 mL	100 ng/μL in TE buffer			

**Number of assays:** 1000 assays.

**Approximate fluorescence excitation/emission maxima, in nm:** 500/530, bound to DNA.

### Product Description

The iQuant™ Broad Range dsDNA Quantitation Kit provides a simple, sensitive, and accurate quantitation for dsDNA. The kit contains concentrated assay reagent, dilution buffer, and pre-diluted dsDNA standards. The assay kit is highly selective for dsDNA, and highly reliable in detecting dsDNA ranging from 2 to 1000 ng, and offers advantages in stability, linear dynamic range, and sensitivity over other traditional of DNA quantitation. The assay is performed at room temperature. Simply dilute the reagent using the buffer provided, add your sample (any volume between 1 μl and 50 μl is acceptable), and read the fluorescence using fluorescence plate reader or Fluorometer such as Qubit® or Quantus™ Fluorometer. The kit is well tolerated to common contaminants such as proteins, salts, solvents and detergents.

### Handling and Disposal

There is no safety data available for iQuant™ BR dsDNA reagent. Treat the iQuant™ BR dsDNA reagent with the safety precautions as other potentially harmful reagents and to dispose of the reagent in accordance with local regulations. Centrifuge the iQuant™ BR dsDNA reagent and the dsDNA standards before opening vials to minimize loss on the cap. Use properly calibrated pipettes for best accuracy.

### General Protocol

#### 1. Measure dsDNA samples using a Fluorescence Microplate Reader

**(Note: For simplicity, the following protocol is written using 10 μL of dsDNA sample volume. In practice, the volume of dsDNA sample could be ranging from 1 μL to 50 μL depending on the concentration of dsDNA sample, then adjust the volume of iQuant™ working solution to 200 μL.)**

1.1 Warm up the iQuant™ Broad Range dsDNA Quantitation Kit to room temperature. Check the iQuant™ BR dsDNA reagent for any precipitation. If precipitation is seen, warm up the vial in a

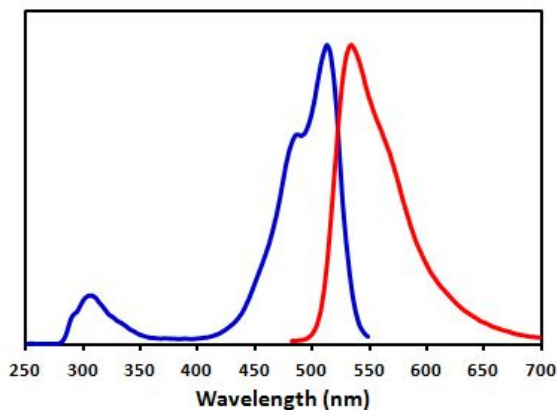
water bath and vortex until dissolved.

- 1.2 Make 1X iQuant™ BR dsDNA Buffer by diluting the 10X iQuant™ BR dsDNA Buffer 1:9 in DI water.
- 1.3 Prepare the iQuant™ working solution by diluting the iQuant™ BR dsDNA reagent 1:200 in 1X iQuant™ BR dsDNA Buffer (prepared from step 1.2) **IMMEDIATELY** before use. Use a clean plastic tube each time you make iQuant™ working solution. For example, to measure 8 samples in duplicate, add 20 µL of iQuant™ BR dsDNA reagent to 4 mL of 1X iQuant™ BR dsDNA Buffer. Mix well and use immediately.
- 1.4 Add 190 µL of the iQuant™ working solution to each well of a black 96-well microplate. Black plates such as Greiner or Corning black 96-well plates are recommended to minimize fluorescence bleed-through from other well.
- 1.5 Prepare a series of dsDNA standard dilutes from iQuant™ BR dsDNA Standard #2 (Component D) or your known dsDNA sample.
- 1.6 Add 10 µL of each dsDNA standard dilutes and the unknown dsDNA samples in duplicate or triplicates into separated wells and mix well by pipetting up and down.
- 1.7 Incubate the microplate at room temperature for 2 minutes in the dark.
- 1.8 Measure the fluorescence using a microplate reader with 485 nm excitation and 530 nm emission, with the appropriate cut-off.
- 1.9 Generate a linear standard curve by plotting fluorescence versus DNA concentration of the DNA standards. Use the standard curve and the fluorescence of the unknown DNA samples to determine the unknown DNA concentration.

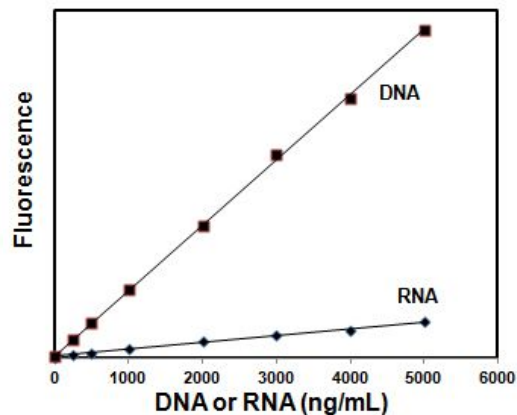
## **2. Measure dsDNA samples using the Qubit® Fluorometer from Invitrogen or the Quantus® Fluorometer from Promega**

**(Note: For simplicity, the following protocol is written using 10 µL of dsDNA sample volume. In practice, the volume of dsDNA sample could be ranging from 1 µL to 50 µL depending on the concentration of dsDNA sample, then adjust the volume of iQuant™ working solution to 200 µL.)**

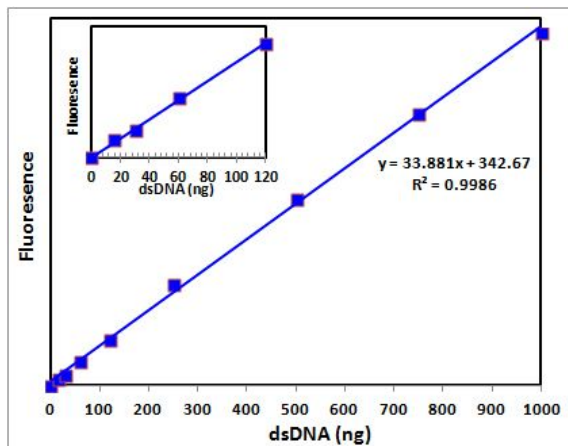
- 2.1. Warm up the iQuant™ Broad Range dsDNA Quantitation Kit to room temperature. Check the iQuant™ BR dsDNA reagent for any precipitation. If precipitation is seen, warm up the vial in a water bath and vortex until dissolved.
- 2.2. Make 1X iQuant™ BR dsDNA Buffer by diluting the 10X iQuant™ BR dsDNA Buffer 1:9 in DI water.
- 2.3. Prepare the iQuant™ working solution by diluting the iQuant™ BR dsDNA reagent 1:200 in 1X iQuant™ BR dsDNA Buffer (prepared from step 1.2) **IMMEDIATELY** before use. Use a clean plastic tube each time you make iQuant™ working solution. For example, to measure 8 samples in duplicate, add 10 µL of iQuant™ BR dsDNA reagent to 2 mL of 1X iQuant™ BR dsDNA Buffer. Mix well and use immediately.
- 2.4. Add 190 µL of the iQuant™ working solution to each assay tube. (**Note:** Use only thin-wall, clear 0.5 mL PCR tubes. Axygen PCR-05-C tubes (VWR, Cat No. 1011-830)).
- 2.5. Add 10 µL of dsDNA standard #1 (Component C), dsDNA standard #2 (Component D), and the unknown dsDNA samples to the appropriate tubes and mix by vortexing 2-3 seconds, and label the lids of each DNA standard tube and unknown sample tubes correctly.
- 2.6. Incubate all tubes at room temperature for 2 minutes in the dark.
- 2.7. Measure the fluorescence on the Qubit® fluorometer using the **dsDNA Broad Range** program, according to the manufacture's recommendation; or the Quantus® Fluorometer according to user manual.



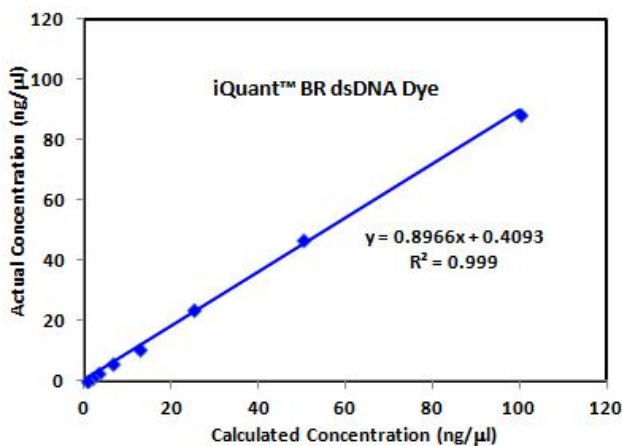
**Figure 1.** Excitation (blue) and emission spectra (red) of iQuant™ BR dsDNA reagent in the presence of dsDNA.



**Figure 2.** DNA selectivity and sensitivity of iQuant™ BR dsDNA assay kit.



**Figure 3.** The quantitation of plasmid dsDNA with iQuant™ BR dsDNA Quantitation Kit using fluorescence plate reader.



**Figure 4.** The quantitation of plasmid dsDNA with iQuant™ BR dsDNA Quantitation Kit using Qubit® Fluorometer.

### Considerations for Data Analysis

It is more prefer to use a dsDNA standard similar to the unknown samples (i.e. similar in size, linear vs circular). We found using the iQuant™ BR dsDNA reagent most linear dsDNA yield similar results. If the fluorescence of an unknown sample is higher than dsDNA standard #2 (Component D), further dilute the sample and add 10  $\mu$ L of diluted sample to perform the assay.

### Appendix

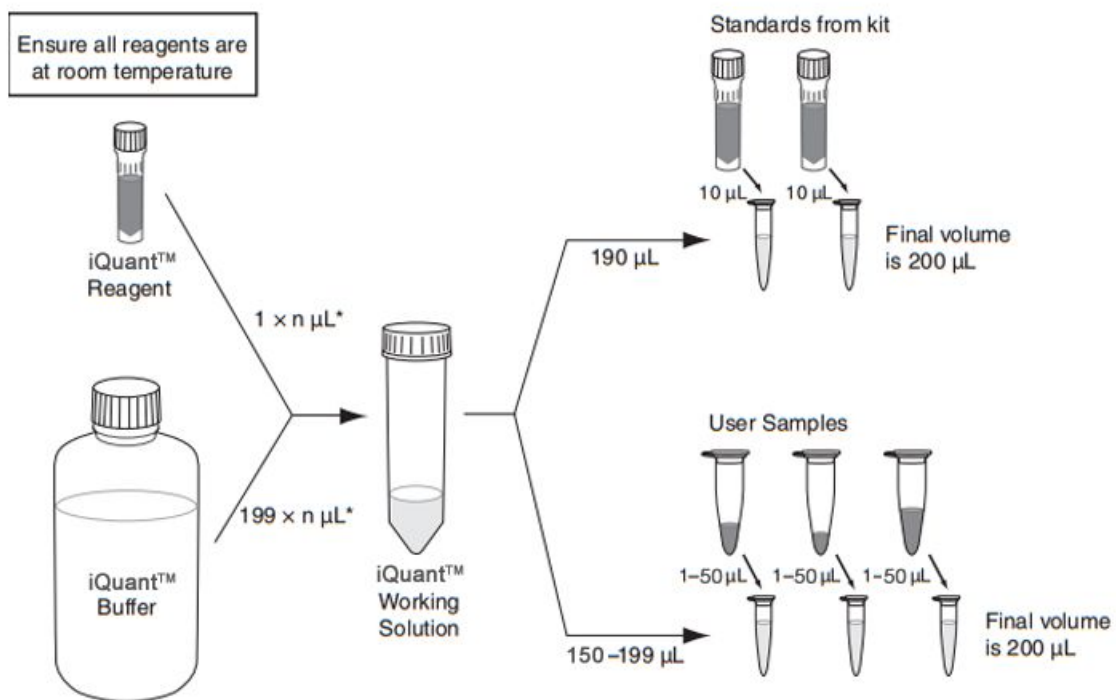
**Table 2. Effect of Contaminants in the iQuant™ Broad Range dsDNA Assay**

Contaminant	Final Concentration in Assay	Concentration in 10 $\mu$ L Sample	Result
<b>Proteins</b>			
Bovine Serum Albumin	50 $\mu$ g/mL	1 mg/mL	OK
<b>Salts</b>			
Sodium Chloride	10 mM	200 mM	OK
Magnesium Chloride	2 mM	40 mM	OK
Sodium Acetate	10 mM	200 mM	OK
Ammonium Acetate	10 mM	200 mM	OK
<b>Organic Solvents</b>			

Ethanol	0.5%	10%	OK
Chloroform	0.1%	2%	OK
Phenol	0.1%	2%	OK
<b>Detergents</b>			
Sodium Dodecyl Sulfate	0.01%	0.2%	OK
Triton X-100	0.005%	0.1%	OK
<b>Other Compounds</b>			
dNTPs	100 $\mu$ M	2 mM	OK
RNA	1X	1X	OK

### Related Products

Cat. No.	Product Name	Unit Size
<b>N010</b>	iQuant™ High Sensitivity dsDNA Reagent (200 X)	1 mL
<b>N011</b>	iQuant™ High Sensitivity dsDNA Quantitation Kit	1000 assays
<b>N014</b>	iQuant™ ssDNA Reagent (200 X)	1 mL
<b>N015</b>	iQuant™ ssDNA Quantitation Kit	1000 assays



**Figure 5.** iQuant™ BR dsDNA quantitation assay workflow