

iQuant™ Broad Range RNA Quantitation Kit (20 – 1000 ng)

Catalog Number: N018, N019

Table 1. Kit Components and Storage

| Material | Amount | Concentration | Storage | Stability | |
|---|--------|------------------------|------------------------------|--|--|
| iQuant™ Broad Range RNA Quantitation Reagent (Cat. No. N018) | | | | | |
| iQuant™ BR RNA 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. | |
| iQuant™ Broad Range RNA Quantitation Kit (Cat. No. N019) | | | | | |
| iQuant™ BR RNA Reagent (Component A) | 1 mL | 200X in DMSO | 2-8 °C Protect from light | | |
| iQuant™ RNA Buffer (Component B) | 30 mL | 10X | | | |
| iQuant™ BR RNA Standard #1 (Component C) | 1 mL | 0 ng/μL in TE buffer | | | |
| iQuant™ BR RNA Standard #2 (Component D) | 1 mL | 100 ng/μL in TE buffer | | | |

Number of assays: 1000 assays.

Approximate fluorescence excitation/emission maxima, in nm: 640/660, bound to RNA.

Product Description

The iQuant™ Broad Range RNA Quantitation Kit provides a simple, sensitive, and accurate quantitation for RNA. The kit contains concentrated assay reagent, dilution buffer, and pre-diluted RNA standards. The assay kit is highly selective for RNA over dsDNA (Figure 1), and highly reliable for initial sample concentrations from 1 ng/μL to 1000 ng/μL, and offers advantages in stability, linear dynamic range, and sensitivity over other traditional of RNA quantitation. The assay is performed at room temperature, and the signal is stable for 3 hours. 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® Fluorometer. The kit is well tolerated to common contaminants such as proteins, free nucleotides, salts, solvents and detergents (Table 2).

To determine the purity of your sample, use the iQuant™ broad range RNA Quantitation Kit together with the iQuant™ broad range dsDNA Quantitation Kit. These measurements give you a much better indication of sample purity than that produced by measuring the A_{260}/A_{280} ratio.

Handling and Disposal

There is no safety data available for iQuant™ BR RNA reagent. Treat the iQuant™ BR RNA 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 RNA reagent and the RNA standards before opening vials to minimize loss on the cap. Use properly calibrated pipettes for best accuracy.

General Protocol

1. Measure RNA samples using a Fluorescence Microplate Reader

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

- 1.1 Warm up the iQuant™ Broad Range RNA Quantitation Kit to room temperature. Check the iQuant™ BR RNA 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™ RNA Buffer by diluting the 10X iQuant™ RNA Buffer 1:9 in RNase-free water.
- 1.3 Prepare the iQuant™ working solution by diluting the iQuant™ BR RNA reagent 1:200 in 1X iQuant™ RNA 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 RNA reagent to 4 mL of 1X iQuant™ RNA 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 RNA standard dilutes from iQuant™ BR RNA Standard #2 (Component D) or your known RNA sample.
- 1.6 Add 10 µL of each RNA standard dilutes and the unknown RNA 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 620 nm excitation and 660 nm emission, with the appropriate cut-off.
- 1.9 Generate a linear standard curve by plotting fluorescence versus RNA concentration of the RNA standards. Use the standard curve and the fluorescence of the unknown RNA samples to determine the unknown RNA concentration.

2. Measure RNA samples using the Qubit® Fluorometer from Life Technologies

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

- 2.1. Warm up the iQuant™ Broad Range RNA Quantitation Kit to room temperature. Check the iQuant™ BR RNA 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™ RNA Buffer by diluting the 10X iQuant™ RNA Buffer 1:9 in RNase-free water.
- 2.3. Prepare the iQuant™ working solution by diluting the iQuant™ BR RNA reagent 1:200 in 1X iQuant™ RNA 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, add 10 µL of iQuant™ BR RNA reagent to 2 mL of 1X iQuant™ RNA 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 RNA standard #1 (Component C), RNA standard #2 (Component D), and the unknown RNA samples to the appropriate tubes and mix by vortexing 2-3 seconds, and label the lids of each RNA 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 **RNA Broad Range** program, according to the manufacture's recommendation.

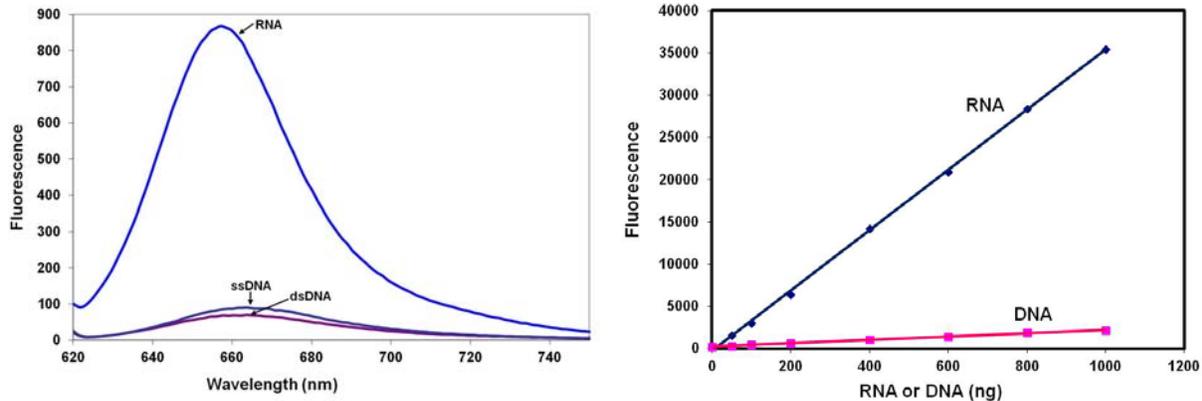


Figure 1. iQuant™ BR RNA Reagent shows great selectivity for RNA over DNA.

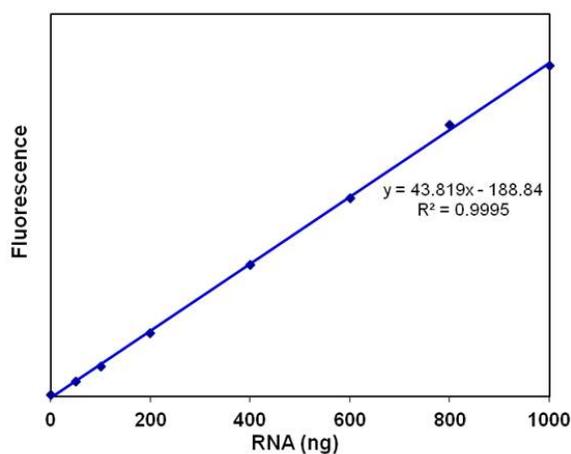


Figure 2. The quantitation of rRNA with iQuant™ BR RNA Quantitation Kit using fluorescence plate reader.

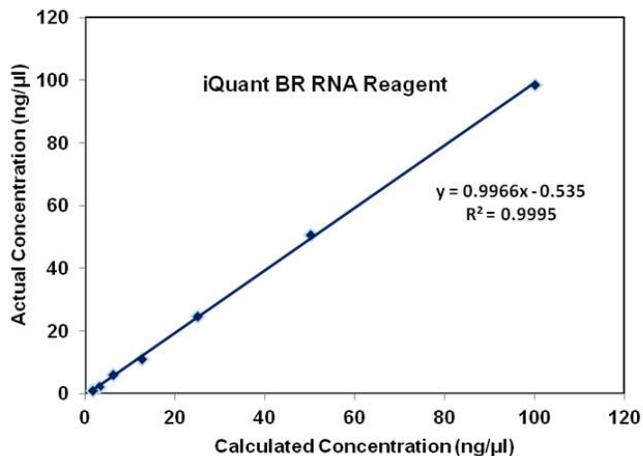


Figure 3. The quantitation of rRNA with iQuant™ BR RNA Quantitation Kit using Qubit® Fluorometer.

Considerations for Data Analysis

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

Appendix

Table 2. Effect of Contaminants in the iQuant™ High Sensitivity RNA Assay

| Contaminant | Final Concentration in Assay | Concentration in 10 μL Sample | Result |
|----------------------|------------------------------|--|--------|
| Proteins | | | |
| Bovine Serum Albumin | 20 $\mu\text{g}/\text{mL}$ | 400 $\mu\text{g}/\text{mL}$ | OK |
| Salts | | | |
| 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 |

| | | | |
|-------------------------|-------------|-------|----|
| Organic Solvents | | | |
| Ethanol | 0.1% | 2% | OK |
| Chloroform | 0.2% | 4% | OK |
| Phenol | 0.1% | 2% | OK |
| Detergents | | | |
| Sodium Dodecyl Sulfate | 0.01% | 0.2% | OK |
| Triton X-100 | 0.001% | 0.02% | OK |
| Other Compounds | | | |
| dNTPs | 100 μ M | 2 mM | OK |
| DNA | 1X | 1X | OK |
| NTPs | 1X | 1X | OK |
| Oligos | 1X | 1X | OK |

Related Products

| Cat. No. | Product Name | Unit Size |
|-------------|---|-------------|
| N010 | iQuant™ High Sensitivity dsDNA Reagent (200 X) | 1 mL |
| N011 | iQuant™ High Sensitivity dsDNA Quantitation Kit | 1000 assays |
| N012 | iQuant™ Broad Range dsDNA Reagent (200 X) | 1 mL |
| N013 | iQuant™ Broad Range dsDNA Quantitation Kit | 1000 assays |
| N014 | iQuant™ ssDNA Reagent (200 X) | 1 mL |
| N015 | iQuant™ ssDNA Quantitation Kit | 1000 assays |
| N016 | iQuant™ High Sensitivity RNA Reagent (200 X) | 1 mL |
| N017 | iQuant™ High Sensitivity RNA Quantitation Kit | 1000 assays |

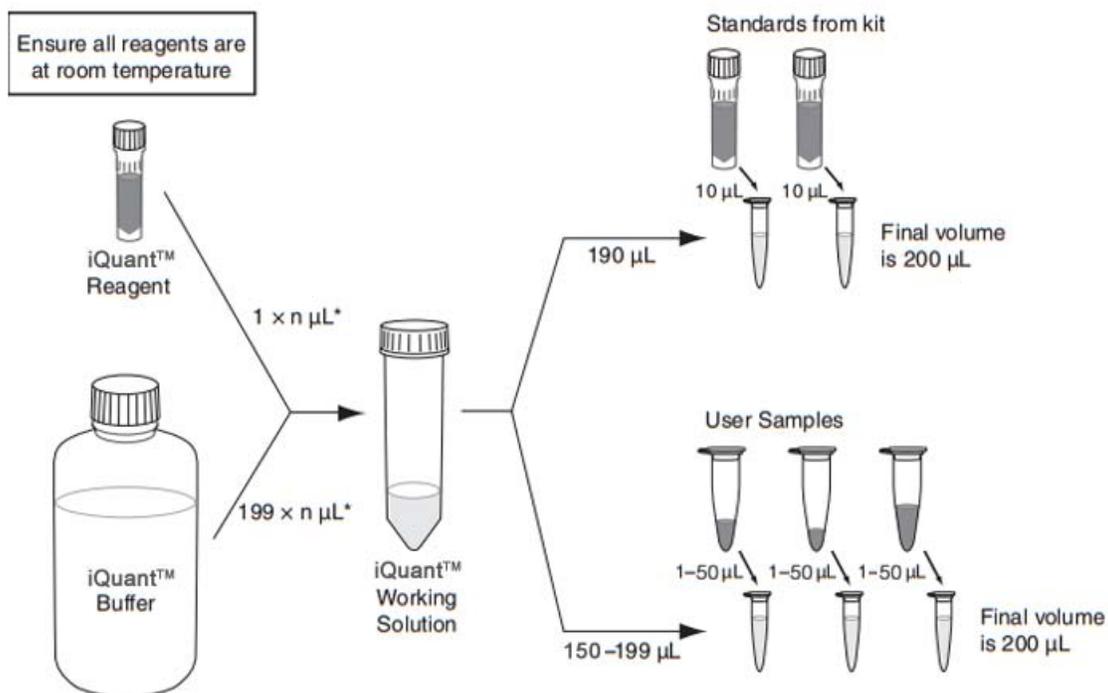


Figure 4. iQuant™ HS RNA quantitation assay workflow