

Result Interpretation

It is preferred for quantitative results to be determined using commercially available software for ELISA evaluation using a 4-parameter curve fit. Alternatively, a semi-log curve fit can be used if 4-parameter software is not available. A spreadsheet that will perform the curve fit and sample concentration calculations is available upon request. Please contact Beacon for further details.

To ensure the validity of the results, please adhere to the following:

- Ensure QC criteria are met.
- The concentration of Cylindrospermopsin in a sample is determined by comparing the average sample absorbance to the standard curve. This value must then be multiplied by the dilution factor used.
- In the event that the average absorbance of the sample is lower than the highest calibrator, further dilute the sample extract in laboratory quality distilled or deionized water to fit into the standard curve and retest alongside the calibrators and controls. Sample results must be multiplied by the total dilution factor used.

Technical Assistance

For questions regarding this kit or for additional information about Beacon products, contact us.

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Safety

Stop Solution is 1N hydrochloric acid. Handle with care. To receive complete safety information on this product, contact Beacon Analytical Systems, Inc., and request Safety Data Sheets.

General Limited Warranty

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Intended Use

The Beacon Cylindrospermopsin Plate Kit is an immunoassay for the detection of Cylindrospermopsin in water samples. This product is intended for research use only.

Principles

Cylindrospermopsin HRP Enzyme Conjugate is pipetted into the test wells followed by the Calibrators, Controls, and the Sample Extract(s). A soluble polyclonal Cylindrospermopsin antibody solution is then added to the test wells to initiate the reaction. During an incubation, Cylindrospermopsin and Cylindrospermopsin HRP Enzyme Conjugate compete for binding to the soluble Cylindrospermopsin antibody which is in turn immobilized on the test wells. Following the incubation, the wells are washed to remove any unbound Cylindrospermopsin and Cylindrospermopsin HRP Enzyme Conjugate. After washing, a colorless substrate is added to the wells and any bound enzyme conjugate will convert the substrate to a blue color. Following an incubation, the reaction is stopped with the addition of Stop Solution and the amount of color in each well is measured. The color of the unknown sample is compared to the color of the calibrators and the Cylindrospermopsin concentration of the sample is derived.

Reagents and Materials Provided

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| 1 Unit | Plate containing 12 test strips of 8 wells each that are vacuum sealed in an aluminized pouch with a desiccant. |
| 5 X 2 mL | Vials of Cylindrospermopsin Calibrators (0, 0.05, 0.3, 0.75 and 2 ppb). |
| 1 X 2 mL | Vial of Cylindrospermopsin Control (0.25 ppb). |
| 1 X 8 mL | Bottle of Cylindrospermopsin HRP Enzyme Conjugate. |
| 1 X 8 mL | Bottle of Cylindrospermopsin Antibody. |
| 1 X 14 mL | Bottle of Substrate. |
| 1 X 14 mL | Bottle of Stop Solution. |

Reagents and Materials Required but Not Provided

- Pipette(s) with disposable tips capable of dispensing the required volume(s).
- Multichannel pipette(s) (8 channels) with disposable tips capable of dispensing the required volume(s) (recommended if running more than two strips at once).
- Laboratory quality distilled or deionized water.
- Reagents and materials for sample preparation.
- Personal protective equipment.
- Paper towels or equivalent absorbent material.
- Wash bottle (optional).
- Timer.
- Microtiter plate or strip reader capable of reading at 450 nm.

Kit Handling Notes and Precautions

- Read the product brochure in its entirety prior to use.
- The kit, in its original packaging, can be used until the end of the month indicated on the box label.
- Do not use reagents after expiration date.
- Store all kit components at 2°C to 8°C (36°F to 46°F) when not in use.
- Reagents should be brought to room temperature, 20°C to 28°C (68°F to 82°F), prior to use. Avoid prolonged (> 24 hours) storage at room temperature.
- Do not freeze kit components or expose them to temperatures greater than 37°C (99°F).
- Running Calibrators, Control and Samples in duplicate will improve assay precision and accuracy.
- Precise transfer of samples and reagents by using a calibrated pipette that is capable of dispensing the required volume is critical to obtain proper assay results.
- If running more than two strips at once, the use of a multi-channel pipette is recommended when adding the Antibody, Substrate and Stop Solution.
- All procedural steps should be completed without interruption. Ensure all reagents, materials and equipment are ready at the appropriate time.
- Each reagent is optimized for use in the Beacon Cylindrospermopsin Plate Kit. Do not substitute reagents from any other manufacturer into the test kit. Do not combine reagents from other Beacon Cylindrospermopsin Plate Kits with different lot numbers.
- Do not reuse test wells.
- Dilution or adulteration of reagents or samples not called for in the procedure may result in inaccurate results.
- Damage to or obstruction of the optical surface may cause unsatisfactory results.

Specificity

Cylindrospermopsin residues can be detected by this assay. Common cyanotoxins which can be found in water samples were tested in the assay and their reactivity is listed in the table below.

Compound	% Cross-Reactivity
Cylindrospermopsin	100
7-Epi-Cylindrospermopsin	153
7-Deoxy-Cylindrospermopsin	126
Microcystin-LR	< 1
Nodularin	< 1

Limit of Detection (LOD) and Quantitation (LOQ)

The LOD and LOQ of this assay was determined through testing a statistically significant (n>40) amount of negative control samples across different individuals, reagent lots, and days.

Sample Type	LOD (ppb)	LOQ (ppb)
Recreational Water	0.025	0.081

Sample Preparation

1. Centrifuge or filter the sample to remove particles, as necessary.
2. Adjust the pH of the sample to be neutral, as necessary.

Assay Procedure

1. Allow kit components and the sample extract(s) to reach room temperature prior to running the test.
2. Place the appropriate number of test wells into a holder. Be sure to re-seal unused test wells in the zip-lock bag with the desiccant to limit exposure to moisture.
3. Dispense **50 µL of Enzyme Conjugate** into each well.
4. Dispense **50 µL of Calibrators, Control and Sample Extract(s)** into the appropriate well. Be sure to use a clean pipette tip for each solution to avoid cross contamination.
5. Dispense **50 µL of Antibody** into each well.
6. Gently shake the wells for 30 seconds using a back-and-forth motion and incubate for **45 minutes** at room temperature.
7. Decant the contents of the wells into an appropriate waste container. Fill the wells to overflowing with laboratory quality distilled or deionized water and then decant. Repeat this wash step four times for a total of five washes. Following the last wash, tap the inverted wells onto absorbent paper to remove excess wash solution.
8. Dispense **100 µL of Substrate** into each well.
9. Gently shake the wells for 30 seconds using a back-and-forth motion and incubate for **45 minutes** at room temperature.
10. Dispense **100 µL of Stop Solution** into each well in the same order of addition as the Substrate.
11. Gently shake the wells for 30 seconds using a back-and-forth motion.
12. Carefully wipe the optical surface with a soft, lint-free wipe. Measure and record the absorbance (Optical Density; OD) of each well at 450 nm using a plate or strip reader within 10 minutes of stopping the assay. If the reader has dual wavelength capability, read at 450 nm minus 605 or 650 nm.
13. Dispose of used test wells in an appropriate waste container.

Quality Control (QC) Criteria

- The correlation coefficient (R^2) of the calibration curve, analyzed using a 4-parameter logistic regression, must be ≥ 0.99 .
- The average absorbance of the zero calibrator replicates must be ≥ 1.0 .
- The average absorbance of calibrator and control replicates must have a coefficient of variation (%CV) < 15%.
- The average absorbance of sample replicates must have a coefficient of variation (%CV) < 20%.
- The concentration of the control must fall between 0.2 and 0.3 ppb.