Beacon Analytical Systems Inc.

EndoAlert Plate Kit

Cat. # 20-0321

Product Insert

PLEASE READ COMPLETELY BEFORE USE

INTENDED USE

The EndoAlert Plate Kit is a kinetic, colorimetric assay for the quantitative determination of bacterial Endotoxin in aqueous solutions. Endotoxin, a bacterial lipopolysaccharide, is one of the major cell wall components of most gram-negative bacteria. The EndoAlert Plate Kit detects low levels of Endotoxin and is therefore a useful tool to assess the integrity of biological and environmental samples. The detection ranges from 0.01 - 10 Endotoxin units (EU/mL).

USE PRINCIPLES

The EndoAlert Plate Kit is a quantitative version of the reaction first described by Levin and Bang in 1968. The test is based upon an enzymatic cascade where Endotoxin activates Factor C in Limulus Amebocyte Lysate (LAL) which in turn activates Factor B. Factor B activates Proclotting Enzyme which then activates Clotting Enzyme. A colorless synthetic peptide substrate is hydrolyzed by Clotting Enzyme to generate a yellow color which can be measured by a spectrophotometer at 405 nm. The degree of color resulting from the reaction is proportional to the amount of Endotoxin in the test sample and can be calculated using a standard curve.

MATERIALS PROVIDED IN THE ENDOALERT PLATE KIT

3 Vials	Chromogenic Lysate	Lyophilized
1 Vial	Endotoxin Standard 10 EU/vial	Lyophilized
1 Bottle	LAL Reagent Water (LRW)	10 mL
1 Piece	96-Well Microtiter Plate	

MATERIALS REQUIRED BUT NOT PROVIDED IN THE ENDOALERT PLATE KIT

All disposable materials must be free of interfering Endotoxin. Any glassware used must be depyrogenated under dry heat (250 °C for at least 0.5 hours is recommended).

- Pipette with disposable tips capable of dispensing 50 µL
- Pipette with disposable tips capable of dispensing 100-1000 µL
- Repeater pipette with disposable tips capable of dispensing 50 µL (optional)
- Pyrogen free glass test tubes (12 X 75 mm) for dilutions
- Parafilm®
- Vortex mixer
- Timer
- Microplate reader capable of reading kinetically at 405 nm and incubates at 37 °C (ex. Molecular Devices SpectraMax Plus 384).

REAGENT STORAGE

- Store all kit reagents at 2-8 °C in the dark.
- Avoid storing kits for extended periods (>24 hours) at room temperature.
- Reagents should be brought to room temperature, 20 to 28°C (62 to 82°F) prior to use.
- Reconstituted Chromogenic Lysate should be stored at 2-8 °C and used within 24 hours. Alternatively, reconstituted Chromogenic Lysate can be frozen at -20 °C for up to 30 days, thawed once and used immediately.
- Diluted standards should be used within 8 hours.

KIT HANDLING NOTES AND PRECAUTIONS

- Perform all steps of the assay procedure using aseptic technique in a laminar flow hood.
- Running diluted standards, samples and controls in duplicate will improve assay precision and accuracy.
- Precise transfer of samples and reagents by using an appropriate and calibrated pipette requires constant monitoring of technique and is critical to obtain proper assay results.
- The use of a repeater pipette to dispense the Chromogenic Lysate when running 8 or more wells is highly recommended.
- Vortex each solution prior to pipetting to ensure accurate measurement of endotoxin concentration.
- Always keep the lid on the 96-Well Microtiter Plate except when adding reagents to avoid accidental contamination.
- Be sure to remove the 96-Well Microtiter Plate lid prior to placing the plate in the reader to avoid optical interference from condensation.
- Dilution or adulteration of reagents or samples not called for in the procedure may result in inaccurate results.
- Each reagent is optimized for use in the EndoAlert Plate Kit. Do not substitute reagents from any other manufacturer into the test kit. Do not combine reagents from other EndoAlert Plate Kits with different lot numbers.
- Avoid using any reagents beyond their expiration date.
- Do not use any kit components that have been damaged or contaminated.
- Wear suitable protective clothing and gloves.
- Establish a clean environment for assay manipulation. All materials and reagents should be free of interfering levels of Endotoxin to eliminate cross contamination. Note that glucan and fungal contamination from the human body, clothes, containers, water, and airborne dust may also cause interference with the EndoAlert Plate Kit.
- The EndoAlert Plate Kit provides a level of Endotoxin only in relation to the standard. It is NOT specific to the species of gram-negative bacteria which is the source of the Endotoxin in the sample. To increase accuracy of the test when the source of Endotoxin is known, use a purified Endotoxin from that species.
- The presence of high concentrations of (1,3) β-D-Glucan may elicit a false positive reaction.

SAMPLE COLLECTION AND PREPARATION

Care should be taken to avoid contamination of the sample with interfering levels of Endotoxin. Be sure to use aseptic technique and only use pyrogen free collection materials. If samples are not able to be tested promptly following collection, store samples at 2-8°C for less than 24 hours or ≤ -18°C for periods of 24 hours or longer. Samples should be stored in appropriate collection containers to ensure accurate measurement of Endotoxin concentration as Endotoxin may adsorb to the inner surface. The pH of the sample should be within the range of 6.0 – 8.0. Sample pH may be adjusted using pyrogen-free sodium hydroxide or hydrochloric acid. Water and simple salt solutions do not require pH adjustments. To avoid contamination, test the pH of a small aliquot of the bulk sample solution.

REAGENT PREPARATION

Perform all steps of the reagent preparation using aseptic technique in a laminar flow hood. Reagents should be brought to room temperature, 20 to 28°C (62 to 82°F) prior to use.

Endotoxin Standards:

The EndoAlert Plate Kit is optimized for linearity between 0.01 EU/mL and 10 EU/mL. An example of standard dilutions can be found below. Alternative standard dilutions may be used to suit the users' requirements. A minimum of 3 standards is recommended.

1. Preparation of an Endotoxin standard curve in LRW at 10, 1, 0.1 and 0.01 EU/mL;

Vial	Endotoxin Standard Concentration (EU/mL)	LRW (µL)	Endotoxin Standard Solution
A	10	1000	
B	1	450	50 µL of the 10 EU/mL Standard
C	0.1	450	50 µL of the 1 EU/mL Standard
D	0.01	450	50 µL of the 0.1 EU/mL Standard
-	Negative Control	450	

   a. Reconstitute the lyophilized Endotoxin Standard by adding 1 mL of LRW. Vortex vigorously for ≥ 20 seconds. Let sit for 15-20 minutes with occasional vortexing.
   b. Prepare a 1 EU/mL endotoxin standard by adding 50 µL of the 10 EU/mL endotoxin standard to 450 µL LRW in a pyrogen free glass tube. Vortex vigorously for ≥ 20 seconds before proceeding.
   c. Prepare a 0.1 EU/mL endotoxin standard by adding 50 µL of the 1 EU/mL endotoxin standard to 450 µL LRW in a pyrogen free glass tube. Vortex vigorously for ≥ 20 seconds before proceeding.
   d. Prepare a 0.01 EU/mL endotoxin standard by adding 50 µL of the 0.1 EU/mL endotoxin standard to 450 µL LRW in a pyrogen free glass tube. Vortex vigorously for ≥ 20 seconds before proceeding.

Chromogenic Lysate:

1. Reconstitute each required vial of the Chromogenic Lysate.
   a. Add 1.1 mL of LRW.
   b. Cover the vial with Parafilm ® and gently swirl to mix.
   c. Let sit for 15-20 minutes.

Note: Confirm the Chromogenic Lysate is completely dissolved before proceeding. After reconstitution, the required vials may be combined to ensure consistency.

ASSAY PROCEDURE

Note: Perform all steps of the assay procedure using aseptic technique in a laminar flow hood. Reagents should be brought to room temperature, 20 to 28°C (62 to 82°F) prior to use.

1. Prepare the plate reader using the following run parameters:

Wavelength	405 nm
Temperature	37°C
Maximum OD	0.5
Onset OD	0.03
Run Time	60 minutes
Read Intervals	30 seconds
Shake	Once before the first reading

2. Pipette 50 µL of each diluted standard, sample, and control into the appropriate wells. Running diluted standards, samples and controls in duplicate will improve assay precision and accuracy.
3. Add 50 µL of reconstituted Chromogenic Lysate to each well containing diluted standards, samples and controls and gently shake the plate by hand to mix. The use of a repeater pipette to dispense the Chromogenic Lysate when running 8 or more wells is highly recommended.
4. Place the plate into the 37°C plate reader with the lid off and begin kinetic assay data collection.
5. Collect and analyze the data for valid assay criteria.

ASSAY CRITERIA

- The correlation coefficient (R) of the standard (log vs. log) should be ≥ 0.980.
- If the RSD% for replicates are greater than 15%, the samples should be retested.
- If unknown samples are found to be out of range of the highest standard, perform additional dilutions so that they fall within range of the standard curve.

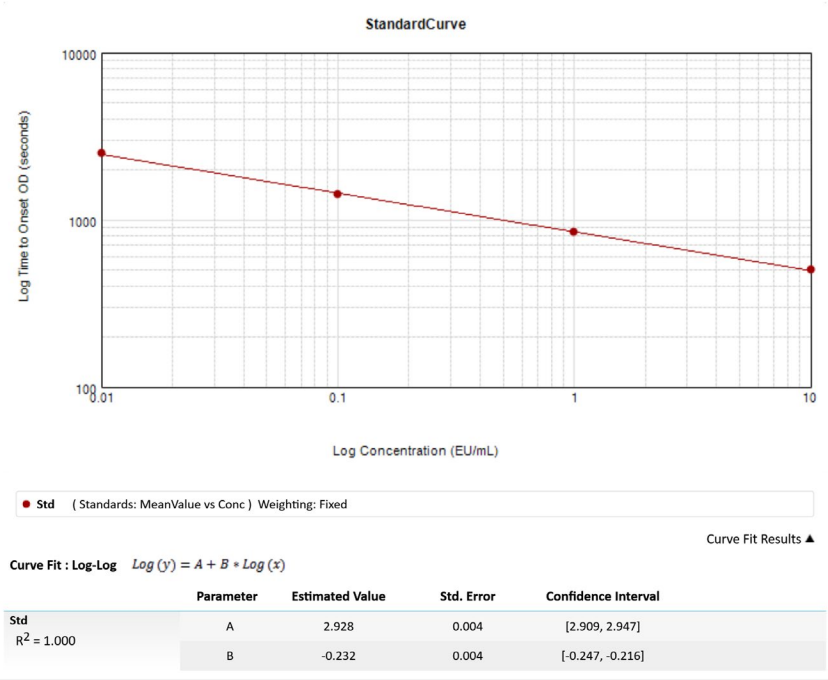
EXAMPLE CALCULATIONS

Endotoxin Standard (EU/mL)	Time to Onset OD (seconds)	Average Reaction Time ± SD*	RSD%	Back Calculation Endotoxin Concentration (EU/mL)
Negative Control	2956.67	2963.39 ± 9.513	0.32	0.00
	2970.12			
0.01	2501.51	2499.92 ± 2.253	0.09	0.01
	2498.32			
0.1	1429.10	1415.66 ± 19.007	1.34	0.11
	1402.22			
1	849.99	847.89 ± 2.977	0.35	1.00
	845.78			
10	505.80	500.42 ± 7.616	1.52	9.72
	495.03			

Actual values may vary; this data is for example purposes only.

* Standard deviation

RSD% = (SD / Average Reaction Time) * 100



TECHNICAL ASSISTANCE

For questions regarding this kit or for additional information about Beacon products, call (207) 571-4302 or contact us at info@beaconkits.com.

SAFETY

To receive complete safety information on this product, contact Beacon Analytical Systems, Inc., and request Safety Data Sheets.

GENERAL LIMITED WARRANTY

Beacon Analytical Systems, Inc. ("Beacon") warrants the products manufactured by it against defects in materials and workmanship when used in accordance with the applicable instructions for a period not to extend beyond a product's printed expiration date. BEACON MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The warranty provided herein and the data, specifications and descriptions of Beacon products appearing in published catalogues and product literature may not be altered except by express written agreement signed by an officer of Beacon. Representations, oral or written, which are inconsistent with this warranty or such publications are not authorized and, if given, should not be relied upon.

In the event of a breach of the foregoing warranty, Beacon's sole obligation shall be to repair or replace, at its option, any product or part thereof that proves defective in materials or workmanship within the warranty period, provided the customer notifies Beacon promptly of any such defect. The exclusive remedy provided herein shall not be deemed to have failed of its essential purpose so long as Beacon is willing and able to repair or replace any nonconforming Beacon product or part. Beacon shall not be liable for consequential, incidental, special or any other indirect damages resulting from economic loss or property damage sustained by a customer from the use of its products. However, in some states the purchaser may have rights under state law in addition to those provided by this warranty.

REV.07142021KH

BEACON ANALYTICAL SYSTEMS, INC.®
82 Industrial Park Road
Saco, ME 04072
Tel. (207) 571-4302 | Fax (207) 602-6502
www.beaconkits.com