



REF 90-00009

Intended Use

The LightDeck MC+CYN Test is a quantitative immunoassay for the simultaneous measurement of microcystins, nodularins and cylindrospermopsin in freshwater samples. Single-use test cartridges are analyzed using the LightDeck MINI Algal Toxin Testing System (hereafter referred to as LightDeck MINI). The test provides water resource managers with preliminary screening test results on raw water samples. Results should be confirmed with approved ELISA, HPLC, or LC-MS/MS methods before making decisions that could impact public health or ecosystems.

The LightDeck MINI operates as a USB-connected peripheral device connected to a computer provided by the user. LightDeck-T software is installed from a USB flash drive provided with the LightDeck MINI.

Performance

- Limit of detection is approximately 0.5 µg/L for microcystins and nodularins and 0.7 µg/L for cylindrospermopsins
- Quantitative dynamic range is approximately 0.5 to 4 µg/L for microcystins and nodularins and 0.7 to 3 µg/L for cylindrospermopsins
- When the assay is above or below quantitative range, the software will report ">" or "<". Sample dilution and re-testing with a new cartridge can be used to bring a "high" sample within quantitative range.
- Assay quantitative range depends on the ambient temperature and all reported results are corrected appropriately for temperature.
- The microcystin assay has demonstrated detection of multiple MC congeners. Data are provided below.

Assay Principle

The LightDeck MC+CYN test cartridges use a multiplexed, competitive immunoassay to generate a quantitative toxin concentration output. The water sample rehydrates a dried pellet containing a mixture of fluorescently-labeled antibodies directed at microcystin, nodularin, and cylindrospermopsin toxins. The antibodies are selected to provide cross-reactivity against multiple microcystin congeners. The cartridge contains a fluidic channel with an immobilized, two-dimensional array of toxin-conjugate spots. When the sample-antibody mixture is added to the cartridge, fluorescently-labeled antibodies bind with their cognate toxin spots generating a fluorescent array image that is automatically analyzed in the LightDeck MINI with the LightDeck-T software. If toxin is present in the sample, antibody binding is inhibited and fluorescent signal is decreased. Cartridges are factory calibrated and LightDeck-T software automatically converts fluorescence intensity into a toxin concentration. For total toxin (dissolved and particulate) detection, algal cell lysis by freeze-thaw methods is required.

Components

Components in Box of Test Cartridges	90-00008
LightDeck MC+CYN Test Cartridges and reagent tubes	25 per box
USB drive with cartridge lot calibration	1 per box
Instructions for Use	1 per box

LightDeck MC+CYN Test cartridges are packaged individually with a microtube containing dried reagents and a desiccant and supplied as a 25-pack. Cartridges are single use only.

Components Required but not Provided	Catalog #
LightDeck MINI	LightDeck 90-00067, Hach 2165600
100 µL fixed volume pipette	Provided with LightDeck MINI, Hach 2946006
Pipet tips	Hach 2948700

Storage and Stability

LightDeck MC+CYN Test cartridges can be stored in their barrier bag pouches refrigerated (2-8 °C) until the expiration date listed on the cartridge pouch. Do not freeze. Allow individual cartridge pouches to warm to room temperature for 10-15 minutes before opening. The LightDeck MC+CYN Test is designed for operation within the temperature range of 10 to 35°C (50 to 95°F). The LightDeck Mini has a temperature sensor that will provide message to the attached computer that the unit is over temperature.

The LightDeck MC+CYN Test cartridges are shipped at ambient temperatures and can be stored on the day of use at ambient temperatures (10 to 37°C or 50 to 99°F). Inside the lid of the box of test cartridges, there is a sensor that will indicate whether the test cartridges have been exposed to elevated temperatures. If the "prolonged exposure" circle on this sensor is filled with red, do not use the test cartridges, as they have been exposed to excessive heat for too long. If this circle on the sensor is filled upon receipt of the box of test cartridges, contact Hach for a replacement.

Sample Collection and Preparation (Lysis/Extraction)

Samples should be collected from natural waters per your laboratory protocols. Samples should be tested within 24 hours of collection. If longer sample storage times are desired, samples should be frozen within 24 hours of collection and thawed before testing. Microcystins can be absorbed by plastics, so it is recommended that samples be stored in glass containers.

Many algal species that produce HAB toxins contain most of the toxin within the cell walls for most of their lifecycle but will release toxins at the end of this lifecycle. In applications where cells can be filtered from the rest of the water, it may be desirable to measure the dissolved toxins, which can be done by simply following this test protocol with a water sample. However, for most applications, the most accurate toxin measurement is made when the cells are lysed to provide a total toxin measurement. To make a total toxin measurement, follow USEPA Method 546 section 11.1 for freezing and thawing the sample three times prior to measuring toxins with this test. This ensures a high degree of cell lysis and accurately reports the total toxin concentration.

Safety and Disposal

The LightDeck MC+CYN Test is:

- This product is intended for use by operators familiar with safe handling of water samples potentially containing toxins produced by algae. Appropriate personal protective equipment is recommended.
- Test cartridges are designed for single use. One sample can be run on one test cartridge.
- Used test cartridges and microtubes should be handled as waste that contains HAB toxins. Follow all local laws and requirements for handling HAB toxin waste.
- After opening up the test cartridge, it should be used within 20 minutes. It is recommended to allow a test cartridge stored at 2-8°C to come to room temperature before opening the pouch to avoid the condensation which might form due to high relative humidity.

Limitations

- The LightDeck MC+CYN test cartridges have not been validated for use with finished drinking water.
- Results should be confirmed with approved ELISA, HPLC, or LC-MS/MS methods before making decisions that could impact public health or ecosystems.
- Detection of total toxin, particulate toxin or intracellular toxin requires cell lysis prior to running the assay. Freeze-thaw lysis is acceptable according to USEPA Method 546 section 11.1. The system has not been validated with chemical lysis methods. Please contact LightDeck prior to using the system with a chemical lysis method.
- Not compatible with brackish water or salt water.
- Not compatible with permanganate or activated carbon.

Test Procedure

- Double click the icon on the computer to open the LightDeck-T software.
 - Click RUN TEST
 - Choose HAB Gen 2 from the drop-down menu.
 - Enter information into the input fields.
 - Click ACCEPT to load your inputs.
- Open the pouch. Remove the test cartridge.
 - Use within 10 minutes.
 - Avoid touching the clear plastic on the bottom of the cartridge.
- Using a fresh pipette tip, add 100 μ L sample to the microtube containing dried reagents and mix by aspirating and dispensing 10 times until all reagents are fully dissolved and well mixed with the sample.
- Add the combined reagents and sample to the inlet port of the cartridge using the same pipette tip.
- Click READY to open the cartridge door to the LightDeck MINI.
- Insert the cartridge into the LightDeck MINI. DO NOT insert if the outside of the cartridge is contaminated with sample.
- The rest of the procedure is automatic. Results are reported when the test is complete.
- Remove the cartridge from the LightDeck MINI and dispose of it appropriately.

Results

Internal Controls

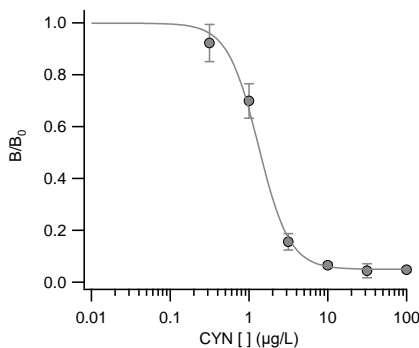
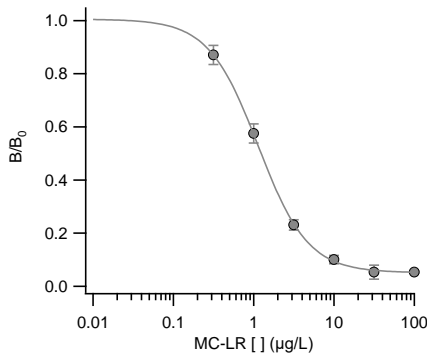
The test cartridge contains internal controls that are designed to detect within run failure modes and invalidate the test result. If a control fails, the result will be reported as invalid.

Automated Result Calculation

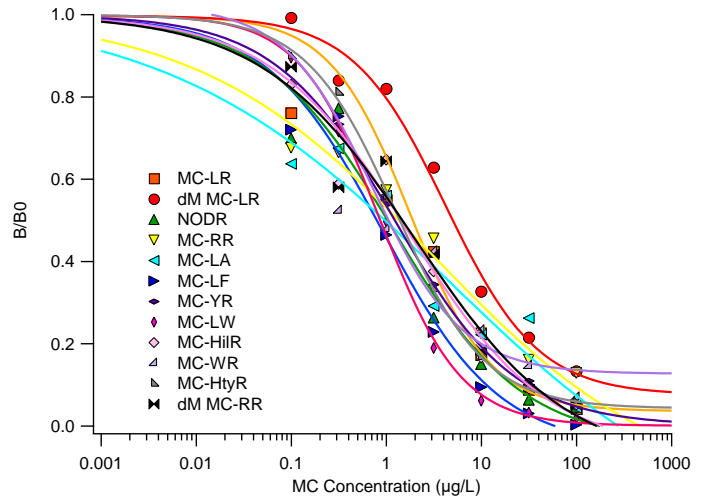
A sample with valid internal controls has the results reported to the user.

Performance Data

Representative standard curves



Microcystin Congener Cross Reactivity



Symbols



Consult instructions for use



Serial number



Batch code/lot number



Catalog number



Use by YYYY-MM-DD



Caution, consult accompanying documents



Electrical hazard



Manufacturer



Date of manufacture



Do NOT recycle. In compliance with European Directive 2002/96/EC on waste electrical and electronic equipment (WEEE), this equipment must not be disposed of as unsorted municipal waste. Instead, it must be collected separately in accordance with local recycling regulations. Presence of the symbol indicates that compliance must be adhered to for this device on waste electrical and electronic equipment (WEEE).



DC electrical power rating



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