

APPLICATION



Determination of Microcystins and Nodularin in Drinking Water by UHPLC/MS/MS using a Luna[®] Omega 1.6 μm Polar C18 (EPA Method 544)

¹Zeshan Aqeel, ¹Simon Lomas, ²David Schiessel
¹Phenomenex, 411 Madrid Avenue, Torrance, CA 90501 USA
²Babcock Laboratories, 6100 Quail Valley Ct, Riverside, CA 92507 USA

Overview

Microcystin congeners like Microcystin-LR and Microcystin-RR are a class of toxins produced by cyanobacteria. They are cyclic heptapeptides that can cause serious damage to the liver (hepatotoxic) once ingested. As environmental conditions change and encourage harmful algal blooms, drinking and irrigation water testing becomes highly important to ensure safety. In this application note we highlight a UHPLC/MS/MS method that analyzes six microcystin toxins and the cyclic pentapeptide nodularin. With the wide range of compound polarities present within this class of cyclic peptide toxins, a stationary phase with a balanced combination of polar and non-polar selectivity is needed to ensure adequate separation. The Luna Omega 1.6μm Polar C18 was selected because of its enhanced polar retention alongside the hydrophobic non-polar selectivity of its C18 group. Additionally, the high efficiency and greater particle inertness of this column allows for greater resolution and higher sensitivity.



UHPLC/MS/MS Conditions

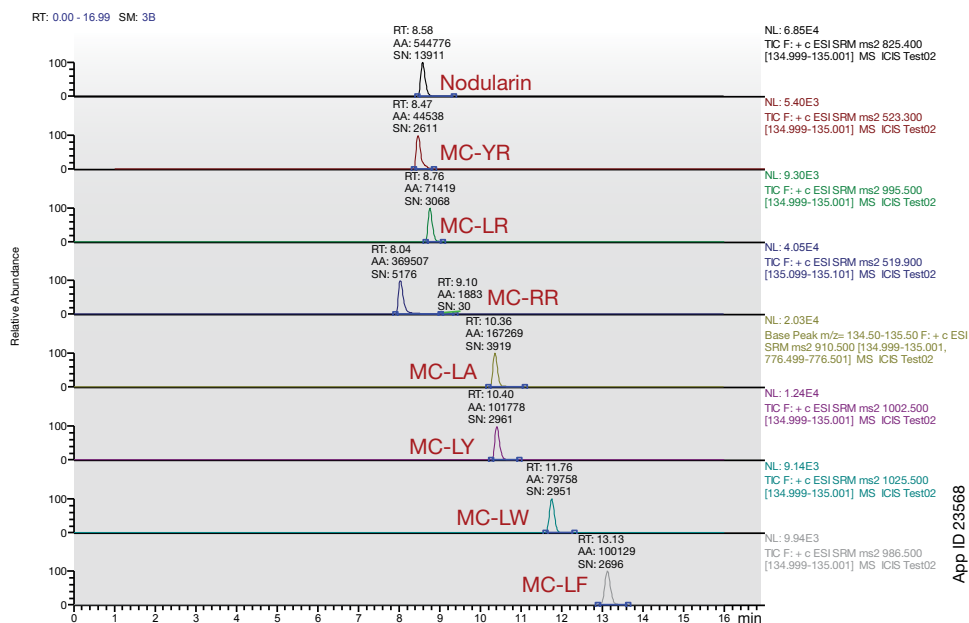
Column: Luna Omega 1.6μm Polar C18
Dimensions: 100 x 2.1 mm
Part No.: 00D-4748-AN
Mobile Phase: A: Water
 B: Methanol
 C: 1 mM Ammonium Fluoride
Gradient:

Time (min)	% A	% B	% C
0	80	10	10
5	20	70	10
13	20	70	10
13.01	80	10	10
18	80	10	10

Flow Rate: 0.2 mL/min
Temperature: 40 °C
System: Thermo Scientific[™] Accela UHPLC
Detection: MS/MS (ESI+)
Detector: TSQ Quantum[™] Ultra
Sample: 1. Nodularin
 2. MC-YR
 3. MC-LR
 4. MC-RR
 5. MC-LA
 6. MC-LY
 7. MC-LW
 8. MC-LF

Acknowledgement

We would especially like to thank David Schiessel and Babcock Laboratories for their support and use of their method, system, and standards for this application.



Name	Q1	Q3	CE
Nodularin	825.4	135.0	54
MC-YR	523.3	135.0	15
MC-LR	995.5	135.0	60
MC-RR	519.9	135.0	30
MC-LA	910.5	135.0	48
MC-LY	1002.5	135.0	50
MC-LW	1025.5	135.0	50
MC-LF	986.5	135.0	45

* All precursors are the [M+H]⁺ ion EXCEPT for MC-YR and MC-RR which were detected as [M+2H]²⁺
 ** MC-LW is not listed as a target analyte in EPA Method 544

App ID 23568



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Luna Omega Ordering Information

1.6 µm Minibore Columns (mm)					SecurityGuard™ ULTRA Cartridges†
Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
Polar C18	00A-4748-AN	00B-4748-AN	00D-4748-AN	00F-4748-AN	AJO-9505
C18	00A-4742-AN	00B-4742-AN	00D-4742-AN	00F-4742-AN	AJO-9502

† SecurityGuard ULTRA Cartridges require holder, Part No.: AJ0-9000

Australia

t: +61 (0)2-9428-6444
f: +61 (0)2-9428-6445
auiinfo@phenomenex.com

Austria

t: +43 (0)1-319-1301
f: +43 (0)1-319-1300
anfrage@phenomenex.com

Belgium

t: +32 (0)2 503 4015 (French)
t: +32 (0)2 511 8666 (Dutch)
f: +31 (0)30-2383749
beinfo@phenomenex.com

Canada

t: +1 (800) 543-3681
f: +1 (310) 328-7768
info@phenomenex.com

China

t: +86 (0)20 2282-6668
f: +86 (0)20 2809-8130
chinainfo@phenomenex.com

Denmark

t: +45 4824 8048
f: +45 4810 6265
nordicinfo@phenomenex.com

Finland

t: +358 (0)9 4789 0063
f: +45 4810 6265
nordicinfo@phenomenex.com

France

t: +33 (0)1 30 09 21 10
f: +33 (0)1 30 09 21 11
franceinfo@phenomenex.com

Germany

t: +49 (0)6021-58830-0
f: +49 (0)6021-58830-11
anfrage@phenomenex.com

India

t: +91 (0)40-3012 2400
f: +91 (0)40-3012 2411
indiainfo@phenomenex.com

Ireland

t: +353 (0)1 247 5405
f: +44 1625-501796
eireinfo@phenomenex.com

Italy

t: +39 051 6327511
f: +39 051 6327555
italiainfo@phenomenex.com

Luxembourg

t: +31 (0)30-2418700
f: +31 (0)30-2383749
nlinfo@phenomenex.com

Mexico

t: 001-800-844-5226
f: 001-310-328-7768
tecnicomx@phenomenex.com

The Netherlands

t: +31 (0)30-2418700
f: +31 (0)30-2383749
nlinfo@phenomenex.com

New Zealand

t: +64 (0)9-4780951
f: +64 (0)9-4780952
nzinfo@phenomenex.com

Norway

t: +47 810 02 005
f: +45 4810 6265
nordicinfo@phenomenex.com

Puerto Rico

t: +1 (800) 541-HPLC
f: +1 (310) 328-7768
info@phenomenex.com

Spain

t: +34 91-413-8613
f: +34 91-413-2290
espinfo@phenomenex.com

Sweden

t: +46 (0)8 611 6950
f: +45 4810 6265
nordicinfo@phenomenex.com

United Kingdom

t: +44 (0)1625-501367
f: +44 (0)1625-501796
ukinfo@phenomenex.com

USA

t: +1 (310) 212-0555
f: +1 (310) 328-7768
info@phenomenex.com

All other countries Corporate Office USA

t: +1 (310) 212-0555
f: +1 (310) 328-7768
info@phenomenex.com



If Luna analytical columns do not provide at least an equivalent separation as compared to a competing column of the same particle size, similar phase and dimensions, return the column with comparative data within 45 days for a FULL REFUND.

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