

Certificate of Analysis

Citicoline

[[[(2R,3S,4R,5R)-5-(4-amino-2-oxopyrimidin-1-yl)-3,4-dihydroxyoxolan-2-yl]methoxy-hydroxyphosphoryl] 2-(trimethylazaniumyl)ethyl phosphate

Compound : Citicoline
Lot number : ULN-51903
Analysis date : 2024-09-16
Purity % : 99.86%
Method : HPLC-UV-MS

Client : UMBRELLA.us
3280 E Hemisphere Loop
Tucson, Arizona 85706

PubChem CID: 13804

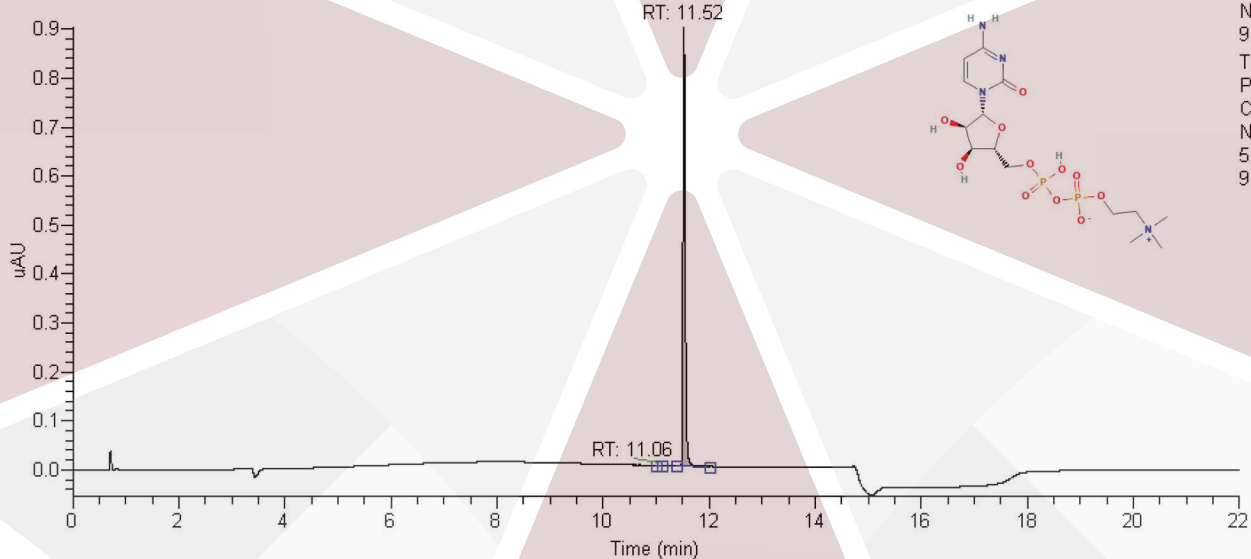
<https://pubchem.ncbi.nlm.nih.gov/compound/13804>

High Performance Liquid Chromatography (HPLC) UV – Purity Test

Citicoline_ULN-5190301_240916124023

9/16/2024 12:40:23 PM

RT: 0.00 - 22.00 SM: 3B



NL:
 9.05E-1
 Total Scan
 PDA
 Citicoline_UL
 N-
 5190301_240
 916124023

PEAK LIST		Number of detected peaks: 2		
	Time (min)	Area	%Area	
1	11.06	4.00E-03	0.14	
2	11.52	2.60E+00	99.86	Citicoline

Analysis Performed by
 Ken Pendarvis, ChE
 Analytical Chemist
 MZ Biolabs
contact@mzbiolabs.com



2024-09-16

Note: Injectable peptides may contain salts and sugars to aid in solubility and act as pH buffers. These are not normally detected using UV and are not considered impurities.

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Mass Spectrometry (MS) – Identity Test

Identity confirmed using HPLC-MS

Molecular weight calculated using monoisotopic m/z values from mass spectrum

Expected monoisotopic mass : 488.11 Da

Measured monoisotopic mass : 488.13 Da

Molecular weight confirmed

Note : Monoisotopic m/z values are not easily seen in full spectrum view for larger molecules and peptides.

The dominant isotopic peak (base peak) shown in the spectrum below can be used to approximate the average molecular weight frequently reported by vendors and databases as a secondary means of confirmation.

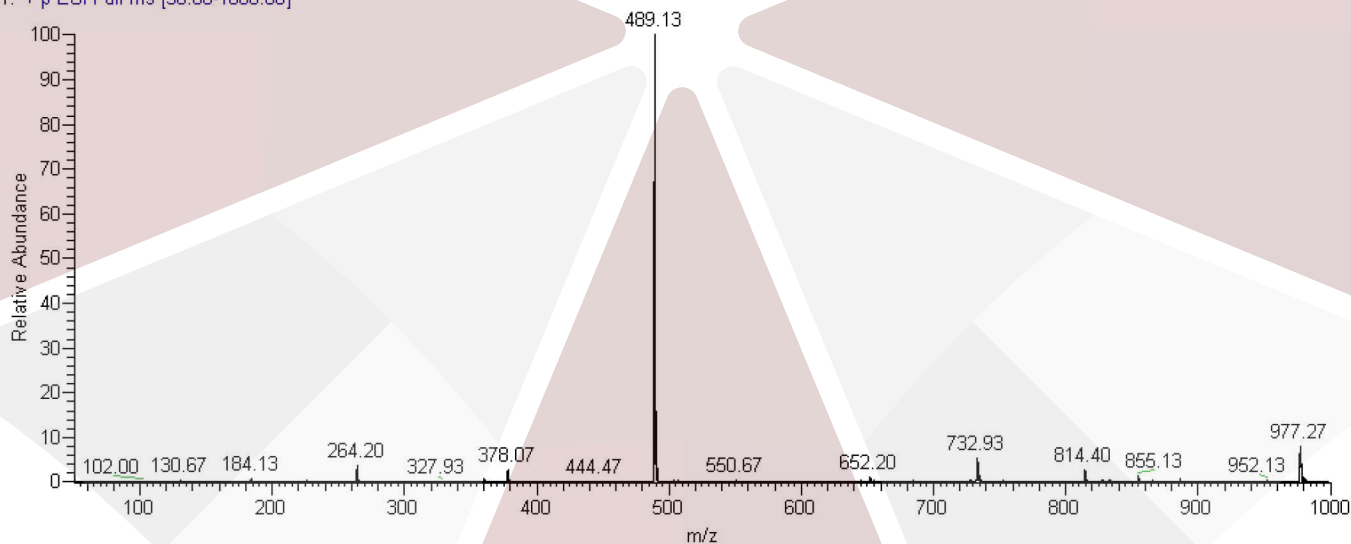
Recorded MS spectrum

Citicoline_ULN-5190301_240916124023

9/16/2024 12:40:23 PM

Citicoline_ULN-5190301_240916124023 #729 RT: 11.59 AV: 1 NL: 2.59E8

T: + p ESI Full ms [50.00-1000.00]



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