

Certificate of Analysis

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Sample Identification

Sample Name NAD+ 500 mg
Batch Number NND-012
Date Published 2026-08-17 14:25

Results for LYO-0519

Peptides	Result	Unit	Uncertainty	Acceptable Range
NAD+ Assay Polar Compound Screening 10mM ammonium formate buffer	458	mg	[± 2]	
NAD+ Purity Peptide Screening 0.1% TFA	98.3	%	[± 0.5]	
NAD+ Identification by Spectrum (FTIR) Peptide Screening 0.1% TFA	948		[± 5]	
NAD+ Identification by RT Peptide Screening 0.1% TFA	0.998		[± 0.005]	
Microbiology	Result	Unit	Uncertainty	Acceptable Range
Bacterial Endotoxin Chromgenic USP<85>/ Eur. Ph. 2.6.14. Bacterial Endotoxin Chromgenic Test	0.007	EU/mg	[± 0]	
Mass Spectrometry	Result	Unit	Uncertainty	Acceptable Range
Molecular Ion Mass Identification (MS Deconvolution) Mass Spectrometry Identity	664	Da	[± 1]	

 LIQUILABS Analytical services	Method Specification		
Determination of identity, content and purity of NAD⁺			
<i>Document number</i> NAD_006_2026	<i>Superseded document</i> -	<i>Number of pages</i> 4	

1. Content Assessment

1.1. Instrumentation

Module	Name	Serial Number
System Controller	Shimadzu CBM-40 Lite	L221226351398
Degassing Unit	Shimadzu DGU-403	NA
Pump	Shimadzu LC-40B XR	L22146350580
Autosampler	Shimadzu SIL-40C XR	L22216351622
Colum Thermostat	Shimadzu CTO-40S	L22236351602
PDA Detector	Shimadzu SPD-M40	L22276352808
SQ MS Detector	Shimadzu LCMS-2050	O12476200760

1.2. Chromatographic conditions

Chromatographic conditions	
Eluent A	0.05% TFA in Water (HPLC, Gradient Grade)
Eluent B	0.0425% TFA in Acetonitrile (HPLC, Gradient Grade)
Flow rate	0.9 mL/min
Program	Gradient elution
Injection volume	2 µL
Colum Temperature	55°C
Column	Waters XSelect CSH C18, 100x2.1mm 2.5µm
Detection wavelength	280nm

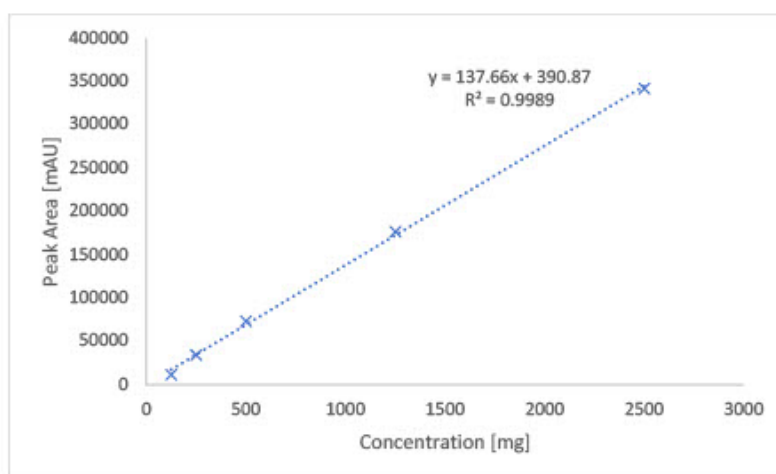
Gradient Program		
Time [min]	A [%]	B [%]
1.5	97.5	2.5
13	45	55
13.5	1	99
14.5	1	99
14.51	97.5	2.5
16	end	

1.3. Sample preparation

Whole amount of container was dissolved in 2mL of water (LCMS Grade). 100 µL of sample was transferred to HPLC vial and diluted by 900 µL water (LCMS Grade) and submitted for analysis.

1.4. Calibration curve

Calibration curve detail	
Quantitative method	External Standard
Calibration Type	Linear
Number of calibration points	5
Force through Zero	Enabled
Weighting Method	None



2. Purity assessment

2.1 Instrumentation

Module	Name	Serial Number
System Controller	Shimadzu CBM-40 Lite	L221226351398
Degassing Unit	Shimadzu DGU-403	NA
Pump	Shimadzu LC-40B XR	L22146350580
Autosampler	Shimadzu SIL-40C XR	L22216351622
Colum Thermostat	Shimadzu CTO-40S	L22236351602
PDA Detector	Shimadzu SPD-M40	L22276352808
SQ MS Detector	Shimadzu LCMS-2050	O12476200760

2.2 Chromatographic conditions

Chromatographic conditions	
Eluent A	0.05% TFA in Water (HPLC, Gradient Grade)
Eluent B	0.0425% TFA in Acetonitrile (HPLC, Gradient Grade)
Flow rate	0.9 mL/min
Program	Gradient elution
Injection volume	2 µL
Colum Temperature	55°C
Column	Waters XSelect CSH C18, 100x2.1mm 2.5µm
Detection wavelength	225nm

Gradient Program		
Time [min]	A [%]	B [%]
1.5	97.5	2.5
13	45	55
13.5	1	99
14.5	1	99
14.51	97.5	2.5
16	end	

2.3 Purity assesment

Purity of compound assesed by area normalization method, comparing area of each peak to sum of area of all peaks detected at wavelenght of 225nm.

3. Identity Assessment

3.1 Instrumentation

Module	Name	Serial Number
System Controller	Shimadzu CBM-40 Lite	L221226351398
Degassing Unit	Shimadzu DGU-403	NA
Pump	Shimadzu LC-40B XR	L22146350580
Autosampler	Shimadzu SIL-40C XR	L22216351622
Column Thermostat	Shimadzu CTO-40S	L22236351602
PDA Detector	Shimadzu SPD-M40	L22276352808
SQ MS Detector	Shimadzu LCMS-2050	O12476200760

3.2 Chromatographic conditions

Chromatographic conditions	
Eluent A	0.05% TFA in Water (HPLC, Gradient Grade)
Eluent B	0.0425% TFA in Acetonitrile (HPLC, Gradient Grade)
Flow rate	0.9 mL/min
Program	Gradient elution
Injection volume	2 µL
Column Temperature	55°C
Column	Waters XSelect CSH C18, 100x2.1mm 2.5µm
Detection wavelength	225nm

Gradient Program		
Time [min]	A [%]	B [%]
1.5	97.5	2.5
13	45	55
13.5	1	99
14.5	1	99
14.51	97.5	2.5
16	end	

3.3 Molecular Ion Mass evaluation

Molecular ion mass was determined by deconvolution of multiply charged ESI-MS spectra to calculate the average neutral (zero-charge) molecular mass by equation:

$$M(\text{neutral}) = (z_i((mz_i) - H)) - ME$$

Where:

mz_i - Measured mass of charged particle

z_i - charge

H - proton mass (1.0076 Da)

ME - mass error

Analysis Report



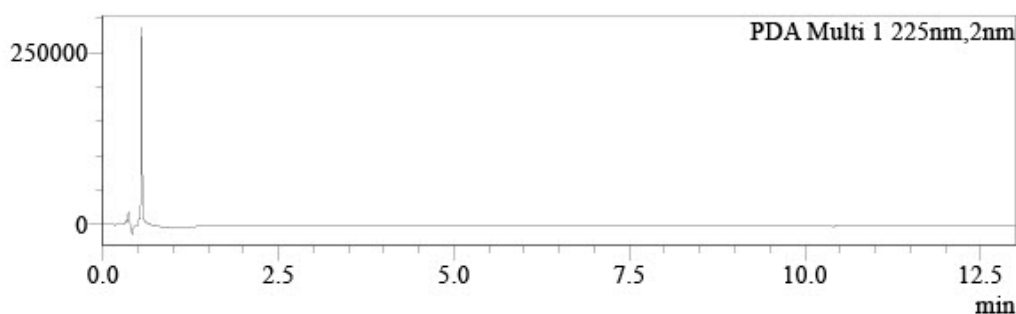
Analysis of quantity and purity of active ingredient by UHPLC with UV detection

Sample Information

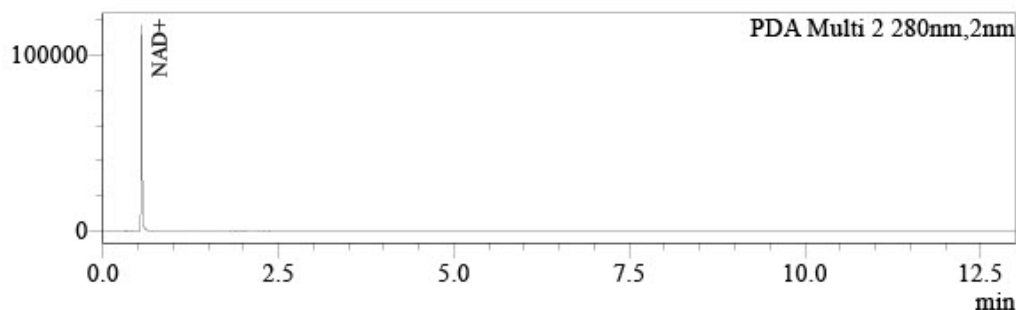
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Data File : LYO-0519__004.lcd
Method File : Peptide screening_V7_Group B.lcm
Date Acquired : 8/6/2026 4:39:12 PM

Chromatogram

uAU



uAU



Peak Table

PDA Ch1 225nm

Name	Ret. Time	Area	Conc.	Unit	Area%
	0.513	6308	0.000		1.672
	0.548	371043	0.000		98.328
		377351			100.000

Peak Table

PDA Ch2 280nm

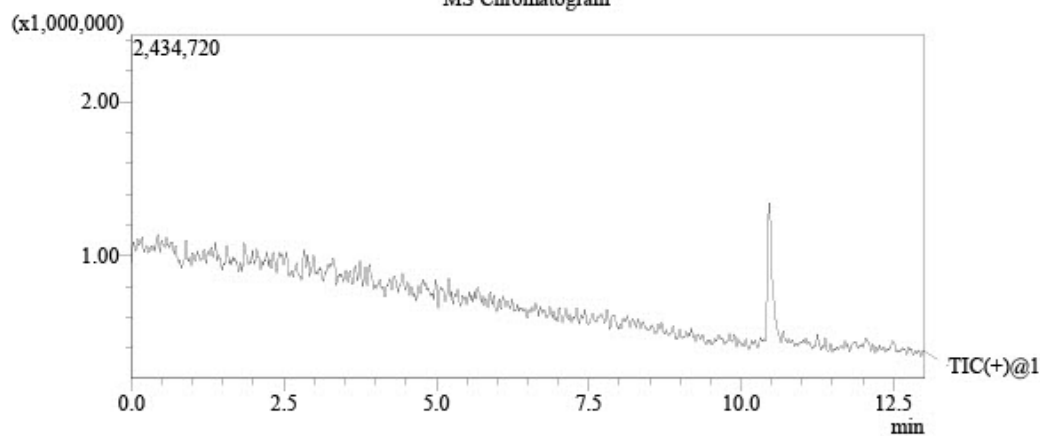
Name	Ret. Time	Area	Conc.	Unit
NAD+	0.548	125468	458.147	mg
		125468		

Analysis Report



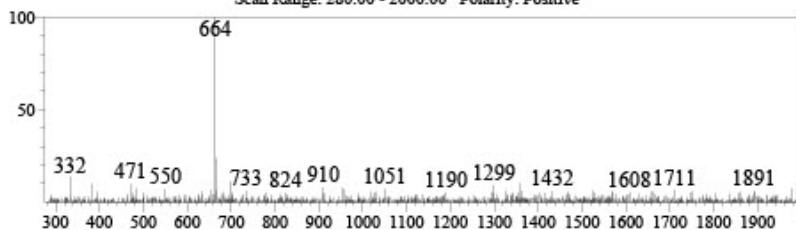
Analysis of identity of active ingredient by UHPLC with mass spectrometric detection

MS Chromatogram

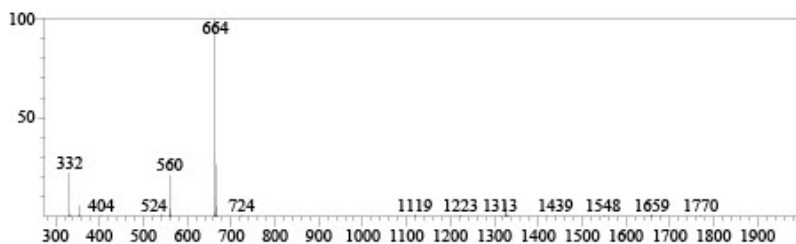


Library Search

Detected compound
Ret. Time: 0.531 Base Peak: 664
Scan Range: 280.00 - 2000.00 Polarity: Positive



Library: Peptide screening lib
Formula: C₂₁H₂₇N₇O₁₄P₂ CAS: 53-84-9 Mol. Weight: 664 Ret. Index: 0
Compound Name: Nicotinamide Adenine Dinucleotide (NAD⁺)



Endotoxin Determination Report

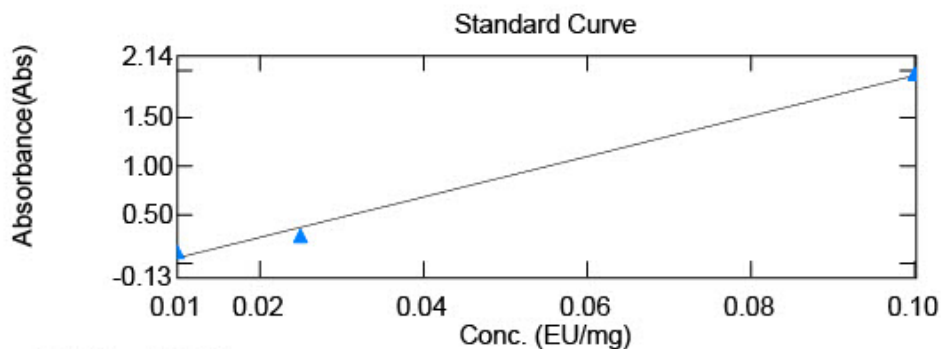


File Information

Filename: C:\UVVis-Data\Data\File_260804_153845.vqud
Date/Time: 08/04/2026 04:55:58 PM

Instrument Information

Instrument Type: UV-1900 Series
Model (S/N): UV-1900i (A12536253123)



$$y = 20.9444x - 0.153119$$
$$r^2 = 0.99483$$

	Sample Name	Conc	Raw_WL545.0	Dilution Rate
1	LYO-0448	1.610	0.6899	40.00
2	LYO-0449	1.987	0.8874	40.00
3	LYO-0450	3.261	1.5542	40.00
4	LYO-0451	0.579	0.4534	20.00
5	LYO-0514	0.223	0.0804	20.00
6	LYO-0515	0.292	0.1528	20.00
7	LYO-0516	0.816	0.7014	20.00
8	LYO-0517	0.143	0.1460	10.00
9	LYO-0518	3.211	1.5282	40.00
10	LYO-0519	3.780	1.8259	40.00
11	LYO-0520	0.188	0.0441	20.00
12	LYO-0521	14.507	1.3661	200.00
13	LYO-0462	3.678	1.7725	40.00
14	LYO-0466	0.310	0.1718	20.00
15	LYO-0467	0.741	0.6224	20.00
16	LIQ-0049	0.010	0.0526	1.00
17	LYO-0468	0.225	0.0822	20.00
18	LYO-0469	0.450	0.3181	20.00
19	LYO-0470	2.350	1.0776	40.00
20	LYO-0471	2.690	1.2555	40.00

	Sample Name	Conc	Raw_WL545.0	Dilution Rate
21	LYO-0472	0.248	0.1071	20.00
22	LYO-0473	0.565	0.4389	20.00
23	LYO-0474	2.342	1.0733	40.00
24	LYO-0475	0.381	0.2456	20.00
25	LYO-0476	13.044	1.2128	200.00
26	LYO-0477	0.266	0.1259	20.00

Responsibles



Mr. Ján Galbavý
CEO

Analysis results relate only to the samples tested.

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