Certificate of Analysis

LIQUILABS
Analytical services

Grail Formula B.V.
Grail Formula B.V.
Hingenderstraat 39
6111 AB Sint Joost
Netherlands
info@24peptides.com

Liquilabs s.r.o.
Inovační 122
252 41 Zlatníky-Hodkovice
Czechia
www.liquilabs.cz

Verify Results Online

Sample Identification

Sample Name	Pinealon 20 mg
Batch Number	GF-PINEA20-B242
Date Published	2026-10-11 08:38

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

Results for LYO-1004

Peptides	Result	Unit	Uncertainty	Acceptable Range
Pinealon Assay Peptide Screening 0.1% TFA	28.0	*mg*	[± 0.1]	
Pinealon Purity Peptide Screening 0.1% TFA	96.6	*%*	[± 0.5]	
Pinealon Identification by Spectrum (FTIR) Peptide Screening 0.1% TFA	998		[± 5]	
Pinealon Identification by RT Peptide Screening 0.1% TFA	0.999		[± 0.005]	

Microbiology	Result	Unit	Uncertainty	Acceptable Range
Total Aerobic Microbial Count USP <61>/Eur. Ph. 2.6.12. Plate Count Method	0	*CFU/g*	[±]	0 - 1000
Total Yeast and Mold Count USP <61>/Eur. Ph. 2.6.12. Plate Count Method	0	*CFU/g*	[±]	0 - 100
Bacterial Endotoxin Chromgenic USP<85>/ Eur. Ph. 2.6.14. Bacterial Endotoxin Chromgenic Test	< 0.001	*EU/mg*		0 - 0.5

Elemental Impurities	Result	Unit	Uncertainty	Acceptable Range
Arsenic Elemental Impurities screening USP ⟨232⟩ / Ph. Eur. 5.20 / 2.4.20	< 0.001	*ppm*		0 - 1.5
Cadmium Elemental Impurities screening USP ⟨232⟩ / Ph. Eur. 5.20 / 2.4.20	< 0.001	*ppm*		0 - 0.5
Quicksilver Elemental Impurities screening USP ⟨232⟩ / Ph. Eur. 5.20 / 2.4.20	< 0.001	*ppm*		0 - 1.5
Lead Elemental Impurities screening USP ⟨232⟩ / Ph. Eur. 5.20 / 2.4.20	< 0.001	*ppm*		0 - 1.5
Nickel Elemental Impurities screening USP ⟨232⟩ / Ph. Eur. 5.20 / 2.4.20	< 0.001	*ppm*		0 - 25
Vanadium Elemental Impurities screening USP ⟨232⟩ / Ph. Eur. 5.20 / 2.4.20	< 0.001	*ppm*		0 - 25
Cobalt Elemental Impurities screening USP ⟨232⟩ / Ph. Eur. 5.20 / 2.4.20	< 0.001	*ppm*		0 - 25

Mass Spectrometry	Result	Unit	Uncertainty	Acceptable Range
Molecular Ion Mass Identification (MS Deconvolution) Mass Spectrometry Identity	418	*Da*	[± 1]	

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

1. Content Assesment

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	10 mM Ammonium Formate in ACN (HPLC, Gradient Grade)
Eluent B	10 mM Ammonium Formate in Water (HPLC, Gradient Grade)
Flow rate	0.6 mL/min
Program	Gradient elution
Injection volume	2 µL
Colum Temperature	40°C
Column	Merck SeQuant ZIC-HILIC 150x2.1mm 3.5µm
Detection wavelength	225nm

Gradient Program		
Time [min]	A [%]	B [%]
2	100	0
18	5	95
20	5	95
22	100	0
30	end	

1

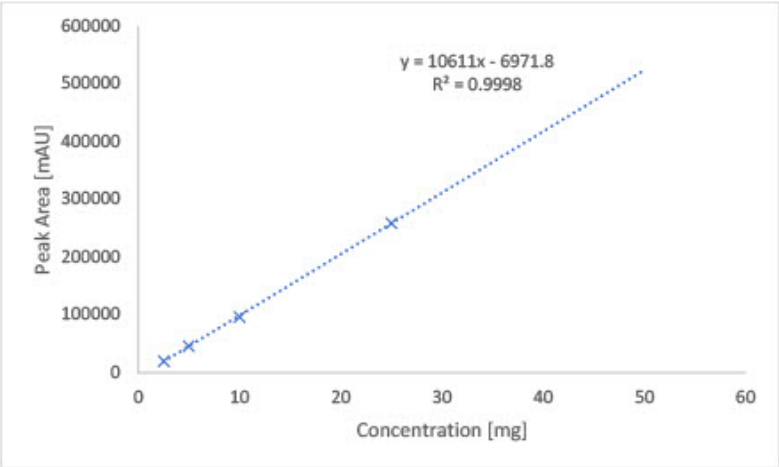
Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

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	4
Force through Zero	Disabled
Weighting Method	None



2

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

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	10 mM Ammonium Formate in ACN (HPLC, Gradient Grade)
Eluent B	10 mM Ammonium Formate in Water (HPLC, Gradient Grade)
Flow rate	0.6 mL/min
Program	Gradient elution
Injection volume	2 µL
Colum Temperature	40°C
Column	Merck SeQuant ZIC-HILIC 150x2.1mm 3.5µm
Detection wavelength	225nm

Gradient Program		
Time [min]	A [%]	B [%]
2	100	0
18	5	95
20	5	95
22	100	0
30	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 225 nm.

3

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

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
Colum 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	10 mM Ammonium Formate in ACN (HPLC, Gradient Grade)
Eluent B	10 mM Ammonium Formate in Water (HPLC, Gradient Grade)
Flow rate	0.6 mL/min
Program	Gradient elution
Injection volume	2 µL
Colum Temperature	40°C
Column	Merck SeQuant ZIC-HILIC 150x2.1mm 3.5µm
Detection w	MS 155-2000 Da

Gradient Program		
Time [min]	A [%]	B [%]
2	100	0
18	5	95
20	5	95
22	100	0
30	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:

$$M(neutral) = (z_i((mz_i) - H)) - ME$$

Where:
mz_i - Measured mass of charged particle
z_i - charge
H - proton mass (1.0076 Da)
ME – mass error

4

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

Analysis Report

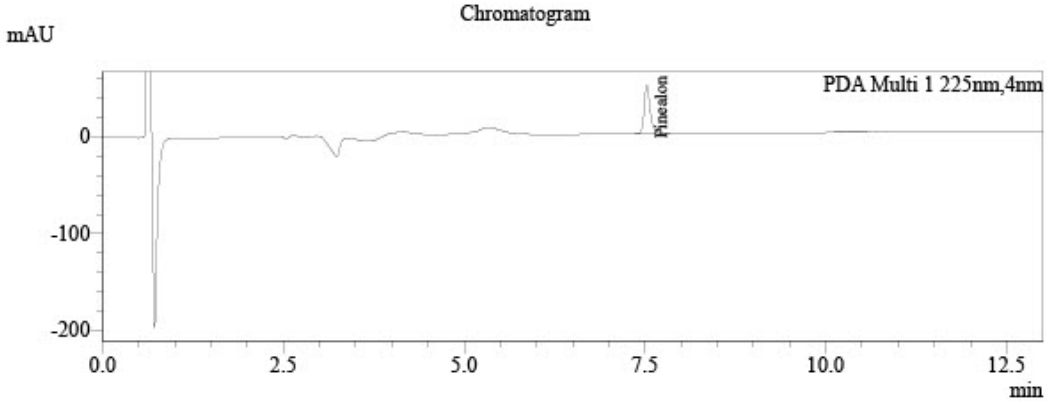
LIQUILABS
Analytical services

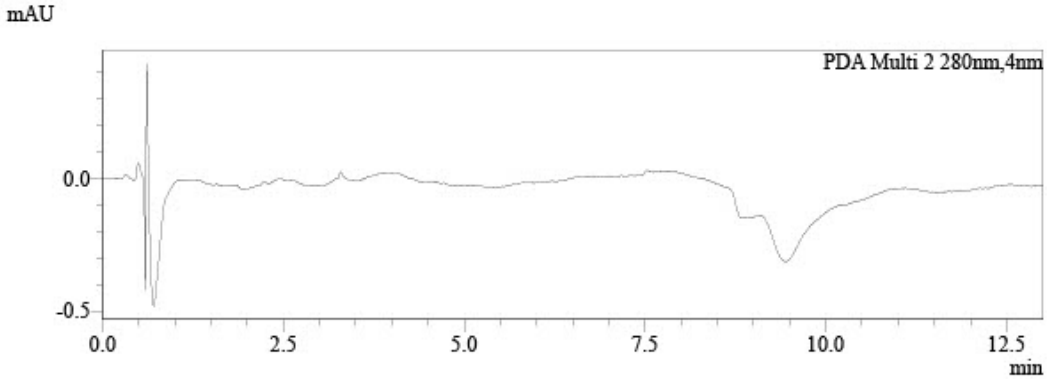
Analysis of quantity of active ingredient by UHPLC with MS detection

Sample Information

Injection Volume	: 2
Data File	: LYO-1004__014.lcd
Method File	: Peptides HILIC_B.lcm
Date Acquired	: 10/2/2026 5:17:00 PM

Chromatogram





Peak Table

PDA Ch1 225nm

Peak#	Name	Ret. Time	Area	Area%	Conc.	Unit
1	Pinealon	7.526	289604	96.551	27.951	mg/L
2		10.340	10346	3.449	0.000	
Total			299950	100.000		

Peak Table

PDA Ch2 280nm

Peak#	Name	Ret. Time	Area	Area%	Conc.	Unit
Total						

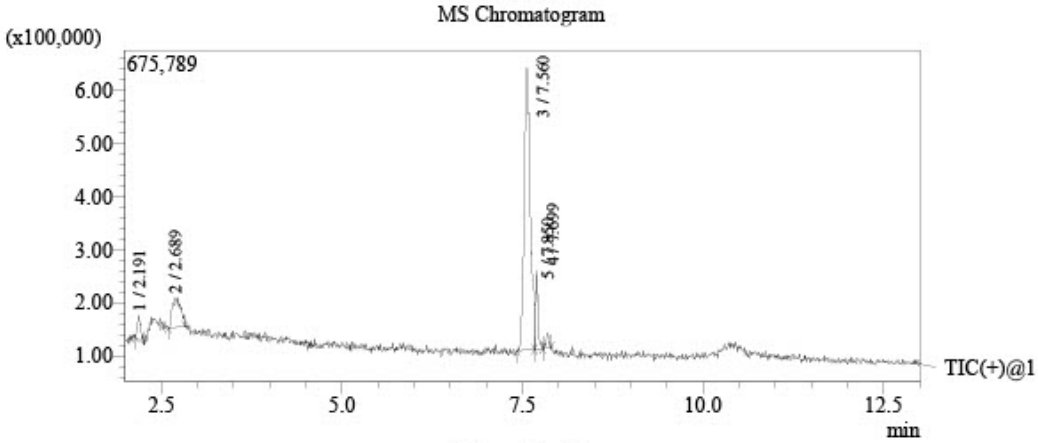
1 / 2

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

Analysis Report

LIQUILABS
Analytical services

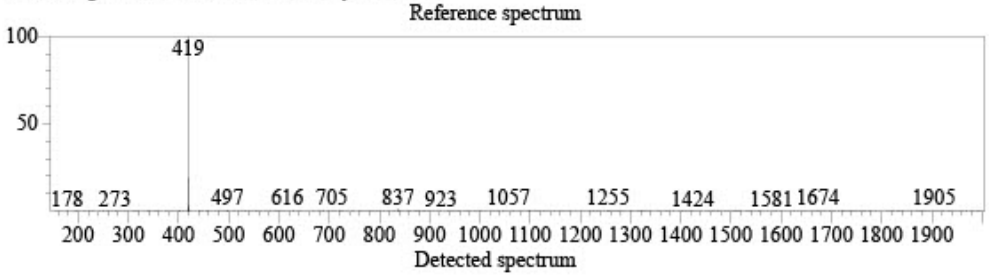
Identification of active ingredient by UHPLC Mass Spectrometr



Library Search

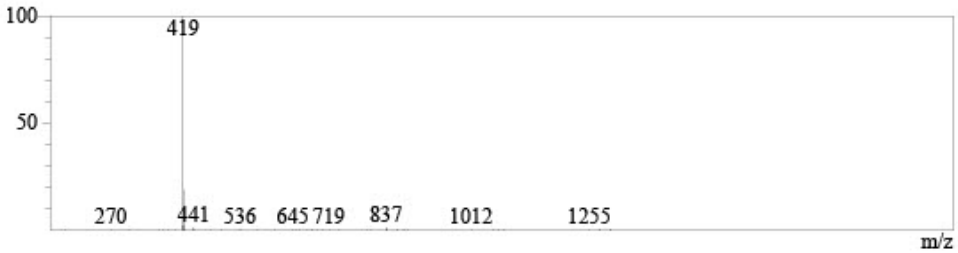
Base Peak: 419(132251)
Scan Range: 155.00 - 2000.00 Porality: Positive

Reference spectrum



Detected spectrum

Library: Peptide HILIC.lib
Formula: C15H26N6O8 CAS: 175175-23-2 Mol.Weight: 418(0!=)
Compound Name: Pinealon



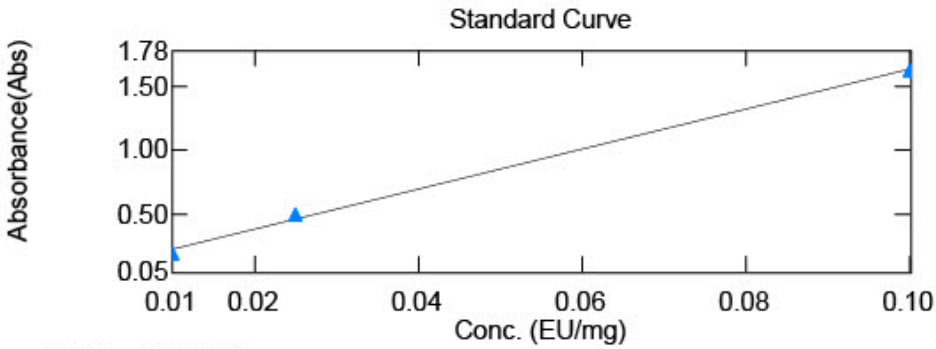
2 / 2

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

Endotoxin Determination Report

File Information
Filename: C:\UVVis-Data\Data\File_260930_145842.vqud
Date/Time: 09/30/2026 03:59:11 PM

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



y = 15.7052 x + 0.0656609
r2 = 0.99825

	Sample Name	Conc	Raw_WL545.0	Dilution Rate
1	LYO-1014	0.055	0.1088	20.00
2	LYO-1015	0.019	0.0804	20.00
3	LYO-1016	0.113	0.1547	20.00
4	LYO-1017	2.333	0.9816	40.00
5	LYO-1018	1.396	1.1619	20.00
6	LYO-1022	0.077	0.1259	20.00
7	LYO-1023	0.073	0.1231	20.00
8	LYO-1028	0.025	0.0851	20.00
9	LYO-1032	0.070	0.1206	20.00
10	LYO-1033	0.023	0.0839	20.00
11	LYO-1034	0.023	0.0838	20.00
12	LYO-1019	4.611	0.9709	80.00
13	LYO-1020	0.043	0.0995	20.00
14	LYO-1021	0.020	0.0816	20.00
15	LYO-1000	0.021	0.0818	20.00
16	LYO-1001	0.023	0.0841	20.00
17	LYO-1002	0.036	0.0943	20.00
18	LYO-1003	0.029	0.0884	20.00
19	LYO-1004	0.022	0.0832	20.00
20	LYO-1005	0.018	0.0797	20.00

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

	Sample Name	Conc	Raw_WL545.0	Dilution Rate
21	LYO-1006	1.201	1.0090	20.00
22	LYO-1007	0.690	0.6079	20.00
23	LYO-1008	0.040	0.0968	20.00
24	LYO-1009	1.688	0.7283	40.00
25	LYO-1010	0.024	0.0846	20.00
26	LYO-1011	35.865	0.7697	800.00
27	LYO-1036	1.937	0.8261	40.00
28	LIQ-0077	0.002	0.0989	1.00
29	LIQ-0078	0.002	0.0965	1.00
30	LIQ-0079	0.002	0.0938	1.00
31	LIQ-0080	0.003	0.1202	1.00
32	LIQ-0081	0.002	0.1005	1.00
33	LIQ-0082	0.003	0.1160	1.00

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

1. Instrumentation and chemicals

1.1. Instruments used

- Sterile Syringe 2mL Luer
- Sterile needles
- Ready made PCA Plate ROTI Aquatest
- Ready made Sab4 Plate ROTI Aquatest

1.2. Chemicals

Sterile physiological solution (0.9% NaCl)

2. Sample preparation and innoculation

2.1 Sample preparation

1. Fresh sterile needle and syringe was used for measuring exactly 2 mL of sterile physiological solution.
2. Needle was changed and by new needle rubber top of peptide containter was penetrated and 2 mL of sterile physiological solution was dispensed.
3. Content of container was completely dissolved and left for 5 minutes to settle potentially created bubbles.
4. This procedure is repeated for two vials.

2.2 Total Aerobic microbial count innoculation and cultivation

1. By sterile needle 1 mL of solution was filled into the sterile syringe.
2. Needle was placed above the flame for few seconds to sterilze.
3. Consequently 1 mL of solution was poured into the ready to use sterile petri dish filled with PCA agar and petri dish was closed.
4. Proces was repeated for two petri dishes.
5. With sterile needle, 1 mL of sterile physiological solution was filled into the sterile needle and was innoculated onto one sterile petri dish filled with PCA agar as negative control sample.
6. Samples and negative control sample were placed in incubator at temperature 37°C for 120h.

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

2.3 Total Yeast and Mold count innoculation and cultivation

1. By sterile needle 1 mL of solution was filled into the sterile syringe.
2. Needle was placed above the flame for few seconds to sterilze.
3. Consequently 1 mL of solution was poured into the ready to use sterile petri dish filled with Sab4 agar and petri dish was closed.
4. Proces was repeated for two petri dishes.
5. With sterile needle, 1 mL of sterile physiological solution was filled into the sterile needle and was innoculated onto one sterile petri dish filled with Sab4 agar as negative control sample.
6. Samples and negative control sample were placed in incubator at temperature 25°C for 72h.

3. Evaluation of results

After incubation time, colonies are counted as cfu (colonies forming units) and result per 1g of sample is determined as:

$$CFU_{avg} = \frac{\sum CFU_n}{n}$$

$$CFU_{avg} = average\ CFU\ counted\ form\ n\ innoculations$$
$$CFU_n = CFU\ counted\ per\ innoculation$$
$$n = number\ of\ innoculations$$

$$CFU\ per\ gram = \frac{CFU_{avg}}{m_s} * DF$$
$$CFU_{avg} = Average\ CFU\ counted\ from\ n\ innoculations$$
$$m_s = mass\ of\ sample\ (mg)$$
$$DF = Dilution\ factor$$

If negative control sample is evaluated as positive, process have to be repeated due to possible contamination in the process of innoculation or incubation.

2

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz

Responsibles

Mr. Ján Galbavý
CEO

Analysis results relate only to the samples tested.
This document shall not be reproduced except in full, without the written approval of Liquilabs s.r.o.

Liquilabs s.r.o. • Inovační 122 • 252 41 Zlatníky-Hodkovice • Czechia
Phone : +420 608 444 727 • Fax : • jan.galbavy@liquilabs.cz • www.liquilabs.cz