

## ANALYTICAL CERTIFICATE

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<b>Sample name</b>	<b>Thymosin beta-4</b>
<b>Batch No.</b>	<b>2024191</b>
<b>Sample No.</b>	<b>NA</b>
<b>Sequence</b>	Ac-Ser-Asp-Lys-Pro-Asp-Met-Ala-Glu-Ile-Glu-Lys-Phe-Asp-Lys-Ser-Lys-Leu-Lys-Lys-Thr-Glu-Thr-Gln-Glu-Lys-Asn-Pro-Leu-Pro-Ser-Lys-Glu-Thr-Ile-Glu-Gln-Glu-Lys-Gln-Ala-Gly-Glu-Ser
<b>Manufacturing date</b>	<b>NA</b>
<b>Submitter of analytical request</b>	<b>Particle s.r.o., Slovakia</b>

### 1. Peptide content by HPLC/CLND:

#### 1.1 HPLC Instrument:

Pump: Agilent 1200 Series, Quat Pump G1311A  
Sampler: Agilent 1260 Series, Hip ALS G1367E  
Degasser: Agilent 1200 Series, Degasser G1379B  
Detectors: Agilent 1200 Series, VWD G1314B  
Nitrogen detector Antek 8060

#### 1.2 HPLC conditions:

Eluents: A – MilliQ water  
B – isopropanol  
D – 1% TFA in MilliQ water  
Flow rate: 1 mL/min  
Gradient:

Time	A (%)	B (%)	D (%)
0	90	0	10
1	90	0	10
10	10	80	10
11	10	80	10
12	90	0	10
16	90	0	10

Column: ARION 5 $\mu$  C4-BIO 300 A, 4.6 x 100 mm  
Serial No 221258

#### 1.3 Sample preparation:

The whole amount of Thymosin beta-4 (10 mg) was dissolved in 2 mL of H<sub>2</sub>O.  
Injection: 2  $\mu$ L

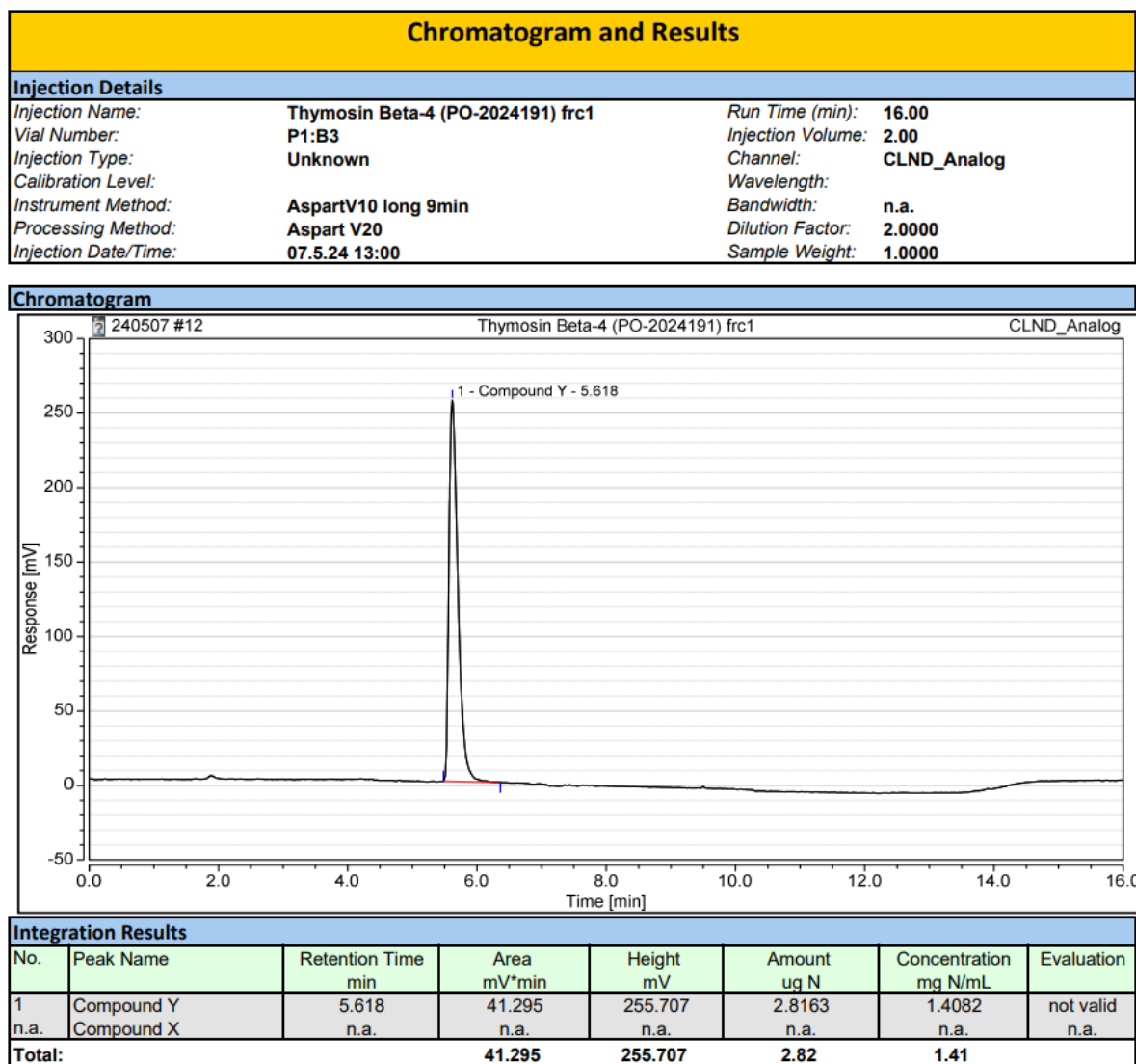
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## 1.4 Chromatograms and calibration curve:

Instrument:CLND-2 Sequence:240507

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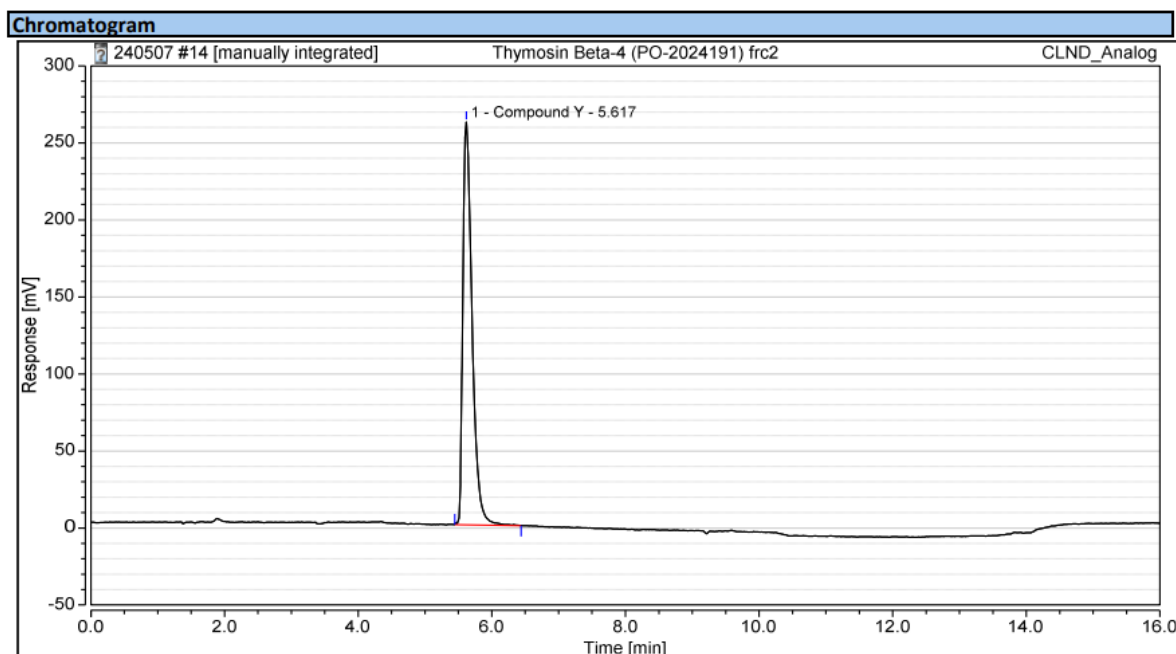
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Instrument:CLND-2 Sequence:240507

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## Chromatogram and Results

Injection Details		
Injection Name:	Thymosin Beta-4 (PO-2024191) frc2	Run Time (min): 16.00
Vial Number:	P1:B3	Injection Volume: 2.00
Injection Type:	Unknown	Channel: CLND_Analog
Calibration Level:		Wavelength:
Instrument Method:	AspartV10 long 9min	Bandwidth: n.a.
Processing Method:	Aspart V20	Dilution Factor: 2.0000
Injection Date/Time:	07.5.24 13:36	Sample Weight: 1.0000



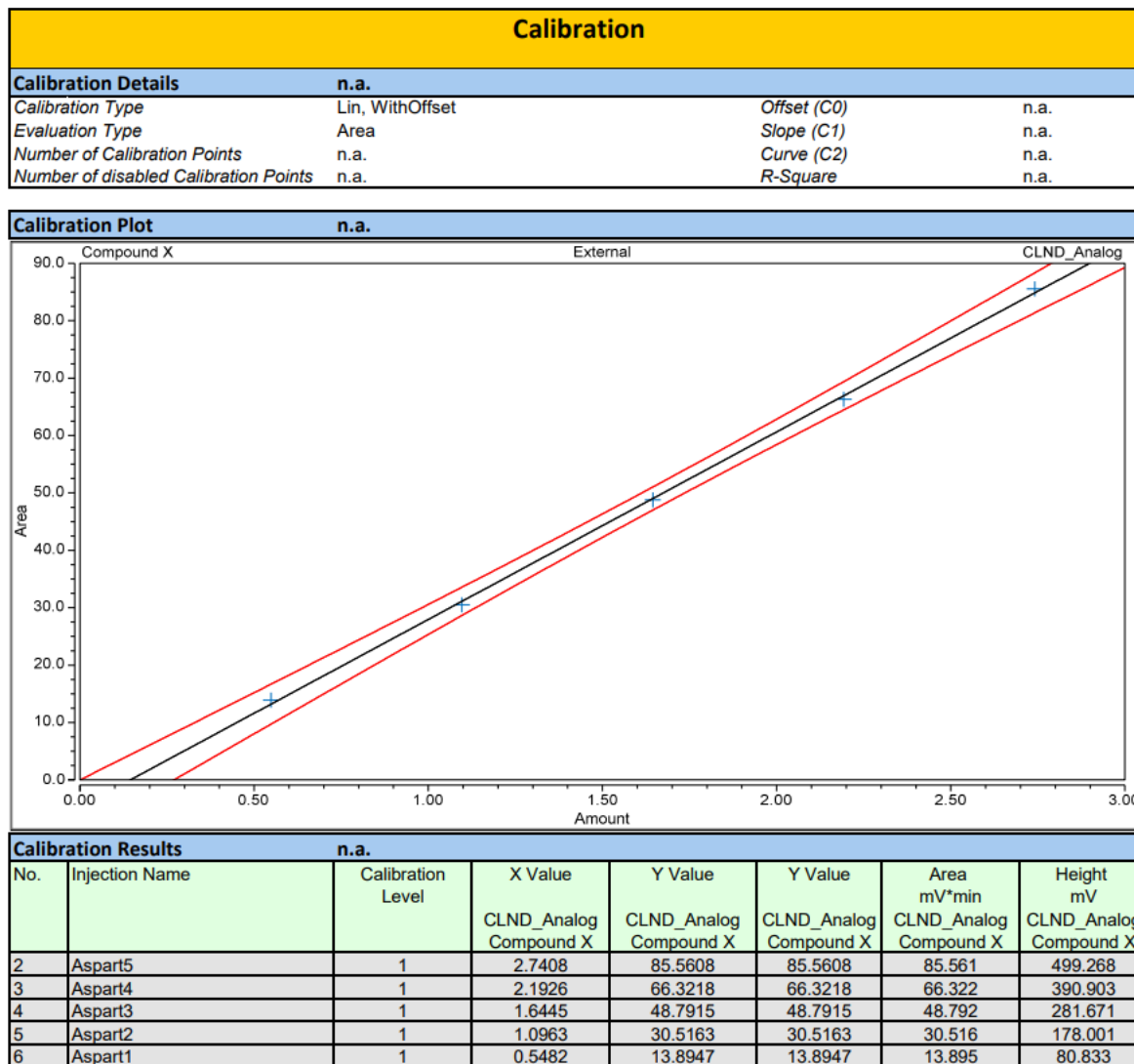
Integration Results							
No.	Peak Name	Retention Time min	Area mV*min	Height mV	Amount ug N	Concentration mg N/mL	Evaluation
1	Compound Y	5.617	42.018	261.418	2.8606	1.4303	not valid
n.a.	Compound X	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>Total:</b>			<b>42.018</b>	<b>261.418</b>	<b>2.86</b>	<b>1.43</b>	

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Instrument:CLND-2 Sequence:240507

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### 1.4 Results:

NNC: Thymosin Beta-4 (PO-2)		Salt:	0
MW (calculated) g/mol	N content (calculated) %	N conc. (measured) mg × N/ml	
4963,51	15,8	1,4193	
Theoretical Volume ml		Lyophilizate amount mg	
1,00		10,00	
Peptide concentration mg/ml                  nmol/ml		Quantified amount mg                          nmol	
8,98                  1810		9,0                  1 810	
Peptide content assay %			
89,8			

### Summary table:

Peptide	Aliquoting (mg)	Total weight of sample (mg)	Content of the peptide by CLND (mg)	Content of the peptide in the sample (%)	Content of the peptide against the amount on label.
Thymosin β-4	10	NA	<b>9,0</b>	NA	89,8 %

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### **2. Purity assessment by UPLC:**

#### **2.1 HPLC Instrument:**

LC-System                      Waters Acquity UPLC  
Detectors:                      UV or DAD at 214 nm

#### **2.2 HPLC conditions:**

Eluents:                      A – MilliQ water + 0.05% TFA  
                                    B – acetonitrile + 0.05% TFA  
Flow rate:                    0.45 mL/min  
Gradient:                    from 5% B to 60% B in 4 min, according to chromatogram results  
Column:                      Waters Acquity BEH, C-18, 1.7µm, 2.1mm x 50mm  
                                    Part No 186002353

#### **2.3 Sample preparation:**

The whole amount of Thymosin beta-4 (10 mg) was dissolved in 2 mL of H<sub>2</sub>O.  
Injection:                    0.2 µL

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## 2.4 Chromatogram of Thymosin Beta-4 (PO-2024191)

### Sample information

#### UPLC2

Channel Description ACQUITY TUV ChA 214nm

Vial : 1:C,8 Vol. : 0.20 ul

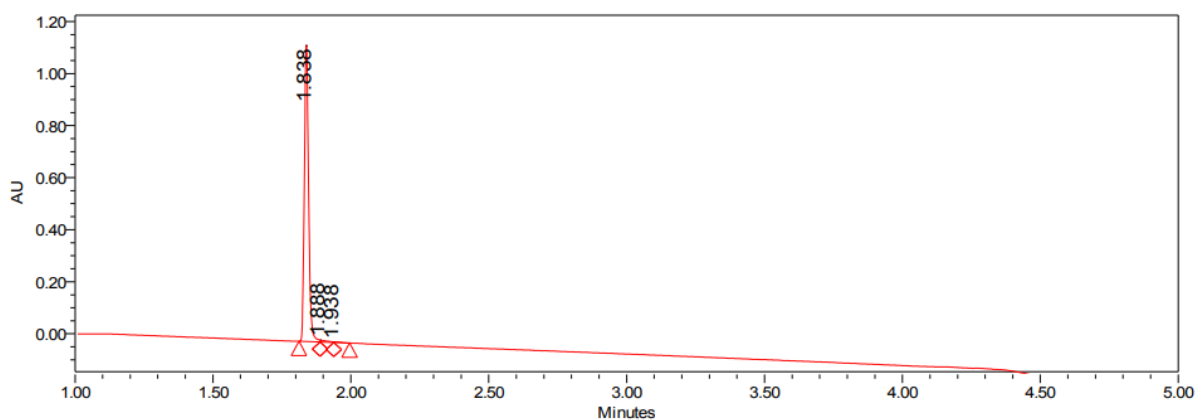
**Sample: Thymosin Beta-4 (PO-2024191)**

Date Acquired 5/7/2024 2:31:33 PM CEST

Date Processed 5/7/2024 4:46:03 PM CEST

Acq Method Set :

Gr\_5\_60\_4mi\_40C\_0\_45\_K2\_met\_s



	RT	Area	Height (µV)	% Area
1	1.838	1228945	1139423	98.47
2	1.888	14431	7876	1.16
3	1.938	4632	2400	0.37

A: 0.05% TFA in water

B: 0.05% TFA in acetonitrile

Gradient :

0.0 - 0.5min 5 - 5 % B

0.5 - 4 min 5 - 60 % B

4.0 - 4.5 min 60 - 100 % B

4.5 - 5.0min 100 % B

5.0 - 5.5min 100 - 5 % B

6min 5 % B

0.45ml/min

Acquity UPLC BEHC18, 1.7µm, 2.1 x 50 mm column

column oven temp. = 40 °C

## 2.5 Result of purity assessment

The purity is 98.47 % at 214 nm.

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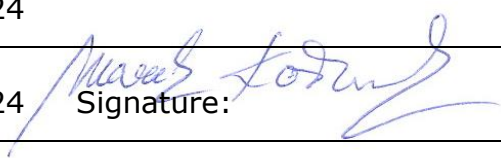
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**CONCLUSION:**

**The sample Thymosin Beta-4 (Batch No. 2024191) was analyzed for peptide content and UV purity.**

**Peptide content is 89.8 % (9,0 mg in 10 mg)**

**Purity is 98.47 % (UPLC at 214 nm).**

<b>ANALYSIS COMPLETED:</b>	Date: 07.05.2024
<b>Issued by QC:</b>	Date: 09.05.2024 Signature: 

As of 09-May-2024 10:27 (UTC+02:00) this information pertains to all reports for Eurofins Batch Number: W124AA1669.

Testing for this Batch was performed under the following regulatory guidelines: GMP Commercial.

Sample Number	Sample Description	Included In This Reporting Group	Report Version	Report Revision Log
W124AA1669-1	Thymosin Beta-4 (PO-2024191) 10 mg glass vials; 1 Box(es); BPT Received Date 02-May-2024	✓	1	Original Report - Analytical Report ABK13571

Contracted Testing Facility	Testing Performed
<p>Eurofins BioPharma Product Testing Slovakia s.r.o. (Bratislava) Kollárovo nám. 9 Bratislava, 811 07 SK CSPharmaSK@eurofins.sk www.eurofins.sk</p> <p>Questions about this report should be directed to your project manager or the general email listed above.</p>	
Other Eurofins BPT Testing Facilities	Testing Performed
<p>Eurofins BioPharma Product Testing Slovakia s.r.o. (Piešťany) Mudronova 25 Piešťany, 921 01 SK</p>	<p>Ph Eur Bacterial endotoxins Total Aerobic Microbial Count - Pour Plate Total Yeast and Mold Count-Pour Plate</p>

Prepared For	Reports Provided To
<p>PARTICLE s.r.o.  Kolonáda 4490/18 Lučenec, 984 01 SK</p> <p>Client Account Number: A01677317RLW Eurofins Quote Number: K8MWPH24000401</p>	<p>Admin (Primary Reporting Contact) admin@particlepeptides.com</p>

PARTICLE s.r.o.  
Kolonáda 4490/18  
Lučenec, 984 01  
SK

Client Account Number: A01677317RLW  
Eurofins Quote Number: K8MWPB24000401

Eurofins Sample Number W124AA1669-1			
<b>Original Received Date:</b>		02-May-2024	
<b>Description:</b>		Thymosin Beta-4 (PO-2024191)	
		10 mg glass vials	
<b>Containers Submitted:</b>		1 Box(es)	
Analysis	Specification	Result	Unit
<b>Total Aerobic Microbial Count - Pour Plate</b>	----	0	CFU/vial
Method: Current Ph Eur (2.6.12); Current USP/NF <61>; Current JP (English) <4.05 I>; Current BP Appendix XVI			
Analysis Date: 03-May-2024 to 08-May-2024			
<b>Total Yeast and Mold Count-Pour Plate</b>	----	0	CFU/vial
Method: Current Ph Eur (2.6.12); Current USP/NF <61>; Current JP (English) <4.05 I>; Current BP Appendix XVI			
Analysis Date: 03-May-2024 to 08-May-2024			
<b>Ph Eur Bacterial endotoxins</b>	Max. 0.5	<0.5	IU/mg
Method: Current Ph Eur (2.6.14, Method A)			
Analysis Date: 03-May-2024 to 03-May-2024			
Sample Compliance Assessment			
W124AA1669-1 meets the requirement(s) for all listed test(s) where specifications were applied.			

**Supplemental Information**

Compliance statement was created according to comparison of test results in this report with the limits stated in product specification. Comparison refers to all of the tested parameters.

Laboratory is working in GMP system, is holder of Certificate of GMP compliance of a manufacturer No. SK/018V/2022 for physical-chemical testing and No. SK/019V/2022 for microbiological testing.

Tests are performed in compliance with GMP requirements for quality control laboratories. Tests are performed according to actual version of specification, unless the customer requires otherwise.

Laboratory is not responsible for the information provided by the customer, which can affect the validity of the results.

Test results can be claimed for 14 days from sending the results to the customer. Sample rests are stored 14 days from sending results to the customer and then are disposed according to Testing laboratory's regulations.

Eurofins BPT Testing Facility	Test
Eurofins BioPharma Product Testing Slovakia s.r.o. (Piešťany) Mudronova 25 Piešťany, 921 01 SK	Ph Eur Bacterial endotoxins Total Aerobic Microbial Count - Pour Plate Total Yeast and Mold Count-Pour Plate

**Contracted Company: Eurofins BioPharma Product Testing Slovakia s.r.o. (Bratislava)**

Kollárovo nám. 9, Bratislava, 811 07 SK  
CSPharmaSK@eurofins.sk

*Questions about this report should be directed to your project manager or the general email listed above.*

Reviewed and electronically signed for Technical Supervisor Approval by  
Vojtech Licko, ASM QC  
for Eurofins BioPharma Product Testing Slovakia s.r.o. , on 09-May-2024 10:24:15 UTC+02:00  
Reviewed and electronically signed for Quality Assurance Release by  
Andrea Vargova, QA/QC / Head of Laboratory  
for Eurofins BioPharma Product Testing Slovakia s.r.o. , on 09-May-2024 10:27:42 UTC+02:00

# Analytical report AR-24-KT-043638-02



## Testing laboratory:

Eurofins Environment Testing Slovakia s.r.o.  
 Robotnícka 820/36, 039 01 Turčianske Teplice  
 IČO: 53 248 376  
 Place of work:  
**Accredited testing laboratory Turčianske Teplice**  
 Robotnícka 820/36, 039 01 Turčianske Teplice  
 tel: 043/490 1562  
 RegistrationEnviroSK@etcee.eurofins.com, www.eurofins.sk

## Customer:

PARTICLE s.r.o.  
 Kolonáda 4490/18  
 984 01 Lučenec  
 SLOVAKIA

Date of Sample Receipt: 22.11.2024 Date of Testing: 22.11.2024 - 26.11.2024

Issue date: 03.12.2024

## Information about Sampling:

Sampler: customer

Sample information: 104-2024-00048105

# Sample description: Thymosin Beta-4 (PO-2024191)

Material: Peptidy

## Physical and chemical tests

Parameter	Unit	Allowed Value	Measured Value	Uncertainty of Method measurement*	Testing method	E	SL	TT
Arsenic (As)	mg/kg	-	<1,5	-	ICP-MS	LS-PP-CH-85	-	TR A
Cadmium (Cd)	mg/kg	-	<0,2	-	ICP-MS	LS-PP-CH-85	-	TR A
Lead (Pb)	mg/kg	-	<0,5	-	ICP-MS	LS-PP-CH-85	-	TR A
Mercury (Hg)	mg/kg	-	<0,3	-	ICP-MS	LS-PP-CH-85	-	TR A

## Notes:

E - evaluation  
 S - satisfied  
 NS - not satisfied  
 (A) - accredited sampling  
 (SA) - accredited sampling executed under the subcontract  
 ŠPP - Standard operation procedure  
 ND - not detected by given method  
 LOQ, LQ – limit of quantification  
 CFU - Colony forming unit  
 NM - necessary quantity  
 m - the highest allowed value at the case of one sample  
 M, c - "M" highest allowed value for the number "c" at the case of 5 sample`s evaluation  
 \* - measurement uncertainty – sampling and analysis – determined by extension coefficient k=2 (with probability of 95%). If sample is taken by the customer uncertainty of sampling is not available.  
 - uncertainty given in % reflects the uncertainty from the result of measurement.  
 \*\* - Acceptable to consumers and no abnormal change  
 SL - analysis laboratory: NZ-Nové Zámky, TR-Turčianske Teplice, RK-Ružomberok, TV-Trebišov  
 TT - type of test  
 A - accredited test executed at the own test laboratory  
 N - non accredited test executed at the own test laboratory  
 SA - accredited test executed under the subcontract  
 SN - unaccredited test executed under the subcontract  
 (TM) - testing outside the laboratory at the customer

## Disclaimer:

Laboratory is a disclaimer when the information is supplied by the customer (#) and can affect the validity of results. If the sample has been provided by the customer, the results refer to the sample as it was received. Gauges and measuring equipment used for testing were calibrated or attested in accordance with the valid metrological instructions. The above mentioned test results refer to the tested sample only! The result given in this Analytical report and marked as non accredited test shall not be a subject of accreditation. The result given in this Analytical report and marked as sub- delivery is the result of a Subcontractors gauging made under the terms and conditions of a contract concluded with him. This Analytical report shall not be reproduced except in full colour version, without written approval of the laboratory. SNAS is a Signatory to the Multilateral Agreement MRA ILAC.

Responsible for correctness:

Michaela Ruttkayová  
Specialist worker

Worked out by: Andrea Podušelová

Validity check of document

**Test Certificate approved by**Michaela Ruttkayová  
Specialist worker