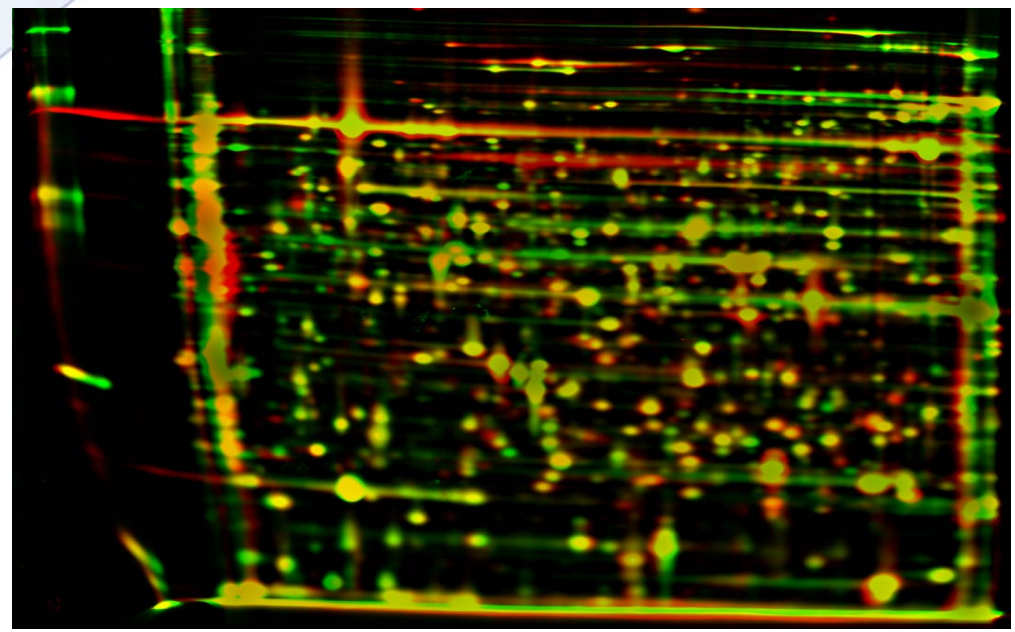
NEW!

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified



SERVA
Electrophoresis

SERVA Trypsins for use in Proteomics

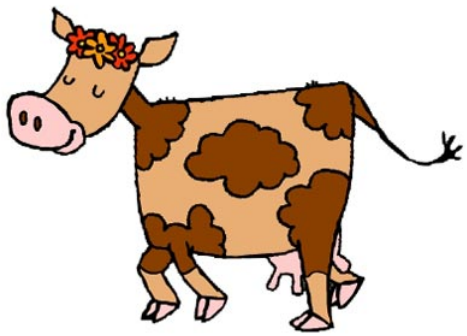
Produced by pharmaceutical company Nordmark GmbH & Co. KG in Germany

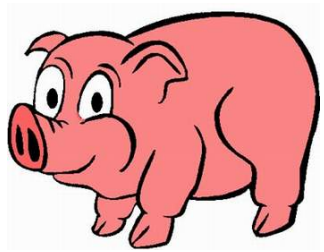
SERVA Electrophoresis

What is trypsin?

- It is a serine endopeptidase which specifically cleaves peptide bonds at the carboxyl side of lysine, arginine and S-amino-ethyl cysteine residues. There is little or no cleavage at arginyl-proline or lysyl-proline bonds.

- It is isolated from pancreas (porcine or bovine) and purified by chromatography

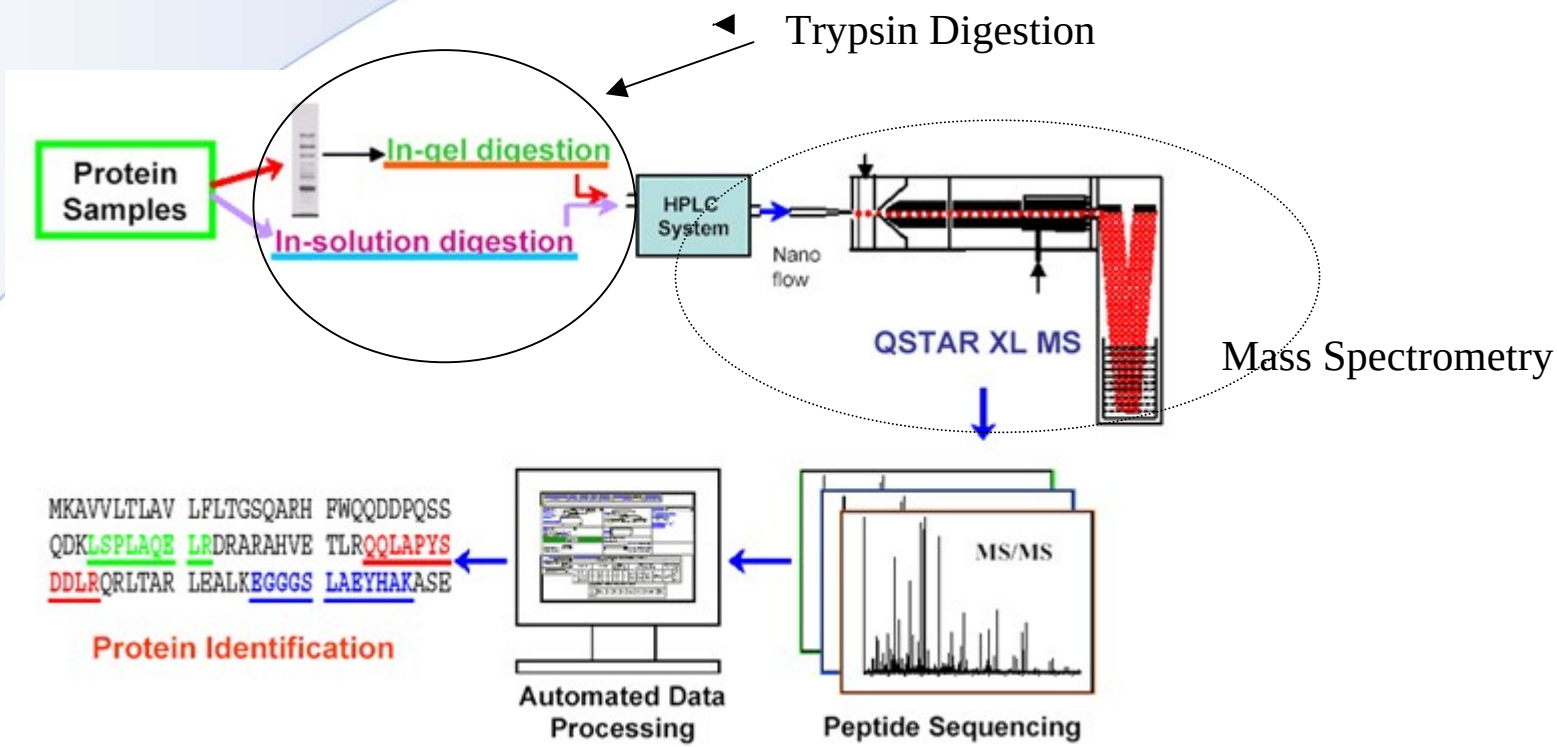




SERVA Electrophoresis

Used for what?

For digestion of proteins prior to sequence analysis for proteomics investigations



SERVA Electrophoresis

Main competitors on the market:

- **Roche**

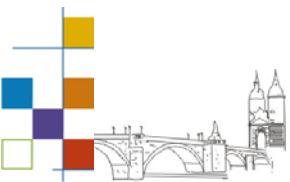
  Trypsin sequencing grade (not modified) (cat.no. 11 418 025 001)

  Trypsin modified, sequencing grade (cat.no. 1 418 475)

- **Promega**

  Sequencing Grade Modified Trypsin (cat.no.V5111)

  Trypsin Gold, Mass Spectrometry Grade (cat.no.V5280)



SERVA Electrophoresis

Trypsins for use in Proteomics

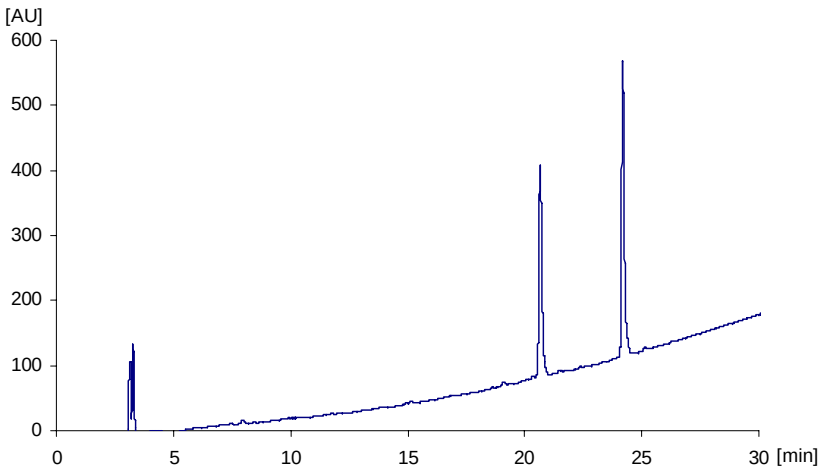
Good protein digestion to peptides is a prerequisite for exact protein identification. To obtain reproducible, reliable results and a high significance of searched results (Mascot Score) the following features are of importance:

- **Specificity**
- **Purity**
- **Absence of chymotryptic activity**
- **Stability**
- **Low autoproteolyis**

SERVA
Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

- **High Specificity**



Specificity of Trypsin NB Premium Grade, MS approved analyzed by Reversed Phase HPLC. RP Fragments: 20.6 min Gly (23)-Lys (29), 24.2 min Phe (1)-Arg (22)

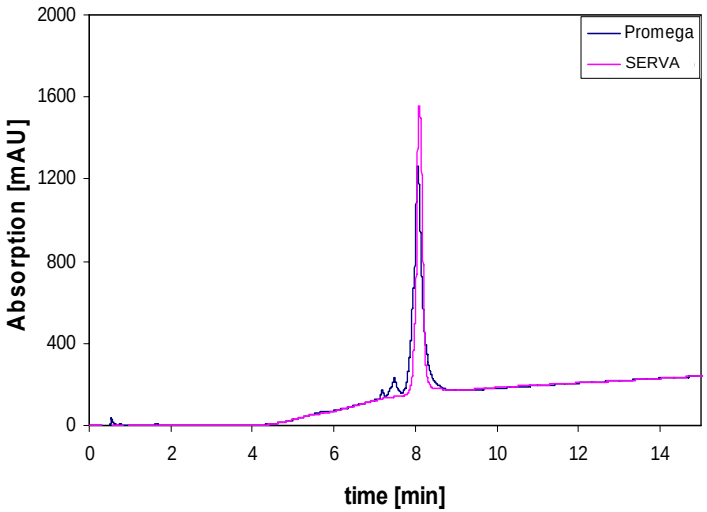
The specificity of SERVA Trypsins is verified with the oxidized B chain of insulin (insulin B_{ox}) as substrate.
25 µg of insulin B_{ox} are incubated with 0.5 µg Trypsin NB Premium Grade, MS approved at 37 °C for 18 h to detect traces of impurities of chymotrypsin.

- **Specific fragments**
- **No artefacts**
- **Prerequisite for protein quantification and indentification**

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

- **High Purity**
- **Absence of chymotryptic activity**



Purity of Trypsin Sequencing Grade, modified and Promega Trypsin Gold, Mass Spectrometry Grade in reversed phase HPLC.

SERVA Trypsins are highly purified enzyme preparation that are free of activity from other proteases. The absence of chymotryptic activity is verified by purity and function control which is carried out for each lot.

- **Specific fragments**
- **High stability**

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

- **High Stability during performance**

Incubation time (h)	Activity (%)	
	SERVA Trypsin NB	Trypsin native, not modified
0	100	100
3	100	43
5	87	30
7	84	25
22	46	5

Stability of Trypsin NB Sequencing Grade modified and Trypsin native, not modified in 20 mM Tris- HC, pH 8.0 at 37 °C

SERVA Trypsins are modified by reductive methylation and purified by chromatography, yielding a highly active molecule that is extremely resistant to autolytic digestion.

- **High activity**
- **High resistance to autolytic digestion**

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

- **High stability during storage**

  - **Lyophilised:**
    - **2-8 °C , 12 month**
    - **- 20 °C, 12 month (ongoing)**

  - **Solubilized:**
    - **2 -8 °C: 4 weeks**
    - **-20 °C: 4 weeks**
    - **4 freeze and thaw cycles**

→ **convenient preparation of aliquots**

SERVA Electrophoresis

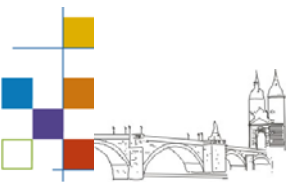
Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

- **High stability during transportation**
  - **Lyophilised:**
    - **40 °C, 7 days**

→ **No need of dry ice during transportation**

saves costs

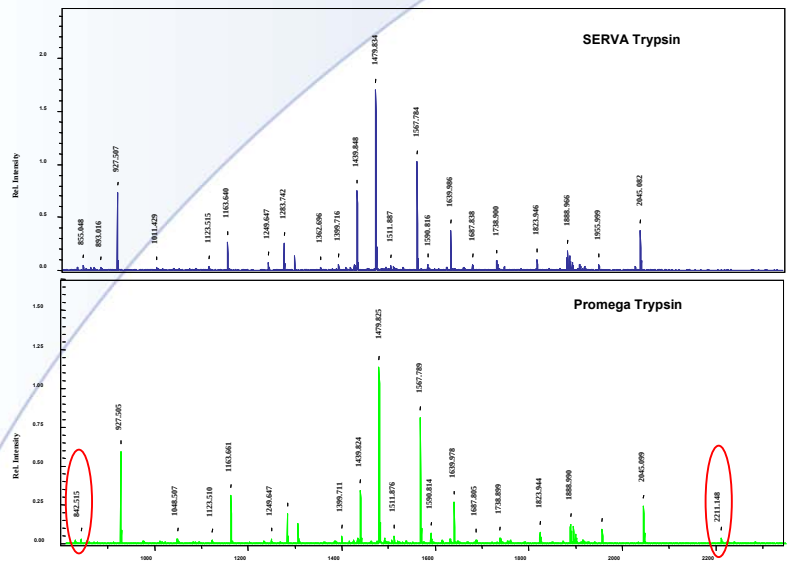
saves space



SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

- **Exceptionally low autoproteolysis**



Comparison of SERVA Trypsin NB Premium Grade and Promega Trypsin Gold. Spectra of BSA digested with SERVA Trypsin NB Premium Grade, MS approved and Promega Trypsin Gold, Mass Spectrometry Grade are shown. Trypsin masses are indicated

Based on excellent and proprietary production procedures, SERVA Trypsins exhibit exceptionally low autocatalytic activity resulting in unique stability. Nearly any trypsin peptides can be detected in the reaction mixture after standard digestion of single proteins or complex protein mixtures.

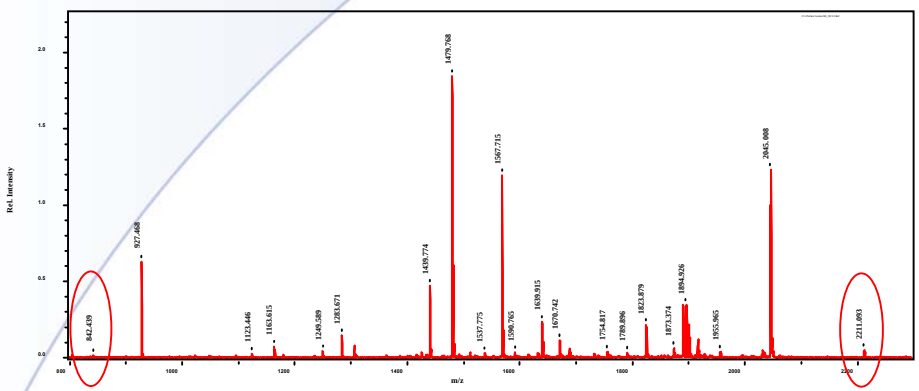
- **High stability**
- **No interferring masses**
- **Easy interpretation of spectra**

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

Trypsin Peptide (TP) Standard

- contains trypsin to generate masses m/z 842 and 2211
- is delivered with the SERVA Trypsins



Peptide mass fingerprint of BSA using SERVA Trypsin NB Premium Grade and TP Standard in a ratio of 5:1.
BSA digestion was carried out with SERVA Trypsin NB Premium Grade, MS approved and TP Standard. Desired masses of m/z 842 and 2211 are indicated.

Some user (especially those who work with MALDI as ionisation) need standard peptides for internal calibration.
TP Standard facilitates easy internal calibration to enhance mass accuracy in MS analysis and can be adjusted to any experimental conditions.

- **easy internal calibration**
- **adjustable to any experimental conditions**

SERVA Electrophoresis

Trypsin NB Sequencing Grade, modified CoA

SERVA Electrophoresis

CERTIFICATE OF ANALYSIS

Trypsin NB Sequencing Grade, modified from porcine pancreas		Cat. No. :	37283
		Lot. No. :	070119

Parameter	Method	Specification	Result
Sequence specificity	Digest of Insulin B chain (ox.) HPLC analysis	Must comply	Complies

For customer information:

Origin	Porcine pancreas
Molecular weight	24 kDa (trypsin)
Appearance	White to off-white powder
Purity (HPLC)	> 90%
Tryptic activity	> 6.000 U/g lyophilisate
Minimum shelf life	01/ 2008
Storage conditions	-15 to -25 °C

Specificity assay:
Detection of two distinct peaks in Reversed Phase HPLC after digestion of oxidized B-chain of insulin at 37°C for 18h.

Unit definition:

Tryptic activity:
1 Unit catalyzes the hydrolysis of 1 µmol Nα-Benzoyl-L-arginine -4-nitroanilide hydrochloride (BAPNA) per minute at 30 °C, pH 8.0.

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved CoA

Each lot is qualified by in-gel digestion and mass spectrometric analysis

SERVA Electrophoresis

CERTIFICATE OF ANALYSIS

Trypsin NB Premium Grade, MS approved from porcine pancreas		Cat. No. :	37284
		Lot. No. :	080171

Parameter	Method	Specification	Result
Sequence specificity	Digest of Insulin B chain (ox.) HPLC analysis	Must comply	Complies
Application (MS) approval	In-gel digestion of BSA and Mass spectrometric analysis	Must comply	Complies

For customer information:

Origin	Porcine pancreas
Molecular weight	24 kDa (trypsin)
Appearance	White to off-white powder
Purity (HPLC)	> 90%
Tryptic activity	> 6.000 U/g lyophilisate
Minimum shelf life	02/ 2009
Storage conditions	-15 to -25 °C

Sequence specificity assay:
Detection of two distinct peaks in Reversed Phase HPLC after digestion of oxidized B-chain of insulin at 37°C for 18h.

Application (MS) approval:
In-gel digest and identification of BSA.

Unit definition:

Tryptic activity:
1 Unit catalyzes the hydrolysis of 1 µmol Nα-Benzoyl-L-arginine -4-nitroanilide hydrochloride (BAPNA) per minute at 30 °C, pH 8.0.

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

Marketingmaterial

- Flyer
- Product Information
- User Manual
- Poster
- Samples

SERVA
Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

TECHNICAL NOTES | SERVA Electrophoresis

Biochemicals
Electrophoresis
Bioseparation
Life Sciences
Specials

Trypsin NB Premium Grade, MS approved

Product Description

Trypsin NB Premium Grade, MS approved is designed for digestion of proteins prior to sequence analysis. Each lot is qualified for use with in-gel digestion and mass spectrometric analysis. Based on excellent and proprietary production procedures, Trypsin NB Premium Grade, MS approved is of unique stability due to exceptionally low autocatalytic activity.

Trypsin NB Premium Grade, MS approved is a serine endopeptidase which specifically cleaves peptide bonds at the carboxyl side of lysine, arginine and S-aminoethyl cysteine residues. There is little or no cleavage at arginyl-proline or lysyl-proline bonds. Cleavage may also be considerably reduced when acidic residues are present on either side of a potentially susceptible bond [1].

Outstanding performance is guaranteed by:

- Each lot MS approved
- Exceptionally low autoproteolysis
- Extreme stability
- High purity
- High specificity
- No chymotryptic activity

Trypsin NB Premium Grade, MS approved is supplied as lyophilisate in vials at 25 µg each. It is manufactured by the pharmaceutical plant of Nordmark Arzneimittel GmbH & Co. KG, Germany.

Incubation time (h)	Activity (%)	
	Trypsin NB Premium Grade, MS approved	Trypsin native, not modified
0	100	100
3	100	43
5	87	30
7	84	25
22	46	5

Tab.1: Stability of Trypsin NB Premium Grade, MS approved and Trypsin native, not modified in 20 mM Tris-HCl, pH 8.0 at 37 °C.

Extreme Stability

Trypsin NB Premium Grade, MS approved is modified by reductive methylation and purified by chromatography, yielding a highly active molecule that is extremely resistant to autolytic digestion (Tab. 1).

High Purity

Trypsin NB Premium Grade, MS approved is a highly purified enzyme preparation that is free of activity from other proteases. The absence of chymotryptic activity is verified by purity and function control which is carried out for each lot (Fig. 1, Fig. 2).

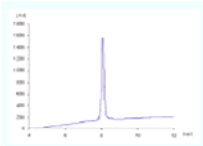


Fig.1: Purity of Trypsin NB Premium Grade, MS approved by Reversed Phase HPLC.

High Specificity

The specificity of Trypsin NB Premium Grade, MS approved is verified with the oxidized B chain of insulin (insulin B_{ox}) as substrate. 25 µg of insulin B_{ox} are incubated with 0.5 µg Trypsin NB Premium Grade, MS approved at 37 °C for 18 h to detect traces of impurities of chymotrypsin (Fig. 2).

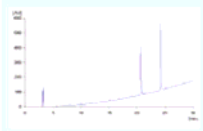


Fig. 2: Specificity of Trypsin NB Premium Grade, MS approved analyzed by Reversed Phase HPLC. RP Fragments: 20.6 min Gly (23)-Lys (29), 24.2 min Phe (1)-Arg (22)

TECHNICAL NOTES

Electrophoresis — Trypsin NB Premium Grade, MS approved

Quality Control

Each lot of Trypsin NB Premium Grade, MS approved is qualified by in-gel digestion and mass spectrometric analysis. An example of a spectrogram is shown in figure 3. Lot specific generated spectrograms using bovine serum albumin (BSA) as substrate are available at tech.service@serva.de.

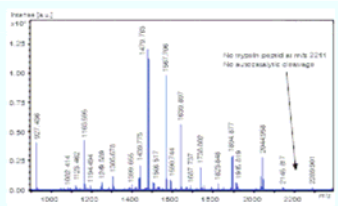


Fig. 3: Spectrogram of BSA digested with Trypsin NB Premium Grade, MS approved. 300 ng BSA were separated by gel electrophoresis and digested with 10 ng/µl Trypsin NB Premium Grade, MS approved in 50 mM NH_4HCO_3 at 37 °C overnight. The peptides generated were analyzed in reflectron mode using the Bruker Ultraflex MALDI-TOF/TOF mass spectrometer. Indicated mass values were identified as BSA protein using the Mascot search engine (Score>300). No signals were identified that indicated autocatalytical digestion of Trypsin NB Premium Grade, MS approved. In contrast, other commercial available modified trypsins exhibited autocatalytical activity under identical conditions indicated by the mass signal m/z 2211 which is a well known trypsin peptide. Mascot scores for protein identification were significant higher using Trypsin NB Premium Grade, MS approved than for other modified trypsins (Ref: A. Pich, unpublished, Medical School Hannover (MHH)).

Contact us!

If you require more detailed information, please contact us:

Technical Support
Pinnaullee 4 · D-25436 Uetersen
Tel.: +49-4122-712534
E-Mail: tech.service@serva.de

Features at a glance:

- Source: porcine pancreas
- Purity: > 90 %
- Tryptic activity: > 6000 U/g*
- No chymotryptic activity detectable
- Modified by reductive methylation
- Each lot qualified by in-gel digestion and mass spectrometric analysis
- Convenient packing: 4 vials at 25 µg each

* Unit definition: 1 U catalyzes the hydrolysis of 1 µmol Nα-Benzoyl-L-arginine-4-nitroanilide hydrochloride (BAPNA) per minute at 30 °C, pH 8.0.

Ordering Information

Product	Quantity	Cat.-No.
Trypsin NB Premium Grade, MS approved	4 x 25 µg	37284.01

Related Products

Product	Quantity	Cat.-No.
Trypsin NB Sequencing Grade, modified	4 x 25 µg	37283.01
Trypsin NB Sequencing Grade	4 x 25 µg	37280.01
Endoproteinase Arg-C	3 x 5 µg	20960.01
Endoproteinase Glu-C	1 mg	20985.01

[1] Wilkinson, J. M. (1998): Fragmentation of Polypeptides by Enzymatic Methods. In: Practical Protein Chemistry: A Handbook. A. Darbre, ed., John Wiley and Sons, New York, N.Y.

SERVA Electrophoresis
SERVA Electrophoresis GmbH
Carl-Benz-Str. 7 · D-69115 Heidelberg · Germany
Phone: +49 (0) 6221 13840-0 · Fax: +49 (0) 6221 13840-10
E-Mail: info@serva.de · Internet: www.serva.de

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

SERVA Electrophoresis

PRODUCT INFORMATION

Trypsin NB Premium Grade, MS approved — Cat.No. 37284

Product Description:

General

Trypsin NB Premium Grade, MS approved is a serine endopeptidase which specifically cleaves at the carboxyl side of lysine, arginine and S-aminoethyl cysteine residues. There is little or no cleavage at arginyl-proline or lysyl-proline bonds. Cleavage may also be reduced when acidic residues are present on either side of a potentially susceptible bond [1].

Application

Trypsin NB Premium Grade, MS approved is specially designed for digestion of proteins prior to mass spectrometric analysis.

Features

- Source: porcine pancreas
- Purity: > 90 %
- Tryptic activity: > 6000 U/g*
- No chymotryptic activity detectable
- Modified by reductive methylation
- Each lot qualified by in-gel digestion and mass spectrometric analysis
- Quantity: ≥ 25 µg/vial, determined by measuring A_{280}.

*Unit definition: 1 U catalyzes the hydrolysis of 1 µmol Nα-Benzoyl-L-arginine-4-nitroanilide hydrochloride (BAPNA) per minute at 30 °C, pH 8.0.

Specificity

The specificity of Trypsin NB Premium Grade, MS approved is verified with oxidized B chain of insulin (insulin B_{ox}) as substrate: 25 µg insulin B_{ox} are incubated with 0.5 µg Trypsin NB Premium Grade, MS approved, dissolved in 100 mM Tris-HCl buffer, pH 8.5, in a total volume of 25 µl at 37 °C for 18 h to detect traces of impurities of chymotrypsin (figure 1).

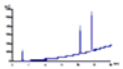


Fig. 1: Specificity of Trypsin NB Premium Grade, MS approved analyzed by Reversed Phase HPLC. RP HPLC is performed under following conditions: Column: PepMap C18™; Solvent A: 0.1 % TFA (v/v) in water; Solvent B: 0.1 % TFA (v/v) in acetonitrile; Gradient: 30 min linear 0 - 50 % B; Flow rate: 1 ml/min; Wave length: 215 nm. Fragments: 20.6 min Gly (23) - Lys (29), 24.2 min Phe (1) - Arg (22)

Version 01/07

SERVA Electrophoresis GmbH • D-69115 Heidelberg • Carl-Benz-Str. 7
Phone + 49 (0) 6221 / 13840-0 • Fax + 49 (0) 6221 / 13840-10 • email info@serva.de • http://www.serva.de

SERVA Electrophoresis

PRODUCT INFORMATION

Trypsin NB Sequencing Grade, modified — Cat.No. 37283

Product Description:

General

Trypsin NB Sequencing Grade, modified is a serine endopeptidase which specifically cleaves at the carboxyl side of lysine, arginine and S-aminoethyl cysteine residues. There is little or no cleavage at arginyl-proline or lysyl-proline bonds. Cleavage may also be reduced when acidic residues are present on either side of a potentially susceptible bond [1].

Application

Trypsin NB Sequencing Grade, modified is specially designed for digestion of proteins prior to mass spectrometric analysis.

Features

- Source: porcine pancreas
- Purity: > 90 %
- Tryptic activity: > 6000 U/g*
- No chymotryptic activity detectable
- Modified by reductive methylation
- Quantity: ≥ 25 µg/vial, determined by measuring A_{280}.

*Unit definition: 1 U catalyzes the hydrolysis of 1 µmol Nα-Benzoyl-L-arginine-4-nitroanilide hydrochloride (BAPNA) per minute at 30 °C, pH 8.0.

Stability

Trypsin NB Sequencing Grade, modified is more resistant towards autolysis even at pH values in weakly basic range (table 1). Therefore the enzyme can be used in high concentrations in the digestion assay.

Incubation time (h)	Activity (%)	
	Trypsin NB Sequencing Grade, modified (Cat. No. 37283)	Trypsin native, not modified
0	100	100
3	100	43
6	87	33
7	84	26
22	46	6

Tab.1: Stability of Trypsin NB Sequencing Grade, modified and Trypsin native, not modified in 20 mM Tris-HCl, pH 8.0 at 37 °C

Storage conditions

Trypsin NB Sequencing Grade, modified should be stored in a dry state at -15 to -25 °C.

Version 01/07

SERVA Electrophoresis GmbH • D-69115 Heidelberg • Carl-Benz-Str. 7
Phone + 49 (0) 6221 / 13840-0 • Fax + 49 (0) 6221 / 13840-10 • email info@serva.de • http://www.serva.de

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

SERVA Electrophoresis

User Protocol

Trypsin NB Sequencing Grade, modified Cat.No. 37283
Trypsin NB Premium Grade, MS approved Cat.No. 37284

Product Description:

General

SERVA Trypsins (Cat.No. 37283, 37284) are specially designed for the digestion of proteins prior to mass spectrometric analysis. Trypsin is a serine endopeptidases which specifically cleaves at the carboxyl side of lysine, arginine and S-aminoethyl cysteine residues. There is little or no cleavage at arginyl-proline or lysyl-proline bonds. Cleavage may also be considerable reduced when acidic residues are present on either side of a potentially susceptible bond [1].

SERVA Trypsins (Cat.No. 37283, 37284) have been produced to provide maximum performance. They are manufactured by the pharmaceutical plant of Nordmark Arzneimittel GmbH & Co. KG in Germany.

Features

- Source: porcine pancreas
- Purity: > 90 %
- Tryptic activity: > 6000 U/g*
- No chymotryptic activity detectable
- Verified specificity
- Quantity: ≥ 25 µg/vial, determined by measuring A_{280}.

- Modified by reductive methylation (Cat.No. 37283, 37284)
- Each lot qualified by in-gel digestion and MS analysis (Cat.No. 37284)

For further details please see product information available at www.serva.de.

*Unit definition: 1 U catalyzes the hydrolysis of 1 µmol Nα-Benzoyl-L-arginine-4-nitroanilide hydrochloride (BAPNA) per minute at 30 °C, pH 8.0.

Storage conditions

Store lyophilisate in a dry state at -15 to -25 °C.

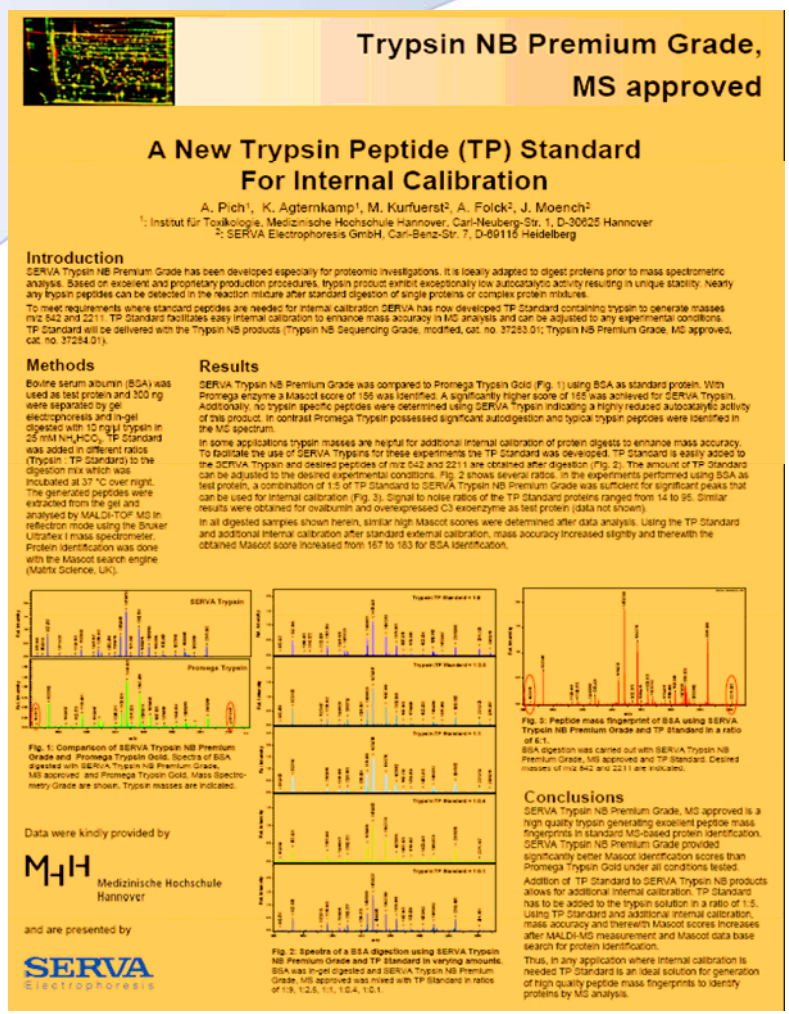
[1] Wilkinson, J. M. (1986): Fragmentation of Polypeptides by Enzymatic Methods. In: *Practical Protein Chemistry: A Handbook*. A. Darbre, ed., John Wiley and Sons, New York, N.Y.

Version 01/07

SERVA Electrophoresis GmbH • D-69115 Heidelberg • Carl-Benz-Str. 7
Phone + 49 (0) 6221 / 13840-0 • Fax + 49 (0) 6221 / 13840-10 • email info@serva.de • http://www.serva.de

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified



Trypsin NB Premium Grade,
MS approved

A New Trypsin Peptide (TP) Standard For Internal Calibration

A. Pich[1], K. Agternkamp[1], M. Kurfuerst[2], A. Folck[2], J. Moench[2]
[1]: Institut für Toxikologie, Medizinische Hochschule Hannover, Carl-Neuberg-Str. 1, D-30625 Hannover
[2]: SERVA Electrophoresis GmbH, Carl-Benz-Str. 7, D-69115 Heidelberg

Introduction

SERVA Trypsin NB Premium Grade has been developed especially for proteomic investigations. It is ideally adapted to digest proteins prior to mass spectrometric analysis. Based on excellent and proprietary production procedures, trypsin product exhibit exceptionally low autocatalytic activity resulting in unique stability. Nearly any trypsin peptides can be detected in the reaction mixture after standard digestion of single proteins or complex protein mixtures.

To meet requirements where standard peptides are needed for internal calibration SERVA has now developed TP Standard containing trypsin to generate masses m/z 842 and 2211. TP Standard facilitates easy internal calibration to enhance mass accuracy in MS analysis and can be adjusted to any experimental conditions. TP Standard will be delivered with the Trypsin NB products (Trypsin NB Sequencing Grade, modified, cat. no. 37283.01; Trypsin NB Premium Grade, MS approved, cat. no. 37284.01).

Methods

Bovine serum albumin (BSA) was used as test protein and 300 ng were separated by gel electrophoresis and in-gel digested with 10 ng/µl trypsin in 25 mM NH_4HCO_3. TP Standard was added in different ratios (Trypsin : TP Standard) to the digestion mix which was incubated at 37 °C over night. The generated peptides were extracted from the gel and analysed by MALDI-TOF MS in reflectron mode using the Bruker Ultraflex I mass spectrometer. Protein identification was done with the Mascot search engine (Matrix Science, UK).

Results

SERVA Trypsin NB Premium Grade was compared to Promega Trypsin Gold (Fig. 1) using BSA as standard protein. With Promega enzyme a Mascot score of 166 was identified. A significantly higher score of 185 was achieved for SERVA Trypsin. Additionally, no trypsin specific peptides were determined using SERVA Trypsin indicating a highly reduced autocatalytic activity of this product. In contrast Promega Trypsin possessed significant autodigestion and typical trypsin peptides were identified in the MS spectrum.

In some applications trypsin masses are helpful for additional internal calibration of protein digests to enhance mass accuracy. To facilitate the use of SERVA Trypsins for these experiments the TP Standard was developed. TP Standard is easily added to the SERVA Trypsin and desired peptides of m/z 842 and 2211 are obtained after digestion (Fig. 2). The amount of TP Standard can be adjusted to the desired experimental conditions. Fig. 2 shows several ratios. In the experiments performed using BSA as test protein, a combination of 1:5 of TP Standard to SERVA Trypsin NB Premium Grade was sufficient for significant peaks that can be used for internal calibration (Fig. 3). Signal to noise ratios of the TP Standard proteins ranged from 14 to 95. Similar results were obtained for ovalbumin and overexpressed G3 exoenzyme as test protein (data not shown).

In all digested samples shown herein, similar high Mascot scores were determined after data analysis. Using the TP Standard and additional internal calibration after standard external calibration, mass accuracy increased slightly and therewith the obtained Mascot score increased from 167 to 183 for BSA identification.

Fig. 1: Comparison of SERVA Trypsin NB Premium Grade and Promega Trypsin Gold. Spectra of BSA digested with SERVA Trypsin NB Premium Grade, MS approved and Promega Trypsin Gold. Mass Spectrometry Grade are shown. Trypsin masses are indicated.

Fig. 2: Spectra of a BSA digestion using SERVA Trypsin NB Premium Grade and TP Standard in varying amounts. BSA was in-gel digested and SERVA Trypsin NB Premium Grade, MS approved was mixed with TP Standard in ratios of 1:9, 1:2.5, 1:1, 1:0.4, 1:0.1.

Fig. 3: Peptide mass fingerprint of BSA using SERVA Trypsin NB Premium Grade and TP Standard in a ratio of 5:1.
BSA digestion was carried out with SERVA Trypsin NB Premium Grade, MS approved and TP Standard. Desired masses of m/z 842 and 2211 are indicated.

Data were kindly provided by

MHH Medizinische Hochschule Hannover

and are presented by

SERVA Electrophoresis

Conclusions

SERVA Trypsin NB Premium Grade, MS approved is a high quality trypsin generating excellent peptide mass fingerprints in standard MS-based protein identification. SERVA Trypsin NB Premium Grade provided significantly better Mascot identification scores than Promega Trypsin Gold under all conditions tested.

Addition of TP Standard to SERVA Trypsin NB products allows for additional internal calibration. TP Standard has to be added to the trypsin solution in a ratio of 1:5. Using TP Standard and additional internal calibration, mass accuracy and therewith Mascot scores increases after MALDI-MS measurement and Mascot data base search for protein identification.

Thus, in any application where internal calibration is needed TP Standard is an ideal solution for generation of high quality peptide mass fingerprints to identify proteins by MS analysis.

SERVA Electrophoresis

SERVA Trypsins vs. Promega Trypsins

SERVA

Promega

	Trypsin NB Premium Grade, MS approved	Trypsin NB Sequencing Grade, modified	Trypsin Gold, Mass Spectrometry Grade	Sequencing Grade Modified Trypsin
Stability (solubilized) 4 °C, -20 °C	4 weeks, 4 weeks	4 weeks, 4 weeks	-, 4 weeks	-, 4 weeks
Storage Stability (lyophilized) 40 °C, 4 °C, -20 °C	7 days, 1year, 1year (ongoing)	7 days, 1year, 1year (ongoing)	3 days 57 °C*, 11/2 year *	3 days 57 °C*, 11/2 year *
Shipping conditions	RT	RT	Dry ice	Dry ice
Qualified by MS analysis	✓		✓	
Autoproteolytis	no tryptic masses	no tryptic masses	tryptic masses	tryptic masses
Efficacy	✓ ✓	✓ ✓	✓	✓
Purity	✓ ✓	✓ ✓	✓	✓
Mascot Score with BSA as reference	✓ ✓	✓ ✓	✓	✓
Package size	4 vials each 25 µg + TP	4 vials each 25 µg + TP	1 vial, 100 µg	1 vial, 100 µg
Source	porcine	porcine	bovine	bovine

*accelerated studies carried out by Milipore, No activity measuremts but test digestions

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified

- **Package size:**

  4 vials, each 25 µg lyophilisate + TP Standard

Cat.-No.	Product	Quantity	Price (net)
37283.01	Trypsin NB Sequencing Grade	4 vials each 25 µg + TP	55,30 €
37284.01	Trypsin NB Premium Grade, MS approved	4 vials each 25 µg +TP	59.50 €

- Convenient package size
- Protection against contamination

- **Sample size:**

  1 vial each 25 µg + TP Standard

SERVA Electrophoresis

Promega Price structure in EU

	France/ BeNeLux	Italy	Spain	GB	Sweden
Sequencing Grade Modified Trypsin (1 vial, 100 µg)	73 €	77 €	81 €	47 £	829 SEK
Trypsin Gold, Mass Spectrometry Grade (1 vial, 100 µg)	102 €	112 €	112 €	55 £	885 SEK

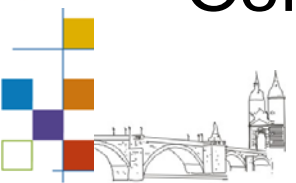
SERVA	Quantity	Price (net)
Trypsin NB Sequencing Grade	4 vials each 25 µg + TP	55,30 €
Trypsin NB Premium Grade, MS approved	4 vials each 25 µg +TP	59.50 €

→ Good price situation for product launch

SERVA Electrophoresis

Trypsin NB Premium Grade, MS approved
Trypsin NB Sequencing Grade, modified
- Outstanding Characteristics

- Due to high efficacy and high purity SERVA Trypsins are applicable for quantitative analysis
- Nearly any autoproteolytic activity leads to very reduced tryptic background
- TP standard allows internal calibration and adaption to any experimental conditions
- Better significance of searched results than for Promega
- Shipping at RT instead on dry ice reduces costs
- Competative price



SERVA Electrophoresis