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Product Information

ProteoMass™ MALDI-MS
Individual Standard

Catalog Numbers **B4181, A8846, P2613, A8346, I6154, I6279, C8857, A8971, A9096, and A8471**
Store at Room Temperature

TECHNICAL BULLETIN

Product Description

The single peptide or protein standard is used to calibrate and test matrix assisted laser desorption ionization (MALDI) mass spectrometers.

Examples of applications:

1. Calibration of the MALDI instrument:
   - A combination of peptide standards provides good calibration across the typical mass range of tryptic digestion fragments (800–3,000 Da) in reflectron mode.
   - A mixture of protein standards allows for calibration over a wide mass range in linear mode (5,000 up to 67,000 Da) depending on the combination of proteins.
   - Angiotensin II and $P_{14}R$ standards provide multiple post source decay (PSD) fragment ions for calibration of PSD data.
2. Tuning of the MALDI Instrument:
   - Combinations of peptide or protein standards allow for optimization of resolution in reflectron and linear modes, respectively.
3. Sensitivity:
   - Sensitivity of the instrument may be tested by using a dilution series of a peptide or protein standard in the mass range of interest.

Each individual standard (see Table 1) is provided in five 1.5 ml clear tubes, each containing 10 nmoles of the dry, salt free standard.

Precautions and Disclaimers

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Each individual standard has been tested on the Shimadzu Biotech Kompact SEQ and AXIMA-CFR to meet certain performance criteria in selected modes of positive ion MALDI mass spectrometric analysis (linear, reflectron, or PSD).

This does not preclude the use of the standard in other modes (i.e., negative ion mode), with instruments made by other manufacturers, or in other forms of mass spectrometry, including, but not limited to, ESI-MS and ESI-TOF. These criteria are guidelines and do not guarantee performance on other manufacturers' instruments. Performance varies depending on the age and maintenance of the instrument in addition to the manufacturer's own specifications.

Handling Dilute Peptide Solutions

Due to their tendency to bind to surfaces, care is required in the preparation of a dilution series of peptide standards. Therefore, it is recommended to use a new pipette tip for each dilution to avoid carryover. In addition, the most dilute solutions (100 and 10 fmol/µl) will remain useful for only one day, as the sample becomes adsorbed onto the tube surface. The nature of MALDI mass spectrometry excludes the precoating of tubes and tips with bovine serum albumin or fetal calf serum. To stablize the solution, 0.1% octyl-β-D-glucopyranoside (Catalog Number O9882)[1,2] may be added, although negative affects on standard performance may be observed.

Preparation Instructions

For optimal performance, each standard requires specific preparation conditions. The conditions for the preparation of individual standard stock solutions, MALDI matrices, and samples, along with methods for applying samples to the MALDI target, may be viewed on our website (www.sigmaaldrich.com) in the technical bulletin for the ProteoMass™ Peptide and Protein MALDI-MS Calibration Kit (Catalog Number MSCAL1). The technical bulletin may be accessed in the related information section of the website product display page for MSCAL1.

Storage/Stability
Each standard is stored at room temperature and is shipped at ambient temperature. Standard stock solutions can be frozen in aliquots, but should not be subjected to more than 3 freeze-thaw cycles. Standard solutions are recommended for use for no longer than one month after reconstitution.

Related Products
MALDI Solvents: High purity, low alkali metal solvents are supplied in high density polyethylene bottles.

0.1% Trifluoroacetic acid (TFA) solution
Catalog Number T3443 30 ml

Acetonitrile (ACN)
Catalog Number A8596 30 ml

1% Trifluoroacetic acid (TFA) solution
Catalog Number T3693 4 ml

MALDI Matrices: 10 × 10 mg of the recrystallized matrix, supplied in 2.0 ml amber tubes.

α-Cyano-4-hydroxycinnamic acid (α-cyano, CHCA)
Catalog Number C8982
3,5-Dimethoxy-4-hydroxycinnamic acid (Sinapinic acid)
Catalog Number S8313

References

1. Vorm, O. et al., 41st ASMS Conference Proceedings, 621, (1994).
2. Sutton, C. W., et al., Electrophoresis, **16**, 308-316 (1995).
3. http://www.ncbi.nlm.nih.gov/sites/entrez?db=protein
4. http://physics.nist.gov/PhysRefData/contents.html
5. http://www.expasy.org/

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Table 1.
ProteoMass Peptide and Protein Standards
(Masses are based on NCBI[3] sequences using NIST standard atomic weights and isotopic masses.[4])

Catalog No. [EC or CAS number]	Product	$(M+H)^+$ Monoisotopic or Average	NCBI[3] Reference (ExPASy Reference)[5]	Formula $(M+H)^+$	Suggested Matrix
B4181 [23815-87-4]	Bradykinin fragment 1–7	757.3997 (Mono)	N/A	$C_{35}H_{53}N_{10}O_9$	α-cyano
A8846 [68521-88-0]	Angiotensin II (human)	1,046.5423 (Mono)	ANGT_HUMAN (P01019)	$C_{50}H_{72}N_{13}O_{12}$	α-cyano
P2613	$P_{14}R$ (synthetic peptide)	1,533.8582 (Mono)	N/A	$C_{76}H_{113}N_{18}O_{16}$	α-cyano
A8346 [53917-42-3]	ACTH fragment 18–39 (human)	2,465.1989 (Mono)	COLI_HUMAN (P01189)	$C_{112}H_{166}N_{27}O_{36}$	α-cyano
I6154 [30003-72-6]	Insulin oxidized B chain (bovine)	3,494.6513 (Mono)	INS_BOVIN (P01317)	$C_{157}H_{233}N_{40}O_{47}S_2$	α-cyano
I6279 [11070-73-8]	Insulin (bovine)	5,730.6087 (Mono) 5,735 (Ave)	INS_BOVIN (P01317)	$C_{254}H_{378}N_{65}O_{75}S_6$	α-cyano or sinapinic acid
C8857	Cytochrome c (equine)	12,362 (Ave)	CYC_HORSE (P00004)	$C_{560}H_{876}N_{148}O_{156}S_4Fe$	α-cyano or sinapinic acid
A8971 [9008-45-1]	Apomyoglobin (equine)	16,952 (Ave)	MYG_HORSE (P68082)	$C_{769}H_{1213}N_{210}O_{218}S_2$	α-cyano or sinapinic acid
A9096 [4.1.2.13]	Aldolase (rabbit muscle)	39,212 (Ave)	ALDOA_RABIT (P00883)	$C_{1733}H_{2774}N_{489}O_{525}S_{11}$	sinapinic acid
A8471 [9048-46-8]	Albumin (bovine serum)	66,430 (Ave)	ALBU_BOVIN (P02769)	$C_{2935}H_{4583}N_{780}O_{899}S_{39}$	sinapinic acid