

The 5-azoniaspiro[4.4]nonyl group for improved MS peptide analysis : a novel non-fragmenting ionization tag for mass spectrometric sensitive sequencing of peptides.

Autorzy

Bartosz Setner
Magdalena Rudowska
Alicja Kluczyk
Piotr Stefanowicz
Zbigniew Szewczuk

Rok wydania

2017

Czasopismo

Analytica Chimica Acta

Numer woluminu

986

Strony

71-81

DOI

10.1016/j.aca.2017.07.029

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

A novel class of ionization tags, based on 5-azoniaspiro[4.4]nonyl (ASN⁺) scaffold were designed for improved analysis of peptides by electrospray tandem mass spectrometry (ESI-MS/MS). A new labeling agent, 1-{{3-oxo-3-(pentafluorophenoxy)propyl}carbamoyl}-5-azoniaspiro[4.4]nonane, was developed to react with amine and/or thiol group-containing peptides. The ionization efficiency of peptides resulting from derivatization was enhanced 10–100 fold, depending on the peptide sequence and hydrophobicity of the ionization tag. The proposed tags are completely stable during collision-induced dissociation (CID) experiments: they do not undergo unwanted fragmentation *via* Hofmann elimination and, more importantly, they cannot be removed by intermolecular nucleophilic attack. Moreover, CID of the derivatized peptide ions generates a dominant series of y-type fragment ions with a high sequence coverage. The proposed procedure was successfully tested on digested model proteins: ubiquitin and bovine serum albumin. We also synthesized isotopically labeled analog of 5-azoniaspiro[4.4]nonyl tag to check its applicability for comparative quantitative LC-ESI-MS analysis. The obtained results indicate the general usefulness of the 5-azoniaspiro[4.4]nonyl quaternary ammonium ionization tag for LC-ESI-MS/MS sequencing and quantification of peptides, especially for those of low abundance.

Słowa kluczowe

Derivatization of peptides, Peptide sequencing

Adres publiczny

<https://doi.org/10.1016/j.aca.2017.07.029>

Strona internetowa wydawcy

<http://www.elsevier.com>

Plik został wygenerowany dnia 2026-06-23 03:00:34

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/ZUZcOW9>.