

Detection of podocin in human urine sediment samples by charge derivatization and LC-MS-MRM method.

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Streszczenie

Detection of podocytes in urine might serve as a useful diagnostic tool in both primary and secondary glomerular diseases. The utility of podocyuria has been confirmed for both pre-eclampsia and glomerulonephritis. Here, we present a new and sensitive method for qualitative LC-MS-multiple-reaction-monitoring (MRM) analysis of podocin, serving as a podocyuria biomarker in urine sediments. The following podocin tryptic peptides with the ¹⁶⁹LQTLEIPFHEIVTK¹⁸², ²¹³AVQFLVQTTMK²²³, ²⁴⁰SIAQDAK²⁴⁶, and ²⁹²MIAAEAEK²⁹⁹ sequences were applied as a model. The selective chemical derivatization of the ε amino group of C-terminal lysine residue in tryptic peptides, by 2,4,6-triphenylpyrylium salt (TPP) as a fixed charge tag, was employed to increase the ionization efficiency, in routine ESI-MS analysis. Additionally, the generation of a reporter ion, in the form of a protonated 2,4,6-triphenylpyridinium cation, makes the derivatized peptide analysis in the MRM mode unambiguous. Identification of derivatized and non-derivatized peptides were performed, and the obtained results suggest that the peptide with the ²⁹²MIAAEAEK²⁹⁹ sequence may serve as a marker of podocyuria.

Słowa kluczowe

podocin, podocyuria, preeclampsia, charge derivation, LC-MS, MRM

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