

High resolution microfluidic microchip electrophoresis for fast separation and quantification of amino acids in complex dietary supplements

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Abstract

In modern nutrition research amino acids and peptides have a broad potential therapeutic applications, and are used as supplements or as functional food ingredients. β -alanine, L-histidine and carnosine are common used in the form of dietary supplements. Carnosine is dipeptide produced by condensation of β -alanine and L-histidine which is the reason these two amino acids are often used simultaneously. Standard methods for analysis of amino acid and peptides have a number of disadvantages. They are expensive, complex and time consuming. Microchip electrophoresis evolved from capillary electrophoresis with purpose of reducing the time and cost of analyzes, the amount of reagents, samples and waste. During the study various parameters was investigated to provide high resolution and to optimize the separation. A key point was to optimize the separation buffer in order to avoid overlapping of the amino acids with the other constituents in the analyzed sample. Linear response region for all three analytes was determined using linear regression. Detection limits were below 1 mg/mL. Proposed microfluidic methods are environmentally friendly and offer great promises for routine multi-analyte pharmaceuticals analyses.

Biography

Nikola Sakač has completed his PhD at the age of 27 years from University of Zagreb. Currently he is working as a professor at the University of Zagreb. He is working in a field of chemical sensors and biosensors and new analytical platforms

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