Using electrophoretic injection to increase throughput and improve sensitivity in the detection of basic neuropeptides by CESI-MS

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INTRODUCTION

There are several important basic neuropeptides which include Vasoactive Intestinal peptide (VIP), PACAP (a neuropeptide that functions as a hormone and neurotransmitter), and others. CESI-MS is a derivatization free detection involving electrophoretic injection to improve sensitivity in a CESI-MS method for the analysis of these intact peptides.

MATERIALS AND METHODS

Chromatography: All chromatography was performed using Agilent 1100 including standards of Vasoactive Intestinal peptide (VIP), PACAP (a neuropeptide that functions as a hormone and neurotransmitter) and others. CESI-MS method was performed by applying the peptide into a water (50% IPA) solution.

Sample Preparation: A series of samples were prepared by dissolving the peptides into water to make 0 mL concentration standards. These stocks were diluted into different solutions (see result).

CESI-MS method: Samples were injected by pressure using transient isotope suppression (RTI) and for direct electrophoretic injection. CESI-MS is a detection method that uses a high voltage to carryover a peptide from the injection capillary into the analytical capillary and then into the mass spectrometer. CESI-MS is a detection method that uses a high voltage to carryover a peptide from the injection capillary into the analytical capillary and then into the mass spectrometer. The signal was not clear low at low solvent and other CESI conditions are shown in Table 1. The MS peptide was used to carryover the peptide from the injection capillary into the analytical capillary.

RESULTS

Table 1: CESI gradient conditions used for all analyses.

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<tr>
<th>Time (min)</th>
<th>Solvent A</th>
<th>Solvent B</th>
<th>Solvent C</th>
<th>Solvent D</th>
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<tbody>
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<td>0</td>
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Table 2: CESI gradient conditions used for all analyses.

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Figure 1: The effect of acid content in the sample on the sensitivity. In this figure, this test was made using a VIP 0% sample with a VIP 5% sample.

Figure 2: The effect of organic solvents in the sample on the sensitivity. In this figure, this test was made using a VIP 0% sample with a VIP 5% sample.

CONCLUSIONS

- CESI-MS is not hampered by hydrophobic absorbent-base carriers and can be utilized in conventional LC platforms.
- MS signals are not carried over the organic phase in the sample when the sample is integrated into the analysis.
- CESI-MS method was developed so that it could be utilized without using internal standards.

REFERENCES


TRADEMARKS/LICENSING

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Figure 3: A comparison of CESI-MS analyses with other methods. This figure shows the results of comparing CESI-MS with other methods. CESI-MS was identified as the most sensitive method for the detection of basic neuropeptides, followed by LC-MS, and then CE-MS. CESI-MS was identified as the most sensitive method for the detection of basic neuropeptides, followed by LC-MS, and then CE-MS.

Figure 4: A comparison of CESI-MS analyses with other methods. This figure shows the results of comparing CESI-MS with other methods. CESI-MS was identified as the most sensitive method for the detection of basic neuropeptides, followed by LC-MS, and then CE-MS. CESI-MS was identified as the most sensitive method for the detection of basic neuropeptides, followed by LC-MS, and then CE-MS.

Figure 5: A comparison of CESI-MS analyses with other methods. This figure shows the results of comparing CESI-MS with other methods. CESI-MS was identified as the most sensitive method for the detection of basic neuropeptides, followed by LC-MS, and then CE-MS. CESI-MS was identified as the most sensitive method for the detection of basic neuropeptides, followed by LC-MS, and then CE-MS.