Alturas Analytics, Inc.
The LC-MS Experts

T 208.883.3400
F 208.974.4475
www.alturasanalytics.com

Accurate and Precise Quantitation of the Pentadecapeptide BPC-157 from Human Plasma by HPLC-MS/MS

Chad Christianson[1], Tara O'Brien[1] and Jennifer Zimmer[1]
[1]Alturas Analytics, Inc, Moscow, Idaho

Introduction

BPC-157 is a pentadecapeptide gastric peptide that possesses free radical scavenging activity and has been shown to reduce inflammation by blocking the production of pro-inflammatory mediators (nitric oxide, prostaglandins, and leukotrienes). The data suggests that BPC-157 promotes proliferation, migration and tube formation of human umbilical vein endothelial cells through activation of ERK1/2 phosphorylation and is effective without a carrier. BPC-157 increases the production of hepatocyte growth factors (HGFs), which stimulate cell proliferation and promote tissue repair by upregulating the genes involved in wound healing. BPC-157 has been shown to have healing properties for gastrointestinal fistulas, intestinal lesions, liver lesions and can be used for the treatment of inflammatory bowel disease and congestive heart failure. BPC-157 has also been shown to accelerate the healing of damaged tendons and ligaments. In order to accurately quantify the peptide in plasma an extraction and HPLC-MS/MS method was developed with a linear range of 0.100-1000 ng/mL.

Methods

A precipitation extraction followed by HPLC-MS/MS analysis was developed for the quantitative analysis of BPC-157 in plasma. Human plasma was spiked with the peptide and the mixture was extracted using a methanol/acetonitrile precipitation. The supernatant was dried and then reconstituted with 100 µL water/acetonitrile containing 0.1% formic acid 4/1 . The sample was then analyzed by HPLC-MS/MS on an API-6500+ (Sciex) mass spectrometer operating in positive ESI mode. Separation was achieved using an Agilent Pursuit Diphenyl column (10 cm x 2.1 mm, 5 µm). Mobile phase A consisted of water with 0.1% formic acid. Mobile phase B was prepared in acetonitrile containing 0.1% formic acid.

Results

The data indicates that with a simple precipitation extraction and HPLC-MS/MS analysis BPC-157 can be accurately and precisely quantified from human plasma. A linear calibration curve can be generated from 0.100 to 1000 ng/mL.

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Conclusions

A simple extraction and HPLC-MS/MS method has been developed to accurately and precisely quantify BPC-157 from human plasma.