

Title

Accurate and Precise Quantitation of the Pentadecapeptide BPC-157 from Human Blood Collected with the Tasso-M20 Microsampling Device and Analyzed by HPLC-MS/MS

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Introduction

Collection of samples for bioanalysis is typically conducted by a trained phlebotomist at a clinic or hospital and requires a painful blood draw and large volumes of blood. This makes pediatric blood sampling difficult and can be burdensome for the elderly or critically ill. The Tasso-M20 device enables at-home, automated self-collection of samples. The device automatically collects 17.5 microliter samples in minutes with very little pain or blood loss. 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). BPC-157 has been shown to have healing properties for gastrointestinal fistulas, intestinal lesions, and 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 blood collected on the Tasso device an extraction and HPLC-MS/MS method was developed with a linear range of 1.00-2000 ng/mL.

Methods

A method was developed to extract BPC-157 from blood collected using a Tasso-M20 device followed by HPLC-MS/MS analysis. For standard preparation BPC-157 was spiked into blood and 17.5 microliters was pipetted onto exposed blank Tasso-M20 tips. The tips were dried at ambient and placed into a DWP 96 and extracted using a methanol/acetonitrile precipitation. The supernatant was dried and then reconstituted with 100 μ L water/acetonitrile containing 0.1% formic acid 4/1. The sample was then analyzed by HPLC-MS/MS on an API-7500 (Sciex) mass spectrometer operating in positive ESI mode. Separation was achieved using an Agilent Pursuit Diphenyl column (10 cm x 2.1 mm, 5 μ m). 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 blood collected with the Tasso-M20 device. A linear calibration curve can be generated from 1.00 to 2000 ng/mL.

Conclusions

A simple extraction and HPLC-MS/MS method has been developed to accurately and precisely quantify BP-157 from human blood collected using the Tasso-M20 device.

Author Bio

Chad Christianson has been operating at Alturas Analytics as a Senior Scientist for the past twenty years. He is responsible developing LC-MS/MS methods for small molecules, peptides, oligonucleotides and large molecules from complex matrices.

Take Home Message

Simple at home collection of blood for bioanalysis is possible using the Tasso-M20 device. A method has been developed to analyze Tasso dried blood samples for the peptide BPC-157 using LC-MS/MS.