



## Independent Clinical Study

# Human Cannabinoid Pharmacokinetics

**Product:** UltraCell™

**Manufacturer:** Zilis, LLC

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## Introduction

Cannabidiol (CBD), a non-psychoactive component of the industrial hemp plant. Cannabidiol is pleiotropic in that it produces many effects through multiple molecular pathways.

The hemp plant has been consumed by humans for thousands of years for its health benefits. The plant is composed of a chemical mixture that includes phytocannabinoids, terpenoids, flavanoids, steroids, and enzymes.

Pharmacokinetics refers to what happens to a substance from the time it enters into the body until the exit of all traces.

The absorption of a substance is also called its bioavailability. The purpose of this study is to identify and define cannabidiol (CBD) bioavailability when infused with UltraCell™ absorption technology. Understanding the pharmacokinetics of a supplement is essential to understanding the onset, magnitude, and duration of its pharmacodynamic effects, maximizing therapeutic benefits and minimizing negative side effects.

## HPLC Testing

High-performance liquid chromatography (HPLC; formerly referred to as high-pressure liquid chromatography), is a technique in analytical chemistry used to separate, identify, and quantify each component in a mixture. Each component in the sample interacts slightly differently with the adsorbent material, causing different flow rates for the different components and leading to the separation of the components.

Each time set had 3 vials of arterial blood drawn. Each sample was tested using HPLC. The report indicates the average of the three blood vials drawn and tested from each subject at each time point.

## Study

This is a study with five subjects participating for a period of four hours. At the onset of this study each subject had arterial blood drawn to set the Baseline of CBD in their bodies, each had a Baseline of 0.0mg of CBD at Baseline. Next, each subject was given an oral dose of the Zilis supplement UltraCell™ full spectrum hemp oil.

Each subject was given 4.12cc amounting to 10 mg of Zilis UltraCell™ Full Spectrum Hemp Oil. Additional blood tests were drawn every 45 minutes for a total of four hours.

**Subjects CBD average at 45 minutes 6.56 mg**

**Subjects CBD average at 90 minutes 6.86 mg**

**Subjects CBD average at 135 minutes 6.83 mg**

**Subjects CBD average at 225 minutes 6.46 mg**

## Conclusion

The proprietary UltraCell™ absorption enhancer adds significant bioavailability to CBD. Onset is quick and it has a lasting duration of product availability.

