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Tech Notes

Keywords:
Morphine Analysis, Microbore, Microdialysate Analysis, Electrochemical Detection

Determination of Morphine in Microdialysates Using UniJet SepStik Microbore Columns

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Purpose

Determination of morphine (F1) in rat blood and brain dialysate samples.

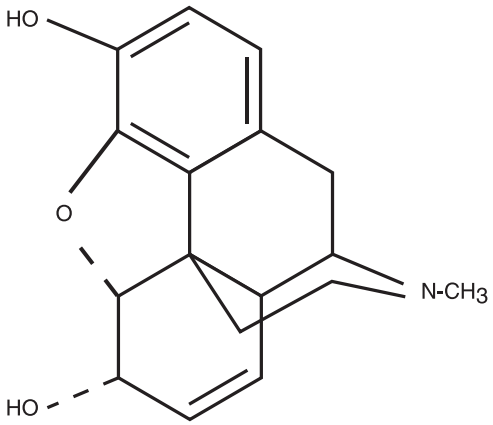

Figure 1. *Structure of morphine*

In order to separate and sensitively detect low morphine levels in microdialysates, a BASi UniJet SepStik microbore column was used. The 1 mm internal diameter increases the concentration of the eluting morphine up to 21-fold compared to standard LC columns.

Existing Methods

Morphine can be analyzed by LCUV at 284 nm, but sensitivity is very low. LCEC with conventional columns provides higher sensitivity; however, the detection limit is still not low enough for some pharmacokinetic studies.

Conditions

System: Microbore capable Liquid Chromatograph
Column: UniJet SepStik Microbore Kit (BAS P/N MF-8949), ODS, 3 µm silica in a 100 x 1.0 mm bed volume.
Mobile Phase: The buffer contains 0.1 M sodium acetate and 0.5 mM EDTA. Adjust the buffer pH to 5.0 with 1 M acetic acid and mix with acetonitrile in the ratio of 95:5.
Flow Rate: 80 µL/min.
Detector: BASi Electrochemical Detector.
Electrochemical Detector Electrode: Glassy Carbon (BAS P/N MF-1000)
Potential: 700 mv vs. Ag/AgCl
Temperature: Was held at 30 °C utilizing a BASi LC-22 Temperature Controller
Detection Limit: 5 pg injected yielded a S/N of 3.
The injection volume was 5µL.
Sample Preparation: Dialysate was directly injected onto the system.

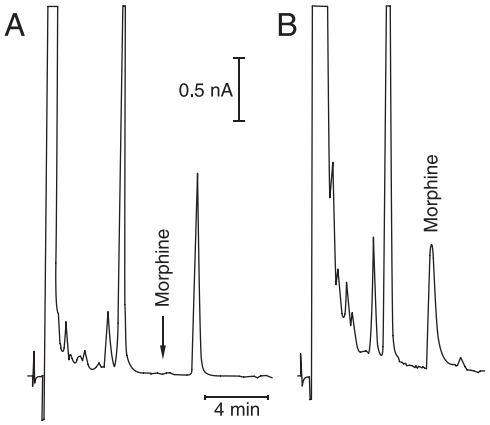

Figure 2. *Chromatograms of rat blood microdialysates collected (A) 30 minutes before and (B) 160 minutes after morphine was injected subcutaneously.*

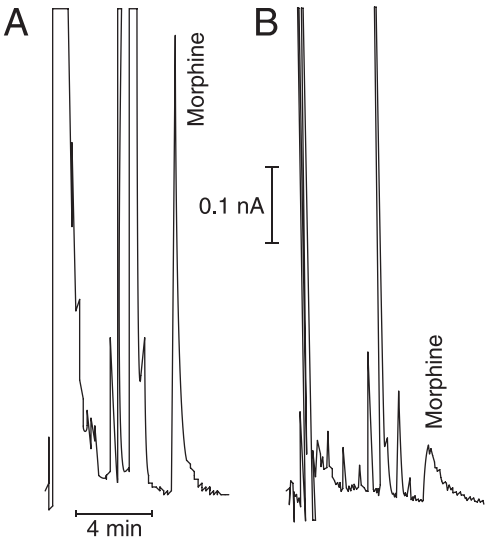

Figure 3. *Comparison of (A) SepStik and (B) conventional column for assay of morphine in rat brain microdialysate collected 20 minutes after the drug was injected subcutaneously.*

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