

Supplementary Information

Simultaneous *in vivo* monitoring of multiple brain metals using an online microdialysis–in-loop solid phase extraction–inductively coupled plasma mass spectrometry system

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The operation sequences of the developed online MD/in-loop PTFE SPE/ICP-MS system for the determination of trace elements in the dialysates are indicated below.

Step A (1A2A3A): Loading buffered microdialysate into PTFE tubing (600 s)

Step B (1A2B3A): Removing waste (90 s)

Step C (1A2B3B): Detaching the analyte and deliver to ICP-MS (120 s)

Step D (1B2B3B): Replacing HNO₃ in PTFE tubing using an air carrier stream (30 s)