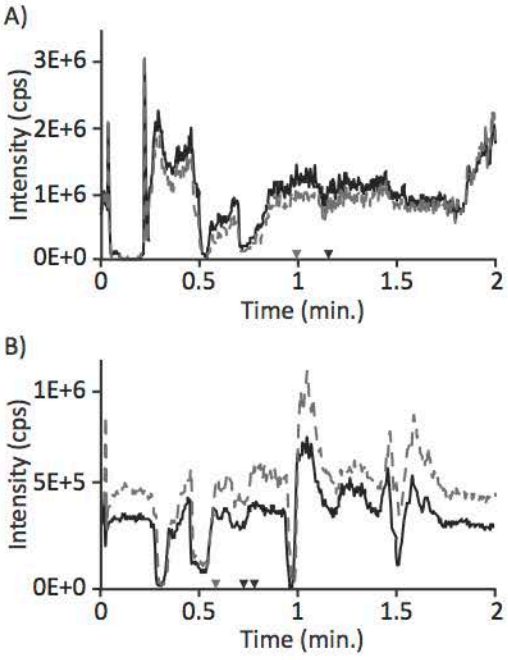
**Supplemental Table: LC and MS/MS parameters for analysis of ertapenem, meropenem, and imipenem.**

| | Ertapenem | Meropenem | Imipenem |
|---|---|---|---|
| MS Settings | | | |
| IonSpray Voltage (IS) | 5000 V | 5000 V | 3500 V |
| Turbo-V Source Temp (TEM) | 700 °C | 600 °C | 700 °C |
| Ion Source Gas 1 / 2 (GS1 / GS2) | Air (50 psi) / Air (50 psi) | Air (50 psi) / Air (50 psi) | Air (50 psi) / Air (50 psi) |
| Curtain Gas / Collision Gas (CUR / CAD) | Nitrogen (30 AU) / Nitrogen (7 AU) | Nitrogen (30 AU) / Nitrogen (7 AU) | Nitrogen (40 AU) / Nitrogen (7 AU) |
| Declustering Potential (DP) | 70 V | 70 V | 70 V |
| Entrance Potential (EP) | 10 V | 10 V | 10 V |
| Intact MRM | 476 m/z → 432 m/z | 384.1 m/z → 68 m/z | 300.1 m/z → 142.1 m/z |
| Collision energy (CE) | 12 V | 70 V | 36 V |
| Collision Cell Exit Potential (CXP) | 18 V | 11 V | 15 V |
| Hydrolyzed MRM | 494 m/z → 450 m/z | 402 m/z → 358 m/z | 318.1 m/z → 103 m/z |
| Collision energy (CE) | 13 V | 11 V | 25 V |
| Collision Cell Exit Potential (CXP) | 17 V | 11 V | 9 V |
| LC Settings | | | |
| Column | Phenomenx Kinetex (PFP, 2.6 $\mu$, 100 Å, 50 x 3mm) | Higgins Phalanx (C18, 5 $\mu$, 100 Å, 150 x 2.1 mm) | Higgins TARGA (C18, 5 $\mu$, 100 Å, 150 x 2.1 mm) |
| Column Buffer | 30% MeOH + 0.1% Formic Acid at 40°C | 10% MeOH + 0.1% Formic Acid at 40°C | 10% MeOH + 0.1% Formic Acid at 40°C |
| Gradient | 0.10 – 30% B<br>0.20 – 60% B<br>0.80 – 95% B<br>1.20 – 95% B<br>1.30 – 30% B<br>2.00 - Stop | 0.10 – 10% B<br>0.80 – 40% B<br>1.10 – 90% B<br>1.50 – 90% B<br>1.60 – 10% B<br>2.00 - Stop | 0.25 – 10% B<br>0.35 – 90% B<br>0.85 – 90% B<br>0.95 – 0% B<br>2.00 - Stop |

***Ion suppression study.*** The direct infusion syringe pump line, mounted with a Hamilton Gastight syringe (4.610 mm internal diameter, Hamilton, Reno, NV) set at 0.7 mL/min, was used to introduce the drug-metabolite solution for assessment of suppression or enhancement. The UFLCXR LC system (Shimadzu, MD, USA) was connected to the ESI interface via a stainless steel tee and delivered solvents according to the appropriate LC method developed for each drug-metabolite pair. Blank (IPA) or matrix (MZ Broth (MZB) M/Z Diagnostics, New Haven, CT) sample was injected from the autosampler and signal intensities for the drug-metabolite MRMs were monitored throughout the LC run.

Supplemental Figure 1



Supplemental Figure. **Ion Suppression Studies for Intact and Hydrolyzed Meropenem and Imipenem.** (A) Ion suppression study for matrix effects on ionization of parent and hydrolyzed meropenem was performed by obtaining Ion chromatograms for samples of meropenem (black solid trace) and hydrolyzed meropenem (gray dashed trace) directly introduced into the mass spectrometer and blank MZB sample injected through the UHPLC. No significant suppression is observed for parent or hydrolyzed meropenem in their retention time windows (triangles). (B) Ion suppression study for matrix effects on ionization of parent and hydrolyzed imipenem was performed by obtaining Ion chromatograms for samples of imipenem (black solid trace) and hydrolyzed imipenem (gray dashed trace) directly introduced into the mass spectrometer and blank MZB sample injected through the UHPLC. No significant suppression is observed for parent or hydrolyzed imipenem in their retention time windows (triangles).