



Member of Hackensack Meridian Health

Drug Metabolism & Pharmacokinetics Core

For more information contact

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Drug Metabolism & Pharmacokinetics Core

The DMPK core at CDI provides small molecule drug and biologics quantification for many anti-infective drug discovery programs. Our methodologies have paved the way to measuring drug exposure in hard-to-reach sites of disease. By bridging local drug exposure measurements with potency readouts, our efforts are supporting the development of predictive PK-PD models and translational platforms.

Major bioanalytical services include:

- Small molecule quantification in plasma & tissue
- Quantification of biologics in plasma & tissue
- Metabolite identification (MetID)
- Laser capture microdissection of specific tissue compartments
- Safe handling of biological specimens containing BSL-2 & BSL-3 pathogens

In vivo PK services include:

- PO/IP/SC/IM dosing in mice/rats
- Full (24 h) PK studies with tissue collection
- Snapshot PK studies (limited time course)
- Dose escalation and tolerability studies
- Metabolic cage mass balance studies
- Application of CYP inhibitors to boost exposure

In vitro ADME services include:

- Plasma and tissue protein binding assays
- Plasma and tissue stability assays
- Drug formulation screening and development
- Hepatic fraction (Microsomes, S9) stability assays

Major Instrumentation:

AB Sciex 5500 QTRAP Mass Spectrometer coupled with ExionLC™ Series UHPLC System

The CDI houses 2 hybrid tandem quadrupole – linear ion trap mass spectrometers that are dedicated to LC-MS/MS analysis of drug compounds. These systems deliver high sensitivity and selectivity with reduced matrix interference for improved drug quantitation.

AB Sciex 6500+ QTRAP Mass Spectrometer coupled with Shimadzu Nexera X2 UHPLC system

This hybrid tandem quadrupole – linear ion trap mass spectrometer is predominantly used for ultra-sensitive LC-MS/MS quantification of drug compounds from challenging samples. This system enables the spatial quantitation of pharmaceuticals from cellular regions isolated using laser-capture microdissection.

AB Sciex Zeno-TOF High Resolution Mass Spectrometer coupled with Shimadzu 40AD UHPLC

The Zeno-TOF excels at Quan-Qual workflows using a fast scan speed high resolution Q-TOF. The Zeno-TOF delivers modern triple-quad like linear dynamic range and sensitivity with simultaneous full scan data collection for evaluation of unknowns. The Zeno-TOF is applied to drug quantification, metabolite identification, or MS based Omics (Metabolomics, Proteomics, Lipidomics).

Thermo Q-Exactive Quadrupole-Orbitrap Mass Spectrometer coupled with UltiMate 3000 UHPLC

The hybrid system combines quadrupole precursor selection with high resolution accurate mass (HRAM). Orbitrap analysis and is predominantly used for the identification of unknown drug metabolites.

Leica Laser Microdissection Microscope 6

The LMD6 microscope is housed within one of CDIs BSL-3 laboratories and is dedicated to the dissection of regions of interest from infected tissue specimens for downstream antimicrobial drug quantitation.

Leica Laser Microdissection Microscope 7

The LMD7 microscope isolates specific cell populations from frozen/FFPE tissue sections and bone sections. The captured cells or regions of interest can then be post-processed for a wide range of downstream applications that includes small molecule and metabolite quantitation.

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