

Physical Sciences Capabilities

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Resource Director
Carol Blevins
Staff: 84

ABSTRACT: The Physical Sciences Resource Center provides personnel, laboratory facilities, and instrumentation support to Defense and Health business areas. The Resource Center has ten Capability Groups with 84 staff members who work together to apply their chemistry knowledge and expertise to solve Clients' needs, achieve project goals, and enhance MRIGlobal's mission.

Instrumentation

Category	Instrument	# Units	Typical Use	Utilization	Validated (Y/N)
Gas Chromatography	GC/MS	13	Compound Identification/confirmation & quantification	High	N
	GC	8	Pharma assay, impurity profile, residual solvent analyses, compound quantification	High	Y
	Headspace	1	Residual solvent determination for pharmaceuticals	Medium	Y
	Thermal Desorption	3	Vapor chamber target confirmation and quantitation	Medium	N
	GC-HRMS	2	High resolution GC/MS for trace analysis of analytes and compound identification in full scan analysis	Medium	N
	GCxGC TOF	1	2-D chromatography with high resolution mass spectrometry	Low	N
	Minicams	6	Surety laboratory safety monitoring, vapor system concentration confirmation	High	N
Liquid Chromatography	HPLC/UPLC	10/4	Pharma assay and impurity profile. Compound quantification	High	Y
	LC/MS QTOF	1	Trace analysis of target analytes for pharma and defense applications	High	N
	LC/MS/MS	7	Trace analysis of target analytes for pharma and defense applications	High	Y
	DART-AccuToF	1	Ambient ionization for compound confirmation	Low	N
Spectroscopy	FTIR	3	Library building, spectral comparisons of reactions, chemical structure confirmation, sample screening & preliminary identification, vapor/gas analysis	Medium	Y
	Raman	2		Low	N
	NMR	1	Purity assessments, reaction monitoring	High	Y
	XRF	1	Elemental analysis	Low	N
Characterization	TGA/DSC	1	Melting point and thermal degradation profiles	Low	Y
	UV/Vis	1	Qualitative and quantitative analysis	Medium	Y
	Karl Fisher (Colometric & Volumetric)	4	Water content determination in pharma drugs, pesticides & formulations	High	Y
	Dissolution	2	How well a pill/tablet/drug dissolves in stomach acid	High	Y
	Disintegration	1	Placebo tablets and capsule analysis	Medium	Y
	SEM EDS	1	Surface coating analysis	Low	N
	CHN-S Elemental Analysis	1	Determine Carbon, Hydrogen, Nitrogen and Sulfur content	Low	N
	Rheometer	1	Viscosity and Thixotropy analysis	Low	N
	Osmometer	1	Measures osmolality via freezing point depression in liquid pharmaceuticals	Low	Y
	Turbidimeter	1	Determine the degree of turbidity in a liquid solution	Low	N

Analytical Support/ Testing and Evaluation

CM: Charmel Grisham # Staff: 12
Business Areas: Defense Federal & Commercial
Projects: QRC, OSE, Radiant Eagle

Chemical Interactions

CM: Reed Oshel # Staff: 12
Business Areas: Defense Federal; Material Science; chemical interactions and characterization, phytochemicals
Projects: QRC, Rubber Chicken, SRF

Bioanalytical & Product Registration

CM: Season Kerns # Staff: 7
Business Areas: Health; Bioanalytical, Analytical Crop Protection, Dose Formulation
Projects: NTP, Commercial

Repository

CM: Kristin Shockley # Staff: 6
Business Areas: Health; Pharma Repository, Support Clinical trials, Regulated Sample Handling
Projects: Commercial, NCI-DCP

Laboratory Space

- HQ:** 64 labs with combined 31,000 ft²
- North KC:** Repository Facility, Pharmaceutical Stability Facility, Analytical Lab, Drug Product Manufacturing Suite (Construction in May 2022)
- Gaithersburg:** Sample Reception Facility (400ft²), Analytical Labs (600ft²), General Use Laboratories (600ft²)
- Deramus Field Station:** 78-acre site in Grandview, Missouri, 17,500 ft² of high bay and standard laboratory space, pilot scale industrial processes, ideal for hazardous operations or requiring extensive outdoor space.

Surety

CM: Eric Peters # Staff: 5
Business Areas: Defense, Health; Surety, MCM
Projects: BGC, Radiant Eagle, Commercial

Chemical Management

CM: Sarah Pickett # Staff: 8
Business Areas: Health; Repositories, Sample Control Center
Projects: NTP, DCP, NCI, ISK, TCI

Synthesis

CM: Pete Deardorff # Staff: 5
Business Areas: Health and Defense
Projects: NINDS, Commercial API production

Pharmaceutical Analysis

CM: Jami Larson # Staff: 16
Business Areas: Health; Pharma
Projects: NCI, DCP, Commercial

Functional Specialists

CM: Carol Blevins # Staff: 4
Business Areas: Health; Pharmaceutical Science
Projects: NTP, NCI-DCP

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