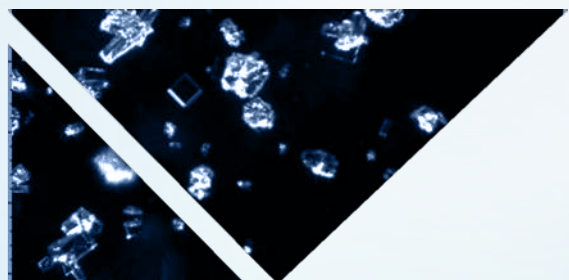
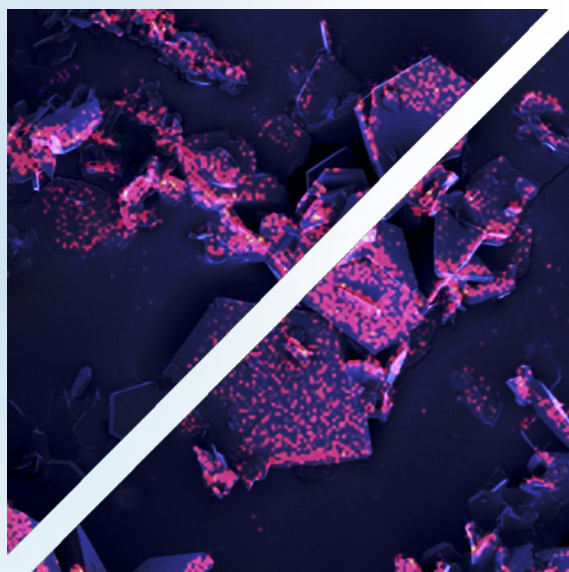


Full-Service Material Science

High-quality support throughout the drug development process

The Pharmaron Material Science team works in collaboration with clients to deliver a precision-based approach to drug development. We use state-of-the-art technologies to develop a detailed and thorough understanding of both intermediate and drug substance behavior. Co-location of the Material Science team with other key players, such as Particle Engineering, Analytical and Process Chemistry, and Formulation Development, means projects are fast, efficient and effective, with precision and integrity as standard.



Top image: SEM/EDS image and elemental analysis
Bottom Image: PAT: *in-situ* microscopy of crystal growth

Why work with us

■ Agile team working

Quick study start-up and flexible scheduling to meet client requirements

■ Advanced technology

State-of-the-art instrumentation for deep understanding of physicochemical properties and crystallization mechanisms

■ Co-located workflows

Ready access to, as well as collaboration and communication with, key groups for streamlined execution

■ Expert partners

Flexible materials characterization to identify the most appropriate solid form for development

■ Dedicated support

Dedicated team with deep expertise across a range of areas including polymorphic characterization and relationship mapping, phase diagrams, crystallography and particle engineering

■ Innovation in research

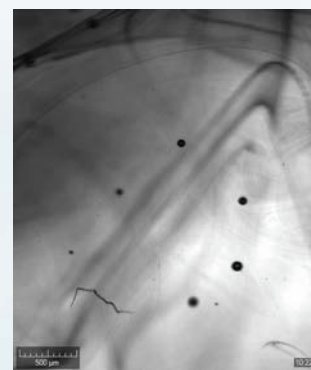
Leaders in adoption of new technologies and techniques, including *in-situ* PAT and Variable Temperature / Variable Humidity XRPD

Core Capabilities

High-Throughput Screening and Characterization	Crystallization Development and Optimization
Comprehensive solid form screen and selection	Solvent selection and form control
Polymorph, salt and co-crystal screening	Solubility prediction and modelling
Chiral resolution by direct crystallization or diastereomeric salt formation	Purification and processability
Advanced characterization and analysis for patent support	Particle engineering through direct crystallization or milling, for formulatability
Polymorph relationship and hydrate mapping	2 mL to 5 L scale development and scale-up process development
Developability assessment	Creating and navigating Liquid/Liquid Phase Separation (oiling) phase diagrams
Amorphous solid preparation using freeze drying	Amorphous solid direct precipitation
Final form selection	Efficiency and sustainability

Instrumentation

- Robotic liquid handling capabilities and balances; high-throughput screening
- Automated reactors from small-scale to mid- and large-scale
- Polymorphic characterization: IR, Raman, thermal analysis, DVS
- XRPD: variable temperature and humidity, capillary, high-throughput stage
- Crystal structure determination: electron diffraction, single crystal XRD
- Particle characterization: optical microscopy, hot-stage microscopy, SEM (EDS/EDX), PSD, DLS
- NMR: Solution phase: ^1H , ^{13}C , ^{19}F , ^{31}P , ^{23}Na , ^{195}Pt , ^{11}B ; Solid state: ^{13}C , ^{123}Na , ^{195}Pt
- PAT: solution focused and particle focused, *in-situ* microscopy and CLD
- Solubility and scale-up predictive software
- Particle size reduction: jet mill, wet mill, hammer mill, cone mill, spray drying, resonant acoustic mixing



in-situ image showing two mechanisms of oiling



Laboratory
Services



Chemistry,
Manufacturing
& Control



Clinical
Development



Biologics
& CGT