A world class pharmaceutical and fine-chemicals manufacturing research facility, inspiring researchers, informing innovation

World-Class Expertise

- Crystallisation
- Process Development
- Materials Characterisation
- Formulation
- Process and Product Analysis

World-Class Capabilities

Primary Processing
Crystallisation platforms covering batch and continuous methods e.g. cooling, anti-solvent, reactive and evaporative crystallisation

Secondary Processing
Formulation platforms investigating solid oral dosage forms e.g. extrusion, blending, compaction and milling

PAT / Spectroscopy
Process monitoring technologies and off-line benchtop spectroscopy techniques e.g. FBRM, PVM, Raman, IR, UV-Vis

X-Ray Diffraction
Powder, single crystal, and small angle X-ray scattering for understanding molecular structure

Imaging
Visualisation using a variety of microscopes e.g. optical, SEM, AFM and nanoscale computed tomography

Materials Characterisation
Techniques to understand the physical properties of solid powders and tablets e.g. BET, porosity, pycnometry, surface energy, vapour sorption, density, dissolution, solubility

We are based in the new Technology and Innovation Centre at University of Strathclyde, Glasgow, UK.
The £100m state of the art facility has been equipped using £16m funding awarded by HEFCE UKRPIF, the Wolfson Foundation and University of Strathclyde. This is supported with £22.8m Industry and charity contributions.

Find out how we can help you
Contact: national-facility@cmac.ac.uk
Web url: www.cmac.ac.uk/facilities.htm
Twitter: @EPSRC_CMAC
**Primary Processing**

**Nucleation Platforms:**
- Valve Mixer, Modular MicroReaction System (MMRS), Erhfeld/BTS
- Impinging Jet Mixer, Microinnova

**Discovery Platforms:**
- OptiMax Synthesis Workstation (1 x 1 L), Mettler Toledo
- EasyMax Synthesis Workstation (2 x 100 mL), Mettler Toledo
- Crystalline (8 mL scale), Technobob
- Crystal 16 (2 mL scale), Technobob
- Zebra Fish & Polar Bear, Cambridge Reactor Design
- NanoAssemblir, microfluidics manufacturing platform, Precision Nanosystems
- Mitos Dropix, Advanced Droplet System, Dolomite
- Crystallisation Discovery Platform, Crissy XL, Zinsser

**Continuous Crystallisation Platforms:**
- Skid mounted modular continuous crystallisation platforms, Microinnova
- DN10, Continuous Crystalliser, Soham Glassware & Cambridge Reactor Design
- DN15, Continuous Crystalliser, NiTech & Alconbury Weston Ltd.
- Rattlesnake, Continuous Crystalliser, Cambridge Reactor Design
- Stirred Tank Reactors, Radleys
- Agitated Cell Reactor, CoFlore, AM Technology
- Taylor Coutte, Scott Glass

**Filtration:**
- Rotary Drum, Continuous filtration, Cordell Group
- Nutsche Filters, Powder Systems
- Falcon Filtration Robot, Cambridge Reactor Design

**Ancillaries:**

**PAT / Spectroscopy**

**FBRM (Focused Beam Reflectance Measurement),**
- Particle Track 4Q400, Mettler Toledo
- Particle Sizing, Innopharma, Eyecon
- PVM (Particle Vision Measurement), PVM V819, Mettler Toledo
- In-Situ Particle Viewer (ISPV), Perdix FT-IR, Matrix MF, Bruker
- ATR-FT-IR, ReactIR 15, Mettler Toledo
- FT-IR, MB3000, ABB
- Raman, RNX2 Hybrid, Kaiser
- Raman, RNX1, Kaiser
- UV-Vis, NMC 105, NCS, 651, MC 6561, Zeiss
- Turbidicity, CrystalEYES, HEL Group
- FT-NIR, Matrix F, Bruker
- Terahertz Raman, Ondax
- pH probes, Mettler Toledo
- Conductivity probes, Mettler Toledo

**Imaging**

**Optical Microscopy, Leica**
- SEM, FE-SEM 8500, Keysight Technologies
- AFM, Dimension FastScan, Bruker
- AFM, MultiMode 8, Bruker
- IR Microscope, Hyperion 3000, Bruker
- Raman Microscope, XPlora Plus, Horiba

**Thermal Imaging Camera, A6702sc InSb, FLIR**
- Microscope Stages: Temperature, Rheology, Freeze Drying, Linkam
- High Speed Imaging, FastCam, Photon
- TOF-SIMS, ION-TOF
- X-Ray Nano Computed Tomography, SkyScan 2211 Bruker

**Secondary Processing**

**Bin Blender, MB015AB (Agilblend)**
- Laboratory Blender, Pharmatech
- High Shear Wet Granulator, TMG 1/6, Vertical Granulator, Glatt
- Fluid Bed Dryer, Strea-1 Pro Laboratory Fluid Bed Unit, GE
- Conical/Hammer Mill, Fitz Mill L1A, Fitzpatrick Company
- Tablet Press, XP1 Research Tablet Press, Korsch
- Dry Granulation, BT120 Bench Top Roller Compactor, Alexanderwerk
- 11mm Hot Melt Extruder/Twin Screw Extruder, Pharma 11, Thermo Electron
- 16mm Hot Melt Extruder/Twin Screw Extruder, Eurolab Pharma 40:1, 1000rpm, Thermo Electron
- Mini Injection Molder, Haake Minijet Pro, Thermo Electron
- Cube Mixer KB, Erweka
- Spray Dryer, B-290, Buchi
- Encapsulator, B-395 Pro, Buchi
- Aerosol Inkjet 3D Printer, A200, Optomec
- Plastic 3D Printer, Leapfrog

**Ancillaries:**
- Tableting Tools, Disintegration Tester, Friability Tester, Sample Divider, Sieves (100mm & 400mm), Filters, Rotary Evaporator

**Materials Characterisation**

**Dissolution Testing:**
- pH Solubility Studies, inForm, Sirius
- Surface Dissolution Imager (SDI), Sirius
- Dissolution testers, DT726 (USP 1, 2, 5, & 6) and DF7270 (USP 4), Erweka

**Thermal Analysis:**
- Simultaneous Thermal Analysis (DSC/TGA), STA449 F1 Jupiter, Netzsch
- Modulated DSC, DSC 214 Polyma, Netzsch

**Chromatography:**
- HPLC-MS, 1290 with Q-TOF, Agilent
- GC-MS, 5977A with headspace sampling, Agilent

**Physical Property Measurements:**
- Surface Area Measurement (BET Analysis), Autosorb-iQ-MP-2ST, Quantachrome
- Mercury Porisimeter, PoreMaster 60, Quantachrome
- Gas Pycnometer, MicroUltrapycnometer 1202, Quantachrome
- Bulk/Tapped Density, AutoTap, Quantachrome
- Surface Energy Analyzer, IGC SEA, Surface Measurement Systems
- Dynamic Vapour Sorption, DVS Advantage 1, Surface Measurement Systems
- Compression Testing (5N & 10N Load Cells), 5942, Instron
- Powder Rheometer, FT4, Freeman Technology
- Liquid Rotational Rheometer, Haake MARS, Thermo Fisher
- Flowability, Copley, BEP2
- Single-Axis Acoustic Levitator with temperature and humidity incubator (OKOLab), Materials Development Inc.
- Surface Contact Angle Goniometer, KRUSS
- Water Activity Measurement, LabMaster AW, Novasina
- Moisture Meter MA, Sartorius
- Hybrid Karl Fischer Moisture Titrator, MKH-700, Kyoto Electronics Manufacturing Co. Polarimeter, Autopol V, Rudolph Research
- Nanoparticle sizer, IZON, Q-Nano
- Next Generation Impactor (NGI), USP 601, Copley
- Quantitative Circular Dichroism, Applied Photophysics

**Benchtop Spectrometry:**
- FT-NIR, MultiPurpose Analyser (MPA), Bruker
- FT-IR with ATR, TENSOR II, Bruker
- 500 MHz NMR, AVHD500, Bruker
- FT-IR with ATR, TENSOR II, Bruker

**Particle Sizing & Shape Analysis:**
- Laser Diffraction Particle Sizing, Mastersizer 3000 with HydroSight, Malvern
- Particle Size & Shape Analysis, Morphologi G3, Malvern
- Particle Size & Shape Analysis, QicPic/Ro6, Sympatec
- Dynamic Light Scattering, ZetaSizer Nano ZS, Malvern
- Nanoparticle Characterisation, NanoSight, Malvern