

EQUIPMENT LIST

Analytical services

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Contact:

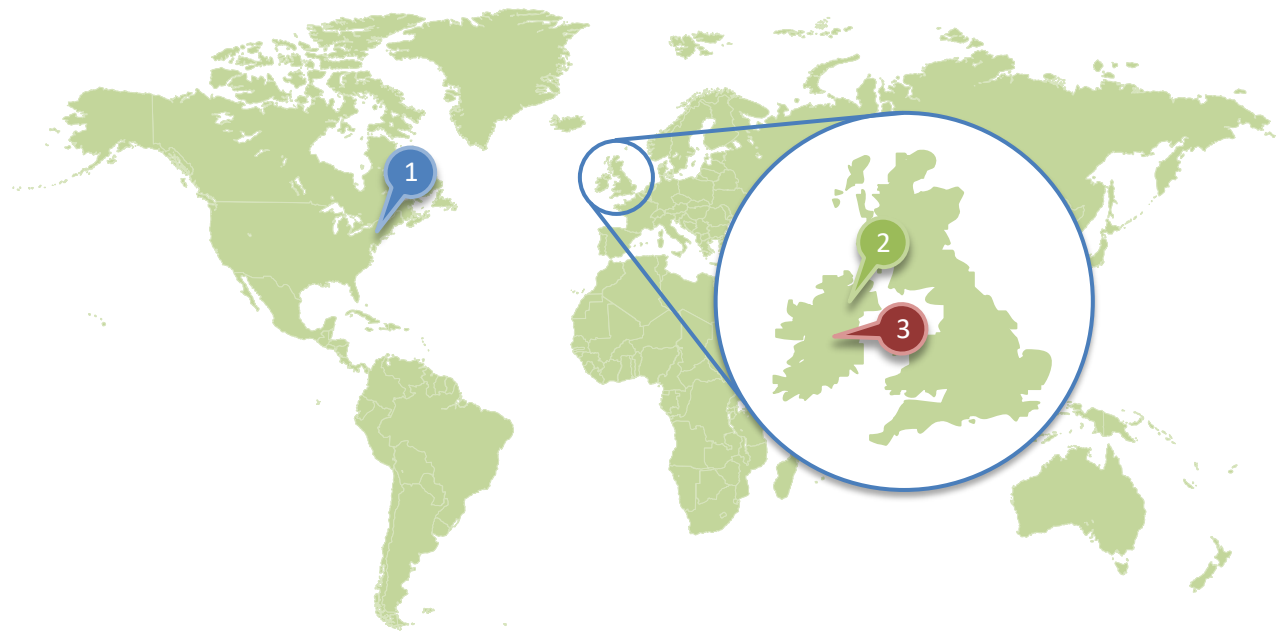
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Location of sites



- 1. Almac Sciences LLC, Souderton, Pennsylvania, United States 3
- 2. Almac Sciences Ltd, Craigavon, Northern Ireland, United Kingdom..... 4
- 3. Almac Sciences Ireland Ltd, Athlone, Ireland..... 7

1. Almac Sciences LLC, Souderton, Pennsylvania, United States

1.1 Analytical equipment (cGMP)

Instrument	Count
Agilent 1200 HPLC system with PDA	1
Agilent 1200 HPLC system with VWD	1
Agilent 1200 HPLC system with VWD and CAD	1
Agilent 1260 HPLC system with PDA	1
Agilent 1260 HPLC system with VWD	3
Agilent 1260 HPLC system with VWD and RID	1
Agilent 1290 HPLC system with PDA	1
Waters Acquity H-Class systems with PDA (HPLC and UPLC)	1
Waters Acquity H-Class systems with VWD (HPLC and UPLC)	1
Agilent 7890A with FID and Agilent 7693 with Auto sampler, head-space (GC Chromatography)	2
Distek Evolution 6100 Dissolution Baths	5
Distek Evolution 6300 Dissolution Bath	1
Evolution 4300 Autosampler with dual pumps	3
Perkin Elmer Spectrum 100 FT-IR with ATR, DRIFT, Transmission	1
Perkin Elmer Lambda 35 UV/VIS spectrophotometer	1
Mettler C30 Coulometric Karl Fisher titrator	1
Mettler V30 Volumetric Karl Fisher titrator	1

2. Almac Sciences Ltd, Craigavon, Northern Ireland, United Kingdom

2.1 Analytical equipment (cGMP)

Technique	Instruments	Features	Numbers
X-ray powder diffraction (XRPD)	Panalytical Xpert Pro MPD Pixcel detector	Reflection, transmission, variable temperature, auto-sampling	1
X-ray powder diffraction (XRPD)	PANalytical Aeris Research Edition	Reflection, transmission, variable temperature, auto-sampling	1
Differential scanning calorimetry (DSC)	Perkin Elmer Jade & Pyris 7	Sub-ambient, auto-sampling	1
Hyper DSC	Perkin Elmer Diamond	Sub-ambient to 350°C, up to 500K/min heat/cool rates	1
Thermogravimetric analysis (TGA)	Mettler Toledo STARe	Simultaneous DSC & TGA	1
Dynamic vapour sorption (DVS)	Hidden Isochema IGAsorp	Aqueous and organic vapour	1
Particle size analysis	Malvern Mastersizer 3000 Sympatec Helos	Wet and dry dispersion	2
Intrinsic dissolution	Distek Evolution 6300	Modified for small samples	1
Infrared spectroscopy (FTIR)	Thermonicolet Avatar 370 Perkin Elmer Spectrum RX1	ATR golden gate	2
Ultraviolet-visible spectroscopy (UV-vis)	Analytik Jena, Specord 200 & Hitachi U-2001		2
Nuclear magnetic resonance (NMR)	Bruker 500MHz Ultrashield Bruker 400MHz Ultrashield	¹ H, ¹³ C, ¹⁹ F and ³¹ P Probes 1D and 2D experiments	2
Chromatography (HPLC)	Agilent, Waters	RI, CAD, Fluorescence detectors ion and size exclusion systems large prep scale capabilities	50
Chromatography (UHPLC)	Agilent / Waters	PDA and UV visible coupled with mass spectrometry	21
Chromatography (GC)	Agilent 6890	ECD, TCD and FID detectors. Headspace systems	8
Liquid Chromatography Mass Spectrometry High Resolution	Agilent 6530 LC-Q-TOF Agilent 6230 LC-TOF	LC-MSn capabilities, accurate mass	2
Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Agilent 7900	Metals analysis	1

Liquid Chromatography Mass Spectrometry	Agilent 6460 LC-Triple Quad AB API 3000 LC-Triple Quad AB API 365 LC-Triple Quad	LC-MSn capabilities	3
Gas Chromatography Mass Spectroscopy	Polaris Q Trace GC Agilent 7890/5975	Simultaneous FID and MS analysis, MS ⁿ capabilities	2
Ion Chromatography	Dionex ICS-3000 and ICS-5000	Conductivity and electrochemical detectors	3
Dissolution	Distek	USP apparatus I and II	8
Water content	Mettler Toledo DL39, C30	Karl Fischer coulometry & titrometry, Stromboli oven	8
Polarimetry	Perkin Elmer 341		1
Autotitrator	Mettler Toledo T70		1
Stability testing	All ICH zones	Large humidity chambers	> 300 m ³ capacity

2.2 Analytical equipment (non-GMP)

Technique	Instruments	Features
Technique	Instruments	Features
Microscopy	Smiths IlluminatIR Olympus BX51 Linkam hot-stage Keyence microscope	From 10 - 200X, polarizing filters, digital image capture, ATR & ARO objectives, -196 to 350°C, linked to FTIR
Raman spectroscopy	Perkin Elmer RamanMicro 200F series Raman Microscope Avalon RamanStation Fusion R1	Microscopy and mapping capabilities
Automated solubility determination	Clarity crystallisation station	Multi well reactor block with turbidity probes
Crystallisation development	Jacketed glass reactors (100mL - 5L) BlazeMetric & particle video imaging (PVM) probes	On-line sampling for particle size and polymorph monitoring
Formulation development	Freeze dryer Spray dryer High shear mixing (Ultra Turrax) Rotary evaporators (Buchi) Ball mill (Retsch)	Development of stabilised amorphous formulations
Software modelling tools	ACDLabs Percepta Dynochem suite Mercury HighScore Plus	pKa, log P, solubility modelling, crystal structure visualisation, unit cell indexing

2.3 Analytical equipment for biocatalysis support (non-GMP)

Instrument	Count
Evaporative light scattering detector	1
Capillary electrophoresis	1
U-HPLC systems (capable of high throughput screening)	6
HPLC systems (capable of high throughput)	13
Gas chromatography systems	3
Fluorescent/UV plate readers	2

3. Almac Sciences Ireland Ltd, Athlone, Ireland

3.1 Analytical equipment

Description	
ICH stability storage	80°C and -20°C freezers
	5°C refrigerated storage
	25°C/60%RH long term stability storage
	30°C/65%RH intermediate stability storage
	40°C/75%RH accelerated stability storage
Mass spectrometry	Sciex API 3000
	Sciex (X2) API 4000
	Sciex API 4000 QTRAP
Chromatography	HPLC Shimadzu LC20 Prominence
	HPLC Waters (X5) UV, PDA, RI and fluorescence detection
	HPLC Perkin Elmer (X2) Series 200
	HPLC Shimadzu UFLC XR
	HPLC Shimadzu UFLC
	GC Agilent 7890A, 6890 (x3) with FID, ECD and NPD detection.
	Agilent Headspace units (x3)
	GC Hewlett Packard 6890
Spectroscopy	Perkin Elmer Wallac Victor 1420
	Molecular Devices Spectramax Plus 384
	FT-IR Bruker Alpha-P
	UV-Vis Analytik Jena Speedcord 205
Electrophoresis	BioRad ChemiDoc MP (Comprehensive imaging system for gels and Western Blots)
	BioRad TransBlot Turbo (Western Blots)
	BioRad Tetra cell (SDS-PAGE, Native PAGE, 2-D PAGE, DGGE, Gel IEF)
Drug product analysis	Dissolution baths Caleva 10+ST
	Disintegration bath Caleva Dist 2
	Friability tester Erweka TA 120

Particle size distribution	Shimadzu SALD-2201														
	Malvern (ZSP Nano series) ZEN5600														
Bacterial Identification system	Biolog Micro station - identification of Bacterial Isolates <ul style="list-style-type: none"> • Gram positive Rods • Gram Positive cocci • Gram negative rods. 														
Micro	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">QCELL260Cooler Incubator</td> <td style="text-align: right;">20-25'C</td> </tr> <tr> <td>Memmert Incubator INE 800</td> <td style="text-align: right;">30-35'C</td> </tr> <tr> <td>Memmert Incubator IFE 600</td> <td style="text-align: right;">42-44'C</td> </tr> <tr> <td>Memmert Incubator INE 600</td> <td style="text-align: right;">35-37'C</td> </tr> <tr> <td>Memmert Incubator INE 600</td> <td style="text-align: right;">30-35'C</td> </tr> <tr> <td>Memmert Cooled Incubator IPC450</td> <td style="text-align: right;">20-25'C</td> </tr> <tr> <td>Memmert Incubator IFE</td> <td style="text-align: right;">37+/-1'C</td> </tr> </table>	QCELL260Cooler Incubator	20-25'C	Memmert Incubator INE 800	30-35'C	Memmert Incubator IFE 600	42-44'C	Memmert Incubator INE 600	35-37'C	Memmert Incubator INE 600	30-35'C	Memmert Cooled Incubator IPC450	20-25'C	Memmert Incubator IFE	37+/-1'C
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Other technologies	Perkin Elmer 2470 Wizard2 (Gamma counter)														
	Perkin Elmer Filtermate (Cell harvester)														
	ASYS Atlantis (Microplate washer - ELISA)														
	CEM Technologies Mars6 (Microwave assisted digester)														
	Savant Speedvac SPD2010 (Vacuum centrifuge)														
	AA with flame and graphite furnace														
	Metrohm Kark Fischer														
	Mettler Toledo T70 Auto-Titrator														
	Caleva Hardness tester														
	Colorimeter														
	CEM Microwave digester Mars 6														
	Microscope														
	Refractometer														
	Polarimeter														
Melting Point															