

Section A: General Service Information and Contact Details

The SIHMDS-AG laboratory is part of the GOSH Genomics laboratory based at Barclay House and provides a specialist service for solid and haematological cancer in children. SIHMDS-AG stands for specialist integrated haematological malignancy diagnostic service- acquired genomics. Together with the Rare and Inherited Disease laboratory it forms the Genomic laboratory and provides testing on behalf of the North Thames Genomic Medicine service (please see our website <https://norththamesgenomics.nhs.uk/about/> for further details). The SIHMDS-AG laboratory is also part of the GOSH paediatric SIHMD service and works closely with other pathology laboratories and the associated clinical teams in the Camelia Botnar Laboratories at GOSH.

The laboratory receives samples from GOSH internal cases via the Blood Sciences laboratory or Histopathology, both located in the Camelia Botnar Laboratories. Samples are transferred via the Hospital's portering service.

Test requesting for internal samples is managed via the EPIC/Beaker LIMS system.

Samples from external referrers are received at the address below and are accompanied by request forms which are scanned into the EPIC/Beaker LIMS system. The laboratory routinely receives referrals from UCLH (part of NT-GMS) for ALLtogether Trial work-up and from Beaumont Hospital, Ireland (CNS tumour NGS panel investigations). Referrals from other NHS centres, private or overseas referrals can be accepted upon completion of relevant contract and information governance processes.

Address for samples:

[SIHMDS-Acquired Genomics Laboratory](#)
[NHS North Thames Genomic Medicine Service](#)
[Great Ormond Street Hospital for Children NHS Foundation Trust,](#)
[Genetics Laboratory](#)
[Levels 4-6 Barclay House, 37, Queen Square,](#)
[London WC1N 3BH](#)

Contacts:

The SIHMDS-AG scientific team can be contacted on: Tel: 020 7405 9200 x5771/ x5755

Our duty scientist email is: gos-tr.pmu@nhs.net

Head of Service: Dörte Wren; email: dorte.wren@gosh.nhs.uk

Laboratory Service Times: Monday to Friday 9am to 5.30pm

Section B: Testing repertoire, TATs and sample requirements

Request forms:

Our Test request form is available online via the North Thames Genomic Medicine Service website:

<https://norththamesgenomics.nhs.uk/request-a-genetic-test/test-request-information/#Cancer>

[Cancer test request forms and information - North Thames GMS : North Thames GMS](#)

- Under “Specialist paediatric cancer testing”> Test request form: GOSH SIHMDS AG order form

Routine standard-of care requests should be submitted using this form. The form must provide patient information including clinical scenario, testing required and the name and contact information of the referring clinician and destination of the report. Date and time of sample acquisition is to be provided as is the Histopathology block number and tumour infiltration assessment for FFPE specimen.

Internal GOSH testing requests must be submitted via the EPIC/Beaker system.

Please note: For Whole genome sequencing (WGS) requests refer to the information provided on the NT-GMS website:

[Test request forms and information - North Thames GMS : North Thames GMS](#)

>Whole genome sequencing (Cancer)

Testing Repertoire – Standard-of-Care (SOC) testing

The laboratory provides molecular and cytogenomic analysis in accordance with the NHSE Test directory. For the latest version please refer to the following website:

[NHS England » National genomic test directory](#)

For testing beyond the scope of the NHSE Test directory, private patient referrals or trial and research studies, please contact the Head of service for further information.

For WGS eligibility please refer to the relevant section on the NT-GMS website and consult the latest version of the NHSE test directory.

Table 1 provides an overview of methods available and accepted test requests per clinical indication are outlined below. For certain assays, a split pathway is in place where the laboratory work is performed by another laboratory but analysis and reporting is performed by SIHMDS-AG. Tests that are commissioned by NHSE as < 7 GMS tests due low sample volume or their specialist nature are performed and reported by the external laboratory. These are referred to as send-away tests (see table 1 for details).

Table 1: Testing methods available

Method	In-house, split-pathway or send-away
FISH	Wet lab work and analysis performed in-house
Karyotype	Wet lab work and analysis performed in-house
SNP array	Wet lab work and analysis performed in-house
Methylation array	Split pathway: Wet lab work performed at UCL Genomics; Analysis and reporting by SIHMDS-AG
DNA NGS and RNA fusion panels	Split pathway: Wet lab work performed at RMH (NT-GMS Cancer Hub); Analysis and reporting by SIHMDS-AG
<i>BCR::ABL1</i> MRD and ABL1 kinase domain mutations for ALL, AML, CML	Send-away North West London Pathology [NWLP] (NT-GMS)
AML MRD Various targets by qPCR including rare breakpoints	Send-away Guy's Hospital (SE-GMS)
BRAF MRD follow-up Histiocytosis/LCH	Send-away Newcastle (NE&Y GMS)

We monitor our Turn-around time (TAT) performance against the national reporting time guidelines (see Table 2 for TATs).

Table 2: Turn-around times (TATs) in calendar days

Priority	Test	TAT
Very Urgent	Diagnostic FISH for ALL (<i>BCR::ABL1</i>), AML (<i>PML::RARA</i>), Burkitt leukaemia/lymphoma (<i>MYC</i>)	3
Urgent	Diagnostic testing FISH Karyotype (urgent)	7
Routine	- SNP array - Methylation array	14
	- NGS DNA panel - RNA fusion panel - Karyotype	14-21

Haemato-oncology investigations

Acute Lymphoblastic leukaemia (ALL)

B-ALL

- Rapid FISH for *BCR::ABL1* fusion
- FISH for *KMT2A* rearrangement, *MYC* rearrangement
- SNP array
- RNA fusion panel
- NGS panel

T-ALL

- RNA fusion panel
- NGS panel

Acute Myeloid Leukaemia (AML)

- Rapid FISH for *PML::RARA* fusion (If indicated)
- FISH for *KMT2A* rearrangement, *TP53* deletion
- Karyotype
- RNA fusion panel
- NGS panel

Transient abnormal Myelopoiesis (TAM)

- NGS panel (*GATA1* gene variants)

Myeloid leukaemia with Down Syndrome (ML-DS)

- Karyotype
- NGS panel

Burkitt Lymphoma/Leukaemia, Diffuse Large B-cell Lymphoma (DLBCL), B-Non-Hodgkins Lymphoma (B-NHL)

- Rapid FISH for *MYC*
- FISH for *BCL2* and *BCL6* rearrangements, 11q deletion/duplication (if indicated)
- NGS panel

Chronic Myeloid Leukaemia (CML)

- FISH for *BCR::ABL1* fusion

- Karyotype
- NGS panel
- MRD testing for *BCR::ABL1* fusion transcript is performed at NWLP

Myeloproliferative Neoplasms (MPN)

- FISH for *BCR::ABL1* fusion; Hyper eosinophilia syndrome: FISH for *FIP1L1::PDGFRA*, *PDGFRB* and *FGFR1*
- Karyotype
- RNA fusion panel
- NGS panel

Myelodysplastic syndromes (MDS) performed on Bone marrow only

- Karyotype (MDS FISH panel for monosomy 5/7, deleted 5q/7q/20q, *MECOM* rearrangement if karyotype fails)
- RNA fusion panel
- NGS panel

Juvenile myelomonocytic leukaemia (JMML)

- FISH for *BCR::ABL1* fusion
- Karyotype (FISH for monosomy 7 if karyotype fails)
- NGS panel

Bone marrow failure (BMF)

Aplastic anaemia and neutropenia

- FISH for monosomy 5/7, deleted 5q/7q
- Karyotype
- NGS panel

Fanconi anaemia

- FISH for monosomy 1q, 3q and 7q
- Karyotype (*bone marrow samples only*)

Langerhans Cell Histiocytosis (LCH)

- NGS panel

Post-bone marrow transplant (BMT) chimerism and maternal engraftment

- FISH for chromosomes X and Y

Solid tumours investigations

Sarcoma

- RNA fusion panel
- FISH testing may be performed in an exceptional and/or urgent cases:

Rhabdomyosarcoma	<i>FOXO1</i> rearrangement
Ewings (PNET)	<i>EWSR1</i> rearrangement
Synovial Sarcoma	<i>SS18 (SYT)</i> rearrangement
Infantile Fibrosarcoma/ Congenital Mesoblastic Nephroma	<i>ETV6</i> rearrangement
Dermatofibrosarcoma protuberans (DFSP)	<i>COL1A1-PDGFB</i>

Medulloblastoma

- Rapid FISH for *MYCN* and *MYC* amplification
- NGS panel
- Methylation array

Neuroblastoma (NBL)

- Rapid FISH for *MYCN* amplification *TERT* rearrangement
- Additional FISH for 1p/q, 11q, 17q imbalance on request only
- SNP array
- NGS panel

Central Nervous System (CNS) tumours

- RNA fusion panel
- NGS panel
- Methylation array
- FISH for 1p/q and 19p/q (on request for oligodendroglioma only)

Sample requirements

Acceptable sample types for each testing indication are listed in table 3. Other sample types such as Pleural Fluid, ascetic fluid, cerebrospinal fluid, cytospin cells or bone marrow trephines are accepted by prior arrangement. Please contact the Duty scientist before sending.

All samples must be labelled with three unique identifiers and accompanied by a completed request form.

Samples must be sent in appropriate containers and packaging and must reach the laboratory within 72hrs or < 24hrs for urgent processing to ensure sample viability. Refer to table 1 for details.

If material allows, please send separate vials of FFPE scrolls for molecular testing: please send one Eppendorf tube of rolled sections per test requested.

We cannot accept samples with pathogens from Hazard Group 3 (e.g. Tuberculosis, TB).

Patient consent

Informed consent from the patient for the test(s) will be assumed on receipt of the test request for the standard-of-care genomic testing and is the responsibility of the referring clinician. The laboratory retains extracted nucleic acid material and fixed cells for audit purposes as well as quality control and method validation in-line with Human Tissue Act legislation and RCPATH guidance.

NHS NORTH THAMES GENOMIC LABORATORY HUB
GREAT ORMOND STREET HOSPITAL FOR CHILDREN NHS FOUNDATION TRUST LONDON

[Website: SIHMDS-AG Service information](#)

Sample types, collection and transport requirements

*FFPE - Formalin-fixed paraffin embedded tissue ** **Fresh tissue in saline (NOT formalin);** *** DNase/RNase free 1.5ml eppendorf tube

Test	Sample requirements			Notes
	Sample Type	Anticoagulant/ container	Amount	
FISH	Bone marrow/blood Bone marrow/blood smear slides *FFPE sections (tissue/bone marrow trephine) Touch imprint slides (tissue) CSF/ body fluid – if involvement confirmed	Lithium heparin Slides Slides Slides Cytospin slides	1-5ml N/A 2-4µm N/A N/A	<72hours old
G-band karyotype	Bone marrow/blood	Lithium heparin	1-5ml	<72hours old
RNA fusion panel	Bone marrow/blood *FFPE rolled sections (tissue/bone marrow trephine) **Fresh/frozen tissue / Frozen mononuclear cells ** Extracted RNA / cDNA	EDTA Eppendorf tube*** Sterile container Eppendorf tube***	1-5ml ≥5scrolls, 5-10µm N/A 1µg	<72hours old Transport frozen tissue and RNA in dry ice
NGS DNA panel	Bone marrow/blood *FFPE rolled sections (tissue/bone marrow trephine) **Fresh/snap frozen tissue /Frozen mononuclear cells Extracted DNA	EDTA Eppendorf tube*** Sterile container Eppendorf tube***	1-5ml ≥5 scrolls 5-10µm N/A 1µg	Transport frozen tissue in dry ice
SNP array	Bone marrow/blood *FFPE rolled sections (tissue/bone marrow trephine) Fresh/snap frozen tissue/Frozen mononuclear cells Extracted DNA	EDTA Eppendorf tube*** Sterile container Eppendorf tube***	1-5ml ≥5 scrolls, 5-10µm N/A 2µg	>30% blasts/tumour content
Methylation array	*FFPE rolled sections (biopsy/tumour excision tissue) **Fresh/snap frozen tissue (biopsy/tumour excision tissue) Extracted DNA	Eppendorf tube*** Sterile container Eppendorf tube***	≥5 scrolls 5-10µm N/A 500ng,	
Monitoring of known BRAF (MRD testing)	Peripheral Blood	Streck tube	5-10ml	<24hours old
Other MRD testing	Bone marrow/blood	EDTA	5-10ml	<24hours old
WGS	Refer to sample handling guidelines for haematological, solid and germline: Test request forms and information - North Thames GMS : North Thames GMS ➤ <u>Whole genome sequencing (Cancer)</u>		Refer to website for eligibility guidelines	

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