

Cancer Cytogenetics Diagnostic Service

User Guide

Contents

Cancer Cytogenetics Diagnostic Service	1
User Guide.....	1
Contact details	2
Hours of Operation	2
Cytogenetic sample requirements	3
Liquid samples.....	3
Formalin fixed paraffin embedded (FFPE) tissue sections.....	3
Laboratory storage of samples:	3
Reporting times:.....	3
Dispatch of Cytogenetic samples.....	4
Cancer Genetics - cytogenetic tests available	5
1. G-banded analysis and FISH analysis of haematological malignancies.....	5
FISH tests available for haematological malignancies.....	5
1.1 Myeloproliferative neoplasms (MPN/CML).....	5
1.2 Acute Myeloid Leukaemia (AML) and Myelodysplastic Syndromes (MDS).....	5
1.3 Acute Lymphoblastic Leukaemia (ALL).....	6
1.4 Non-Hodgkin’s Lymphoma (NHL)	6
2. FISH analysis of CD138 positive cells in plasma cell neoplasia.....	6
3. FISH analysis of peripheral blood or bone marrow aspirate in chronic lymphocytic leukaemia	6
4. FISH tests for formalin fixed paraffin embedded solid tumour samples.....	7
5. FISH tests for formalin fixed paraffin embedded tissue for lymphoma	8



Contact details

Address:

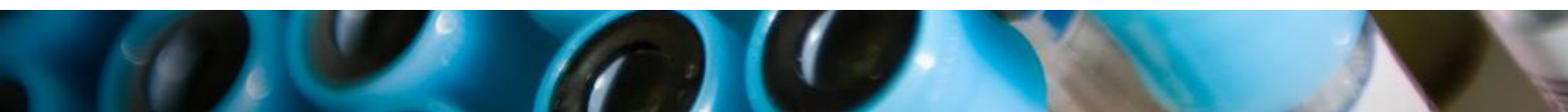
Genetics Department
5th Floor Tower Wing
Guy's Hospital
Great Maze Pond
London
SE1 9RT

General enquiries 0207 188 1709

Hours of Operation

Monday to Friday 9.00am to 5.00pm

Weekends/Bank Holidays There is no service at weekends or bank holidays. Samples requiring urgent processing or analysis at these times should be discussed in advance.



Cytogenetic sample requirements

Liquid samples

- Peripheral blood in lithium heparin or bone marrow transport medium.
- All other samples in bone marrow transport medium
 - Do not spin down or freeze samples before sending
 - Samples must arrive within 24 hours
 - Samples not being dispatched the same day as they are taken should be refrigerated overnight at 4°C and sent the next morning
 - Minimum volume - as available and dependant on white cell count

Formalin fixed paraffin embedded (FFPE) tissue sections

- 3-4µm sections on unstained APES slides with appropriate immunohistochemistry (IHC)/H&E slide for correlation
- Please send sufficient slides to enable repeat testing if necessary

Samples for UroVysion FISH assay

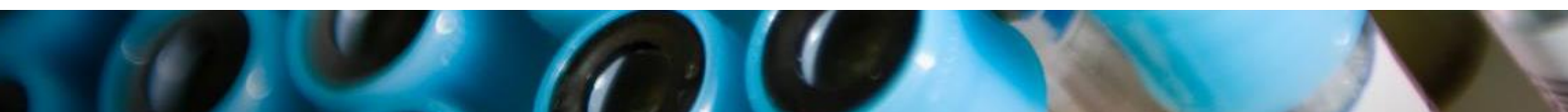
- unstained ThinPrep slide

Laboratory storage of samples:

- Liquid samples are processed and stored as fixed cell suspensions
 - retained for 6 months
- Unused FFPE tissue sections
 - IHC/H&E and surplus unstained slides will be returned to the referring centre when the sample has been reported
- Images from G-banded karyotype analysis are stored indefinitely

Reporting times:

- Urgent: 95% of samples reported within 14 calendar days
- Routine: 95% of samples reported within 21 calendar days



Dispatch of samples

All slides and liquid samples should be sent by courier to:

Cancer Genetics
5th Floor Tower Wing
Guy's Hospital
Great Maze Pond
London
SE1 9RT

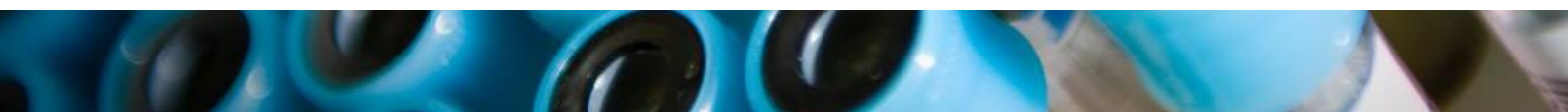
Please explain to couriers that samples must be brought to the specimen reception at the above address, **not** the main hospital specimen reception.

Paraffin embedded tissue blocks should be sent to Cellular Pathology for sections to be cut and mounted on slides:

Cellular Pathology
2nd Floor North Wing
St Thomas' Hospital
Westminster Bridge Road
London
SE1 7EH

Please make sure that all samples are sent according to the Transport of clinical Specimens Regulations:

- IATA Packaging Instructions 650 (PI 650) for transport of clinical specimens by Royal Mail or courier require a "Triple Layer" system of packaging, which comprises a primary leak proof receptacle within a secondary leak proof receptacle contained in an outer rigid package.
- There should be sufficient absorbent material between the primary and secondary packing to absorb all liquid and the primary or secondary packing should be strong enough to withstand a 95 KPa pressure differential and to withstand a drop of 1.2 metres.
- The paperwork must be enclosed between the secondary and outer packaging. The package should be clearly labeled Diagnostic Specimen or Clinical Specimen.
- Please ensure all paperwork is accurately completed and contains 3 unique patient identifiers



Cancer Genetics - cytogenetic tests available

1. G-banded analysis and FISH analysis of haematological malignancies

Sample types: bone marrow, peripheral blood and other fluids which have an involvement with haematological malignancy (e.g. ascetic fluid)

Disease types:

Acute myeloid leukaemia (AML)

Acute lymphoblastic leukaemia (or lymphoma) (ALL)

Chronic myeloid leukaemia (CML)

Myelodysplastic syndromes (MDS)

Myeloproliferative neoplasms (MPN)

Non-Hodgkin's lymphoma with bone marrow involvement

FISH tests available for haematological malignancies

1.1 Myeloproliferative neoplasms (MPN/CML)

Probe	Abnormality	Sub-type of MPD
BCR/ABL	t(9;22)/var/cryptic/del der(9)	CML/ET
4q12 tri-colour	Cryptic 4q12 deletion	Hypereosinophilic Syndrome (HES)/Chronic Eosinophilic Leukaemia (CEL)
PDGFR β	5q32-33	MDS/MPD
FGFR1	t(8p11;?)	8p11 Myeloproliferative syndrome (EMS)

1.2 Acute Myeloid Leukaemia (AML) and Myelodysplastic Syndromes (MDS)

Probe	Abnormality	Disease/FAB
RUNX1/RUNX1T1	t(8;21)	AML M2
PML/RAR α	t(15;17)	APL
RAR α	t(17;?)	varAPL
CBF β /MYH11	inv(16)/t(16;16)	AML M2Eo/M4Eo
KMT2A (MLL)	11q23	AML M4/M5
EGR1/D5S23,D5S721	del(5q31)/-5	AML/MDS/5q- syndrome
D7S486/CEP7	del(7q31)/-7	AML/MDS
D20S108	del(20q)	MDS
Chromosome 8 alpha satellite	Trisomy 8	AML/MDS
ETV6	t(12p13;?)	AML/MDS
EVI	inv(3)/t(3;3)	AML/MDS
PDGFR β	5q32-33	CMML

1.3 Acute Lymphoblastic Leukaemia (ALL)

Probe	Abnormality
BCR/ABL	t(9;22)
ETV6/RUNX1	t(12;21)
KMT2A (MLL)	11q23
KMT2A/AFF1	t(4;11)
TCF3(E2A)	t(1;19)/t(17;19)
ETV6	dic(9;12)
PDGFR β	<i>PDGFRB</i> (5q32-33) rearrangement
4q12 tri-colour	<i>PDGFRA</i> (4q12) rearrangement
ABL2	<i>ABL2</i> (1q25) rearrangement

1.4 Non-Hodgkin's Lymphoma (NHL)

Please see section 5 below

2. FISH analysis of CD138 positive cells in plasma cell neoplasia

Probe	Abnormality
CKS1B/CDKN2C	1q21 amplification/1p36 deletion
TP53/ATM	del(17p) and gain of chromosome 11
DLEU/13q34/CEP12	del(13q)-13
IGH	t(14;?)
IGH/FGFR3	t(4;14)
IGH/CCND1	t(11;14)
IGH/MAF	t(14;16)
IGH/MAFB	t(14;20)
IGH/CCND3	t(6;14)
D5S23,D5S721/CEP9/CEP15 (Multi-colour panel)	Hyperdiploidy

3. FISH analysis of peripheral blood or bone marrow aspirate in chronic lymphocytic leukaemia

Probe	Abnormality
TP53/ATM	del(17p13)/del(11q22.3)
DLEU/LAMP/CEP12	del(13q)/trisomy 12

4. FISH tests for formalin fixed paraffin embedded solid tumour samples

FISH probe	Abnormality	Tumour type
SS18 (SYT)	t(18q11;)	Synovial sarcoma
FUS CHOP (DDIT3)	t(16p11;) t(12q13;)	Myxoid/round cell liposarcoma (<i>FUS/CHOP</i>) Angiomatoid fibrous histiocytoma (<i>FUS/ATF1</i>) Low grade fibromyxoid sarcoma (<i>FUS/CREB3L2</i>)
FOXO1A (FKHR)	t(13q14;)	Alveolar rhabdomyosarcoma
EWSR1	t(22q12;)	Ewings/PNET Desmoplastic small round cell tumour (with <i>WT1</i> @ 11p13) Myxoid/round cell liposarcoma (with <i>CHOP</i> @ 12q13) Myxoid chondrosarcoma (with <i>NR4A3</i> @ 9q22) Clear cell sarcoma (with <i>ATF1</i> @ 12q13) (salivary hylanizing & odontogenic CCC)
ALK	<i>ALK</i> rearrangement	Inflammatory myofibroblastic tumour NSCLC
ROS1	<i>ROS1</i> rearrangement	NSCLC
RET	<i>RET</i> rearrangement	NSCLC
MET	Amplification of MET	NSCLC
MYB	t(6;9)(p22~23;p23~24)	MYB-NFIB Salivary and other adenoid cystic carcinoma
MAML2	t(11;10)(q21;p13)	CRTC1(MECT1)-MAMML2 Salivary mucoepidermoid carcinoma
ETV6	t(12;15)(p13;q25)	ETV6-NTRK3 Mammary analogue secretory carcinoma
HER2	Amplification of HER2	Invasive carcinoma of the breast

Vysis UroVysion FISH panel	Copy number variation	ThinPrep slides from patients with suspected urothelial cancer
----------------------------	-----------------------	--

5. FISH tests for formalin fixed paraffin embedded tissue for lymphoma

Probe	Abnormality	Sub-type of NHL
IGH/MYC	t(8;14)(q24;q32)	Burkitt's & DLBCL
IGH/CCND1	t(11;14)(q13;q32)	Mantle cell
IGH/BCL2	t(14;18)(q32;q21)	Follicular & DLBCL
IGH	t(14q32;?)	Non-specific
ALK	t(2p23;?)	Anaplastic LCL
BCL6	t(3q27;?)/amplification	DLBCL/Non-specific
IGH/MALT1	t(14;18)(q32;21)	MALT/MZL
BIRC3(API2)/MALT1	t(11;18)(q21;q21)	MALT/MZL
MYC	t(8q24;?)	Burkitt's & DLBCL