Oncology - Sample Prioritisation and Reporting Times

Cytogenetics

Sample prioritisation and reporting performance targets of the professional standards of the Association of Clinical Genetic Science are used as minimum standards, including General Best Practice Guidelines, Haemato-Oncology Best Practice Guidelines, Guidelines for FISH Scoring in Oncology and disease-specific Guidelines for CML/MPN, AML/MDS and ALL and General Genetic Laboratory Reporting Recommendations (ACGS haem onc; FISH oncology; CML/MPN; AML/MDS; ALL; reporting).

Urgent referrals: Acute leukaemia and CML at diagnosis or possible relapse

All acute leukaemia and chronic myeloid leukaemia cases at diagnosis will be treated as 'urgent' and 95% of cases will be reported within 14 calendar days. For adult B-ALL, an urgent *BCR-ABL1* FISH will also be performed upon sample arrival and a preliminary verbal result will be reported within 24 hours. It is not our policy to perform urgent *BCR-ABL1* FISH for diagnostic samples with ?CML, as we usually have a karyotype within four/five days from sample arrival and a preliminary, verbal result is always given as soon as obtained.

However, if specifically requested or if we are aware that a quick G-banding result will not be available within the above specified time, a *BCR-ABL1* FISH will be set up and its result verbally reported within 24 hours.

Rapid FISH tests: APL, Burkitt lymphoma

95% will be reported in 3 working days. In practice, the majority of cases will have a verbal report available within 24 hours or in 3 working days, if paraffin-embedded.

Routine referrals for routine cytogenetic analysis: all other referrals

95% of all other referrals will be reported within 21 calendar days. The laboratory operates a 'priority' system whereby cases requiring quick attention; non-urgent cases can be prioritised upon special request from clinicians.

The reporting time targets for paraffin-embedded tissue sections referred for FISH is 21 days for 'non-urgent cases', while all 'urgent cases' are usually reported within seven days from receipt.

Culture only

All samples with "?MDS", "?MPN" or uncertain diagnosis will be cultured and the cell suspension stored but they will not be automatically analysed unless there is a specific request to proceed with the analysis. An 'oncology storage' report will be sent within 21 days. If cytogenetic/FISH/molecular analysis is required for these cases, this can be activated **at any time** by email or phone giving the reason for the request. This policy ensures that only those cases with known marrow involvement following morphology examination are analysed. **Consultants are requested to cooperate as fully as possible with this policy. This is to avoid unnecessary and labour intensive analytical work and helps the laboratory to process its large workload.**

Molecular

- Generally, samples referred for molecular analysis will be reported within 21 days of receipt.

- Testing for *JAK2* p.(Val617Phe), *JAK2* exon 12, *CALR* and *MPL*, *KIT* (for AML), *NPM1*, *IDH1*, *IDH2*, *TP53*, *NRAS*, *KRAS*, *SF3B1*, *SRSF2* and *BRAF* is undertaken using a targeted and bespoke next-generation sequencing approach; all pending samples are analysed on a weekly basis as a batch.

- RT-PCR analysis is performed on a weekly basis and is undertaken following consideration of the referral reason provided, eligibility for a BMT and in some cases, the cytogenetic result.

- Myeloid NGS panel aimed at improving diagnostic accuracy of cases which fall largely into the following categories: persistent cytopenia, suspected MDS, persistent unexplained eosinophilia, triple negative MPN and MDS/MPN. In addition, this panel can improve risk stratification and prognostication in cases with a confirmed diagnosis of MDS, myelofibrosis, systemic mastocytosis and aplastic anaemia. Undertaken on a weekly basis as a batch.

- *FLT3*-ITD is undertaken by fragment analysis every day and results are routinely available within four days; however, a preliminary result is usually provided on the phone within 24-48 hours from sample receipt.

- *KIT* D816V for systemic mastocytosis is done by digital PCR which is undertaken on a weekly basis as a batch.

- Upon request, other genetic tests (e.g.: *BCR-ABL1* variants, rare translocations in MPN and MDS/MPN) can be undertaken by the Leukaemia Research Group following discussion with Prof. Nick Cross.

Calling off samples that prove NOT to require cytogenetic or molecular tests

Many diagnoses will be in doubt until after the marrow aspirate has been examined. Please send only those where there is a high probability of the Cytogenetic result having clinical usefulness. If examination of the aspirate indicates a diagnosis for which cytogenetics is irrelevant (eg.: ITP, megaloblastic anaemia, iron deficiency, alcoholic changes, metastatic carcinoma, etc.); PLEASE phone the laboratory to call off the analysis.

Please note that *BCR-ABL1* kinase domain mutation analysis is now performed at the Birmingham Genetics Laboratory, so samples should be sent directly there.