Bristol Genetics Laboratory is a UKAS accredited medical laboratory No.9307.

North Bristol NHS Trust

# Minimal Residual Disease (MRD) analysis in Acute Lymphoblastic Leukaemia (ALL)

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## Samples Required

A 3-5ml sample of bone marrow, collected in an 8.5ml ACD vacutainer, should be collected at all MRD time-points

Samples should be accompanied by a FULLY completed request form (available as a download at www.nbt.nhs.uk/genetics or from the laboratory).

Please include details of test, family history, address and POSTCODE, NHS number, referring clinician and unit/hospital.

## Consent and DNA/RNA Storage

All genetic testing requires consent. It is the responsibility of the referring clinician to ensure that appropriate consent has been obtained.

Stored material from all referrals may be retained for quality assurance purposes and may be used anonymously for the development of new tests for the disorder in question.

## Clinical Background and Genetics

- Acute lymphoblastic leukaemia (ALL) is the most common form of paediatric cancer accounting for one-third of all malignancies in children.
- ALL is characterised by the accumulation of malignant white cells in the bone marrow and blood leading to bone marrow failure (anaemia, neutropaenia & thrombocytopaenia) and infilitration of organs (liver, spleen, lymph nodes, meniges, brain, skin or testes).
- Long-term survival for children with ALL has improved dramatically from around 4% in the early 1960s to as many as 80% in current clinical protocols.
- Efforts to further improve outcome include the development of more precise risk group classification.
- Several large-scale studies have demonstrated that sensitive detection of sub-microscopic levels of leukaemia (called Minimal Residual Disease, MRD) allows accurate evaluation of early treatment response in children and adults with ALL and provides an independent prognostic indicator of outcome.
- Risk group assessment based on MRD analysis is now an integral part of most modern treatment protocols for ALL.
- Despite these excellent response rates 20-25% of patients relapse.
- MRD analysis during the first treatment phases of relapsed ALL and shortly before stem cell transplantation have also been shown to have high prognostic value.
- MRD-based stratification is now central to all current UK treatment protocols for childhood and infant ALL

## Service offered

- BGL is part of the Bristol Haemato-oncology Diagnostic Service (BHODs) and has access to a full range of complementary pathology services.
- MRD analysis is performed using real-time quantitative PCR (RQ-PCR) analysis of immunoglobulin and T-cell receptor gene rearrangements.
- This approach to MRD analysis is a complex process including: sample processing, target identification, design of patient-specific assays, sensitivity testing and MRD analysis of remission samples. It is widely applicable in ALL and routinely reaches a quantitative range of 1 in 10,000.
- Quality assurance is maintained through twice yearly participation in the QA schemes for Ig/TCR RQ-PCR-based MRD diagnostics organised by EuroMRD.

## Referrals

- **Diagnostic Testing**
  MRD analysis is provided for clinical centres treating patients on frontline and relapse trials in infant and paediatric ALL where stratification of therapy is based on MRD assessment undertaken at end of induction and consolidation
- **Target reporting Time**
  The turnaround time for MRD testing is 5 working days from receipt of sample
- **Indicative Costs**
  Please contact the laboratory for up to date prices.
- **Please contact the laboratory regarding requests to provide ad-hoc or on-going MRD monitoring**
- **Laboratory contact:** For enquiries/requesting contact:
  Jeremy.hancock@nbt.nhs.uk 0117 41 46173

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