MRD at a glance

An educational resource from CatALLyst™



What is MRD?

- · Measurable residual disease, also known as minimal residual disease, refers to the presence of leukemic cells below the limit of detection of conventional morphology
- Achieving MRD(-) status has been shown to reduce risk of relapse and offer longer overall survival²



How do I test for MRD?

- Consulting with your facility's pathologist prior to testing may yield the best results.
- A bone marrow sample is required, and the preferred MRD sample comes from the first or early pull of the bone marrow.³ The second pull may have up to a 50% reduction in leukemic cells^{4,5}
- In addition, the MRD sample should have a smaller volume (eq, 2 mL) because a large sample volume (eq, 10 mL) may contain a lower proportion of blasts^{5,6}

There are 3 standard techniques for MRD testing

Type of test	How it works	Peak sensitivity	Turnaround time	Sample requirements	Additional considerations
Flow cytometry	Differentiates between ALL cells and normal leukocytes ⁷	1 cancer cell in 10,000 normal cells (0.01%) ⁸	< 1 day ^{6,*}	 Fresh bone marrow sample⁹ No baseline sample required⁹ 	 • ≥ 6-color assays are the most commonly used to detect abnormal MRD immunophenotypes³ Adequate sensitivity for MRD quantification requires special calibration and assessment of a large number of cells and may not be available from some labs⁶
Polymerase chain reaction (PCR)	Detects clonal rearrangements in immunoglobulin and/ or T cell receptor genes. Additionally, PCR can be used to detect gene fusions (eg, <i>BCR-ABL1</i>) ¹⁰	1 cancer cell in 100,000 normal cells (0.001%) ⁸	 ~ 1-2 weeks (eg, <i>BCR-ABL1</i>)⁴ 2-4 weeks (ASO-PCR)^{6,11} 	 Fresh bone marrow sample not required⁹ Baseline sample, or prior sample obtained at diagnosis with detectable disease, is required to characterize leukemic clones for MRD analysis⁹ 	 BCR-ABL1 PCR is applicable only for Ph(+) patients¹² ASO-PCR requires patient-specific assays (limited availability in the US)^{13,14}
Next- generation sequencing (NGS)	Detects clonal rearrangements in immunoglobulin and/or T cell receptor genes ³	1 cancer cell in 1,000,000 normal cells (0.0001%) ¹⁵	~ 1 week ⁶	 Fresh bone marrow sample not required⁹ Baseline sample, or prior sample obtained at diagnosis with detectable disease, is required to characterize leukemic clones for MRD analysis^{7,9} 	• FDA-approved NGS assay is commercially available ^{16,17}



Where do I send samples for MRD testing?

- · If you do not have access to testing facilities within your practice, consider sending the sample to a CLIA-certified lab
- · Visit CatALLyst.com/understanding-MRD to download a list of CLIA-certified testing facilities

Philadelphia chromosome-positive.
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15. Ladetto M, Brüggemann M, Montillo L, et al. *Leukemia*. 2014;28:1299-1307. 16. clonoSEQ[®] Assay Technical Information. Adaptive biotechnologies[®]. 17. Food and Drug Administration. https://www.fda.gov/news-events/ Information. Adaptive biotechnologies[®]. 17. Food and Drug Administration. https://www.fda.gov/news-events/ Information. Adaptive biotechnologies[®]. 17. Food and Drug Administration. https://www.fda.gov/news-events/ press-announcem



