

# Fast Facts: Genetic and Molecular Profiling in Hematologic Malignancies

Molecular profiling of hematologic malignancies represents the analysis of biofluids or tissue samples to identify molecular alterations that can serve as **biomarkers**.

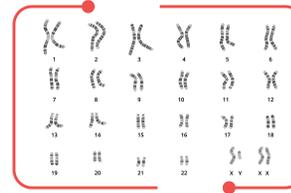
It has **important clinical applications**, facilitating:

- **timely diagnosis**
- **risk stratification**
- **prognostication of disease course**
- **patient selection for targeted therapies**
- **monitoring of treatment efficacy**

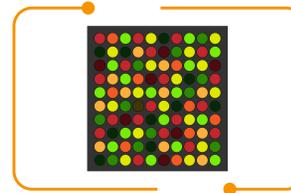
Emerging applications of molecular profiling include liquid biopsy with ctDNA analysis and integration with machine learning and artificial intelligence.

The process of molecular profiling involves obtaining informed consent, sample collection, sample preparation and preservation, molecular and data analysis, and data interpretation. The genetic and molecular profiling findings are presented in a **molecular profiling report**.

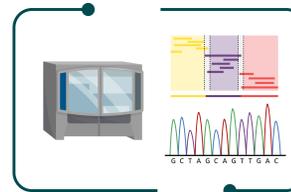
## Genetic and molecular profiling techniques



Karyotyping



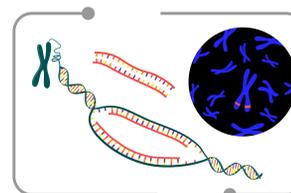
Chromosomal Microarrays



Next-Generation Sequencing (NGS)



Quantitative Polymerase Chain Reaction (qPCR)-based assays



Fluorescence In Situ Hybridization (FISH)



Immunocytochemistry, Immunohistochemistry, and Flow Cytometry

Interpretation of complex molecular profiling results is supported by multidisciplinary teams, such as molecular tumor boards, and by specialized online resources which help clinicians translate findings into personalized care. These collaborative structures ensure decisions are informed by the latest evidence while remaining tailored to each patient's needs.

Patients undergoing molecular profiling should be educated and counselled in a personalized and culturally sensitive manner considering their strengths and individual needs.