

The Importance of FLT3 Mutations Testing in AML

Acute myeloid leukaemia (AML) is a type of blood cancer.¹ It is one of the most common types of leukaemia in adults,² and accounts for 1% of all cancers in the UK.³ AML can occur at any age but it is most common in people aged 65 years and older.⁴



- In the UK, the incidence rate of AML was **4.8 per 100,000 in 2016**.⁵ Around **3,100 people** are diagnosed with AML in the UK annually^{1,3}
- AML is **slightly more common among men** than women³
- The 5-year relative survival rate for AML is only **14% for men** and **16% for women** in England⁶

Mutations in AML

AML is caused by various chromosomal abnormalities and genetic mutations, including NPM1, IDH1, IDH2, N-RAS, CEBPA, TET2 and FLT3. The most common mutation is **FLT3**, which affects **over a third of AML patients**.⁷

Management decisions for AML rely upon **genetic testing and clinical guidelines** emphasise the importance of testing to assess patient prognoses and evaluate treatment strategies.^{9,10}

FLT3 mutations are involved in the growth of cancer cells⁸

Patients with certain gene mutations, including FLT3 mutations, have lower survival rates⁹

What does mutations testing involve?

The majority of genetic tests used to identify the different AML mutations analyse samples of patients' blood or bone marrow.¹¹

The EU's publicly funded research network of excellence for blood cancer (The European LeukemiaNet) recommends a genetic testing technique called reverse transcriptase–polymerase chain reaction (RT-PCR).⁹



RT-PCR is used to make millions of copies of a specific, short section of DNA in just a few hours, enabling a reliable analysis of DNA from a small sample.^{12,13}

Once enough DNA is available, the test is able to differentiate between different genetic mutations.^{14,15}



Computer programmes analyse the results and provide a detailed report noting which genetic mutations are most prevalent.^{14,15}

Mutations in relapsed and refractory AML

- Refractory AML occurs when patients have residual leukaemia cells in their bone marrow after two courses of intensive chemotherapy⁹
- Relapsed AML occurs when a patient develops AML again after previously achieving complete remission¹⁶



In AML, the prognosis for **patients with relapsed or refractory disease is poor, and survival for patients with relapsed or refractory FLT3 mutation-positive AML is especially poor**.^{17,18}

Due to the poor outcomes caused by FLT3 mutations in AML, **confirming patients' FLT3 mutation status following relapse is important to help inform the treatment strategy**.^{19,20}

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