

Qualitative FLT3-ITD Detection by Fragment Analysis

FMS-like tyrosine kinase 3 (FLT3) is a member of the class III receptor tyrosine kinase family. The protein is normally expressed on hematopoietic stem progenitor cells and appears to play an important role in stem cell survival and the development of dendritic and natural killer cells. The first and best-studied FLT3 mutation is an internal tandem duplication (ITD) typically of a portion of the juxtamembrane (JM) region. While the length of the duplicated segment ranges in size, the insertion usually occurs in-frame, resulting in constitutive autophosphorylation of the receptor, and is thus a gain-of-function mutation of the FLT3 proto-oncogene. FLT3-ITD mutations occur in about 35% of adult AMLs and 10-15% of pediatric AMLs and have been associated with an increased risk of relapse and decreased disease-free, event-free, and overall survival rates. Per NCCN guidelines, the presence of FLT3-ITD, particularly with a high allelic ratio (≥ 0.5), is a negative prognostic factor in AML of specific cytogenetic subgroups. Multiple FLT3 kinase inhibitors have been approved for AML with FLT3 mutations, both alone and in combination with other conventional chemotherapy or hypomethylating agents¹⁻¹⁰. This assay is not to be used for monitoring minimum residual disease (MRD). For more information, call the lab at 513-636-9820.

Mutation Target:

FLT3-ITD

Reporting Units:

Qualitative: Positive / Suspicious / Negative

Acceptable Specimens:

- 3 mL whole blood in EDTA tube
- 1 mL bone marrow in EDTA tube

Unacceptable Specimens:

- Decalcified tissue
- Frozen whole blood or bone marrow
- Sample collected in heparin

Shipping Conditions:

- Blood and bone marrow samples at 4°C in insulated container by overnight courier. Do NOT freeze.
- **For all samples, ship for delivery on Monday through Friday. Receiving docks are CLOSED on weekends and holidays; do NOT ship if delivery will occur on those days.**

Testing Schedule:

FLT3-ITD testing is performed Mon-Fri. For testing outside of this schedule, call the lab at 513-636-9820.
TAT: 1-4 business days.

CPT Codes:

81245

Clinical Lab Index:

FLT3-ITD:
<https://www.testmenu.com/cincinnatichildrens/Tests/1159087>

Contact Information:

Cincinnati Children's Division of Pathology
Molecular and Genomic Pathology Services (MGPS)
Phone: 513-636-9820
Fax: 513-517-7099
Email: pathology@cchmc.org
Website: cincinnatichildrens.org/pathology

For pricing or billing questions, call 513-636-4261.

Shipping Address:

Cincinnati Children's Hospital Medical Center
Attn: Molecular and Genomic Pathology Services (MGPS)
240 Albert Sabin Way, R2.001
Cincinnati, OH 45229

References:

1. Turner A, et al. *Blood*. 1996; 88:3383-3390.
2. McKenna H, et al. *Blood*. 2000; 95:3489-3497.
3. Birg F, et al. *Blood*. 1992; 80:2584-2593.
4. Carow C, et al. *Blood*. 1996; 87:1089-1096.
5. Kiyoi H, et al. *Leukemia*. 1998; 12:1333-1337.
6. Thiede C, et al. *Blood*. 2002; 99:4326-4335.
7. Kottaridis P, et al. *Blood*. 2001; 98:1752-1759.
8. Yokota S, et al. *Leukemia*. 1997; 11:1605-1609.
9. Rau & Loh. *Hematology Am Soc Hematol Educ Program*. 2018; 2018:286-300.
10. Antar A, et al. *Leukemia*. 2020; 34:682-696.