

IRF4/DUSP22 Gene Rearrangement by FISH

The *IRF4/DUSP22* locus is rearranged in a newly recognized subtype of non-Hodgkin lymphoma, large B-cell lymphoma with *IRF4* rearrangement. These lymphomas are uncommon, but are clinically distinct from morphologically similar lymphomas, including diffuse large B-cell lymphoma, high-grade follicular lymphoma, and pediatric-type follicular lymphoma. The *IRF4/DUSP22* locus is also rearranged in a subset of ALK-negative anaplastic large cell lymphomas (ALCL), where this rearrangement is associated with a significantly better prognosis.

Disease Overview

Incidence

- Large B-cell lymphoma with *IRF4* rearrangement accounts for <1% of all non-Hodgkin B-cell lymphomas overall
 - More common in younger patients, with an incidence of 5-6% under age 18
- *IRF4/DUSP22* rearrangement is found in 30% of ALK-negative ALCLs

Symptoms/Findings

Large B-cell lymphoma with *IRF4* rearrangement typically presents with limited stage disease in the head and neck, while the presentation of ALK-negative ALCLs is variable.

Disease-Oriented Information

Patients with large B-cell lymphoma with *IRF4* rearrangement typically have a favorable outcome after treatment. Rearrangement of the *IRF4/DUSP22* locus in ALK-negative ALCL is associated with a better prognosis than ALK-negative ALCL without this rearrangement.

Test Interpretation

Analytical Sensitivity

The limit of detection (LOD) for the *IRF4/DUSP22* probe was established by calculating the upper limit of the abnormal signal pattern in normal cells using the Microsoft Excel BETAINV function. The LOD of *IRF4/DUSP22* fluorescence in situ hybridization (FISH) is 11% when 100 cells are enumerated. Using the LOD of 11% the analytical sensitivity was found to be 100% when testing two 6p25 rearranged samples.

Results

Positive

- Depending on the context of the case, the presence of the 6p25 gene rearrangement supports a diagnosis of large B-cell lymphoma with *IRF4* rearrangement or ALK-negative ALCL with *IRF4/DUSP22* rearrangement.

Negative

- Absence of the 6p25 gene rearrangement

Tests to Consider

[IRF4/DUSP22 \(6p25\) Gene Rearrangement by FISH 3001568](#)

Method: Fluorescence in situ Hybridization (FISH)

- Test is useful in identifying ALK-negative anaplastic large cell lymphomas and large B-cell lymphoma with *IRF4* rearrangement
- The rearrangement is associated with an improved prognosis

See [Related Tests](#)



Limitations

- *IRF4/DUSP22* FISH testing has not been validated for
 - Tissue fixed in alcohol-based or non-formalin fixatives
 - Decalcified tissue
- Results should be analyzed in conjunction with morphology, immunohistochemistry, and immunophenotyping results.

Additional Resources

Castellar ERParrilla, Jaffe ES, Said JW, et al. [ALK-negative anaplastic large cell lymphoma is a genetically heterogeneous disease with widely disparate clinical outcomes](#). *Blood*. 2014;124(9):1473-1480. PubMed

Salaverria I, Philipp C, Oschlies I, et al. [Translocations activating IRF4 identify a subtype of germinal center-derived B-cell lymphoma affecting predominantly children and young adults](#). *Blood*. 2011;118(1):139-147. PubMed

Swerdlow S, Campo E, Jaffe E, et al. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues, Revised 4th ed. International Agency for Research on Cancer, 2017.

Related Information

[B-Cell Lymphomas](#)
[T-Cell and NK-Cell Lymphomas](#)

Related Tests

[MUM1/IRF4 by Immunohistochemistry 2003975](#)

Method: Immunohistochemistry

[BCL-6 by Immunohistochemistry 2003457](#)

Method: Immunohistochemistry

[BCL-2 by Immunohistochemistry 2004513](#)

Method: Immunohistochemistry

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