T-Cell Clonality by Next Generation Sequencing

Indications for Ordering

- Diagnosis of T-cell lymphoproliferative disorders
- Monitor minimal residual disease (MRD) in T-cell lymphoproliferative disorders

Test Description

- DNA extracted from whole blood, bone marrow, formalin-fixed, paraffin-embedded (FFPE) tissue, or fresh/frozen tissue
- PCR amplification of *TCRG* gene rearrangements
- Massively parallel sequencing (next generation sequencing [NGS]) for assessment of clonality

Tests to Consider

Primary test

T-Cell Clonality by Next Generation Sequencing 2008409

- Diagnose and monitor T-cell lymphoproliferative disorders
- Preferred test to monitor MRD in T-cell lymphoproliferative disorders
  - Ability to detect previously identified clonal populations at very low levels
- Higher sensitivity than T-cell clonality tests by other methods

Related tests

T-Cell Clonality by Flow Cytometry Analysis of TCR V-Beta 0093199

- Aid in diagnosis of T-cell lymphoproliferative disorders
- Lacks sensitivity of NGS

Leukemia/Lymphoma Phenotyping by Flow Cytometry 2008003

- Aid in diagnosis of hematopoietic neoplasms
- Monitor therapy in patients with established diagnosis of hematopoietic neoplasms

Disease Overview

Diagnostic issues

- T-cell lymphomas account for ~15% of all lymphomas (WHO, 2008)
- T-cell lymphoproliferative disorders may be a diagnostic challenge
  - T-cell clonality testing aids in distinguishing between benign and reactive T-cell populations
    - NGS is test of choice due to sensitivity and ability to detect lower level of clonality

Genetics

Gene – *TCRG*

Structure/function

- *TCRG* gene rearrangements occur in early T-cell lymphoid differentiation
- Polyclonal rearrangements are characteristic of either benign or reactive disease
- Monoclonal rearrangements are characteristic of T-cell lymphoproliferative disorders

Test Interpretation

Results

- Detected – monoclonal *TCRG* gene rearrangement was detected
- Previous clone detected – previously detected *TCRG* gene clonal rearrangement is present
- Not detected – no *TCRG* gene rearrangement detected
- Indeterminate – specimen partially meets criteria for clonality and is thus indeterminate for the presence of a *TCRG* gene rearrangement

Limitations

Clonal *TCRG* gene rearrangements below the limit of detection will not be reported