Test Definition: TH1CP

T-Helper Cell Type 1 Cytokine Panel, Plasma

Overview

Useful For

Assessment of T-helper cell type 1-associated cytokines levels in plasma to understand the etiology of autoimmune and pro-inflammatory conditions when used in conjunction with clinical information and other laboratory testing

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
IFNGP	Interferon Gamma, P	No	Yes
IL12P	Interleukin 12p70, P	No	Yes
IL2P	Interleukin 2, P	No	Yes
TNFP	Tumor Necrosis Factor Alpha, P	No	Yes
SILRP	IL-2 Receptor Alpha Soluble, P	Yes	Yes

Method Name

Immunoassay

NY State Available

No

Specimen

Specimen Type

Plasma EDTA

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Lavender top (EDTA)
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL Plasma
Collection Instructions:
1. Immediately after specimen collection, place the tube on wet ice.
2. Within 2 hours of collection, centrifuge at 4 degrees C, 1500 x *g* for 10 minutes and aliquot plasma into a plastic vial.
3. Freeze immediately.

Additional Information:
1. Plasma for this test cannot be shared with other tests. Submit specimen for this test in its own vial.
2. This test cannot be added onto a previously collected specimen.

3. If a refrigerated centrifuge is not available, it is acceptable to use a room temperature centrifuge, provided the sample is kept on ice before centrifugation and is frozen immediately afterward.

Specimen Minimum Volume

Plasma: 0.3 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject
Heat-treated specimen	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma EDTA	Frozen	14 days	

Clinical & Interpretive

Clinical Information

Cytokines are important mediators of cell-to-cell communication within the innate and adaptive immune systems. The expression of most cytokines is highly regulated and generally occurs in response to foreign or self-antigenic stimulation. The functions of cytokines are extremely varied, with many cytokines also displaying pleiotropic effects, depending on their cellular target. As a group, cytokines and their receptors represent a highly complex and critical regulatory system for normal immune response.

T-helper cell type 1-associated cytokines, including interleukin (IL) 2, IL-12p70, interferon gamma (IFNg) and tumor necrosis factor alpha (TNFa) reflect cell mediated immunity and may be useful when evaluating the etiology of immune-mediated disorders. For example, IFNg is the central driver of several hyperinflammatory states including hemophagocytic lymphohistiocytosis (HLH) and macrophage activation syndrome (MAS).(1-4) The pathogenic role of IFNg is demonstrated by the efficacy of emapalumab, an IFNg-neutralizing antibody approved for HLH, with response monitored through IFNg and downstream effectors.(5) Additionally, soluble cytokine receptors provide alternative readouts of immune activation. For example, soluble IL-2 receptor alpha (sIL-2R/sCD25), produced by proteolytic cleavage of the membrane-bound receptor during T-cell activation, is incorporated into the diagnostic criteria for HLH as one of eight criteria and, together with IFNg, supports diagnosis and treatment monitoring.(2)

Beyond hyperinflammation, sIL-2R is a clinically established marker in other T-cell driven and granulomatous conditions such as sarcoidosis and lymphoproliferative disorders, such as T-cell leukemia/lymphoma.(6,7) More broadly, Th1 cytokines are associated with a range of immune-mediated diseases, including inflammatory bowel disease, where TNFa and IL-12/23 are validated therapeutic targets, and systemic autoimmune rheumatic diseases such as systemic lupus erythematosus, Sjogren disease, and rheumatoid arthritis.(8)

Reference Values

INTERFERON GAMMA:
<18 years: Not established
> or =18 years: < or =2.5 pg/mL

INTERLEUKIN 12p70:
<18 years: Not established
> or =18 years: <1.5 pg/mL

INTERLEUKIN 2:
<18 years: Not established
> or =18 years: <2.0 pg/mL

TUMOR NECROSIS FACTOR ALPHA:
<18 years: Not established
> or =18 years: < or =11.8 pg/mL

SOLUBLE INTERLEUKIN 2 RECEPTOR ALPHA:
<18 years: Not established
> or =18 years: < or =1929 pg/mL

Interpretation

Elevated cytokine concentrations could be consistent with the presence of infection or another inflammatory process.

Cautions

Results from cytokine testing should not be used to establish or exclude a specific diagnosis.

Cytokine testing should only be used in conjunction with clinical information and other laboratory testing as part of a patient's overall assessment.

Normal concentrations of cytokines do not exclude the possibility of infection or another inflammatory condition.

Cytokine concentrations could be affected by immunomodulatory agents.

Clinical Reference

1. La Rosee P, La Rosee F. HLH: diagnostics revisited and improved. Blood. 2024;144(22):2274-2275. doi:10.1182/blood.2024026243
2. Henter JI, Horne A, Arico M, et al. HLH-2004: Diagnostic and therapeutic guidelines for hemophagocytic lymphohistiocytosis. Pediatr Blood Cancer. 2007;48(2):124-131. doi:10.1002/pbc.21039
3. Henter JI, Sieni E, Eriksson J, et al. Diagnostic guidelines for familial hemophagocytic lymphohistiocytosis revisited. Blood. 2024;144(22):2308-2318. doi:10.1182/blood.2024025077
4. Bracaglia C, de Graaf K, Pires Marafon D, et al. Elevated circulating levels of interferon-g and interferon-g-induced chemokines characterise patients with macrophage activation syndrome complicating systemic juvenile idiopathic arthritis. Ann Rheum Dis. 2017;76(1):166-172. doi:10.1136/annrheumdis-2015-209020
5. Al-Mashdali AF, Mohamed F, Osman M, et al. Real-world use of emapalumab in hemophagocytic lymphohistiocytosis:

a scoping review of published evidence. Front Pharmacol. 2026;17:1749084. doi:10.3389/fphar.2026.1749084
6. Eurelings LEM, Miedema JR, Dalm V, et al. Sensitivity and specificity of serum soluble interleukin-2 receptor for diagnosing sarcoidosis in a population of patients suspected of sarcoidosis. PLoS One. 2019;14(10):e0223897. doi:10.1371/journal.pone.0223897
7. Shiratori S, Kosugi-Kanaya M, Shigematsu A, et al. Ultra-high level of serum soluble interleukin-2 receptor at diagnosis predicts poor outcome for angioimmunoblastic T-cell lymphoma. Leuk Lymphoma. 2015;56(9):2592-2597. doi:10.3109/10428194.2014.1001985
8. Zhang X, Feng R, Wang Y, et al. Low dose IL-2 therapy restores regulatory T cells in patients with systemic lupus erythematosus in a dose-dependent manner: a phase IIb trial. Nat Commun. 2026;17(1):5493 doi:10.1038/s41467-026-72245-7

Performance

Method Description
Measurements of the cytokines tumor necrosis factor, interferon gamma, interleukin (IL) 2, soluble IL-2 receptor alpha, and IL-12p70 are performed using laboratory-developed immunoassays.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Thursday

Report Available
2 to 8 days

Specimen Retention Time
14 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

Fees & Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification
This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

Test Definition: TH1CP

T-Helper Cell Type 1 Cytokine Panel, Plasma

CPT Code Information

83520 x5

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
TH1CP	Th1 Cytokine Panel, P	82335-1

Result ID	Test Result Name	Result LOINC® Value
IFNGP	Interferon Gamma, P	27415-9
TNFP	Tumor Necrosis Factor Alpha, P	3074-2
SILRP	IL-2 Receptor Alpha Soluble, P	76039-7
IL12P	Interleukin 12p70, P	41760-0
IL2P	Interleukin 2, P	33939-0