MAYO CLINIC LABORATORIES

Test Definition: LCYP

Cytokine Panel, 13 Analytes, Quantitative, Serum

Overview

Useful For

Aiding in the assessment of the pathophysiology of immune, infectious, or inflammatory disorders when used in conjunction with standard clinical assessment

May be used for research purposes

Method Name

Immunoassay

NY State Available

No

Specimen

Specimen Type

Serum

Shipping Instructions

Specimen must be shipped frozen. Testing will be canceled if received ambient or refrigerated.

Specimen Required

Collection Container/Tube: Serum gel or red top

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL Serum

Collection Instructions:

1. As soon as possible or within 2 hours of collection, centrifuge and aliquot 1 mL of serum into a plastic vial.
2. Send frozen.

Note: Critical frozen. **Separate specimens must be submitted** when multiple tests are ordered.

Specimen Minimum Volume

Serum: 0.5 mL

Reject Due To

Heat-inactivated specimens	Reject
Contaminated specimens	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Frozen	30 days	

Clinical & Interpretive

Clinical Information

Cytokines play a pivotal role in both innate and adaptive immune pathways by mediating diverse cellular functions. Elevated cytokines have been reported in infection, autoimmune diseases, malignancy, post-transplant states, immune deficiency with dysregulation, and after immunomodulatory therapy. Cytokine levels have demonstrated utility as biomarkers in autoinflammatory and autoimmune diseases and for monitoring treatment responses to biologics. Multiplex cytokine profiling can reveal characteristic patterns, including broad elevation of pro-inflammatory mediators (such as interleukin [IL]-6, tumor necrosis factor alpha [TNF-alpha], IL-8) in systemic inflammation, increased Th1-type cytokines (such as IFN-gamma, IL-2) in cell-mediated activation, and elevated Th2-type cytokines (such as IL-4, IL-5, IL-13) in allergic or certain antibody-mediated processes, while increased IL-10 or soluble IL-2 receptor may indicate regulatory activation or lymphoproliferation. Cytokine serum panels can help distinguish IL-1beta-driven autoinflammatory syndromes (eg, familial Mediterranean fever) from conditions more strongly associated with TNF-alpha and IL-6 (eg, rheumatoid arthritis). Elevated levels of soluble IL-2R and IL-10, often accompanied by increased interferon gamma (IFN-gamma) and IL-6, have been shown to differentiate complicated common variable immunodeficiency (CVID) patients with autoimmunity and/or lymphoproliferation from those with predominantly infection-only phenotypes. The cytokine storm (CS), observed in sepsis, CAR-T cell therapy, COVID-19 infection and other infectious and noninfectious conditions, is characterized by markedly increased circulating cytokine levels due to overactivation of immune cells. Measuring cytokine levels following CAR-T cell therapy is important for characterizing therapy-induced toxicities such as cytokine release syndrome (CRS). Elevations in cytokines including IL-1beta, IL-2, IL-6, IL-8, IL-10, IFN-gamma, and TNF-alpha have been reported in CRS, with higher and earlier peaks within the first week after infusion generally correlating with greater severity. Characterization of CS and CRS facilitates earlier and more targeted intervention with available cytokine-directed treatments (such as antibodies targeting IL-1, IL-6, TNF-alpha, IFN-gamma) in appropriate clinical contexts, to improve outcomes and reduce the risk of life-threatening complications.

Reference Values

Tumor Necrosis Factor-alpha: < or =15.4 pg/mL
Interleukin 2: < or =1.3 pg/mL
Interleukin 2 Receptor Soluble: 353.0-1745 pg/mL
Interleukin 12: < or =1.8 pg/mL
Interferon gamma: < or =3.7 pg/mL
Interleukin 4: < or =1.0 pg/mL
Interleukin 5: < or =2.5 pg/mL
Interleukin 10: < or =2.9 pg/mL
Interleukin 13: < or =21.0 pg/mL
Interleukin 17: < or =1.3 pg/mL
Interleukin 1 beta: < or =5.7 pg/mL
Interleukin 6: < or =5.3 pg/mL

Interleukin 8: < or =20.7 pg/mL

Interpretation

Results are used to understand the pathophysiology of immune, infectious, or inflammatory disorders, or may be used for research purposes.

Cautions

Cytokine levels may demonstrate diurnal variation. For longitudinal comparison, it is recommended that cytokine levels be determined at the same time of day.

Clinical Reference

1. Chetaille Nezondet AL, Poubelle PE, Pelletier M. The evaluation of cytokines to help establish diagnosis and guide treatment of autoinflammatory and autoimmune diseases. J Leukoc Biol. 2020;108(2):647-657. doi:10.1002/JLB.5MR0120-218RRR

2. Liu C, Chu D, Kalantar-Zadeh K, George J, et al. Cytokines: From clinical significance to quantification. Adv Sci (Weinh). 2021;8(15):e2004433. doi:10.1002/advs.202004433

3. Jogdand A, Gilbert KM, Hong JS, et al. Utility of serum cytokine testing to differentiate complicated common variable immunodeficiency in resource limited settings. J Allergy Clin Immunol Glob. 2025;4(3):100488. Published 2025 Apr 23. doi:10.1016/j.jacig.2025.100488

4. Nie J, Zhou L, Tian W, et al. Deep insight into cytokine storm: from pathogenesis to treatment. Signal Transduct Target Ther. 2025;10(1):112. Published 2025 Apr 16. doi:10.1038/s41392-025-02178-y5. Hughes AD, Teachey DT, Diorio C. Riding the storm: managing cytokine-related toxicities in CAR-T cell therapy. Semin Immunopathol. 2024;46(3-4):5. Published 2024 Jul 16. doi:10.1007/s00281-024-01013-w

Performance

Method Description

Analyte specific antibodies are pre-coated onto a microfluidic Simple Plex cartridge. Samples are diluted and added to the cartridge. The sample runs through a microfluidic channel that binds the protein of interest. The Ella platform washes off any unbound analyte and adds a detection reagent. Each channel utilized for analyte capture encompasses three glass nano reactors coated with a capture antibody, providing analyte values in triplicate. A calculated analyte value is then generated from the factory-calibrated standard curve that is built into every cartridge.

PDF Report

No

Day(s) Performed

Tuesday, Thursday, Friday

Report Available

5 to 8 days

Specimen Retention Time

7 days

Performing Laboratory Location

Progentec Diagnostics, Inc

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 Progentec Diagnostics. It has not been cleared by the US Food and Drug Administration (FDA). This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

CPT Code Information

83520 x 12
83529

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
LCYP	Cytokine Panel, Quantitative, S	Not Provided

Result ID	Test Result Name	Result LOINC® Value
CYP01	Tumor Necrosis Factor alpha (TNF-a)	Not Provided
CYP02	Interleukin 2 (IL-2)	Not Provided
CYP03	Soluble Interleukin-2 Recep(sIL-2R)	Not Provided
CYP04	Interleukin 12 (IL-12)	Not Provided
CYP05	Interferon gamma (IFN-g)	Not Provided
CYP06	Interleukin 4 (IL-4)	Not Provided
CYP07	Interleukin 5 (IL-5)	Not Provided
CYP08	Interleukin 10 (IL-10)	Not Provided
CYP09	Interleukin 13 (IL-13)	Not Provided
CYP10	Interleukin 17 (IL-17)	Not Provided
CYP11	Interleukin 1 beta (IL-1b)	Not Provided
CYP12	Interleukin 6 (IL-6)	Not Provided
CYP13	Interleukin 8 (IL-8)	Not Provided