Test Definition: CYTH2

T-Helper Cell Type 2 Cytokine Panel, Plasma

Overview

Useful For

Assessment of plasma cytokine levels to understand the etiology of allergic conditions and parasitic infections when used in conjunction with clinical information and other laboratory testing

Method Name

Bead-Based Multiplex Immunoassay

NY State Available

Yes

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
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**.

Specimen Minimum Volume

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	21 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 regulator of a normal immune response.

Interleukin (IL)-4, IL-5 and IL-13 form a cytokine gene cluster on chromosome 5q and are coordinately regulated during Th2 cell differentiation.(1) Monitoring circulating concentrations of these cytokines can therefore aid in evaluating conditions associated with Th2 cell activation, such as allergic diseases and parasitic infection. IL-4 promotes the differentiation of naïve T cells into Th2 cells and is essential for IgE class switching, a hall mark of allergic sensitization.(2) IL-5 is a potent activator of eosinophils and a key regulator of their growth, differentiation, and survival. It is a key driver of eosinophilic asthma, and several biologic therapies targeting IL-5 have been approved for its treatment.(3) IL-13 is secreted primarily by Th2 cells and promotes B-cell maturation, IgE class switching, and modulates macrophage activity. Its central role in the pathogenesis of several atopic diseases has led to the development of targeted therapies, some of which are now approved for the management of atopic dermatitis.(4) Finally, IL-10 is a potent anti-inflammatory cytokine which acts on Th2 cells to limit immune response to pathogens, thereby preventing host tissue damage.

Reference Values

IL-4:
<18 years: Not established
> or =18 years: <100 pg/mL

IL-5:
<18 years: Not established
> or =18 years: <20.0 pg/mL

IL-10:
<18 years: Not established
> or =18 years: <7.0 pg/mL

IL-13:
<18 years: Not established
> or =18 years: <700 pg/mL

Interpretation

Elevated cytokine concentrations could be consistent with the presence of allergic conditions or parasitic infections.

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 parasitic infection or allergic condition.

Cytokine concentrations could be affected by immunomodulatory agents.

Clinical Reference

1. Cousins DJ, Lee TH, Staynov DZ. Cytokine coexpression during human Th1/Th2 cell differentiation: direct evidence for coordinated expression of Th2 cytokines. J Immunol. 2002;169(5):2498-2506
2. Junttila IS. Tuning the Cytokine Responses: An Update on Interleukin (IL)-4 and IL-13 Receptor Complexes. Front Immunol. 2018;9:888. doi:10.3389/fimmu.2018.00888
3. Jackson DJ, Wechsler ME, Brusselle G, Buhl R. Targeting the IL-5 pathway in eosinophilic asthma: A comparison of anti-IL-5 versus anti-IL-5 receptor agents. Allergy. 2024;79(11):2943-2952
4. Simpson EL, Guttman-Yassky E, Eichenfield LF, et al. Tralokinumab therapy for moderate-to-severe atopic dermatitis: Clinical outcomes with targeted IL-13 inhibition. Allergy. 2023;78(11):2875-2891
5. Hirahara K, Aoki A, Nakayama T. Pathogenic helper T cells. Allergol Int. 2021;70(2):169-173. doi:10.1016/j.alit.2021.02.001
6. Li KP, Shanmuganad S, Carroll K, Katz JD, Jordan MB, Hildeman DA. Dying to protect: cell death and the control of T-cell homeostasis. Immunol Rev. 2017;277(1):21-43. doi:10.1111/imr.12538

Performance

Method Description

Measurement of plasma cytokine levels is performed using a laboratory-developed immunoassay.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Wednesday

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.

CPT Code Information

83520 x4

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CYTH2	Th2 Cytokine Panel, P	82335-1

Result ID	Test Result Name	Result LOINC® Value
622931	IL-4	27161-9
622933	IL-5	33938-2
622930	IL-10	26848-2
622932	IL-13	33822-8