MAYO CLINIC LABORATORIES

Test Definition: BHYPS

Hypersensitivity Pneumonitis Panel, Immunoglobulin G, Serum

Overview

Useful For

Evaluation of patients suspected of having hypersensitivity pneumonitis induced by exposure to *Alternaria tenuis/alternata, Aspergillus fumigatus, Aureobasidium pullulans, Laceyella sacchari, Micropolyspora faeni, Penicillium chrysogenum/notatum, Phoma betae,* and *Trichoderma viride*

Method Name

Fluorescence Enzyme Immunoassay (FEIA)

NY State Available

No

Specimen

Specimen Type

Serum

Ordering Guidance

This is a panel of tests which includes serology for: *Alternaria tenuis/alternata*, *Aspergillus fumigatus, Aureobasidium pullulans*, *Laceyella sacchari*, *Micropolyspora faeni*, *Penicillium chrysogenum/notatum*, *Phoma betae*, and *Trichoderma viride*. If only *Aspergillus fumigatus* is requested, order SASP / *Aspergillus fumigatus*, IgG Antibodies, Serum.

Specimen Required

Container/Tube: Sarstedt Aliquot Tube, 5 mL (T914)
Preferred: Serum gel
Acceptable: Red top
Specimen Volume: 0.5 mL Serum
Collection Information: Centrifuge and aliquot serum into a plastic vial.

Specimen Minimum Volume

Serum: 0.3 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	28 days	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Hypersensitivity pneumonitis (HP) is a complex inflammatory lung disease triggered by repeated inhalation of various organic and inorganic antigens in susceptible individuals.(1-3) The condition presents significant diagnostic challenges due to its diverse clinical presentations, variable disease progression, and overlap with other interstitial lung diseases.(1,3-5) The 2020 American Thoracic Society and Japanese Respiratory Society, and Asociacion Latinoamericana del Torax (ATS/JRS/ALAT) Clinical Practice Guideline emphasizes that HP diagnosis requires a comprehensive multidisciplinary approach integrating clinical history, exposure assessment, radiological findings, and when necessary, histopathological examination.(1,5) Currently, no single test is sufficient for definitive diagnosis of HP.

Serum IgG testing serves as one component of the diagnostic workup for HP, particularly in identifying specific antigenic exposures. However, studies demonstrate significant limitations in the diagnostic performance of serum IgG testing alone.(1,3,4) The clinical validity of HP antibody assays is enhanced when used within a structured diagnostic framework.(1) Multidisciplinary team meetings have shown improved diagnostic agreement in diffuse parenchymal lung diseases, highlighting the importance of integrating serological findings with other clinical data rather than relying on laboratory results in isolation.(2) Contemporary understanding of HP recognizes an expanding spectrum of causative agents beyond traditional organic dust. Occupational causes encompass diverse antigens including microbial agents, animal proteins, and chemical compounds.(6,7). The use of multi-analyte antibody panels can help identify specific antigenic exposures, particularly in occupational settings, though the absence of detectable antibodies does not exclude HP diagnosis.

Recent research has identified distinct clinical phenotypes in HP that may influence the interpretation of serological testing.(8) The relationship between specific exposures and clinical presentations varies considerably, with some patients developing disease despite minimal apparent exposure while others with significant exposure remain asymptomatic. The pathogenesis of HP involves complex immune mechanisms beyond simple antibody-mediated responses, including T-cell activation and inflammatory cascades.(1,3) This complexity underscores why serological testing alone cannot be used to establish or exclude the diagnosis of HP.(3, 4) In addition, reference intervals for the analytes tested do vary between laboratories, even when the same instrument and reagents are used.(9-10)

The panel's clinical validity is established through its ability to identify specific antigenic exposures and immune responses associated with HP, while requiring integration with comprehensive clinical assessment for optimal diagnostic accuracy. Healthcare professionals should utilize these assays as one component of a comprehensive diagnostic evaluation, maintaining awareness of their limitations while leveraging their potential to identify relevant exposures and guide further clinical investigation.

Reference Values

Alternaria alternata, IgG antibody: < or =19.0 mg/L
Aspergillus fumigatus, IgG antibody: < or =102.0 mg/L
Aureobasidium pullulans, IgG antibody: < or =16.0 mg/L
Laceyella sacchari, IgG antibody: < or =45.0 mg/L
Micropolyspora faeni, IgG antibody: < or =6.0 mg/L
Penicillium chrysogenum, IgG antibody: < or =94.0 mg/L
Phoma betae, IgG antibody: < or =16.0 mg/L
Trichoderma viride, IgG antibody: < or =16.0 mg/L

Interpretation

Antibody levels greater than the reference range indicate that the patient has been immunologically sensitized to the antigen or a related antigen. The significance of an elevated antibody response is dependent on a combination of patient's clinical history, HRCT (high-resolution computed tomography) scan findings, pathological examination, and certain risk factors (eg, environmental and occupational determinants). Results must be interpreted as a component of a comprehensive diagnostic evaluation and known limitations of hypersensitivity tests.

Cautions

IgG antibodies to *Alternaria tenuis/alternata, Aspergillus fumigatus, Aureobasidium pullulans, Laceyella sacchari, Micropolyspora faeni, Penicillium chrysogenum/notatum, Phoma betae,* and *Trichoderma viride* may be found in sera from healthy individuals; the presence of these specific antibodies is not sufficient to establish the diagnosis of hypersensitivity pneumonitis.

Elevated concentration of antibodies to *Aspergillus fumigatus* may be also found in patients with invasive aspergillosis and cavitary lung disease.

The concentrations of antibodies to these antigens may decrease following treatment, although elevated concentrations may persist in treated patients.

The test method utilizes the fluorescence enzyme immunoassay (FEIA) on Phadia ImmunoCAP 250. Values obtained using the same test system or different assay methods cannot be used interchangeably. Alternative reference values established utilizing the same reagents or test system may be influenced by the characteristics of the local cohorts and environmental exposures.

Clinical Reference

1. Raghu G, Remy-Jardin M, Ryerson CJ, et al. Diagnosis of Hypersensitivity Pneumonitis in Adults. An Official ATS/JRS/ALAT Clinical Practice Guideline. Am J Respir Crit Care Med. 2020;202(3): e36-e69
2. Walsh SLF, Wells AU, Desai SR, et al. Multicentre evaluation of multidisciplinary team meeting agreement on diagnosis in diffuse parenchymal lung disease: a case-cohort study. Lancet Respir Med. 2016;4(7):557-565
3. Barnes H, Troy L, Lee CT, Sperling A, Strek M, Glaspole I. Hypersensitivity pneumonitis: Current concepts in pathogenesis, diagnosis, and treatment. Allergy. 2022;77(2):442-453
4. Jenkins AR, Chua A, Chami H, et al. Questionnaires or Serum Immunoglobulin G Testing in the Diagnosis of Hypersensitivity Pneumonitis among Patients with Interstitial Lung Disease. Ann Am Thorac Soc. 2021;18(1):130-147
5. Johannson KA, Barnes H, Bellanger AP, et al. Exposure Assessment Tools for Hypersensitivity Pneumonitis. An Official American Thoracic Society Workshop Report. Ann Am Thorac Soc. 2020:17(12):1501-1509
6. Kongsupon N, Walters GI, Sadhra SS. Occupational causes of hypersensitivity pneumonitis: a systematic review and

compendium. Occup Med (Lond). 2021;71(6-7):255-259
7. Calaras D, David A, Vasarmidi E, Antoniou K, Corlateanu A. Hypersensitivity Pneumonitis: Challenges of a Complex Disease. Can Resp J. 2024;2024:4919951
8. Barnes H, Lu J, Glaspole I, Collard HR, Johannson KA. Exposures and associations with clinical phenotypes in hypersensitivity pneumonitis: A scoping review. Respir Med. 2021;184:106444
9. Raulf, M, et al. Update of reference values for IgG antibodies against typical antigens of hypersensitivity pneumonitis: Data of a German multicentre study. Allergo Jour Int. 2019;28(6):192-203
10. Lozier B, Martins T, Slev P, Saadalla A. Determination of Positivity Cutoff for an Automated Aspergillus fumigatus-Specific Immunoglobulin-G Assay in a National Reference Laboratory. J Appl Lab Med. 2025;10(3): 619-628

Performance

Method Description
The Phadia ImmunoCAP System-specific IgG-fluorescence enzyme immunoassay (FEIA) provides an in vitro method for measuring the levels of circulating specific IgG antibodies in human blood samples. Specific IgG from the patient's serum reacts with the antigen of interest, which is covalently coupled to an ImmunoCAP. After washing away nonspecific IgG, enzyme-labeled anti-IgG antibodies are added to form a complex. After incubation, unbound enzyme anti-IgG is washed away and the bound complex is then incubated with a developing agent. After stopping the reaction, the fluorescence of the eluate is measured. The fluorescence is proportional to the amount of specific IgG that is present in the patient's sample (ie, the higher the fluorescence value, the more specific IgG antibody is present).(Package insert: Phadia AB, Uppsala, Sweden 2009)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
2 to 5 days

Specimen Retention Time
14 days

Performing Laboratory Location
Biopharma Diagnostics Laboratory

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

86001 x 8

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
BHYPS	Hypersensitivity Pheum Panel,IgG, S	35577-6

Result ID	Test Result Name	Result LOINC® Value
BH01	Alternaria alternata, IgG Ab	26951-4
BH02	Aspergillus fumigatus, IgG Ab	26954-8
BH03	Aureobasidium pullulans, IgG Ab	26955-5
BH04	Laceyella sacchari, IgG Ab	105270-3
BH05	Micropolyspora faeni, IgG Ab	26948-0
BH06	Penicillium chrysogenum, IgG Ab	26957-1
BH07	Phoma betae, IgG Ab	35551-1
BH08	Trichoderma viride, IgG Ab	49687-7
BH09	Hypersensitivity Interpretation	69048-7