MAYO CLINIC LABORATORIES

Test Definition: FHLCG

Immunoglobulin G (IgG) Heavy and Light Chain (HLC) Pairs, Kappa and Lambda with Ratio

Overview

Useful For

Heavy and light chain pair quantitation may be useful for:

1. Distinguishing between broadly migrating monoclonal proteins and restricted polyclonal immunoglobulin patterns on serum electrophoresis.
2. Quantitating monoclonal IgG proteins that are difficult to quantitate using serum protein electrophoresis alone.
3. Providing a more specific quantitation of the monoclonal protein than total IgG measurements alone.

Method Name

Turbidimetric

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Specimen Type: Serum
Container/Tube: Red top or SST
Specimen Volume: 0.75 mL
Collection Instructions: Draw blood in a plain red-top tube, serum gel tube(s) is also acceptable. Separate serum immediately after coagulation (30 minutes) to prevent hemolysis. Send 0.75 mL of serum refrigerated in a plastic vial.

NOTE: Patient should be fasting for eight hours to avoid lipemic sample interference.

Specimen Minimum Volume

0.5 mL

Reject Due To

Hemolysis	Mild reject; Gross reject
Lipemia	Mild reject; Gross reject
Icterus	NA
Other	Microbially-contaminated specimen; specimen containing particulate matter

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	
	Ambient	14 days	
	Frozen	14 days	

Clinical & Interpretive

Clinical Information

Elevated serum concentrations of monoclonal protein are indicative of an underlying abnormality, such as monoclonal gammopathy of undetermined significance (MGUS), multiple myeloma, and other lymphoproliferative disorders. International guidelines recommend serum protein electrophoresis or nephelometric immunoglobulin quantification as tools to monitor patients' disease (alongside other tests including flow cytometry and serum free light chain analysis). Total IgG nephelometric assays will include nontumor immunoglobulin, and measurement of either IgG Kappa or IgG Lambda may give a more accurate representation of tumor production.

Furthermore, measurement of both IgG Kappa and IgG Lambda, calculation of the IgG Kappa:IgG Lambda ratio, and comparison with values found in normal subjects can give a more sensitive indication of clonality. Additionally, changes in the IgG Kappa:IgG Lambda ratio and its normalization when compared to a normal ratio range should assist in monitoring patients' disease. Use of the IgG Kappa:IgG Lambda ratio will also compensate for any changes in plasma volume and correct for half life variations due to receptor saturation.

Reference Values

IgG Kappa (g/L): 4.03 - 9.78
IgG Lambda (g/L): 1.97 - 5.71
IgG Kappa:IgG Lambda ratio: 0.98 - 2.75

Interpretation

An elevated IgG heavy and light chain (HLC) pair ratio suggests a clonal proliferation of an IgG Kappa clone of plasma cells.
A low IgG HLC pair ratio suggests a clonal proliferation of an IgG Lambda clone of plasma cells.

Cautions

Decisions on patient evaluation and management must not be given on the basis of IgG Kappa, IgG Lambda, or IgG Kappa:IgG Lambda ratio measurements alone. Clinical history and other laboratory findings must be taken into account.

Heavy and light chain (HLC) quantitation should be used as a complementary method to serum protein electrophoresis.

The effect of therapeutic drugs on the measurement of IgG Kappa and IgG Lambda by this assay has not been evaluated.

Small increases in the concentrations of monoclonal IgG proteins may not result in an altered HLC pair ratio.

Clinical Reference

1. Dimopoulos M, Kyle R, Fermand JP, et al. Consensus recommendations for standard investigative workup: Report of

the International Myeloma Workshop Consensus Panel 3. *Blood.* 2011 May 5; 117(18):4701-4705. PubMed 21292778
2. Rajkumar SV, Harousseau JL, Durie B, et al. Concensus recommendations for the uniform reporting of clinical trials: Report of the International Myeloma Workshop Consensus Panel 1. *Blood.* 2011 May 5; 117(18):4691-4695. PubMed 21292775
3. Bradwell AR, Harding SJ, Fourrier NJ, et al. Assessment of monoclonal gammopathies by nephelometric measurement of individual immunoglobulin kappa/lambda ratios. *Clin. Chem.* 2009 Sep; 55(9):1646-1655. PubMed 19617289
4. Ludwig H, Milosavljevic D, Zojer N, et al. Immunoglobulin heavy/light chain ratios improve paraprotein detection and monitoring, identify residual disease and correlate with survival in multiple myeloma patients. *Leukemia.* 2013 Jan; 27(1):213-219. PubMed 22955329
5. Bradwell A, Harding S, Fourrier N, et al. Prognostic utility of intact immunoglobulin Ig'?/Ig'? ratios in multiple myeloma patients. *Leukemia.* 2013 Jan; 27(1):202-207. PubMed 22699454

Performance

PDF Report
No

Day(s) Performed
Tuesday, Friday

Report Available
1 to 9 days

Performing Laboratory Location
LabCorp Burlington

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.

CPT Code Information
83883 x 2

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
FHLCG	IgG Heavy Light Chains (HLC), S	74773-3

Test Definition: FHLCG

Immunoglobulin G (IgG) Heavy and Light Chain (HLC) Pairs, Kappa and Lambda with Ratio

Result ID	Test Result Name	Result LOINC® Value
Z5613	IgG Kappa, S	74862-4
Z5614	IgG Lambda, S	74863-2
Z5615	IgG K/L HLC Ratio	74868-1