



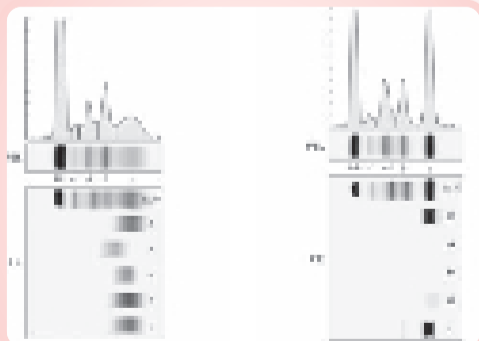
# Gammopathy

Gammopathy refers to heterogeneous group of immunoglobulin disease characterized by the presence in serum or urine of a paraprotein (monoclonal gammopathy) or two distinct paraproteins (biclonal gammopathy)

## Characteristic Features of Monoclonal Gammopathies

Disease	Monoclonal immunoglobulin spike (M-protein)	Other features
Multiple myeloma	Narrow M-Protein spike > 3 g/dL	<ul style="list-style-type: none"> <li>Skeletal lesions present in 80 % patients</li> <li>&gt; 10% plasma cells on bone marrow biopsy</li> <li>Anemia, pancytopenia, hypercalcemia, and renal disease may be present</li> </ul>
Smoldering multiple myeloma	M-protein level > 3 g/dL	<ul style="list-style-type: none"> <li>10 % plasma cell involvement on bone marrow biopsy</li> <li>No lytic bone lesions, no anemia, no hypercalcemia, and no renal disease</li> </ul>
Monoclonal Gammopathy of Undetermined Significance (MGUS)	M-protein level < 3 g/dL	<ul style="list-style-type: none"> <li>&lt; 10 % plasma cell involvement on bone marrow biopsy</li> <li>No M-protein in urine, no lytic bone lesions, no anemia, no hypercalcemia, and no renal disease</li> </ul>
Waldenström Macroglobulinemia	IgM present	<ul style="list-style-type: none"> <li>Hyperviscosity and hypercellular bone marrow with extensive infiltration by lymphoplasma cells</li> </ul>
Plasma cell Leukemia	Low levels	<ul style="list-style-type: none"> <li>Peripheral blood contains &gt; 20 % plasma cells</li> <li>Few bone lesions and few hematologic disturbances</li> <li>Occurs in younger patients</li> </ul>
Franklin Disease (Heavy chain disease)	-Heavy chain incomplete -Light chain absent	
Solitary plasmacytoma		<ul style="list-style-type: none"> <li>No urine/ serum/ marrow abnormalities</li> </ul>

## Serum Electrophoresis Graph Photo with M Band



The M-spike (M-protein) demonstrates the clonal expansion of one type of plasma cell. The IFE and PEL results on the left are from a normal specimen. The results on the right are from an abnormal specimen, demonstrating an IgG lambda M-spike

## Laboratory Tests in Diagnosis of Gammopathy

### Protein electrophoresis

- Identifies presence of monoclonal immunoglobulin spike (an M-spike or M-protein)
- Differentiates between stable and increasing M-spikes
- Interprets an elevated Immunoglobulin class as polyclonal versus monoclonal
- Quantitates the elevated protein level
- Screens for diseases such as multiple myeloma, macroglobulinemia, or amyloidosis

### Immunofixation

- Gold standard for detection and characterization of monoclonal proteins
- More sensitive than protein electrophoresis for detecting monoclonal immunoglobulins
- Identifies the heavy and/or light chain isotype

### Serum free light chain analysis

- Allows quantitation of both  $\kappa$  and  $\gamma$  free light chains and calculates the free light chain  $\kappa$ :  $\gamma$  ratio
- Provides a risk assessment for progression of Monoclonal Gammopathies of Undetermined Significance (MGUS) to multiple myeloma
- Monitors the disease course in patients with a monoclonal protein that cannot be measured by protein electrophoresis
- Superior to immunofixation electrophoresis for detection of monoclonal light chain diseases

Serum free light chain quantitation, in conjunction with serum protein electrophoresis and immunoelectrophoresis, offers a higher sensitivity for diagnosis of monoclonal gammopathies

## Metropolis Gammopathy Test Profile

### Immunoglobulin profile

IgG, IgM, IgA

### Immunofixation qualitative profile

Protein electrophoresis, Immunofixation

### Immunofixation quantitative profile

Protein electrophoresis, Quantification of heavy and light chain, Immunofixation with characterization of M band

#### Sources:

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#### Metropolis Health Services (India) Ltd.

#250 D, Udyog Bhavan (Behind Glaxo), Hind Cycle Marg, Worli, Mumbai - 400 030 Tel: +91-22-6650 5555. Fax: +91-22-6662 2080.

E-mail: support@metropolisindia.com. Web Site: www.metropolisindia.com

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