



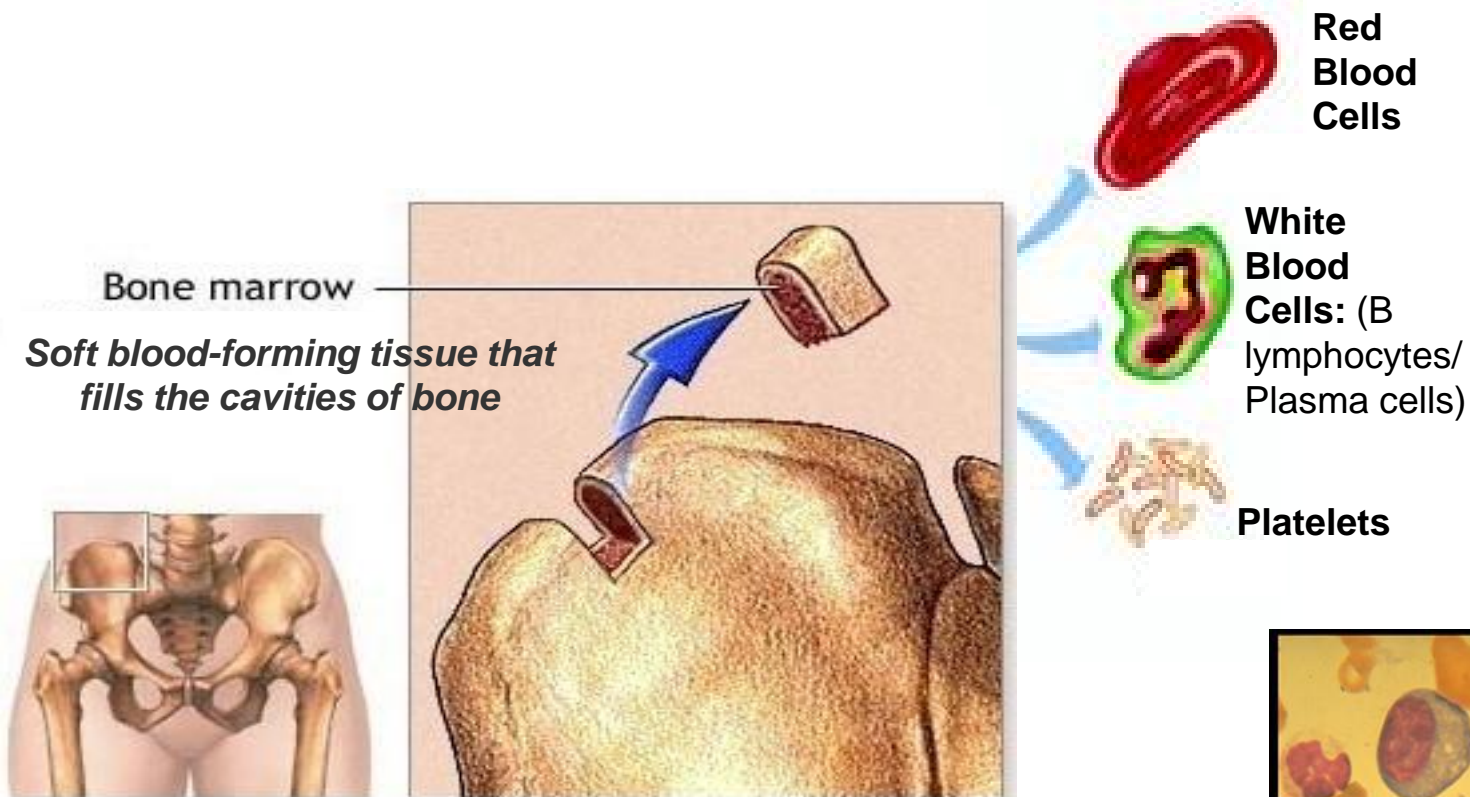
Understanding Freelite[®], the lab test for serum free light chains

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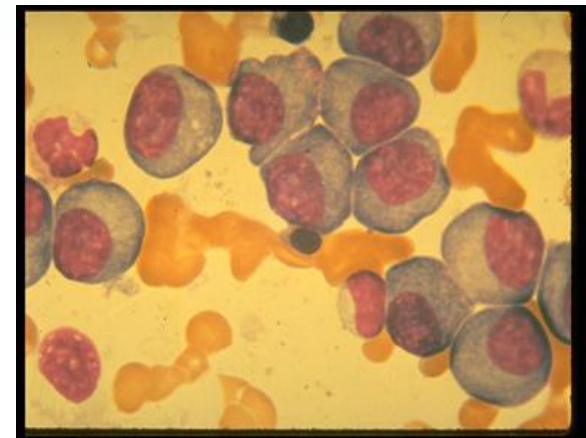


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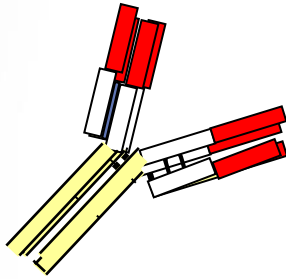
AL Amyloidosis: abnormality of proteins from Plasma Cells in the Bone Marrow



Plasma cells make antibodies (immunoglobulins) to block bacteria and viruses



Antibodies Are Made Up Of Heavy Chains And Light Chains



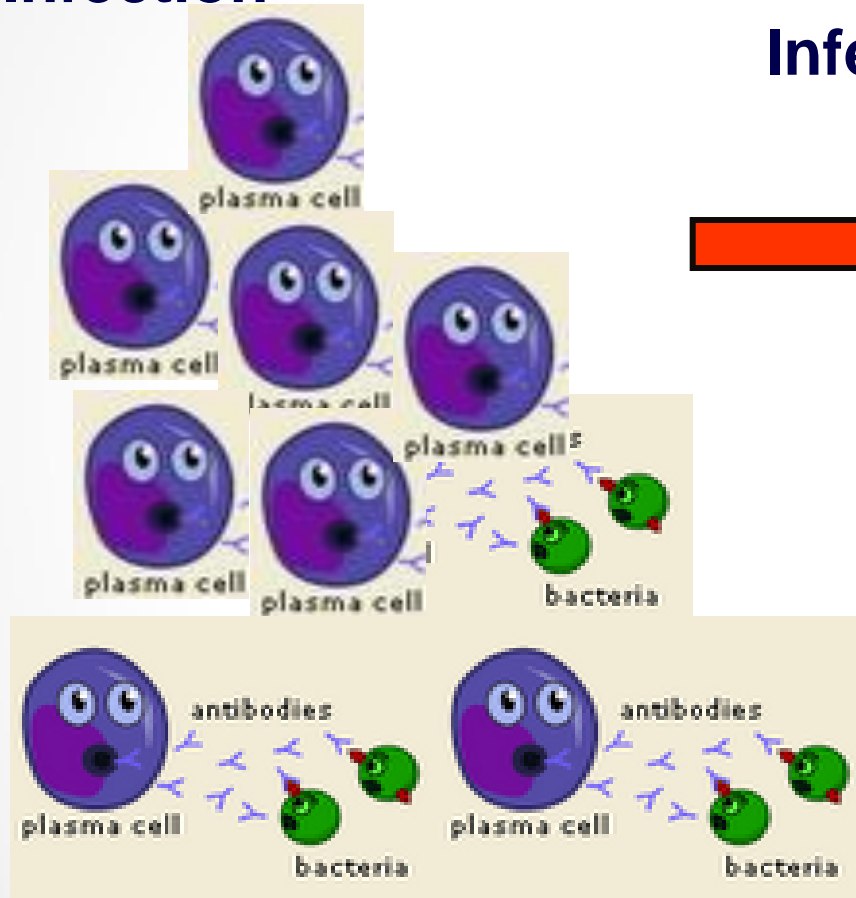
Immunoglobulin
(Antibody)

Light Chains

Heavy Chains

Plasma cells increase in response to infection

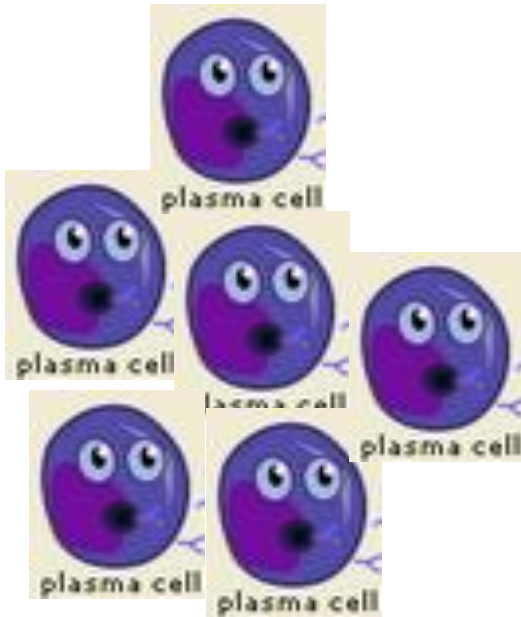
Infection



Infection cleared



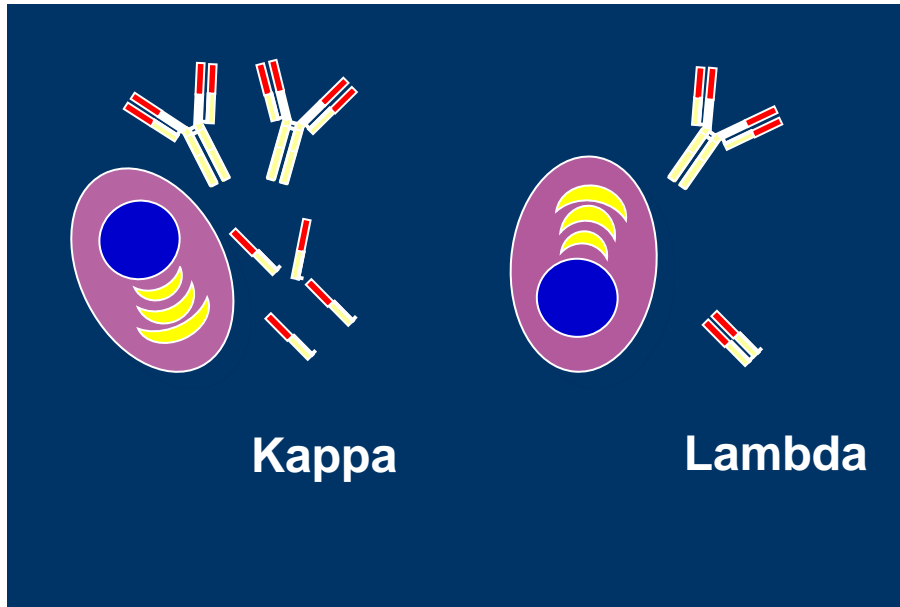
In AL (or primary) amyloidosis, there is an abnormal expansion of plasma cells



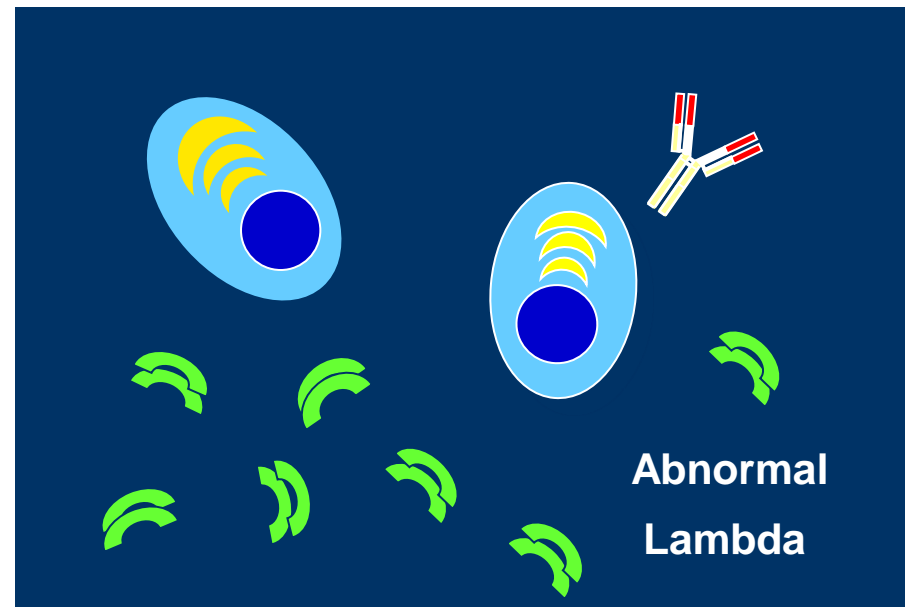
- AL = increase of one specific (clone) of defective plasma cells
- These plasma cells produce and secrete abnormal free light chains (FLCs) into the blood
- Levels of FLCs are associated with the number of defective plasma cells in a patient with AL amyloidosis

What makes these FLCs Abnormal??

Primary [AL] Amyloidosis is a plasma cell disorder

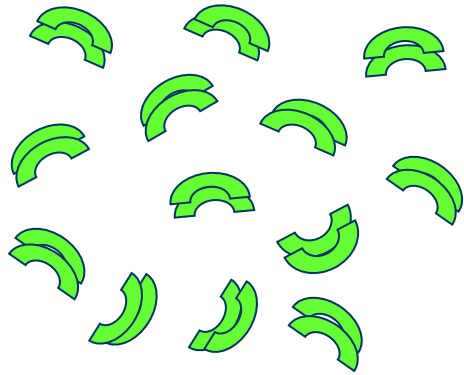


Normal Healthy Plasma cells



Mutated (diseased) Plasma cells

These abnormal light chains have mutations which make them “sticky”



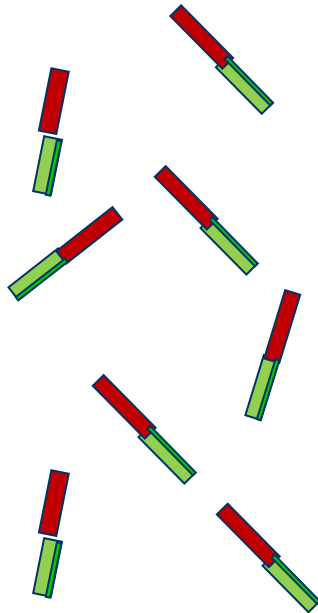
They bind together to form an amyloid protein complex



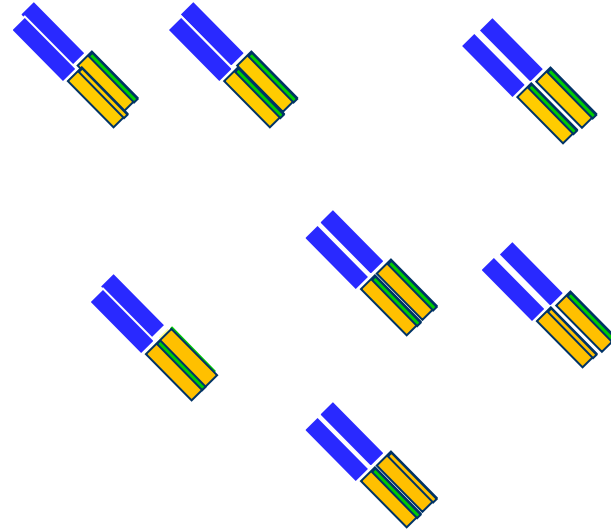
Amyloid proteins accumulate in target organs such as the **HEART** and **KIDNEYS**



The FreeLite Test Measures both types of Free Light Chains - Kappa And Lambda



Kappa Free Light Chains
(Leonhard Korngold “Kappa”)



Lambda Free Light Chains
(Rose Lipari “Lambda”)

Normal Ranges for Serum Free Light Chains

<u>Units</u> (mg/L)	<u>Units</u> (mg/dL)
Kappa: 3.3–19.4 mg/L	Kappa: 0.33–1.94 mg/dL
Lambda: 5.7–26.3 mg/L	Lambda: 0.57–2.63 mg/dL
κ/λ ratio: 0.26–1.65	κ/λ ratio: 0.26–1.65

Examples

May

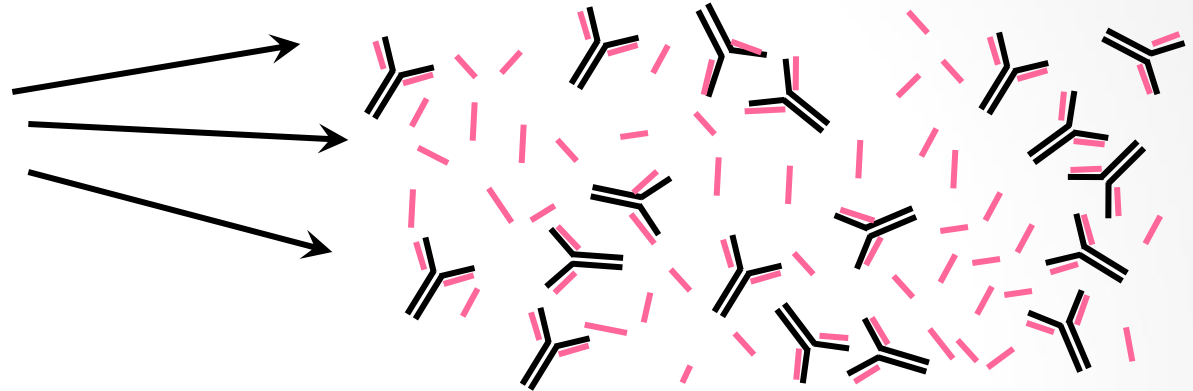
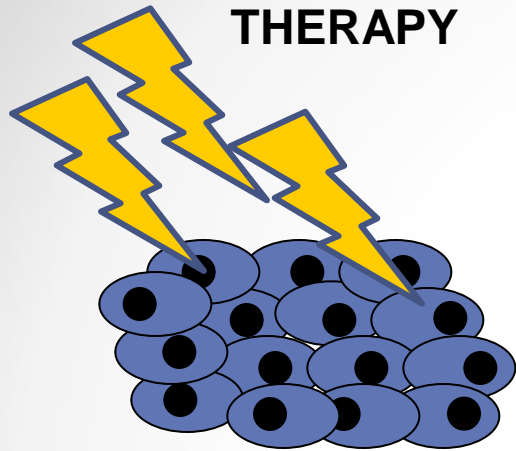
Description	Flag	Result	Normal Range
KAPPA LAMBDA FREE LIGHT CHAIN			
KAPPA FREE LIGHT CHAIN	H	38.50 MG/DL	0.33 - 1.94
LAMBDA FREE LIGHT CHAIN	L	0.31 MG/DL	0.57 - 2.63
KAPPA LAMBDA RATIO	H	124.19 %	0.26 - 1.65

July

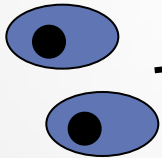
Free K+L Lt Chains, Qn, S	303.00	High	mg/L	3.30 - 19.40
Free Kappa Lt Chains, S				
Results verified by repeat testing				
Free Lambda Lt Chains, S	0.56	Low	mg/L	5.71 - 26.30
Results verified by repeat testing				
Kappa/Lambda Ratio, S	541.08	High		0.26 - 1.65

= 385 mg/L

AL amyloidosis Therapy



**KILLS
ABNORMAL
PLASMA CELLS**



***LESS ABNORMAL
PLASMA CELLS =
FEWER LIGHT
CHAINS + LESS
AMYLOID***

**Why do doctors watch
difference rather than ratio
for involved light chain?**

Involved FLC (iFLC) & Difference in FLC (dFLC)

- If your abnormally elevated light chain is lambda then:
 - Involved FLC (iFLC) is lambda
 - Uninvolved FLC is kappa
 - dFLC is lambda-kappa
 - dFLC is used more for monitoring
 - FLC ratio still very important
 - Diagnosis
 - Assessing Complete Response (CR)

ISA Consensus Panel 2010 Updated Hematologic response criteria

Response Criteria (following treatment)

Complete Response (CR): negative serum and urine IFE and normal FLC ratio

Very Good Partial Response (VGPR): dFLC <40 mg/L

Partial Response (PR): dFLC decrease >50%

No Response (NR): none of the above

Examples of Response Criteria Calculations

- **Partial Response:** difference between the involved and uninvolved LC decrease by greater than 50% (compare two test results)
Example: $k = 1 \text{ mg/dL}$, $\lambda = 25 \text{ mg/dL}$, $d\text{FLC} = 24$ \longrightarrow $k = 0.8 \text{ mg/dL}$, $\lambda = 10 \text{ mg/dL}$, $d\text{FLC} = 9.2$ [50% of 24 = 12, $12 > 9.2$]
- **Very Good Partial Response:** Difference between involved and uninvolved LC is less than 4 mg/dL (only one test result required)
Example: $k = 1 \text{ mg/dL}$, $\lambda = 4.2 \text{ mg/dL}$, $d\text{FLC} = 3.2 \text{ mg/dL}$
- **Complete Response:** normal FLC ratio; serum and urine IFE (-) (one test result)
Example: $k = 0.8 \text{ mg/dL}$, $\lambda = 2 \text{ mg/dL}$, ratio $0.8/2 = 0.4$
(FLC ratio nr = 0.26-1.65)


Additional Resources

- www.wikilite.com (web version of our “black 6th edition book”)
- Google “Binding Site”
- Email us info@thebindingsite.com
- Call The Binding site 800-633-4484
 - Experts are on hand to assist you
- Understanding Serum Free Light Chain Assays (IMF booklet)

www.thebindingsite.com

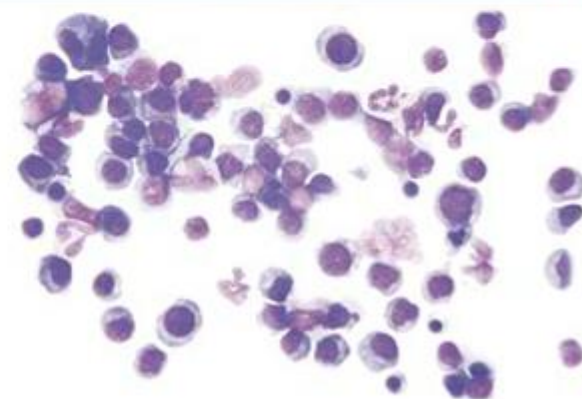
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Recognizing the Signs and Symptoms of Multiple Myeloma in the Primary Care Setting

Educational Webinar Resource for Clinicians

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Video Now Available: Freelite® - The Standard of Care for Myeloma

February 20th 2014

Dr. Rafael Fonseca Discusses Multiple Myeloma: Monitoring and Treatment

February 12th 2014

Binding Site's Hevylite® assays are now available in the USA!

January 10th 2014



Questions?



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*For more information
Or to keep up-to-date!!*

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