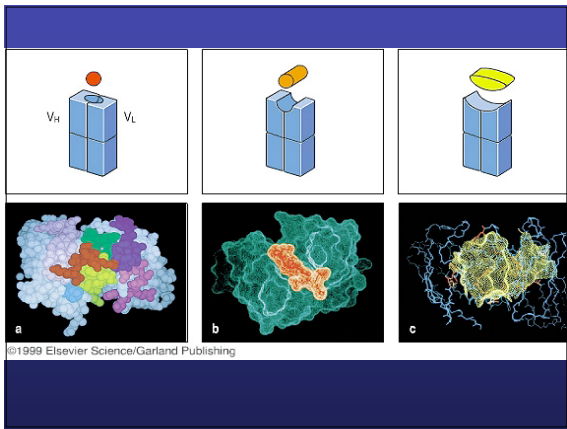


Non-covalent forces	Origin	
Electrostatic forces	Attraction between opposite charges	$-\text{NH}_3^+ \quad \text{OOC}^-$
Hydrogen bonds	Hydrogen shared between electronegative atoms (N,O)	$\delta^- \text{N} \cdots \text{H} \cdots \text{O} = \text{C} \delta^-$
Van der Waals forces	Fluctuations in electron clouds around molecules oppositely polarize neighboring atoms	$\delta^+ \cdots \delta^-$ $\delta^- \cdots \delta^+$
Hydrophobic forces	Hydrophobic groups interact unfavorably with water and tend to pack together to exclude water molecules. The attraction also involves van der Waals forces	$\text{H} \cdots \text{O} \quad \text{H} \cdots \text{O} \cdots \text{H}$ $\delta^- \quad \delta^+ \quad \delta^-$ $\delta^- \quad \delta^+ \quad \delta^-$ $\text{H} \cdots \text{H}$

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Five Classes (or Isotypes) of Antibodies Are Determined by Different Heavy Chain Constant Regions

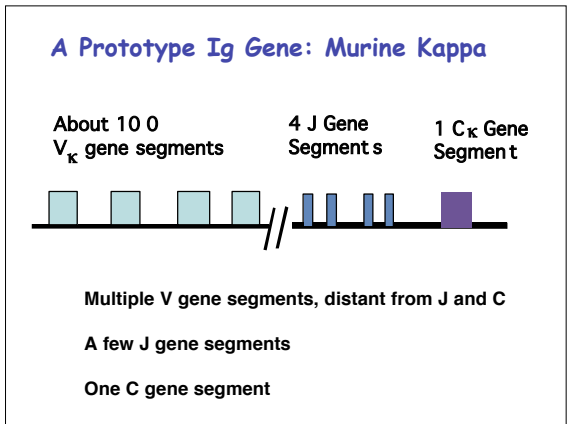
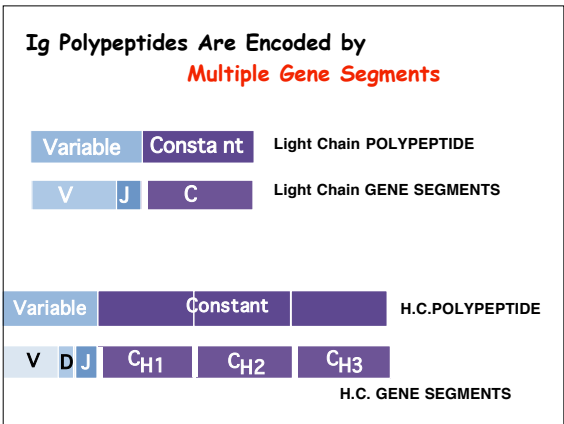
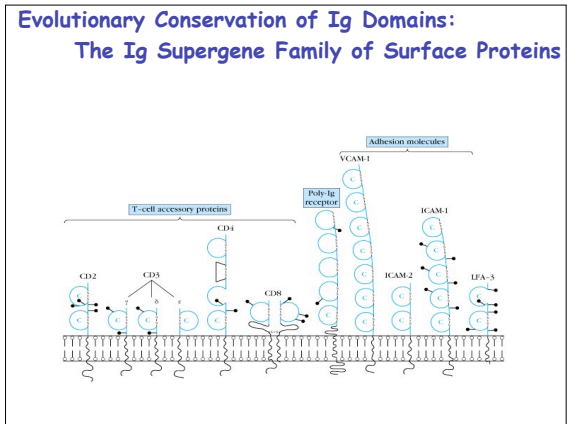
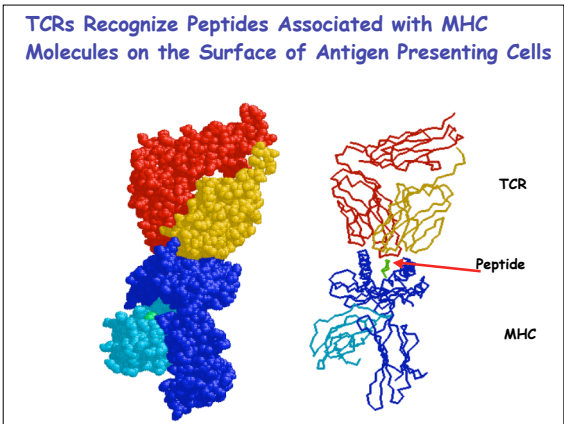
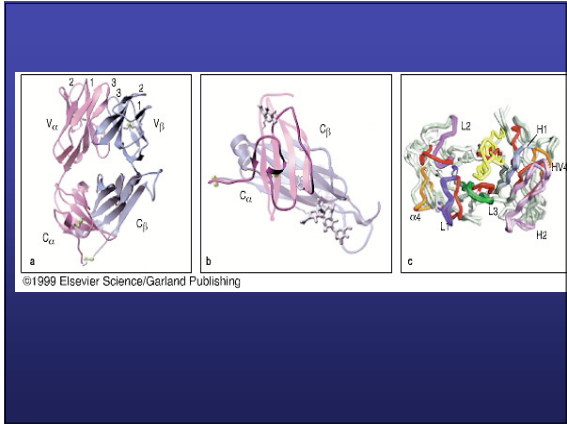
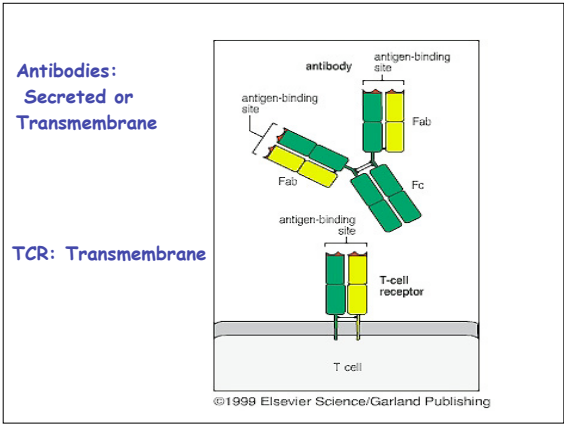
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Ig isotypes have different antigen elimination properties.

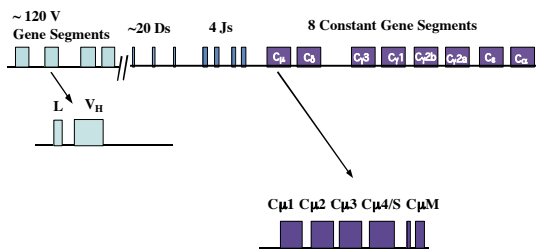
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T Cell Receptors Have ONLY ONE Function

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Murine Ig Heavy Chain Gene Organization



Human Ig Loci

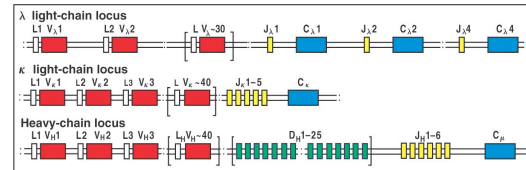
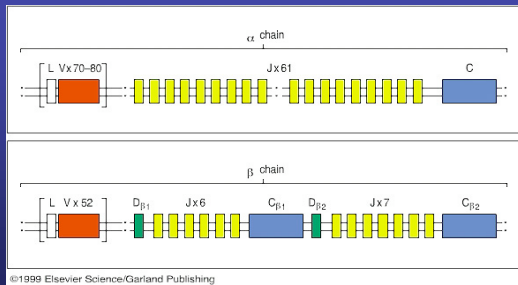
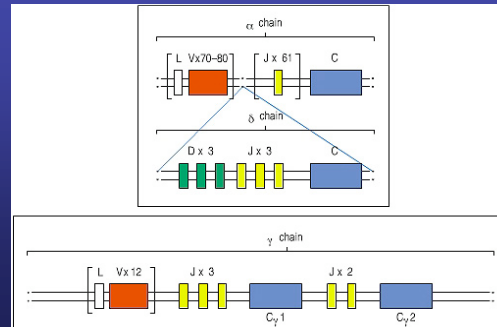


Figure 4-4 Immunobiology, 6/e. © Garland Science 2005



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SUMMARY

1. Antibodies are comprised of 2 heavy and 2 light chain polypeptides.
2. N-terminal variable regions of antibodies recognize antigen and C-terminal heavy chain constant regions eliminate antigen.
3. Heavy and light chains are comprised of multiple Ig domains that have a characteristic beta pleated sheet structure.
4. Hypervariable amino acids in loops between beta sheets of variable regions contact antigen.
5. T cell receptors are comprised on one alpha and one beta chain and resemble Fab fragments of antibodies.
6. Genes encoding antibodies and TCRs are comprised of multiple V, D, J gene segments and one or a few C gene segments.