

Lecture 5.

Learning Objectives and Summary

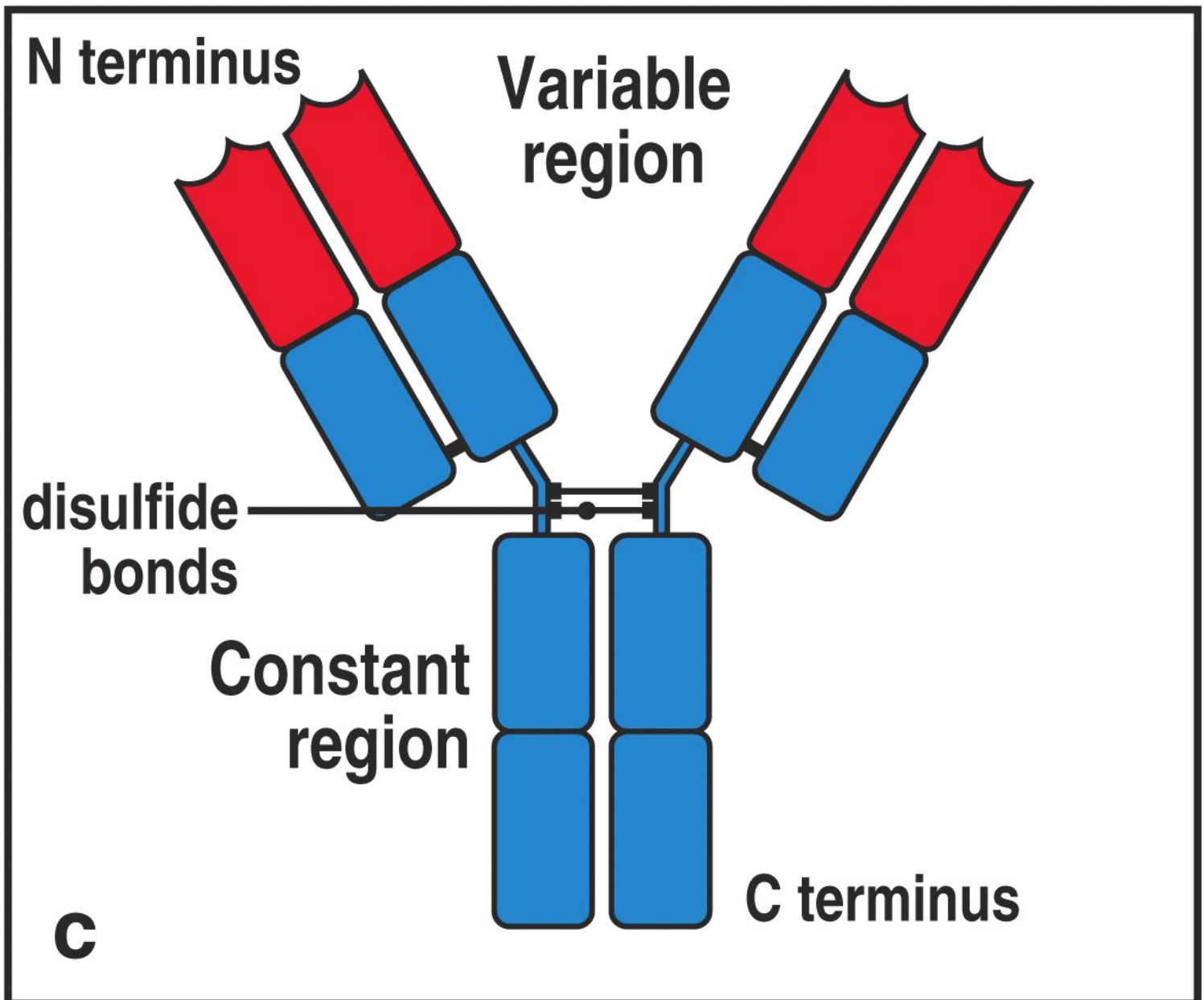


Figure 3-1 part 3 of 3 Immunobiology, 6/e. (© Garland Science 2005)

5. Structure of immunoglobulin and T cell antigen receptor genes and proteins

Learning objectives:

1. Understand the structure and function of immunoglobulin heavy and light chain polypeptides
2. Appreciate the structure of an “immunoglobulin domain”
3. Understand the structure and function of TCR α and β polypeptides
4. Learn how hypervariable regions of Ig and TCR proteins contribute to antigen recognition
5. Understand the organization of Ig and TCR genes in their germline configurations.

SUMMARY

1. Antibodies (immunoglobulins) are comprised of two heavy and two 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 β pleated sheet structure.
4. Hypervariable amino acids in loops between β sheets of variable regions contact antigen.
5. T cell receptors are comprised on one α and one β 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.