**Chapter Overview**

**Chapter 6: Genes and Genomes**

As the genetic material, DNA provides a blueprint that directs all cellular activities and specifies the developmental plan of multicellular organisms. An understanding of gene structure and function is therefore fundamental to an appreciation of the molecular biology of cells. The development of gene cloning represented a major step toward this goal, enabling scientists to dissect complex eukaryotic genomes and probe the functions of eukaryotic genes. Advances in DNA sequencing then brought us to the exciting point of knowing the complete genome sequences of thousands of bacteria, of yeast, and of many species of plants and animals, including humans. This chapter will focus on the organization of eukaryotic genes and the types of sequences in the genomes of higher eukaryotes, many of which play important roles in gene regulation rather than encoding proteins.