



Figure 8.7. Overview of the essential steps in genetic engineering: moving a gene from one organism to another. (With permission, from T. D. Brock, K. M. Brock, and D. M. Ward, *Basic Microbiology with Applications*, 3d ed., Pearson Education, Upper Saddle River, NJ, 1986, p. 169.)

Most often, such a shotgun approach is very inefficient. More specific approaches use *hybridization*. A *probe* can be synthesized chemically to be complementary to a portion of the gene. The probe is usually much shorter than the gene, but sufficiently long that it is unlikely for other genes to have the same complementary DNA sequence. The construction of the probe requires some knowledge of either the nucleotide sequence of the desired gene or a partial amino acid sequence for the desired gene. Since the genetic