



FIGURE 24.6. Changes in specificity of nucleic acid polymerases. The crystal structures of three different types of nucleic acid polymerase are shown. (A) Klenow fragment DNA-dependent DNA polymerase, (B) human immunodeficiency virus (HIV) RNA-dependent DNA polymerase (also known as **reverse transcriptase**), and (C) T7 phage DNA-dependent RNA polymerase. The three-dimensional structures of these proteins are very similar, indicating a common evolutionary origin. Each enzyme is considered to have three main domains much like a hand: a palm domain (shown in *blue*), a thumb domain (*green*), and a finger domain (*purple*). The sugar-specificity region of each enzyme is highlighted in *yellow* and *red*. Changes in these few amino acids are all that is required to change the specificity of these enzymes.

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