



Figure 11.16 A Hypothetical Model for Activity at the Replication Fork. The overall process is pictured in five stages with only one cycle of replication shown for sake of clarity. In practice, all these enzymes are functioning simultaneously and more than one round of replication can occur simultaneously; for example, new primer RNA can be synthesized at the same time as DNA is being replicated. (1) DNA gyrase, helicases, and single-stranded DNA binding proteins (SSBs) unwind DNA to produce a single-stranded stretch. (2) The primosome synthesizes an RNA primer. (3) The replisome has two DNA polymerase III complexes. One polymerase continuously copies the leading strand. The lagging strand loops around the other polymerase so that both strands can be replicated simultaneously. When DNA polymerase III encounters a completed Okazaki fragment, it releases the lagging strand. (4) DNA polymerase I removes the RNA primer and fills in the gap with complementary DNA. (5) DNA ligase seals the nick and joins the two fragments.