



FIGURE 11.1 Structural comparison of ionotropic and metabotropic receptors. (A) Ionotropic receptors bind transmitter, and this binding directly translates into the opening of the ion channel through a series of conformational changes. Ionotropic receptors are composed of multiple subunits. Shown are the five subunits that together form the functional nAChR. Note that each of nAChR subunit wraps back and forth through the membrane four times and that the mature receptor is composed of five subunits. (B) Metabotropic receptors bind transmitter and, through a series of conformational changes, bind to G proteins and activate them. G proteins then activate enzymes such as adenylyl cyclase to produce cAMP. Through the activation of cAMP-dependent protein kinase, ion channels become phosphorylated, which affects their gating properties. Metabotropic receptors are single subunits. They contain seven transmembrane segments, with the cytoplasmic loops formed between the segments providing the points of interactions for coupling to G proteins. Adapted from Kandel *et al.* (1991).