



**FIGURE 19.2** Structure of opioid receptors. (a) Serpentine model of the opioid receptor. Each transmembrane helix is labeled with a roman number. The white empty circles represent nonconserved amino acids and white circles with a letter represent identical amino acids among the four opioid receptors. Violet circles represent further identity between the MOR, DOR, and KOR. Green circles highlight the highly conserved fingerprint residues of family A receptors, Yellow circles depict the two conserved cysteines in EL loops 1 and 2, likely forming a disulfide-bridge. IL, intracellular loop; EL, extracellular loop. (b) Proposed arrangement of the seven transmembrane helices of opioid receptors as viewed from the top (extracellular side). (Reproduced with permission from Waldhoer, M. et al., *Ann. Rev. Biochem.*, 73, 953, 2004, Copyright Annual Reviews, <http://www.annualreviews.org>.)