

Naloxone is a competitive antagonist with high affinity for the μ opioid receptor (MOR) used to reverse opioid overdose. The molecular conformation of the MOR binding sites for Naloxone has been identified through a cell-based photocrosslinking method. Two internal molecular binding sites within the MOR transmembrane domain bind to Naloxone to stabilize the receptor in a deactivated conformational state via hydrophilic and hydrophobic forces. To visualize the binding sites and conformational changes induced by Naloxone in the MOR, we developed a 3D-printed model. Photocrosslinking methods were demonstrated within the transmembrane domains by using two colors of UV paint to represent the hydrophilicity/hydrophobicity of the binding amino acid residues within the two Naloxone binding sites. Due to limitations caused by the COVID-19 pandemic, the 3D model was redesigned into a digital model. In conclusion, our model successfully demonstrates how photocrosslinking can be used to identify specific Naloxone binding site residues within the μ opioid receptor.