



OPIOID RECEPTORS IN THE BODY

Opioid receptors are dispersed throughout the body, but a few key regions are involved in the major effects (and side effects) of opioid drugs.

BRAIN Opioids bind to receptors expressed in many parts of the brain, including the cerebellum, nucleus accumbens, and hypothalamus. Many of these regions are involved in pain perception, emotion, reward, and addiction.

BRAINSTEM Opioid activity in the brainstem can affect breathing by quieting neurons that control respiration. Respiratory depression is a dangerous side effect of opioid drugs, and is commonly cited as the cause of death in cases of opioid overdose.

SPINAL CORD The transmission of pain signals in the spinal cord, especially in a region called the dorsal horn, is dampened by opioids binding to receptors on these cells. This is one intended target of opioid treatments and a mechanism of the drugs' unrivaled analgesic properties.

PERIPHERAL NEURONS Pain-sensing neurons send nociceptive messages from the periphery to the spinal cord. Binding opioid receptors in these neurons is another way that opioid drugs curb pain sensations.

INTESTINE Opioid receptors are expressed in neurons regulating peristalsis. Inhibition of these cells upon opioid binding leads to another side effect of opioid medications, constipation.