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Hydromorphone

National Cancer Institute

Source

National Cancer Institute. *Hydromorphone*. NCI Thesaurus. Code C62034.

The hydrogenated ketone of morphine, a semi-synthetic opioid with analgesic effects. Hydromorphone selectively binds the mu-opioid receptor which is linked through G-proteins. Binding stimulates the exchange of guanosine triphosphate (GTP) for guanosine diphosphate (GDP) on the G-protein complex and interacts with and inhibits adenylate cyclase located at the inner surface of the plasma membrane. This leads to a reduction in intracellular cyclic 3',5'-adenosine monophosphate (cAMP). Further, voltage-gated potassium channels are activated, thereby causing hyperpolarization and reducing neuronal excitability. In addition, the opening of voltage-gated calcium channels is inhibited, thereby leading to an inhibition of calcium entry and a reduction in the release of various neurotransmitters, including GABA, vasopressin, somatostatin, insulin and glucagons.