# Cannabis concentrated in the pain pathways of

Life, Emotions

Cannabis isa flowering plant from which more than 400 compounds have been identified.

Delta- 9- tetrahydrocannabinol (??- THC) is themost potent psychoactive compound identified. Other potent cannabinoids include??- THC, cannabidiol and cannabinol (Thehealth effects of cannabis and cannabinoids: the current state of evidence andrecommendations for research, 2017). ??-THC acts within the brain by binding to cannabinoid receptors, CB1 and CB2. CB1 and CB2receptors are G- protein- coupled receptors known to inhibit the action ofadenylate cyclase and activate mitogen- activated- protein kinase. CB1receptors are prevalent at the terminals of central and peripheral neurons of thecerebral cortex, hippocampus, lateral caudate- putamen, substantia nigra parsreticulata, globus pallidus, entopeduncular nucleus and the molecular layer ofthe cerebellum.  They are alsoconcentrated in the pain pathways of the brain and spinal cord.

Their highconcentration in the aforementioned areas may account for the ability of CB1receptor agonists such as ??- THC to impair cognition and memory as well asmotor function and anticonception. CB2 receptors are mainly present in immunecells including lymphocytes, macrophages, mast cells, microglial cells, killercells and peripheral mononuclear cells. The body producesnatural chemicals -endocannabinoids- which together with their receptors comprisethe endocannabinoid system. These endocannabinoids - N- arachidonoyl-ethanolamine (anandamide) and 2- arachidonoyl glycerol- function as retrogradesynaptic messengers.

Increasing calcium ions in post synaptic neurons resultsin the release of endocannabinoids such as 2- arachidonoyl- glycerol. Thisresults in the activation of presynaptic CB1 receptors which leads to theinhibition of neurotransmitters such as glutamate and GABA. Endocannabinoids thereforehelp to maintain homeostasis by preventing excessive neuronal activity in thecentral nervous system. Anandamideregulates emotions such as fear and anxiety (amygdala), learning and memory(hippocampus), appetite and sexual behavior (hypothalamus), motor coordinationand balance (cerebellum), complex thinking, feeling and movement (neocortex)and motivation and reward (nucleus accumbens. Cannabinoids such as ??- THC cantherefore affect emotions, learning and memory, appetite and sexual behavior, motor coordination and balance, movement and motivation and reward by bindingto the CBD receptors in the brain.