

Drug use is part of the human life from the ancient times. Besides their recreational utilization, sustained misuse of these substances can lead to the development of drug addiction especially in susceptible individuals and thus cause serious health and social problems. The aim of this thesis is to briefly introduce brain structures which are affected by addictive substances, and describe some of the mechanisms and molecules that contribute to addiction. A crucial brain structure which plays a role in drug addiction is the reward system, with dopamine as the main neurotransmitter. After repeated use of drugs, in neurons of this system certain molecules and epigenetic changes are accumulating that promote chronic nature of addiction. Especially important is the highly stable transcription factor Δ FosB, which in cooperation with other molecules promotes relapse even after several months or years of the last drug use.