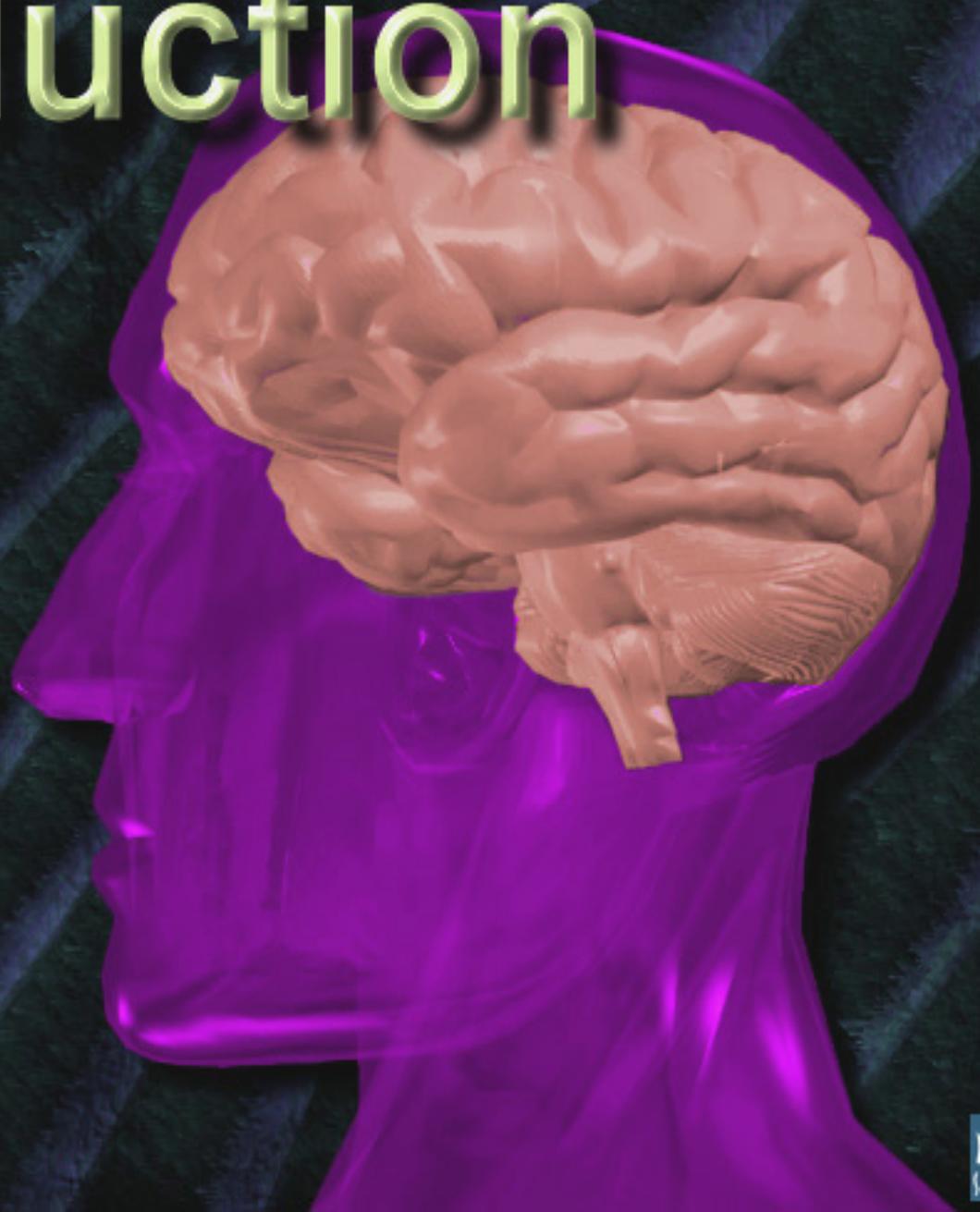
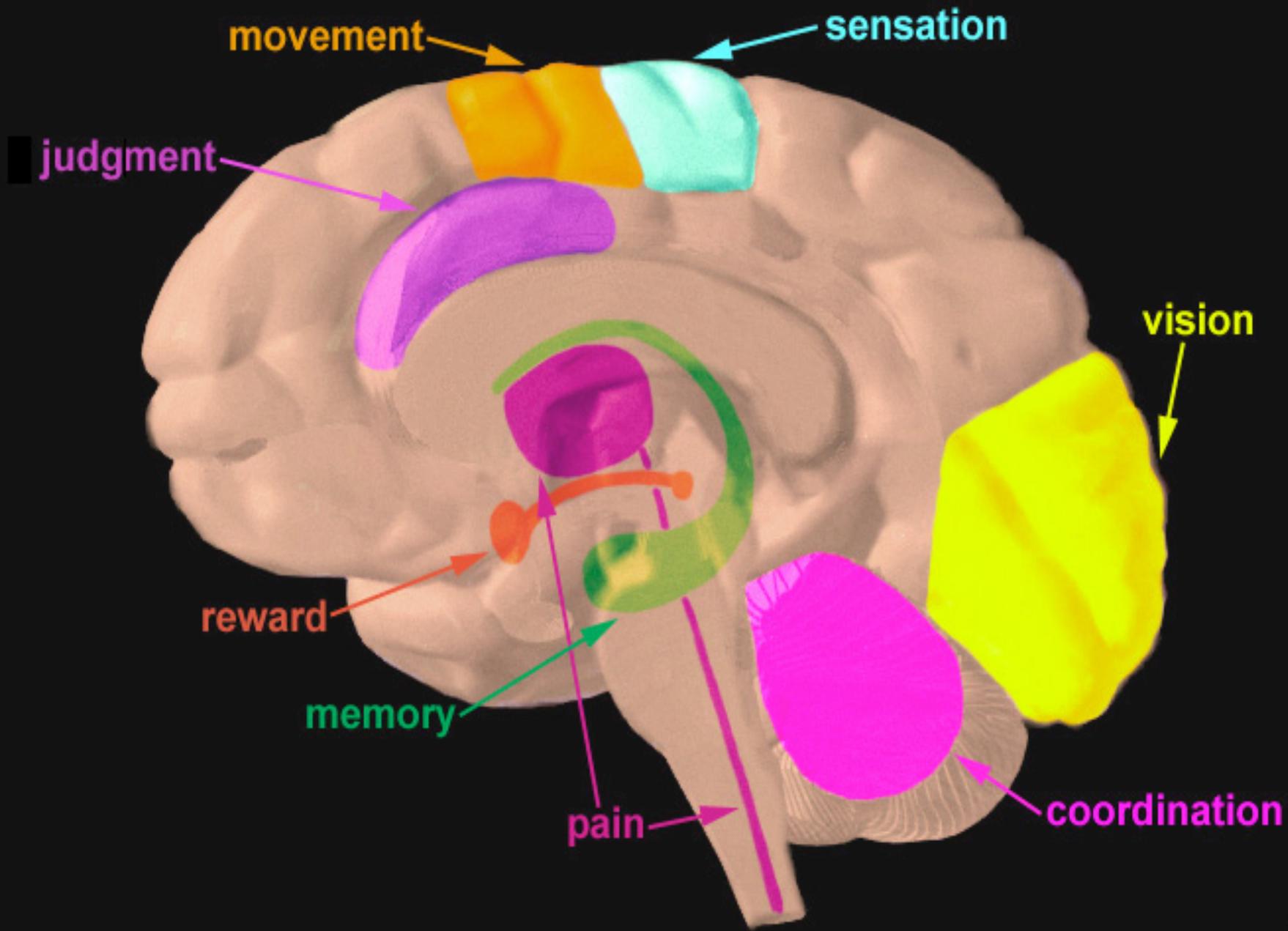
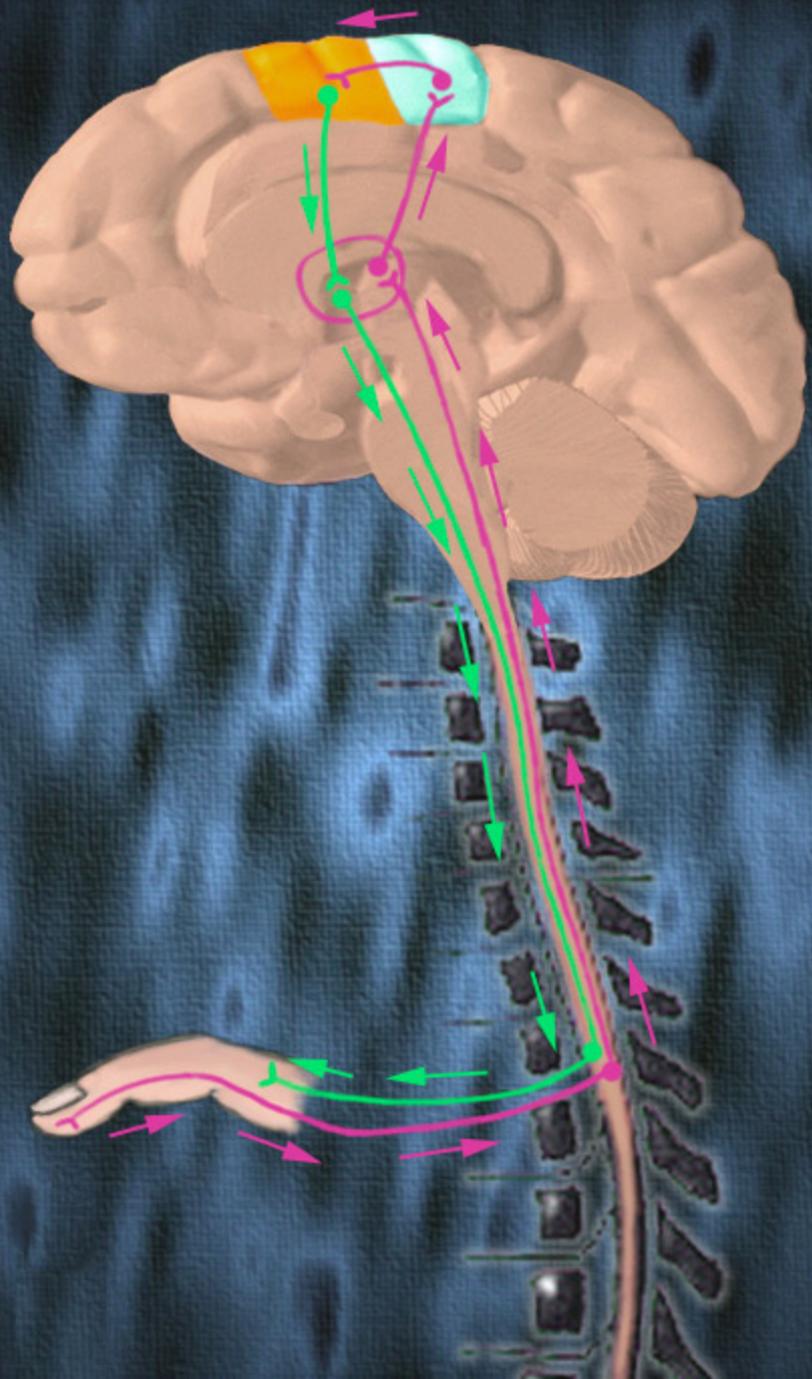


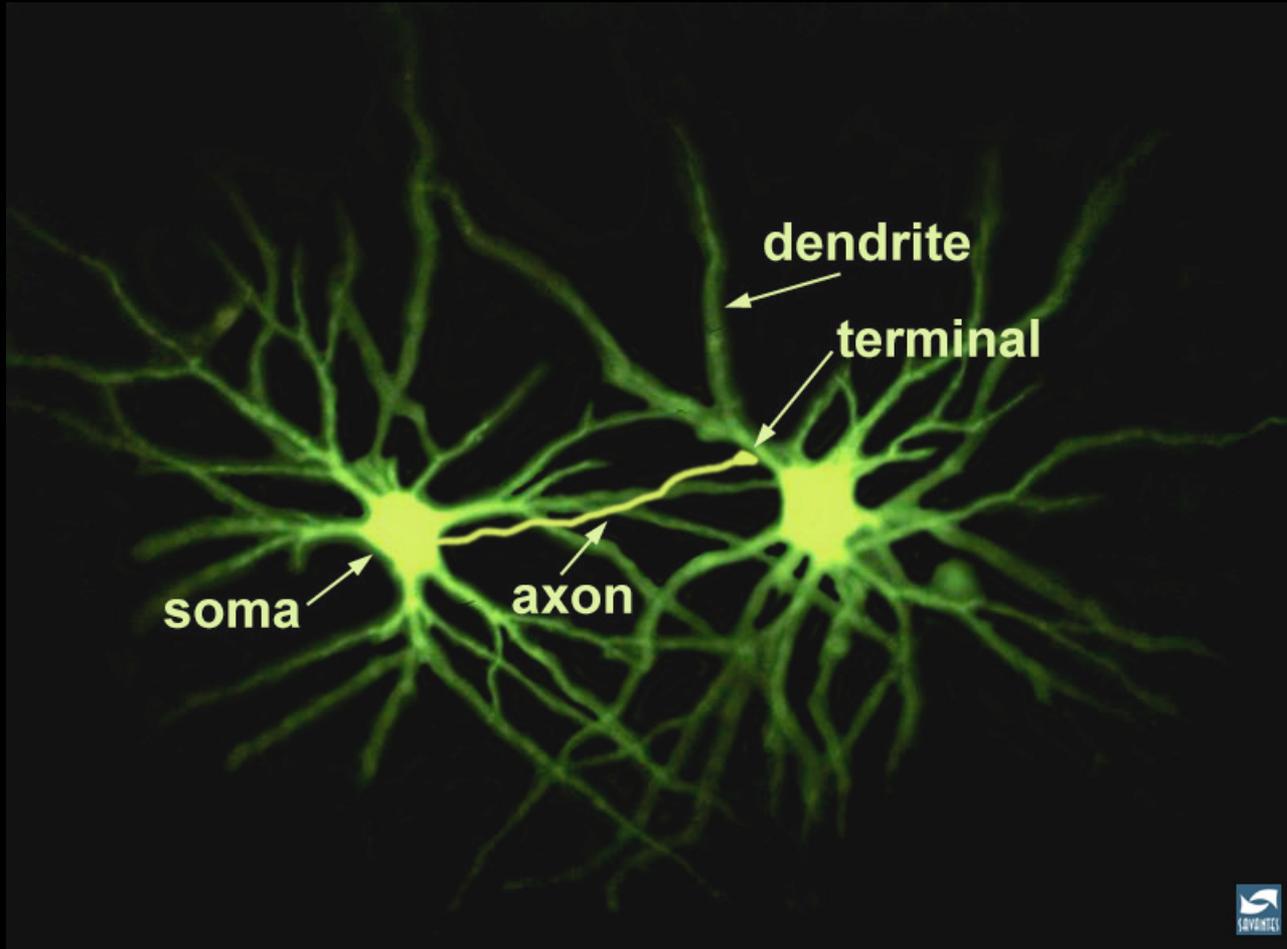
# Introduction to the brain

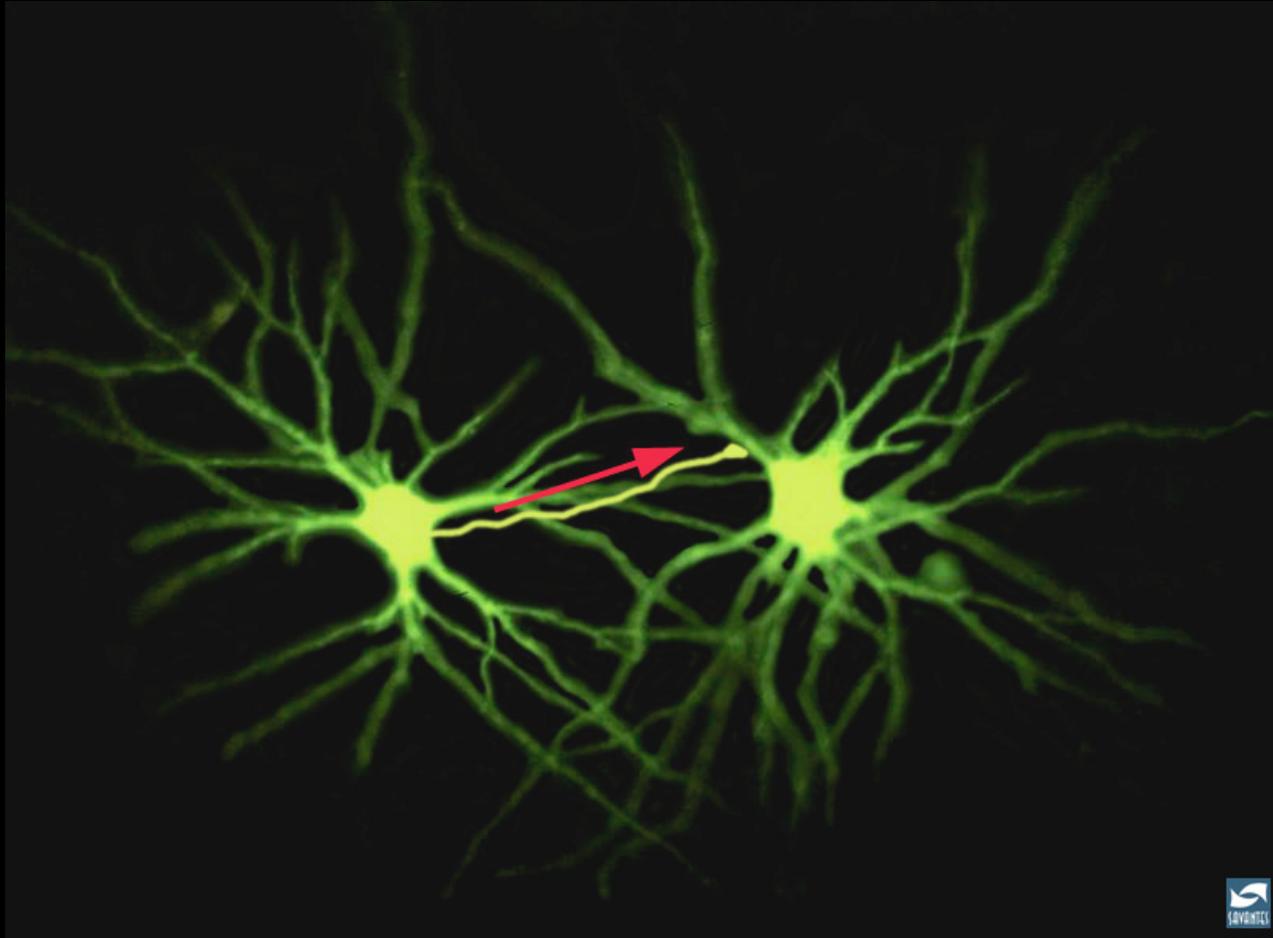


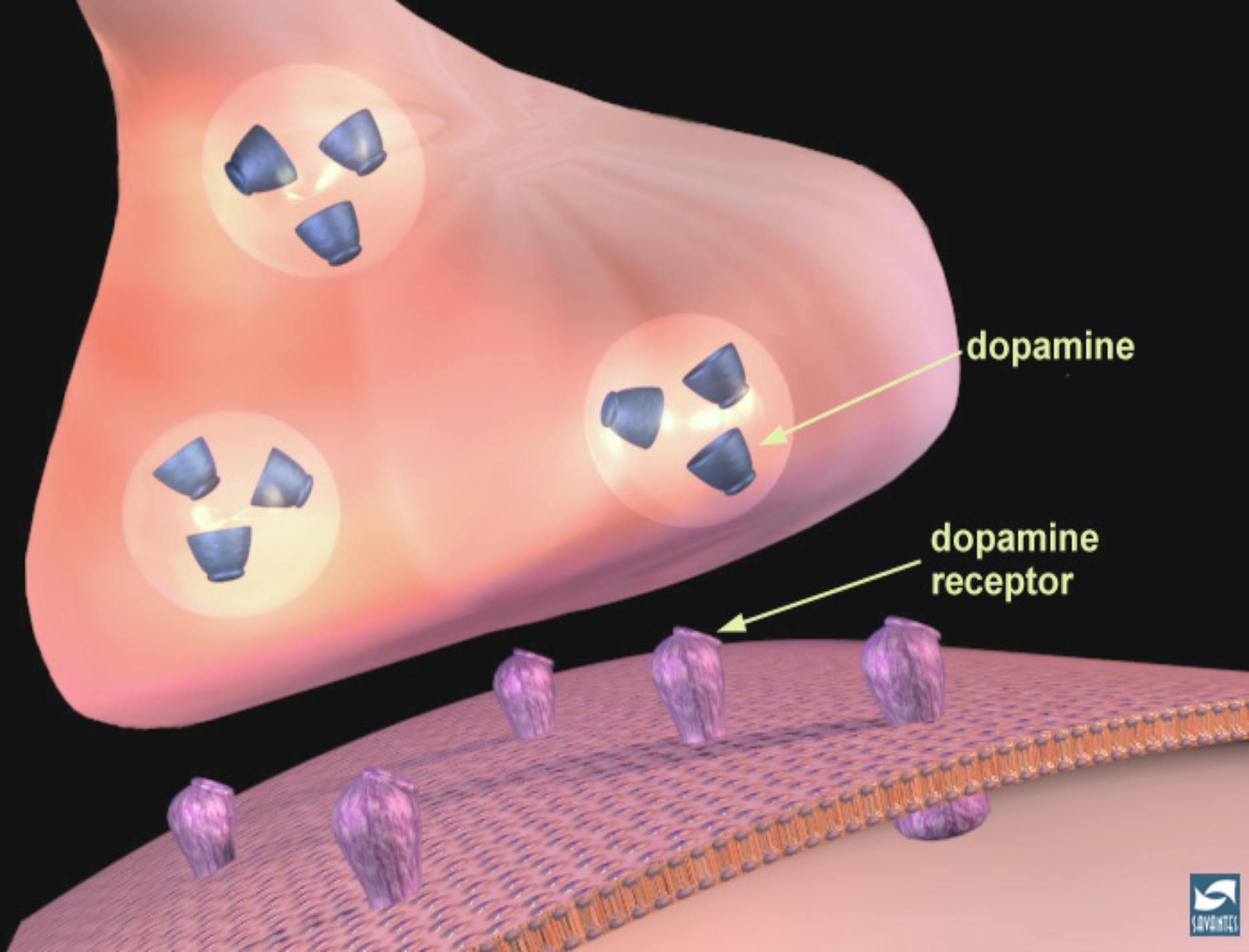






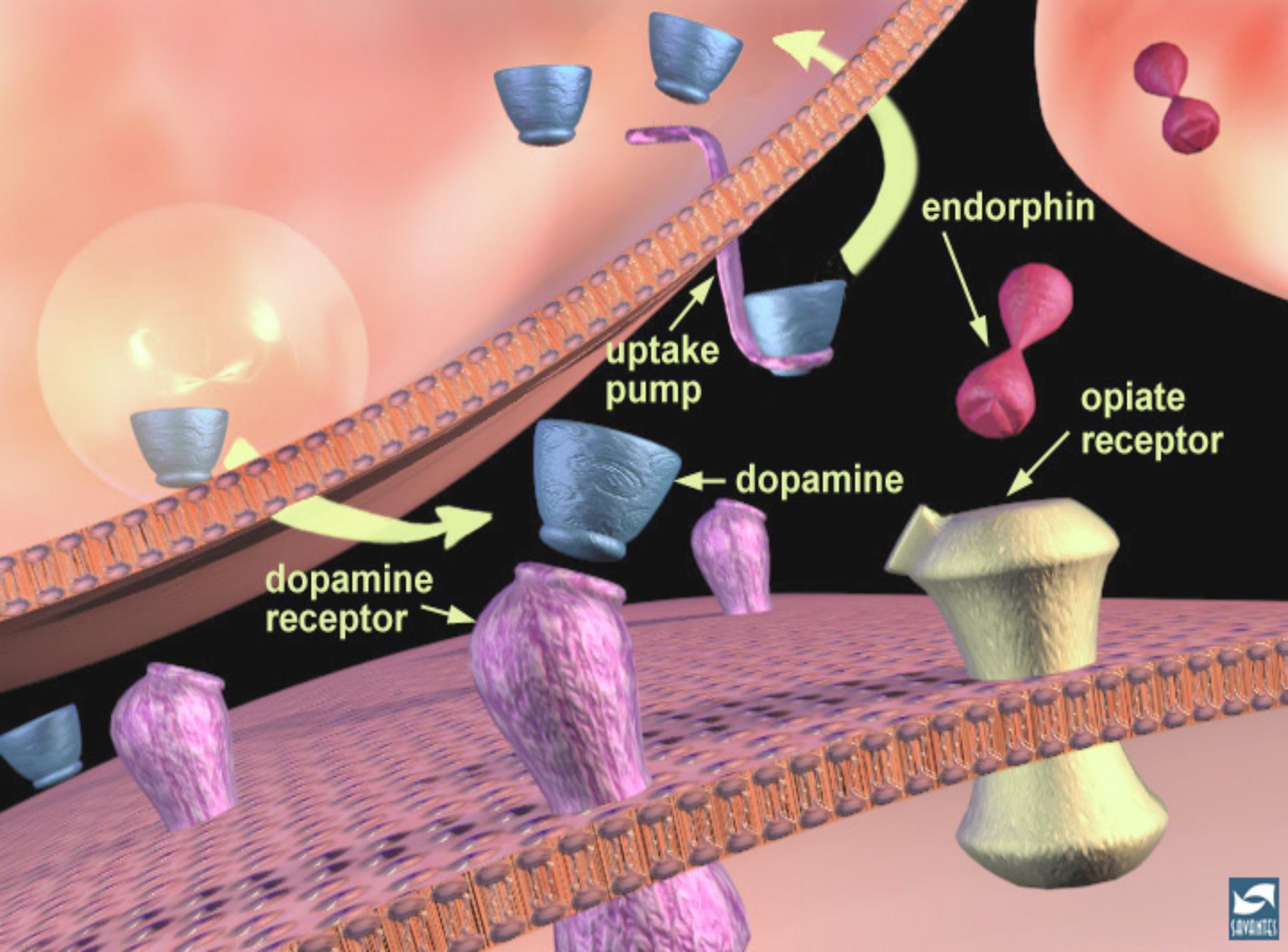






dopamine

dopamine  
receptor



endorphin

uptake pump

dopamine

dopamine receptor

opiate receptor

# The Reward Pathway and Addiction

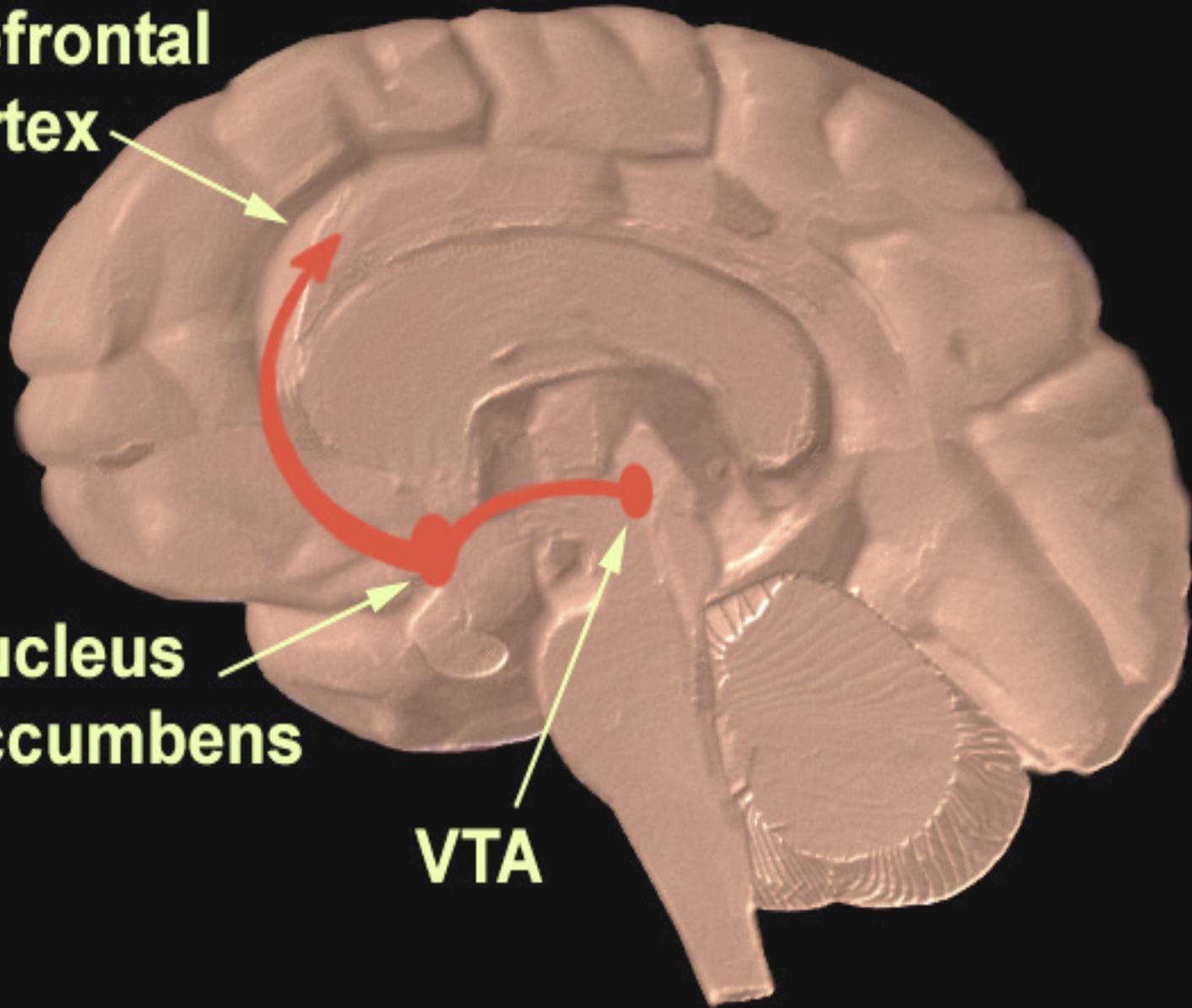
# Natural Rewards

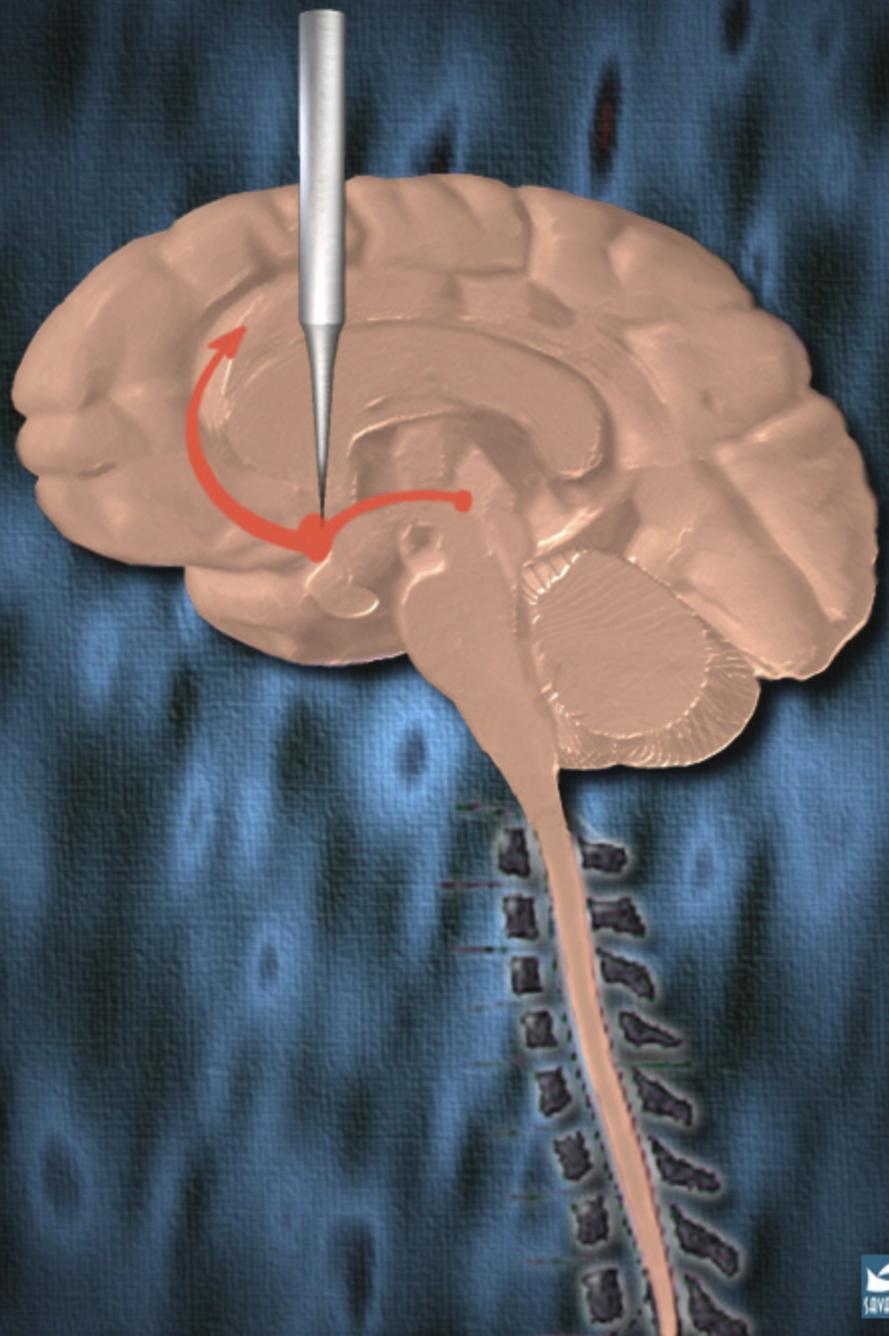
Food  
Water  
Sex  
Nurturing

**prefrontal  
cortex**

**nucleus  
accumbens**

**VTA**



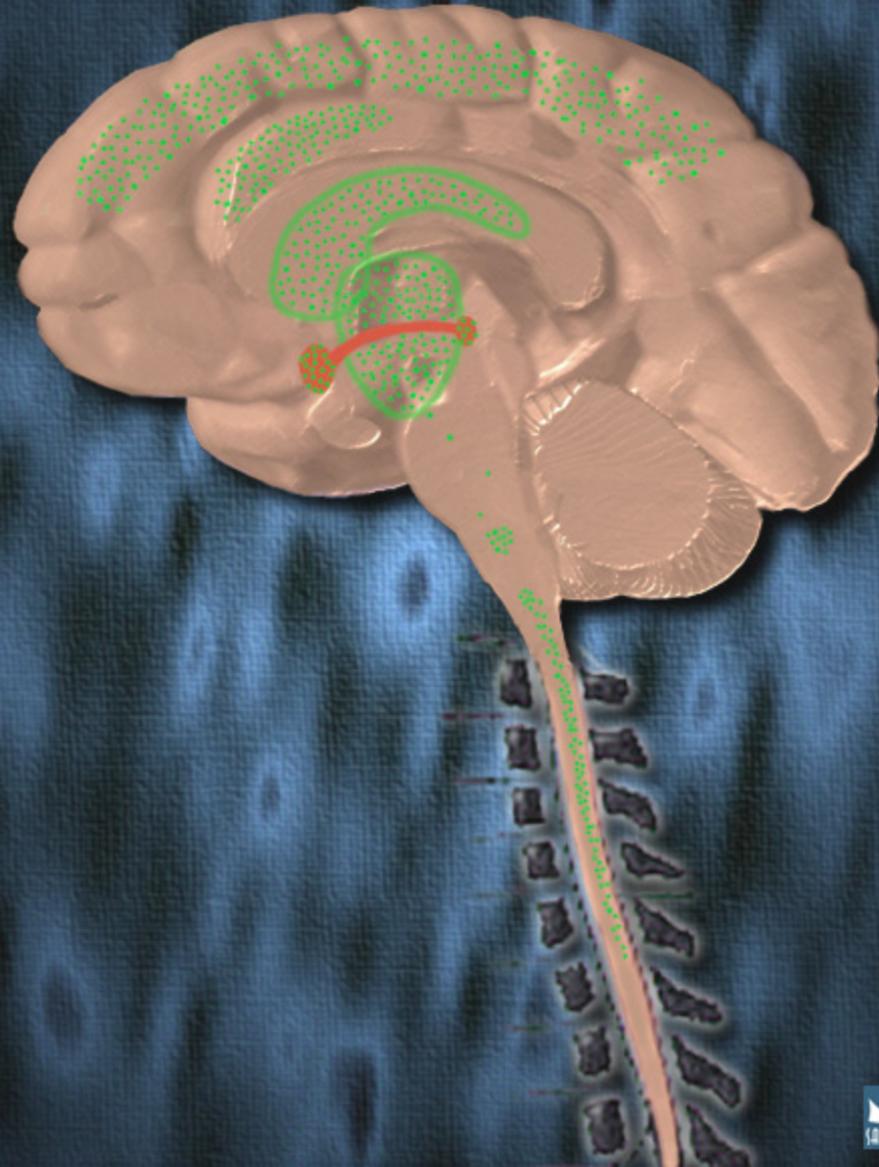


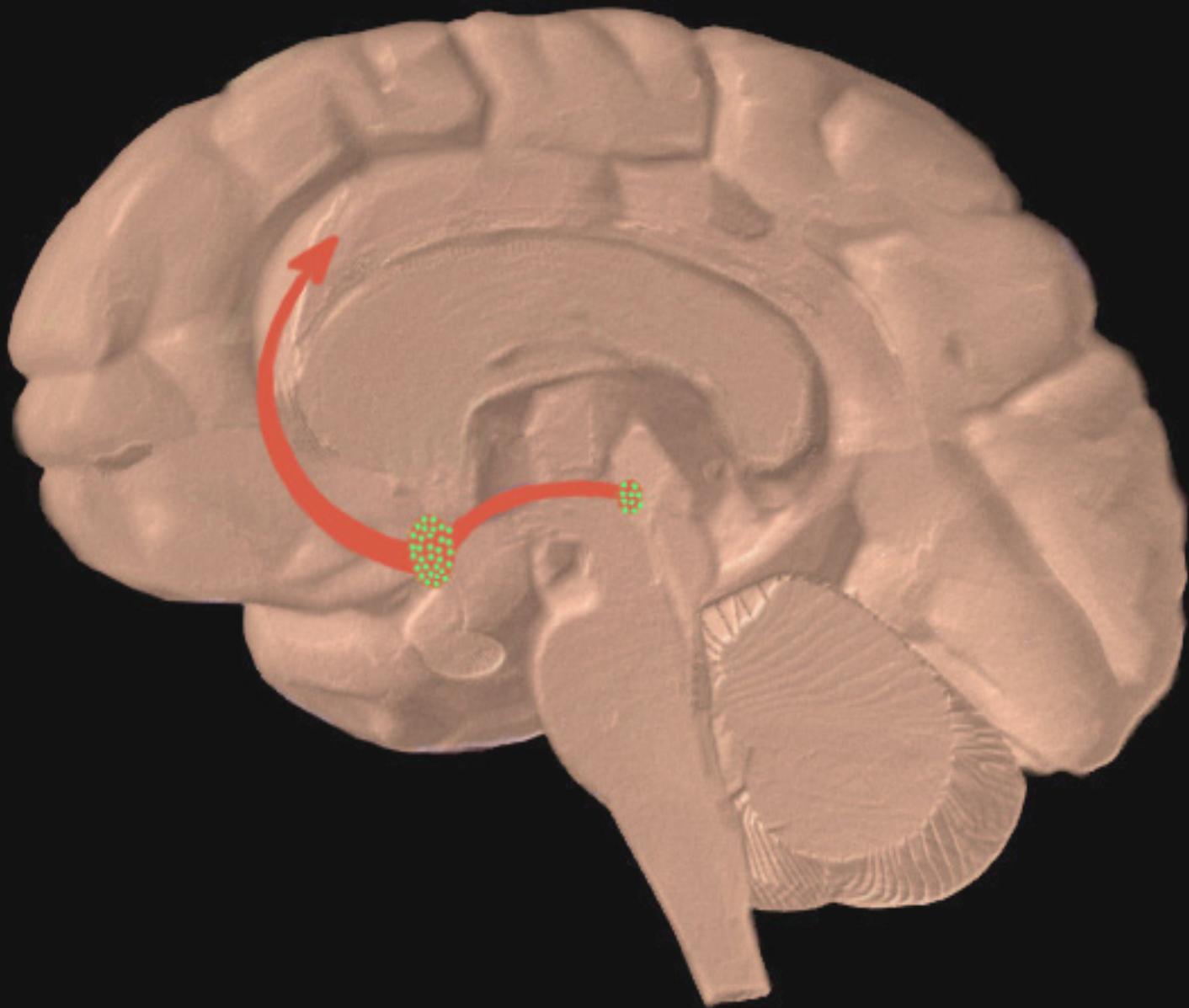
# Addiction

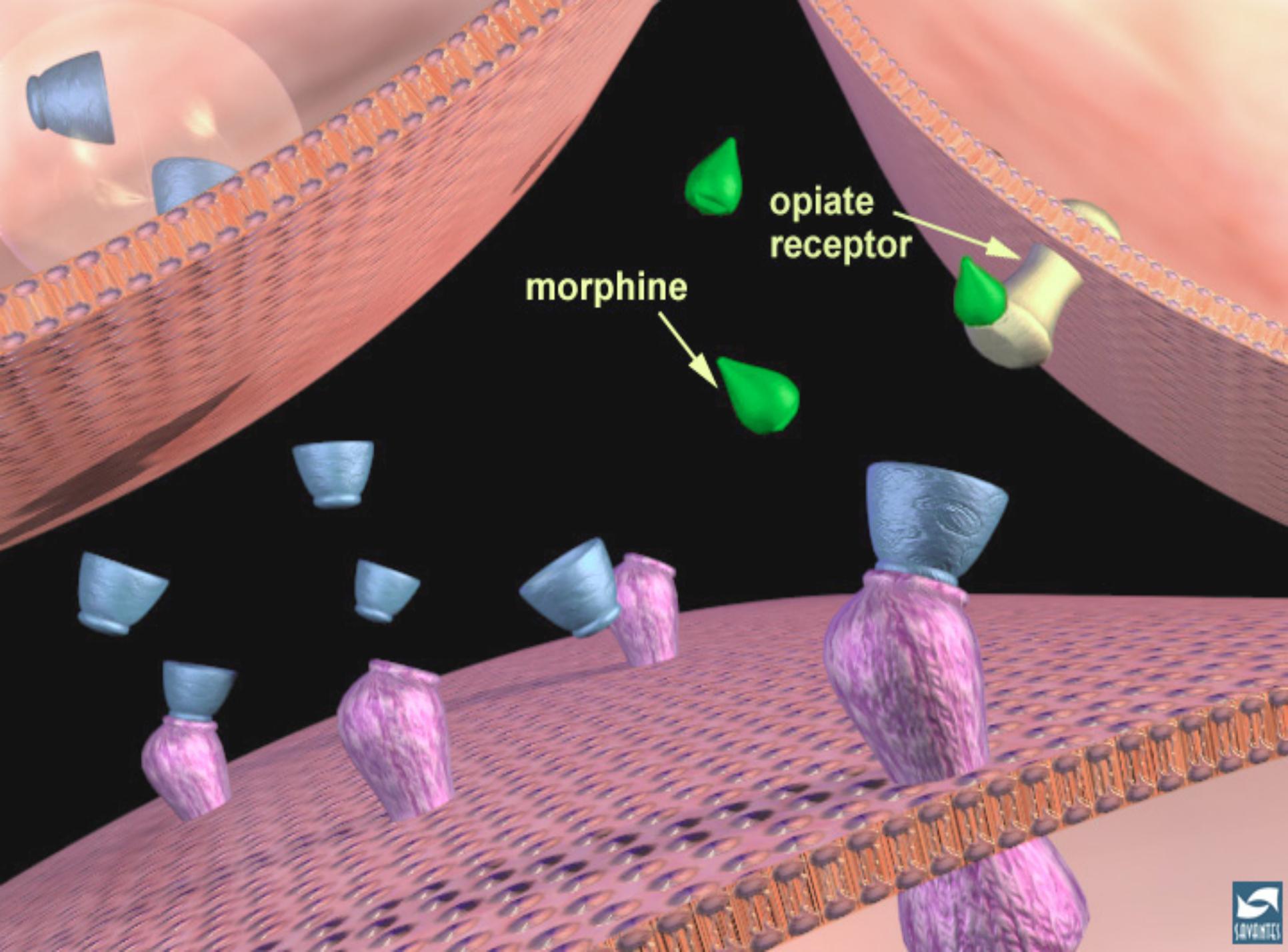
**A state in which an organism engages in a compulsive behavior**

- **behavior is reinforcing (rewarding or pleasurable)**
- **loss of control in limiting intake**

# The Action of Heroin (Morphine)

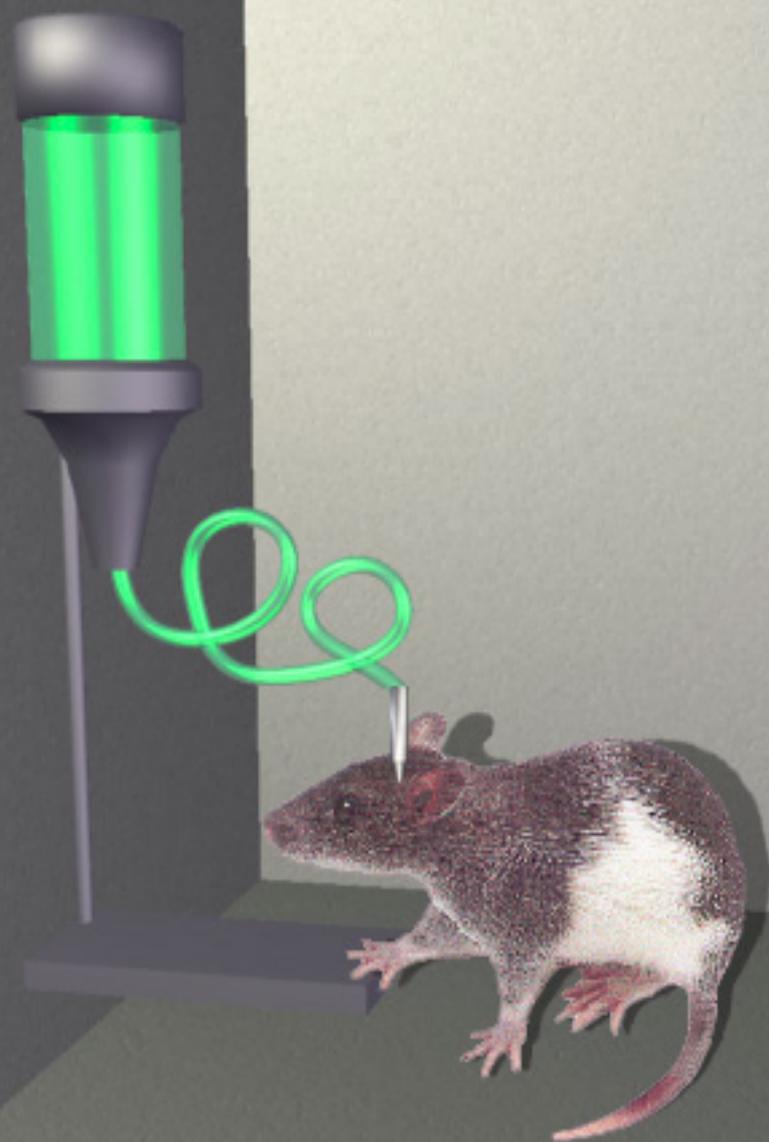






**morphine**

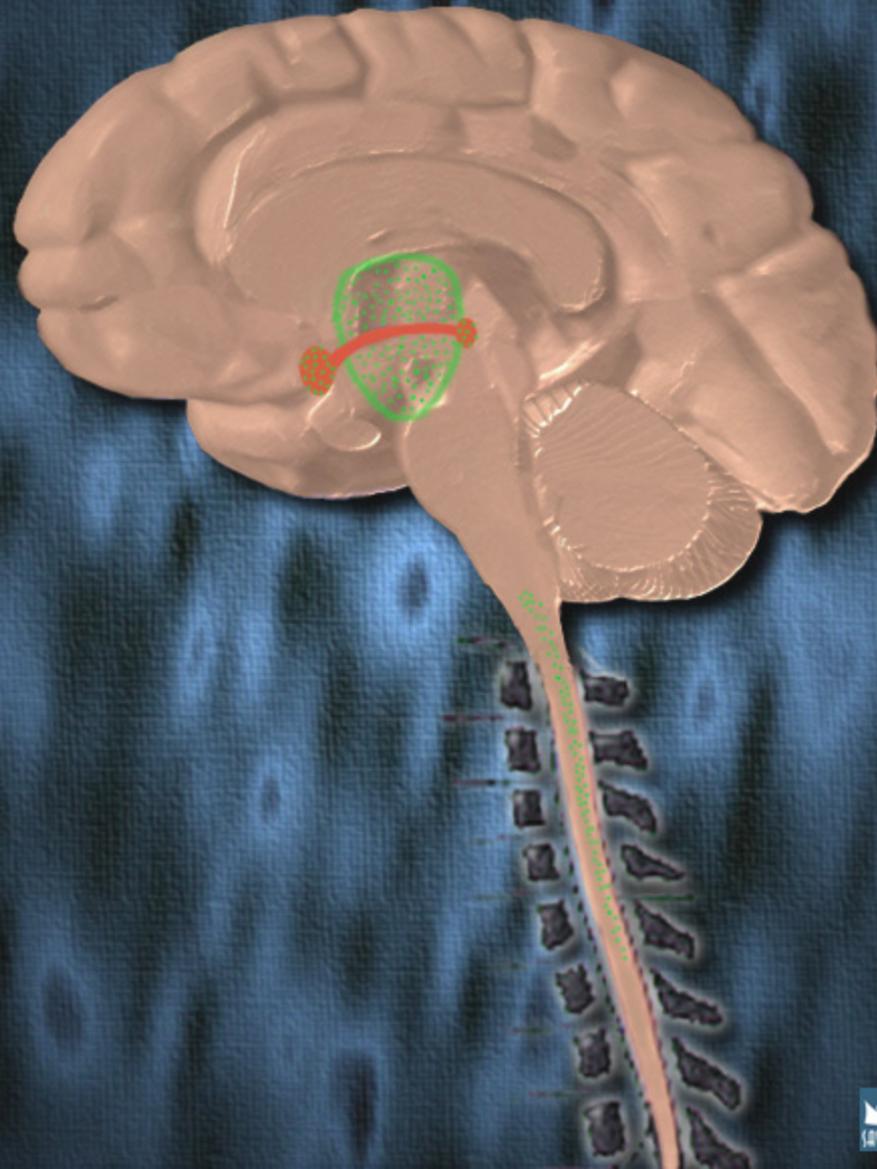
**opiate  
receptor**



# Tolerance

A state in which an organism no longer responds to a drug

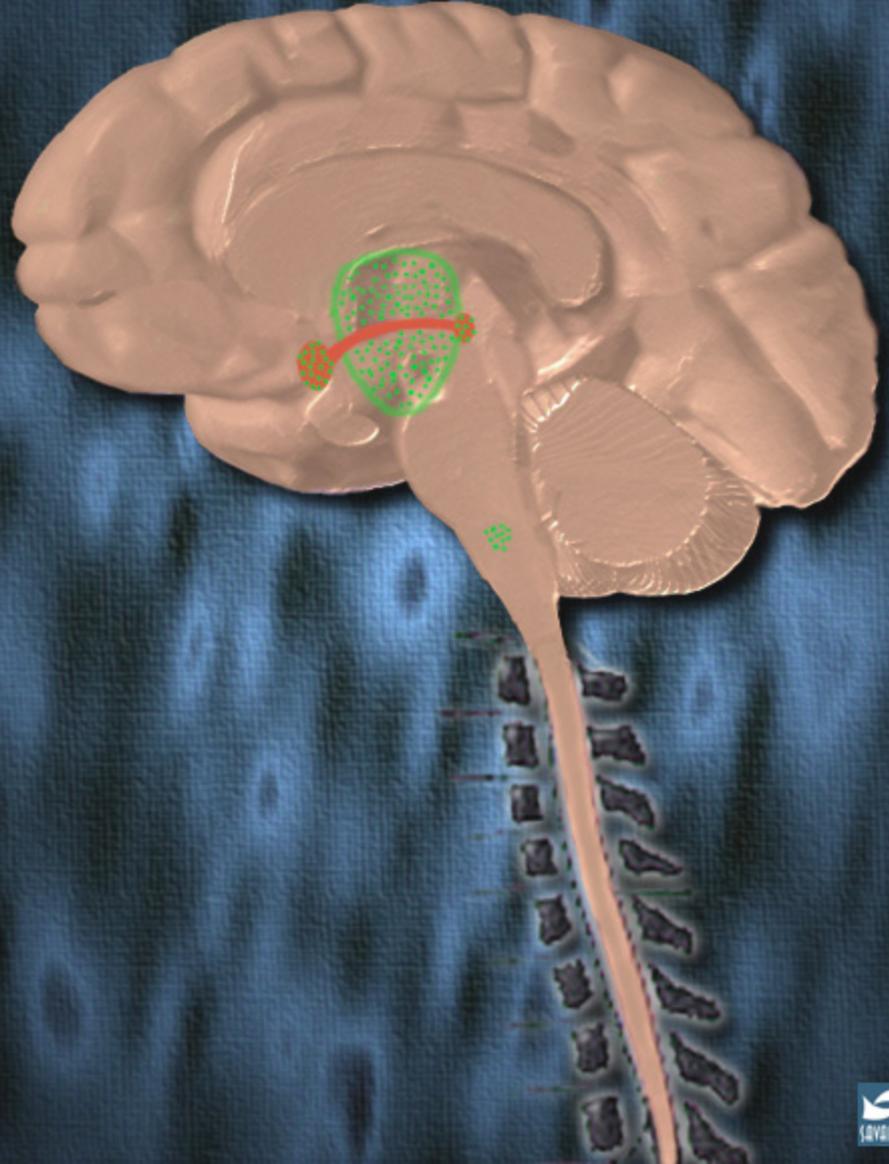
- a higher dose is required to achieve the same effect

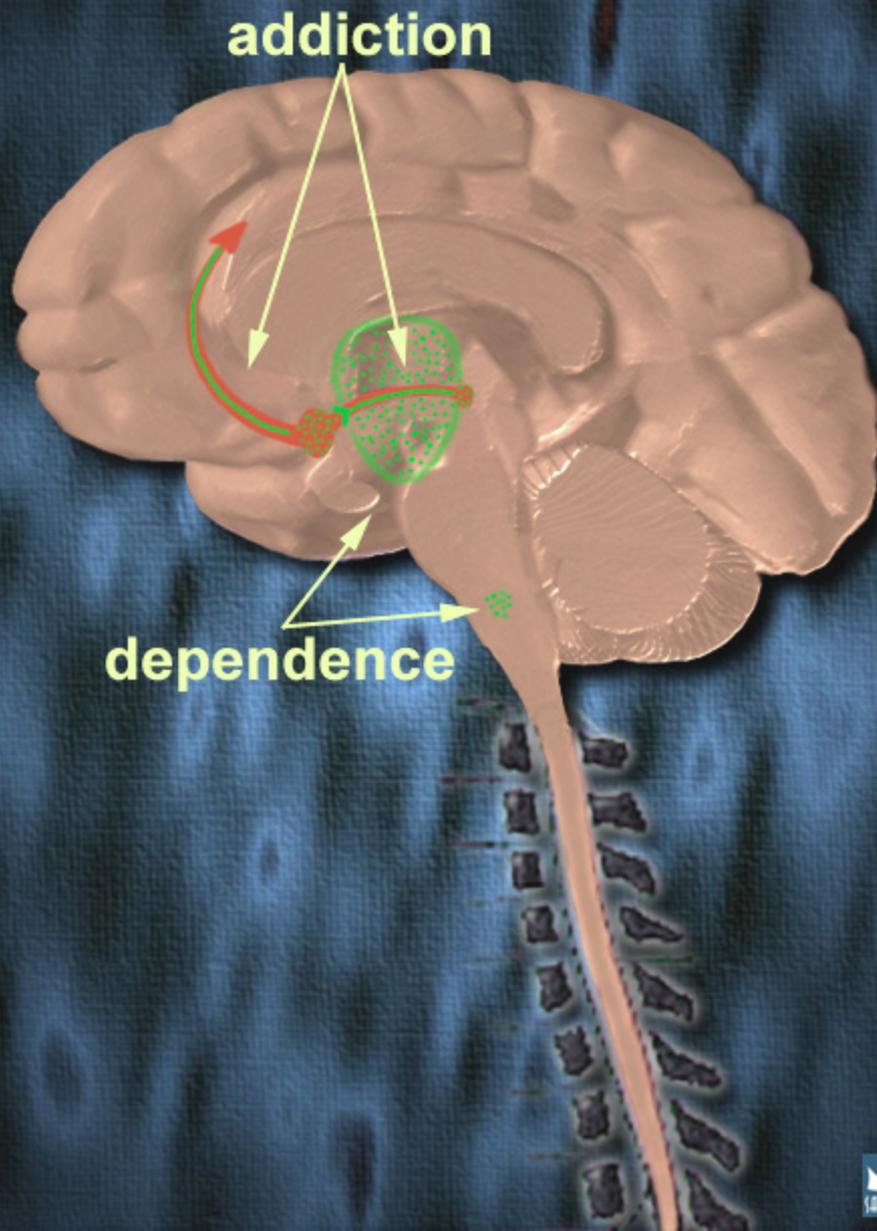


# Dependence

A state in which an organism functions normally only in the presence of a drug

- manifested as a physical disturbance when the drug is removed (withdrawal)

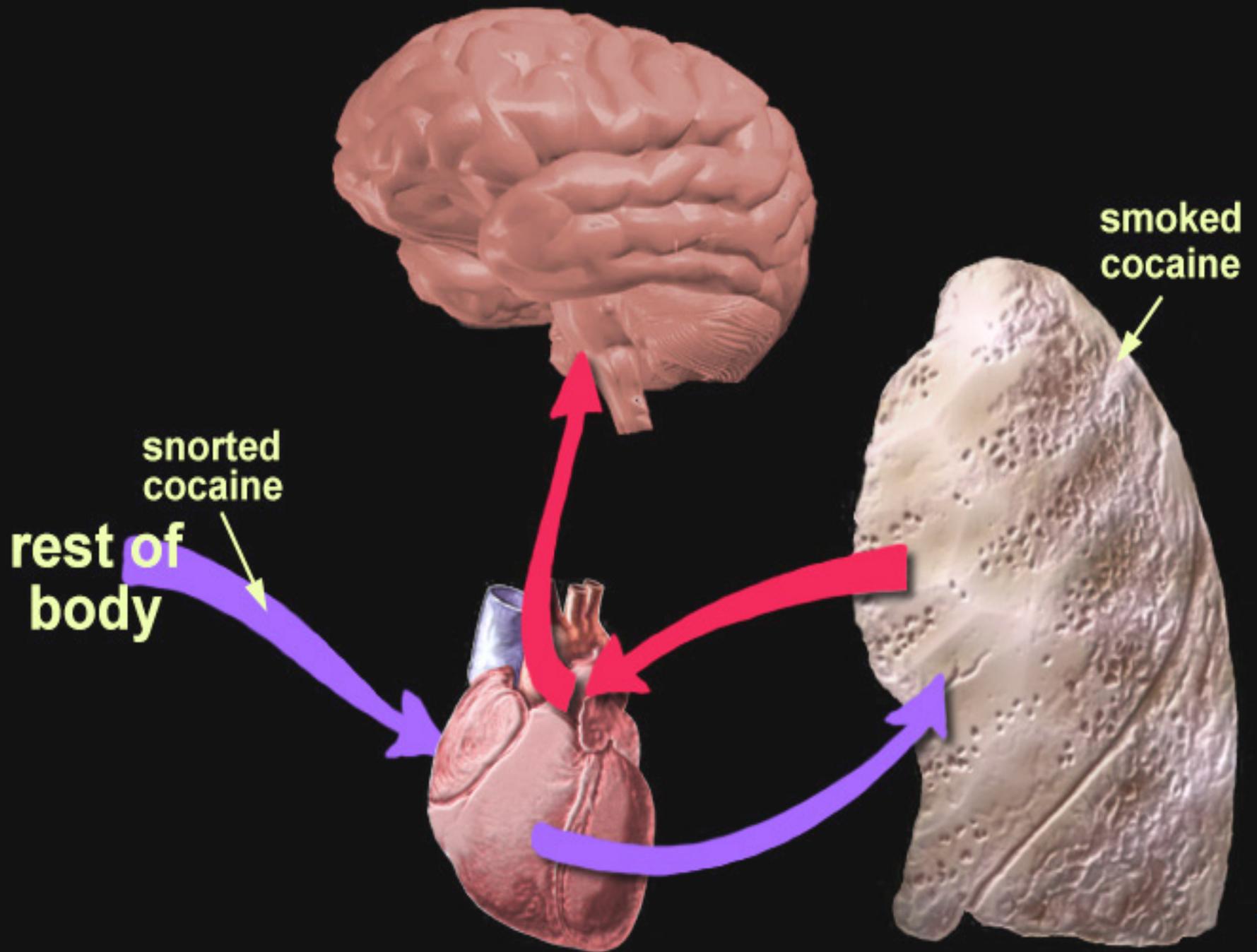




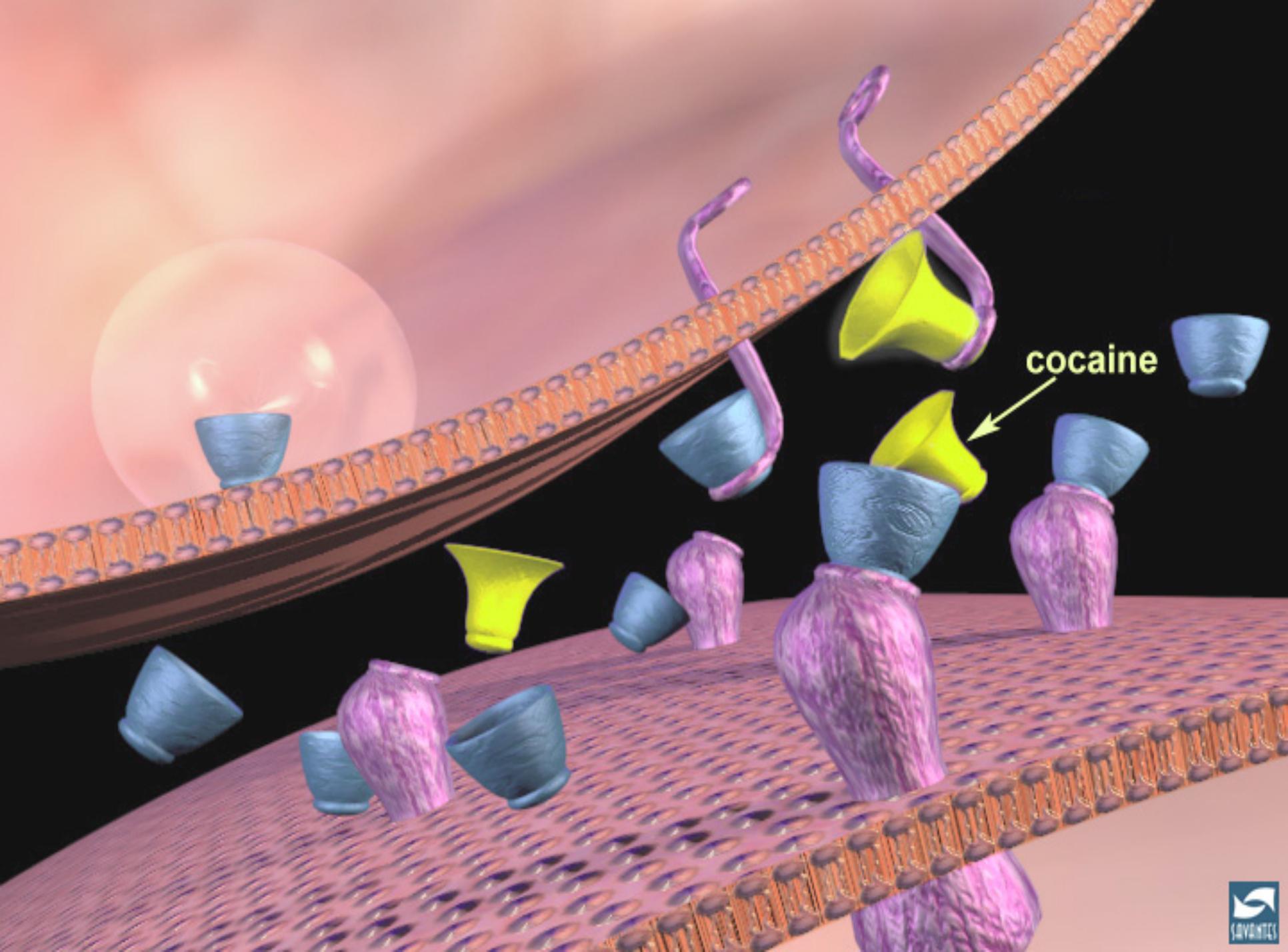
**addiction**

**dependence**

# The Action of Cocaine







cocaine





# Activation of the reward pathway by addictive drugs

