

Neurobiology of Addiction

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Addiction

Compulsive, repetitive use of psychoactive substances or engagement in behaviours that activate and disrupt reward circuits

Distortions in frontal cortex:

- *overvaluing of reward
- *undervaluing of risks to obtain reward
- *lowered ability to connect addictive behaviours to consequences

Genetics

- 50% attributable to genetics
- Different systems involved

Neurotransmitters

Primarily Dopamine: essential neurotransmitter for cognitive functioning and experience of pleasure

Priming

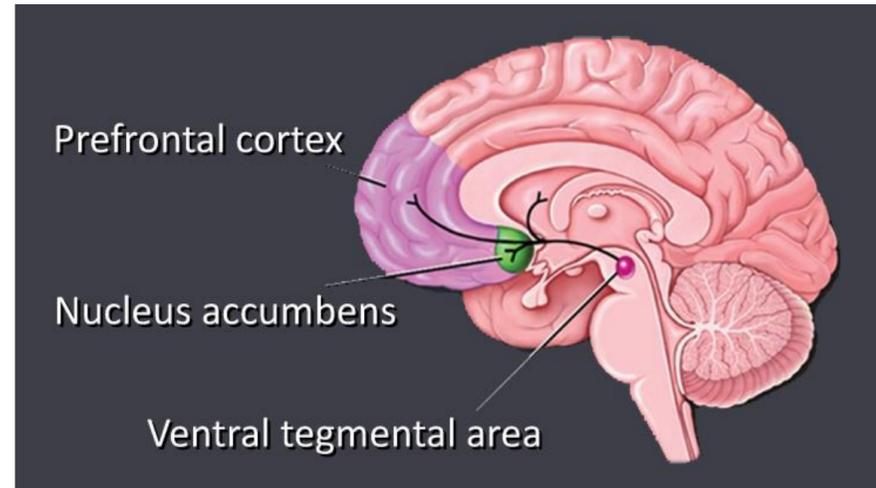
- people associate euphoria of drug use with objects and people associated with the drugs

Tolerance/Dependence

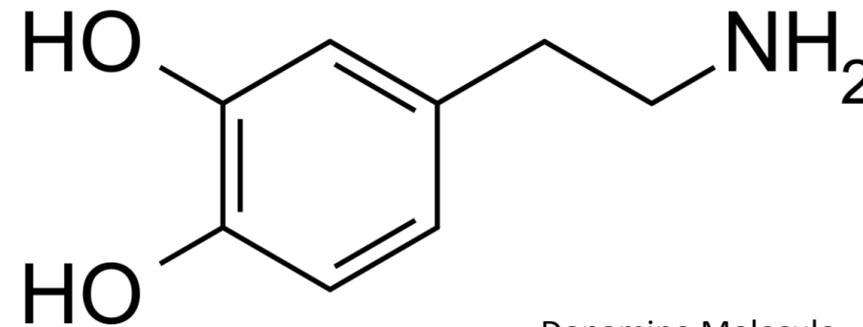
- Dopamine levels rise, causing activation of a protein (CREB) that dampens responsiveness of the brains response system (more drug is needed to elicit a response)

Sensitization

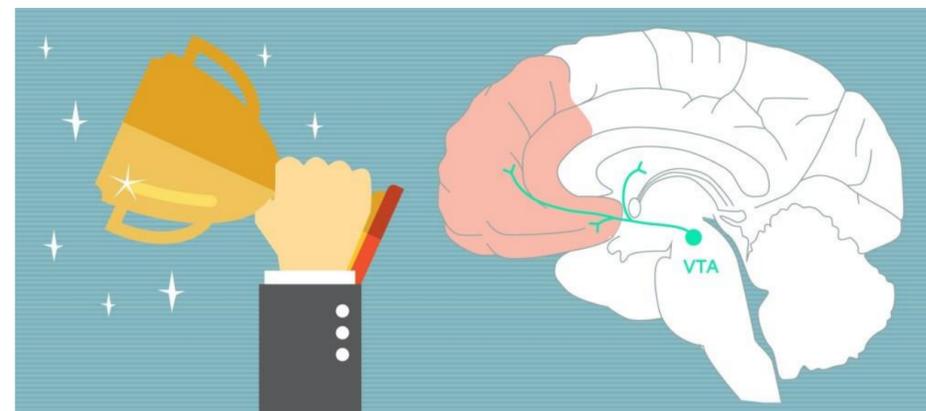
- Heightened response to a substance after a period of abstinence → may increase risk of relapse even after years of abstinence
- Linked to a protein called delta FOSB; increases in this protein leads to increases in the brain's reward activity and remain stable months or years after use has stopped and creates root of hypersensitivity to substances, and often drives cravings



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Addictions has a **progressive, chronic, relapsing/remitting course**

Progression Influences

- Other mental health disorders (schizophrenia, bipolar, depression, borderline personality disorder)
- High risk taking/novelty seeking

Switching to another substance

- Addicted brain
- Cravings
- Compulsive use of similar substance/engage in similar compulsive behaviour that affect brain reward circuits

Loss of control

Impaired functioning leads to social, economic, and physical health consequences; negative effects on family relationships and friendships

Context

Remaining in the same context makes recovery more challenging because of the associations (priming) linking environment to substance use

Biological Processes: Abstinence/relapse cycle is rooted in neuro-chemical processes

How it Presents: Chronic course, affecting mental and physical health, intellectual and emotional functioning, social and occupational function



References

Gutman, Sharon. (2006). Why Addiction Has a Chronic, Relapsing Course. *The Neurobiology of Addiction*. *Occupational Therapy in Mental Health*.