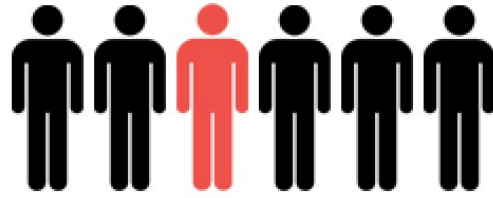


Major Depressive Disorder

1 out of 6 people in the US will succumb to clinical depression during their lifetime



Experiences with MDD

- Depressed mood
- Decreased energy
- Trouble concentrating
- Lost interest in activities
- Guilt or feelings of hopelessness
- Sleep disturbances
- Appetite changes
- Suicidal thoughts or attempts

32 average age of MDD onset

Women are twice as likely to develop MDD

Neurobiology & Neural Circuitry of Depression

Deep brain stimulation

Electrical stimulation of the **subgenual cingulate cortex (Cg25)** or **nucleus accumbens (NAc)** can help patients with severe MDD.

Ghrelin and leptin

Hormones that act on the **hypothalamus (HYP)** and other limbic regions (HP, VTA, and NAc) modulate mood.

Stress

Increases in cortisol levels can reduce the amount of neurogenesis in the **hippocampus (HP)** depressing mood.

Dopamine

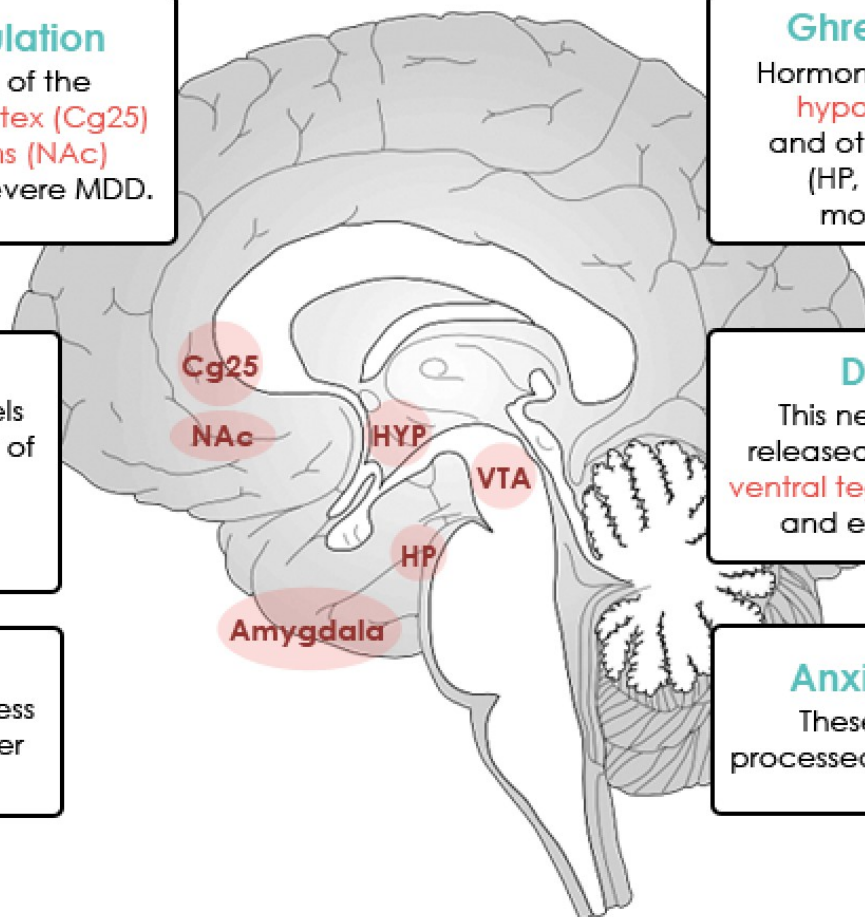
This neurotransmitter is released by neurons in the **ventral tegmental area (VTA)** and enhances mood.

Neurogenesis

People with MDD have less neurogenesis and smaller **hippocampi (HP)**.

Anxiety and Fear

These emotions are processed by the **amygdala**.



Neurobiological studies continue to deepen our understanding of depression (There is hope!)

References and Resources:

Clicker Clip Art: <http://www.clicker.com/clipart-clickr.html>

Global Medical Education: <http://www.gmeded.com/gme-info-graphics/major-depression>

Mayo Clinic: <http://www.mayoclinic.com/health/depression/>

Krishnan V. & Nestler E.J. (2008). The molecular neurobiology of depression, *Nature*, 455 (7215) 894-902.