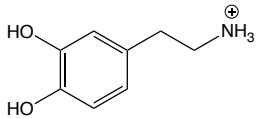


Lecture 12 handouts filled-in and presented by students in the fall of 2024.

Based on the article “Biological Connection to the Feeling of Happiness”, Josmitha Maria Dsouza, Anirban Chakraborty, Jacintha Veigas, Journal of Clinical and Diagnostic Research. 2020 Oct, Vol-14(10): VE01-VE05

a. Dopamine



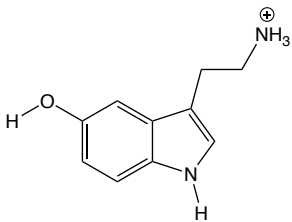
“Feel good” hormone helps you feel pleasure/motivating you to pursue happiness. Achieving even small goals increases dopamine levels.

To boost dopamine:

- Break down large tasks into smaller ones.
- Engage in enjoyable activities
- Eat foods with amino acids
- Exercise regularly
- Get enough sleep
- Listen to music

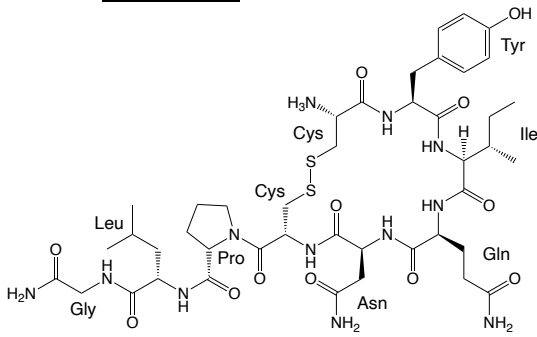
Maintaining healthy dopamine levels are important for fostering happiness and motivation.

b. Serotonin



Serotonin, known as the "confidence molecule", is generally released when you feel significant. Serotonin plays a role in happiness and overall positive moods by increasing optimism and satisfaction levels. It is synthesized from the amino acid L-tryptophan which can be obtained through foods like eggs and cheese, as well as sunlight, exercise, and accomplishment. Anti-depressant meds such as serotonin reuptake inhibitors are commonly used to increase serotonin artificially.

c. Oxytocin



Oxytocin, often called the "cuddle hormone", is a peptide released during physical bonding activities like hugging, cuddling and sexual activity.

- It plays an important role in social bonding, emotional connections, and reproductive behavior
- Negative social interactions & stress can lower oxytocin levels, affecting emotional well-being and relationships

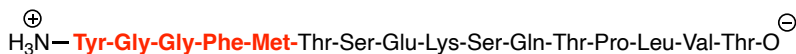
It is synthesized in the hypothalamus, and stored in the pituitary gland

- Oxytocin influences many biological processes (muscle contraction), regulation of social behaviors, and modulation of stress responses.
- A lack of human bonding combined with negative social interaction and loneliness can reduce release of oxytocin and overall happiness.

Those who have strong, healthy relationships with friends and loved ones have more frequent releases of oxytocin and are overall happier. Consumption of protein-rich foods lipids, and minerals increases synthesis, i.e. figs, avocados, spinach

d. Endorphins

α -Endorphin



β -Endorphin

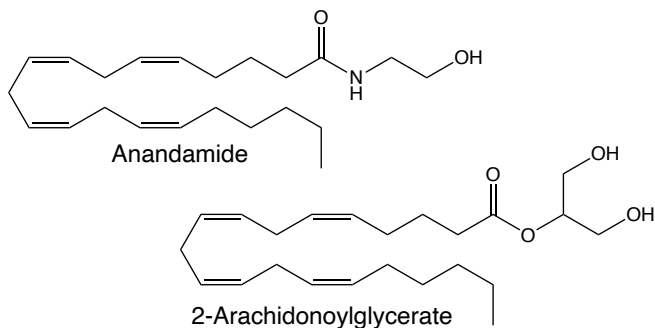


γ -Endorphin



Endorphins are known as "pain killing molecules" since they reduce the feeling of pain and cause positive responses. Endorphins are also a response to high stress levels. Multiple agents induce endorphin secretion which leads to a sustained euphoric feeling. Some examples include exercising in a group, sunshine (UV rays), laughter, and eating certain foods such as dark chocolate & spicy food. Exercising in a group releases more endorphins than exercising in isolation.

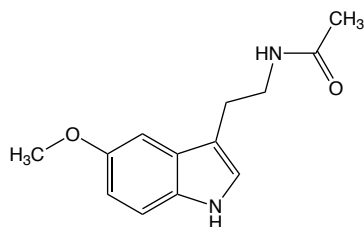
e. Endocannabinoids



Endocannabinoids are self-produced cannabinoids that act on CB1 and CB2 receptors, playing a role in mood, memory, pleasure, and stress management. Anandamide, a key endocannabinoid, is known for promoting feelings of bliss. Stress and various stimuli trigger the release of endocannabinoids, which protect the body from stress by activating brain areas in which cannabinoid receptors are the strongest and most present. Methods to stimulate the endocannabinoid system include exposure to cold, consuming coffee, olive oil, dark chocolate, probiotics, and exercise. These activities can enhance CB1 and CB2 receptors, promoting well-being and reducing stress effects.

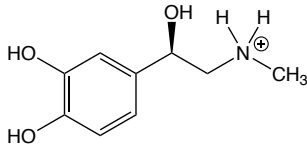
Endocannabinoids, often called the "bliss molecule", are natural chemicals produced by the body that affect CB1 + CB2 receptors, improving mood, memory, motivation and emotional balance. Anandamide and THC from cannabis also affects these receptors, causing feelings of pleasure. When stressed, the body releases endocannabinoids to protect against the effects of stress especially in parts of the brain tied to happiness. Meanwhile, epinephrine, or adrenaline, helps us react to danger ("fight-or-flight") by increasing energy but must be regulated to prevent long-term harm. Techniques like meditation, cold exposure and foods like extra virgin olive oil, dark chocolate and probiotics can boost the endocannabinoid system, reducing stress while promoting well-being.

f. Melatonin



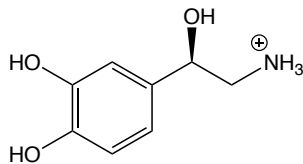
Melatonin is a hormone produced by the pineal, gland that regulates the sleep-wake cycle, with production increasing in darkness to promote sleepiness. Melatonin is affected by age, light, and other environmental and physiological factors. It is related to happiness and increases in the dark, playing a role in depression as well. Things like watching your phone before bed, varying amounts of sunlight intake, meditation, and consumption of different foods can have an influence on melatonin release.

g. Epinephrin



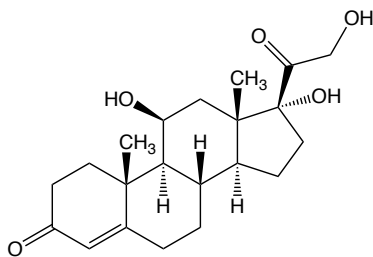
Epinephrine, also known as adrenaline, primarily acts as a stress hormone, triggering the “fight or flight” response. It increases heart rate, blood flow, and energy availability, which can create feelings of alertness and excitement. When one comprehends a situation as dangerous and stressful a sudden release of adrenaline occurs, therefore epinephrine could contribute to happiness by reducing grief and intensifying the capacity to strive despite suffering. To get the epinephrine to act on our call you can go up the stairs, participate in yoga / meditation, and consume a well-balanced diet.

h. Norepinephrine



Norepinephrine is a hormone and neurotransmitter connected to happiness and is involved in the body's “fight or flight” response. Norepinephrine increases heart rate, blood pressure, and energy during stress and helps you stay sharp. High levels of norepinephrine are linked to feelings of delight and exaltation, while low levels are linked to despair. You can boost levels of norepinephrine by eating foods rich in the amino acid tyrosine including cheese, nuts, and meat. Exposure to cold or heat can also increase its levels.

i. Cortisol



Cortisol is the body's stress hormone, where the production and discharge of the hormone is found at the adrenal cortex. Cortisol keeps the body on high alert, thus, high levels of stress lead to increased production of cortisol. As cortisol helps manage how the body uses carbs, fats, and proteins as well as regulates blood pressure and blood sugar levels, long-term high levels of cortisol (caused by extreme stress, overconsumption of alcohol, etc.) can have negative effects such as weight gain and a weakened immune system, cortisol is best a for us at a balanced level, because too much or too little is harmful. Good cortisol levels can be attained through good diet, good sleeping practice, And restricted use of screentime before bed.

j. Genetics of Happiness

Genetics play a significant role in our happiness, contributing about 35 - 50% to our overall well-being. Research on twins has shown that around 50% of the variation in happiness is linked to genetic factors while further studies indicate that this heritability can rise to about 80% over time. The two key genes associated with happiness are 5-HTT gene (affects serotonin transport) and the MAO-A gene (mood regulation). Individuals with the Long (L) allele of the 5-HTT gene report significantly Higher life satisfaction, while those with low-activity variant of MAO-A gene tend to express greater happiness, specifically among women. These highlight the strong influence of genetics on our emotional well- being.

k. Anthropometric Typology

Anthropometric typology classifies individuals based on physical measurements, such as body shape, size, and composition. Bodily good-looking people are perceived as more friendly and socially proficient than physically unattractive people. Individuals who feel positive about their body type usually report higher levels of happiness. Conversely, those dissatisfied with their body may experience lower self-esteem and increased mental health issues.