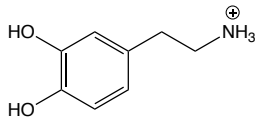


Lecture 12 handouts filled-in and presented by students in the fall of 2023.

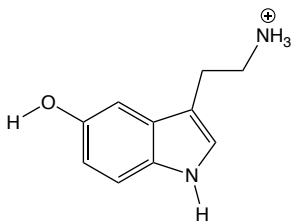
Based on the article “Biological Connection to the Feeling of Happiness”, Josmitha Maria Dsouza, Anirban Chakraborty, Jacintha Veigas, Journal of Clinical and Diagnostic Research. 2020 Oct, Vol-14(10): VE01-VE05

a. Dopamine



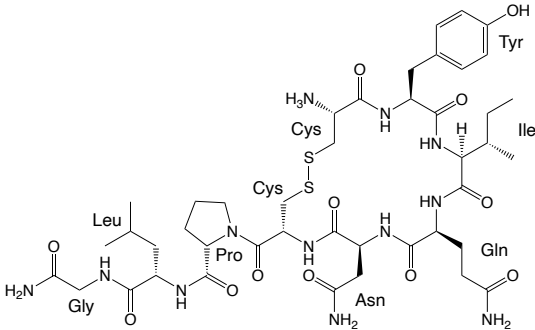
Dopamine is the primary reward molecule in the brain . Many things trigger its release: protein-rich foods, acts of affection, exercise and accomplishments. The key to increasing dopamine levels is to fragment big goals into smaller units so that fulfillment from each goal occurs. Amino produce dopamine and can be obtained by protein abundant foods such as eggs and dairy, and foods such as saturated fats (butter) decrease dopamine signals. However, huge dopamine rushes can lower the brains sensitivity to the neurotransmitter and make it harder to reach the “happy” threshold of dopamine. (Stay tuned, the class is about to dive into this in a BIG way!) This neurotransmitter is also a great motivational force. Humans will chase it as is seen negatively with addicts or positively with athletes.

b. Serotonin



The confidence molecule known as serotonin is responsible for one’s feeling of satisfaction, happiness and optimism. Serotonin increases when we feel significant, as such, an example is when one completes a challenging task, bolstering self-confidence and fulfillment. On the other hand, isolation and feelings of sadness reduce serotonin. Reduced serotonin levels are correlated to counterproductive activities, some of which include illegal activities like gang activities. Knowing such, one would ideally like to increase their serotonin levels by such activities as regular workouts, 10 to 15 minutes of sunlight exposure, fiber-rich diets, massage therapy and as stated before, setting and completing challenges for one’s self.

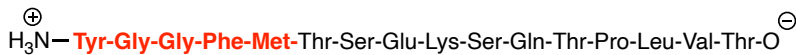
c. Oxytocin



Oxytocin, also known as the “love hormone” is released in the brain when we show acts of bonding and trust with another person. Giving hugs, showing honesty, developing faith and integrity cause oxytocin to be released. Foods such as avocados, watermelon spinach etc. can increase oxytocin production. Oxytocin can be thought of as the glue that keeps healthy relationships together, as its accountable for love, loyalty and honesty. However, harmful encounters such as insults can reduce oxytocin levels. Oxytocin can also be released with activities such as giving someone your full attention, meditation, staying in touch (even through social media), petting a dog and memorable experiences.

d. Endorphins

α -Endorphin



β -Endorphin

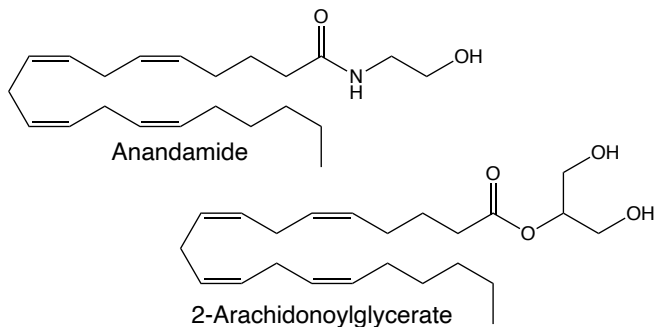


γ -Endorphin



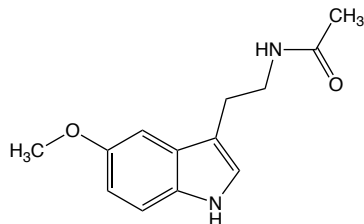
Endorphins are molecules that are known to alleviate pains. They lessen the perception of pain and trigger a positive response as a “self-produced morphine”. The hypothalamus and pituitary gland manufacture endorphins. Endorphins resemble opiates in their chemical makeup. Endorphins are released during high stress levels and physical pain and tranquilize the brain in order to induce happiness. Things such as UV rays, exercise, pain and even laughter can aid in the release of endorphins.

e. Endocannabinoids



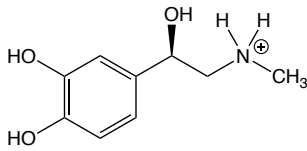
Endocannabinoids are known as the “bliss molecule” and represent a self-produced cannabis. They help improve mood, emotion, memory and motivation, demonstrating a bond between endocannabinoids and emotional situations. Stress-like trauma and emotional strains are responsible for the secretion of endocannabinoids that go on to defend the body from the negative consequences of stress. Cold temperatures, sipping coffee, probiotics and exercise can all stimulate the endocannabinoid system by upregulating CB1 receptors.

f. Melatonin



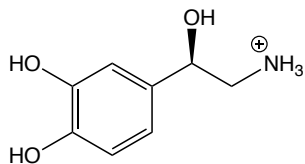
Melatonin is a hormone that is connected to the body’s readiness to sleep. Factors like age and light, and other environmental factors can affect the amount being produced. Melatonin levels increase in the dark, it helps in relaxation which aids the restorative process that happens when we sleep. Light plays an important role in the production of melatonin, such as watching a phone or electronic gadget before bed, as it decreases melatonin discharge. It is the shorter (blue) wavelengths of light that decrease melatonin levels, so you should avoid blue light from devices before going to sleep. Interestingly, the sun’s natural radiance leads to early melatonin production and allows for a good sleep.

g. Epinephrin



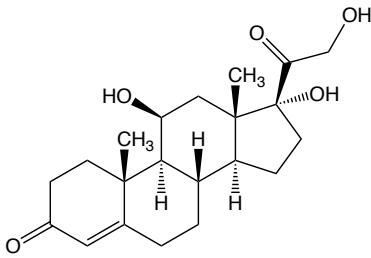
Epinephrine, also known as adrenaline, is the “energy molecule”. It is produced in reaction to intense stress and also stimulates the “fight or flight” response. Through epinephrine release, the body reacts by increasing the heart rate and raising oxygen consumption in the tissues, while also declining insulin release from the pancreas to support the liver. As you approach a dangerous situation, the increased levels of the epinephrin molecule will make you “go”, while getting rid of any uneasiness feelings. The information of the situation is sent to the amygdala which then signals the hypothalamus to connect to the adrenal medulla to release epinephrine. If you signal or your body signals this rush too much, then your blood vessels could be damaged, but you can use some tricks to keep it under control like yoga, meditation, sharing and a well-balanced diet.

h. Norepinephrine



Norepinephrine is a neurotransmitter synthesized inside nerve axons. Higher concentrations of norepinephrine lead to delight and exaltation, while low levels lead to despair. Norepinephrine also helps a person to be sharp in times of danger. Balanced norepinephrine levels can be achieved by eating foods that contain the amino acid tyrosine. Both cold exposure and heat exposure (such as a sauna) increase synthesis of norepinephrine by two/three-fold within minutes.

i. Cortisol



Cortisol, also known as the stress hormone, is a marker for depression and allows a person to be on high alert. A natural equilibrium of cortisol makes us feel confident and stable. Having too much or too little can cause illnesses such as rapid weight change, fatigue and muscle weakness. The best ways of securing an equilibrium of cortisol is having good sleeping habits, reducing screen time before bed and a diet with lots of vegetables. Immediate reducers of cortisol include meditating, yoga, spending time in nature and listening to music.

j. Genetics of Happiness

Genetics contribute to about 35% - 50% of human happiness. Retests of twins have demonstrated that 80% of well-being is hereditary. Genes linked with happiness include 5-HTTLPR and MAO-A. The 5-HTT gene codes for serotonin transporters and has a long(L) or short(S) allele. Two long alleles leads to more contentment, a long and short or two short alleles leads to less contentment. The MAO-A gene is involved in mood management because the gene product is an enzyme catalyst that breaks down serotonin, dopamine, epinephrine and norepinephrine among other substrates. Low activity of MAO-A is associated with inappropriate aggressiveness and other disorders.

k. Anthropometric Typology

Anthropometric typology describes a correlation between physical attributes of individuals and happiness. Ectomorph humans, or those described with lean, delicate bodies are often fragile, capable, confident, and more vulnerable to schizophrenia. Those who are considered physically beautiful are often preferred as companions and carry positive attitudes. Bodily good-looking people are perceived as more friendly, authoritative, and mentally and socially sound than unattractive people. Bias in beauty is even displayed in schools, where tutors perceive a charming child as automatically intelligent.