Writing Assignment #4
BIOL 294
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The article titled “Why some people don’t feel the buzz of caffeine” moderately details the effects caffeine has on different people and why. The causes of caffeine sensitivity relate to particular genes found in certain people. These genes can affect how the body responds to caffeine by producing enzymes and receptors within the brain that break down and regulate caffeine as it is introduced to the body. The CYP1A2 gene is responsible for that enzyme. The number of copies of this particular gene is what determines the amount of the enzyme produced, thereby affecting the rate at which caffeine is broken down. The receptors mentioned are adenosine receptors. Before the CYP1A2 gene instructs the enzyme to begin breaking down the caffeine, these receptors must first alert the body to the presence of caffeine within the system. The body produces these receptors based on caffeine consumption and, in some cases, the instructions from the genome. Rather than developing a tolerance to caffeine like in the first instance, the body’s genome naturally has an excess number of receptors. This causes the body to require a larger quantity of caffeine before these receptors can become bound. This information allows the article to shift to how caffeine and the effects from the genetics regulating caffeine intake and metabolism affect the physical health of a person. These factors cause the body to be sensitive to caffeine, have a medium sensitivity, or be highly tolerant to caffeine. In discussing health, sensitivity to caffeine is a beneficial trait. When a person is tolerant or highly tolerant of caffeine, their intake will generally be higher. A higher intake of caffeine is more likely to increase the risk of heart and kidney problems, among other conditions. The body’s health relates directly to the level of physical activity it can maintain. People who metabolize caffeine quickly due to genetics, minimal caffeine intake, or both are able to utilize the drug efficiently, benefiting them through the timely breakdown that produces a quick release of energy. This timely manner of reacting to caffeine prevents the body from harboring the drug for a prolonged period of time which can lead to the side effects mentioned above. However, those without the necessary factors to allow for this expedited caffeine breakdown, are found to hold caffeine for a longer period of time within the body. While this may not affect the physical wellbeing of someone initially, repeatedly consuming caffeine prevents the body from properly maintaining these systems, leading to health problems. The gene affecting how the body manages caffeine is something that nutritionists are beginning to test for through certified genetic companies. Testing for the CYP1A2 may increase due to the effects caffeine has on certain medications used to treat behavioral disorders like ADHD.

The review article used to confirm information within the popular article, “Novel insights on caffeine supplementation, CYP1A2 genotype, physiological responses and exercise performance”, began by supporting the statements made on adenosine receptors and their relationship with caffeine. By “blocking” these receptors, caffeine intake does result in the

effects typically associated with adenosine antagonists, such as the promotion of alertness. The article then immediately mentions the effects of caffeine on exercise. However, in this particular topic, the article displayed differing results. There are studies showing that caffeine is beneficial in some areas, while others show that depending on the traits and activity of the person studied, caffeine is not beneficial. This relates to the popular article's mentioning of those with a slower metabolism of caffeine not reaping the benefits of caffeine regarding exercise. The review article confirms this by mentioning the caffeine-metabolizing enzyme's levels affected by the CYP1A2 gene. The review article mentioned that this gene, while the focus of this particular popular article, is not necessarily the only gene to take part in the regulation of caffeine within the body. As the review article continues to discuss exercise, it goes into some detail regarding the health issues caused by caffeine. The popular article mentioned that prolonged exposure to caffeine will cause vasodilation. In particular, the review article mentions the effect of vasodilation on the heart muscles, leading to heart problems, as discussed in the popular article.

These articles both cite a particular primary article and study that initiated the writing of the popular article. While the review article did support many of the statements made by the popular article, the review article cited studies that presented a broader and sometimes different view of the topic.

References

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