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Chemistry 162 Honors

My Interest in Science

Science has the capacity to explain the world around us, as well as the capacity to help us understand the world within us. The latter is what I am most intrigued by. My goal in studying science is to better understand how the human body works and how its functions relates to our lifestyle choices, specifically in the realms of nutrition and fitness. I want to help everyday people (as opposed to athletes) make the best lifestyle decisions in order to function optimally.

Our individual life choices shape how we interact with the world, and I believe that the world would be a happier and kinder place if we all practiced healthier habits. I have also seen family members battle health issues and how crippling that can be. I think it's important to be informed about the vessels we live. So many processes are happening in our bodies that we are unaware of. Learning more about them can help each of us appreciate our bodies more and view them more positively.

More than anything, I am curious about how different foods impact us. For instance, many people are a fan of soaking or sprouting their grains before eating them. Does soaking grains in an acidic solution before cooking them decrease bloating, a heavy/tired feeling, or a stomach ache for those that experience those symptoms after eating conventionally processed grains? I hypothesize that, in the majority of cases where people report having trouble digesting grains, soaking decreases such symptoms because

it partially breaks down the substances in grains (which are a kind of seed) that are meant to protect these seeds from being digested and destroyed.

I am especially fascinated by how our diets can impact mental health. After hearing several reports that people with conditions such as depression, anxiety, ADHD, and OCD have benefitted from eating more healthfully, one question I am led to ask is: could eating more vegetables alleviate symptoms of depression? Based on anecdotal evidence alone, I would say yes, eating more vegetables would help alleviate depression, not just because of the nutrients in the vegetables, but also because the pursuit of eating vegetables usually leads people to be more conscious of what they are eating and thus enables them to gain a sense of accomplishment by taking control of what they're consuming and doing something they believe is healthy for them.

Beyond anecdotal evidence, there is also scientific evidence that magnesium—which can be found in leafy greens, along with whole grains and nuts—can help those who battle depression. A study in *PLoS ONE* (Tarleton, Littenberg, MacLean, Kennedy, & Daley, 2017) tested whether over-the-counter magnesium supplements improved patients' depression symptoms. The depression of adults with mild-to-moderate symptoms was assessed using the Patient Health Questionnaire-9. During the next six weeks, they all took the same Mg_2Cl supplements every day with an average of 86% consistency. After those six weeks, their perceived symptoms were assessed again, and they had improved significantly (Tarleton, Littenberg, MacLean, Kennedy, & Daley, 2017). Another study in *Nutrition* found similar results when giving depressed, magnesium-deficient patients magnesium oxide supplements (Rajizadeh, Mozaffari-Khosravi, Yassini-Ardakani, Dehghani, 2016). I found the design of this experiment to be

especially reliable because their control was a placebo group, and the magnesium oxide was found to be more effective at relieving symptoms than the placebo (Rajizadeh, Mozaffari-Khosravi, Yassini-Ardakani, Dehghani, 2016). Since there are foods rich in magnesium, I am now especially curious about whether the results of these studies could be replicated using changes in patients' diets instead of supplements.

However, I cannot just promote health by understanding the biological and chemical processes in our bodies. I must also understand how people think about health, which is why I am interested in the psychology of the decisions we make. For example, I wonder: do the lifestyles of the people someone lives with impact his or her own lifestyle choices? I hypothesize that yes, our lifestyle choices are impacted by the people we live with. These "lifestyle choices" can range from how much sleep we get, to whether we drink alcohol, what we eat, and how often we exercise. However, our relationship with the people we live with can determine how strongly we are influenced by their behavior. The choices I make about my health are more strongly impacted by my mother and the time I spend living with her than they are impacted by my roommate. That said, seeing my roommate workout and go to bed earlier do motivate me to do the same.

In today's world, it is becoming more and more common for people to be motivated not just by those in their "real" lives, but also by those online. A study in published in *Preventive Medicine Reports* (Zhang, Brackbill, Yang, & Centola, 2015) found that the content we interact with online can impact how often we exercise. In this experiment, college students who were all at the same university were put into three groups: one group, the control, was given a simple online program that allowed them to sign up for weekly fitness classes at the university; the second group was given the same

basic online program but was also sent online messages each week promoting physical activity; and the third group participated in an anonymous online group of four to six other people who were signing up for fitness classes, as well, and they could view their peers' progress (Zhang, Brackbill, Yang, & Centola, 2015). While both experimental groups enrolled in more classes than the control group, the people who were part of the online community had the greatest increase in class enrollment, compared to their original levels of attendance (Zhang, Brackbill, Yang, & Centola, 2015). This suggests that online peers can have an impact on how likely someone is to exercise.

Clearly, scientific research has a lot to offer when it comes to our health and health promotion. My interest in science mainly stems from my interest in people and my desire to know how our bodies and minds work. I hope that by the end of college I will be equipped to spread knowledge of the sophisticated science that is happening within us.

References

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