Dear Editor,

Please find enclosed a modified version of my Newspaper Science Column manuscript “A Study in Genomics”. To address the concerns and comments raised by the 3 reviewers, I made the following changes to improve and clarify the manuscript. It is my hope that these changes make the manuscript acceptable for publication in Microreviews in Cell and Molecular Biology.

Sincerely,

Abigail Peters

Reviewer 1:

1. Comments made by reviewer 1 were not helpful, there were no edits in the review.

2. No changes were made based on the comments by reviewer 1 because no edits were prompted by reviewer 1’s comments.

Reviewer 2:

1. Reviewer 2’s comments were slightly helpful, there was not much clarity in the comments made but I think I understand what they were trying to say.

2. Additional text was added to the last paragraph of the manuscript to give the paper the feeling of “finality” that reviewer 2 is looking for.

Reviewer 3:

1. Comments made by reviewer 3 were not helpful, there were no edits in the review.

2. No changes were made based on the comments by reviewer 3 because no edits were prompted by reviewer 3’s comments.

A Study in Genomics

Dr. Darren Hagen is a professor of genetics at Oklahoma State University. He comes from a line of teachers, and as he progressed through high school his goal was to become a public school teacher, just like his family. That was until he took a genetics course during his time as an undergraduate. The subject clicked and Hagen found a passion that he decided to chase after. This is what led him to eventually conducting research and teaching at the university level; “I loved the challenge of research. Nature has had a billion years to evolve and set up rules and when we’re doing research we’re trying to figure those rules out.” Hagen is involved in research that generally surrounds genomics. Genomics is the study of the functional genome, which is mainly focused on specific elements within the genome such as genes, promoters, enhancers, and many other things that are involved in genomic processes. Many of Dr. Hagen’s published works revolve around genomics and all warrant interest. However, there is one work that stands out in particular. It is titled “Progesterone Effects on Extracellular Vesicles in the Sheep Uterus,” and is especially interesting because it also looks at how progesterone, a sex hormone, promotes growth and implementation of pregnancy. The study while done on sheep is also thought to be applicable to humans. Specifically, this study focused on progesterone treatment and the prevalence of extracellular vesicles (EV). This could be compared to a taxi for proteins inside of an organism. It was found that an increase of progesterone is related to an increase of these extracellular vesicles and in a larger picture, growth of the fetus. This is a small example of how genomics is involved in our everyday lives.

The genome of mammals has intrigued scientists for years. It has been developing through evolution for millennia before scientists even knew there were processes happening in the body that we have no control over. Recently, genomics has been a hotbed for activity both in the lab and as a discussion around the dinner table. Companies such as 23 and Me have cornered the market on “at home” genetic testing. As doctors move towards a more personalized approach to medicine, it is widely believed that having the knowledge of what your genes are coding for will be helpful. These tests look at genetic markers in DNA and are able to give the person being tested an idea of what their genome suggests in terms of traits, familial history, and diseases that may develop in the future such as Alzheimer’s. When asked about this subject Dr. Hagen had a slightly different view, “… I’m not so sure I want to know my future health and well-being as suggested by my genome… I’m not sure how I would handle knowing that my family might have to take care of me… That sounds gut-wrenching to me.” Genetic testing is a very personal decision and one that should not be taken lightly.

Much of the information that is provided through genetic tests by companies such as 23 and Me, use past tests on genes to inference what it could mean at a larger scale. When individuals see that they have tested positive for genes associated with Alzheimer’s or breast cancer it can lead to a panic. When scientific tests are taken at home people read everything there is about the subject until they believe they are an expert. Hagen shared an anecdote about his aunt, “…You would think she’s the leading expert on heredity. She can tell me about how this disease or that trait was passed on to whom because they were a certain sex, or whatever. This is one of the times I think a little knowledge is dangerous… I’ll never hear the end of her expertise.” In scientific experiments, it is often said, “correlation does not equal causation,” and when genetic tests are not done through a professional some of these ideas can get lost and cause panic. But, from the perspective of using this information for studies on genomics in the future, individuals getting their DNA tested leads to a large increase of data that can be backlogged and used in the future to start figuring out how genetics may cause certain diseases, instead of simply tracking associations. The future for studies such as this is bright, there is a large variety of people taking this test. It is a company that has a global reach and hopefully with enough tests and enough time, strides towards finding causes for these different genetic diseases can be taken.

Reference

Gregory W Burns, Kelsey E Brooks, Eleanore V O’Neil, Darren E Hagen, Susanta K Behura, Thomas E Spencer, Progesterone effects on extracellular vesicles in the sheep uterus, Biology of Reproduction, Volume 98, Issue 5, May 2018, Pages 612–622, https://doi-org.argo.library.okstate.edu/10.1093/biolre/ioy011