

#### Genetics Assignment 4

The primary article I choose to review is called Deciphering osteoarthritis genetics across 826,690 individuals from 9 populations (Boer, 2021). The purpose of this article's experiment is to analyze the human genome in 826,690 individuals from 9 populations to try and find a genetic link among people who suffer from various forms of osteoarthritis. I decided to review this article because it is a prominent part of over 32.5 million U.S adults and seriously inhibits their quality of life (CDC, 2020).

First, lets define exactly what osteoarthritis is. Osteoarthritis is the degradation of cartilage in the joints. Osteoarthritis can affect any joint in the body but is most found in the joints of the hands, knees, and hips. The symptoms include aching, swelling, stiffness, and decrease in range of motion (CDC, 2020). There are patterns that can be drawn up when looking for links between people who suffer from osteoarthritis. For example, two common causes of osteoarthritis are genetic heredity, where someone is born with a higher likelihood of getting it from their family history, and obesity. People who are obese put a lot of extra pressure on their joints which cause damage over time.

As previously mentioned, this article studies the human genome to search for a genetic link between people who suffer from this disease with the hope of developing a treatment plan. The 826,690 individuals studied in this experiment come from all different backgrounds and only 177,517 individuals suffer from osteoarthritis (Boer, 2021). It is important to look at people who don't suffer from the disease, so the scientist have something to compare their results to. The main grievance the authors of this article had was that the current procedure for treating their patients was pain tolerance. The doctors focused on treating the symptoms instead of looking for a more long-term solution. The author's proposed solution is a drug related solution. They found 637 potential genes that could be a druggable site of treatment. These 637 genes were found through a precise method of, "fine-mapping," and, "functional analysis." Of the 637 genes, 205 were found to be in the druggable genome database and 10 were previously studied in clinical trials for similar symptoms to osteoarthritis. There were over 70 different types of genes that were possible candidates for osteoarthritis treatment (Boer, 2021).

Weight was also another huge factor to the advancement of osteoarthritis. Joints like the knees and hips are at a bigger risk of damage due to excess weight from an obese patient. The obvious solution to alleviate joint pain due to being obese is to lose weight, but it doesn't mean that your joints are fixed. Once they are damaged it is very difficult or even impossible to fix. That is where the drug treatment comes into play. If the patient can mix a healthy lifestyle and prescription drugs that were developed through targeting specific genes and provide anti-inflammatory properties and much needed pain relief.



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### References

Boer G. Cindy, et al. Deciphering osteoarthritis genetics across 826,690 individuals from 9 populations. *Nature*; <https://doi.org/10.1016/j.cell.2021.07.038> (2021).

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