

Results: Using my completed `gene_finder.py`, I found five candidate proteins in X73525.fa. I ran these candidates through Protein BLAST and found that they were all real genes, proteins from the salmonella bacterial disease. Using BLAT, I learned that the first two candidates I found best align with the Manatee, while the third best align with humans. Based on these findings, I would expect the candidate proteins I found to come from either manatees or humans. The first candidate is “involved in a secretory pathway responsible for the surface presentation of determinants needed for the entry of *Salmonella* species into mammalian cells¹” while the second candidate is an enzyme “that catalyzes the hydrolysis of a phosphate bond in ATP to form ADP².” If I remember correctly from biology class, that means it is an enzyme that uses up ATP by stripping away one phosphate group, therefore creating ADP.

Reflection: In the “real world,” gene finding technology and genome sequencing have been, in my opinion, some of the largest innovations in biological technology in a very long time. When used correctly, they can determine risk for diseases, ancestry, “genetic weight,” and much more. In the medical field, using DNA and gene finding technology to better understand patients and their medical histories and futures is incredibly powerful: we can already determine risk factors for cancer and other diseases using DNA, and we are likely to find new uses for the technology in the future. However, this technology must be used carefully. It is not perfectly accurate, because its accuracy depends on previously acquired data and a series of educated guesses about which genes contribute to which diseases, so drawing conclusions from DNA interpretation is still not a foolproof process.

I imagine a future version of my gene finder to be a combination of a gene finder and a Protein BLAST application that would enable users to input their genomes and receive a list of diseases and probabilities that they would develop these diseases during their lifetimes.

¹ <https://www.uniprot.org/uniprot/P40699>, accessed 2/9/2020

² <https://www.tocris.com/pharmacology/atpases>, accessed 2/9/2020