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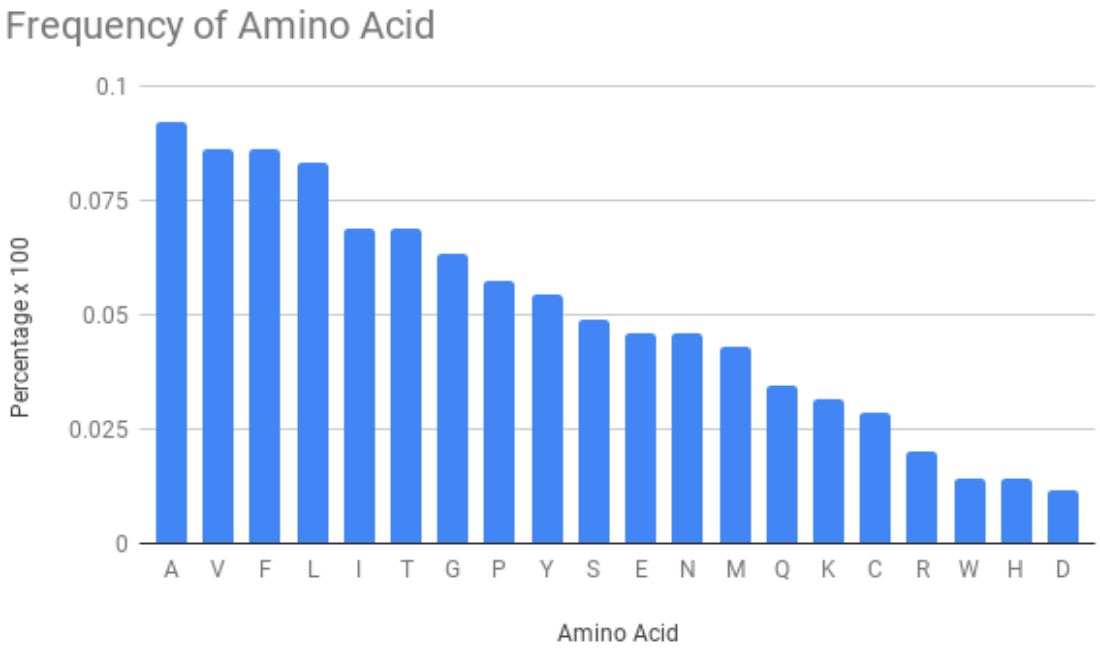
Part 1

1. There are more than 47,000 results that came up for the Rhodopsin protein with differing gene names, organism and length.
2. There are only 500 reviewed entries, while the remaining entries are still unreviewed.
3. For homo sapiens (humans), the total reviewed entries are 87, while there are still 28 unreviewed entries.
4. The entry for human Rhodopsin is P08100, and the length is 348.
5.
    a. The primary function of the rhodopsin is to act as a photoreceptor required for image forming vision at low light intensity and cell viability after birth. It also triggers conformational change that activates signaling via G-proteins.
    b. It is found mostly in the retina, and also expressed in 87 organs.
    c. Retinitis pigmentosa 4(RP4) and Night blindness, congenital stationary, autosomal dominant 1(CSNBAD1)

Part 2



3.

4. The most frequent amino acid is the Leucine, and the least frequent is the Cysteine. When you compare the two bar graphs, the distribution is quite similar, with the most frequent amino acid appearing around 9-10%, while the least frequent amino acid is from 0-2%.

Part 3

2. There is a difference when the window size is set to 5 and 20. First of all, we have more data that is revealed when the window size is smaller, because the set intervals are reduced. Regarding the shape of the graphs, the smaller window size gives more accuracy about the scores throughout the sequence. For the larger window size, there seems to be more positive

hydrophobic scores than negatives, while the smaller window of 5 have a larger portion that have a negative score(although it is less than 50%).

3. The seven transmembrane helices begin from 37-61(length of 25), 74-96(23), 111-133(23), 153-173(21), 203-224(22), 253-274(22) and 285-309(25). One of the first observations that can be seen about the transmembrane helices is the length. They are all quite similar in length, ranging from 21 to 25 in all 7 positions. Furthermore, the average hydrophobicity of the TM positions seems to be positive, when compared with the hydropathy plot at window size set to 20.