BIO 310 HW1

Alper Bingol - 23661

Part 1.

1. 49491 total results.

2. 512 reviewed, 48979 unreviewed entries.

3. 87 reviewed entries for Homo sapiens.

4. Entry is P08100, length is 348.

5.

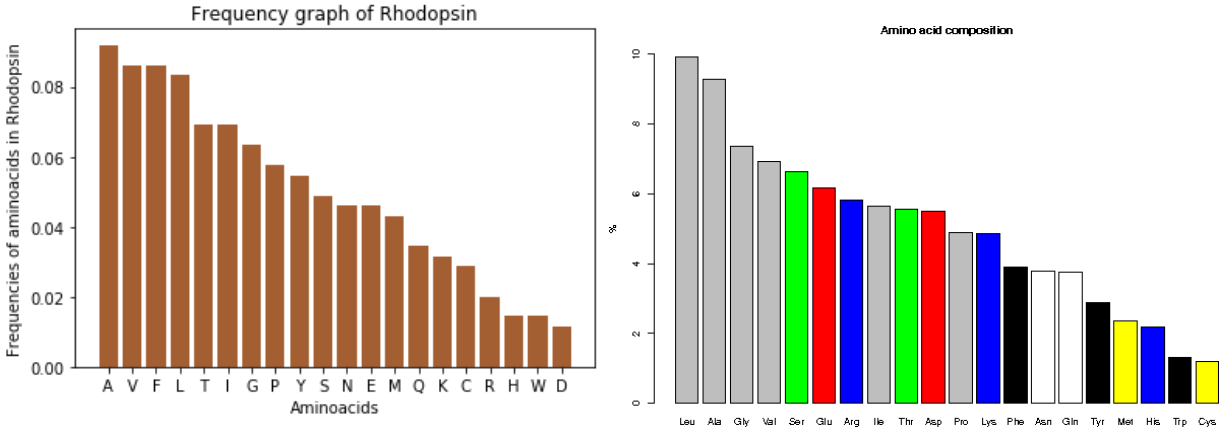
(a) Rhodopsin is a photoreceptor which is required for image-forming vision at low light intensity.

(b) Endoplasmic Reticulum

(c) Congenital stationary night blindness, retinitis pigmentosa

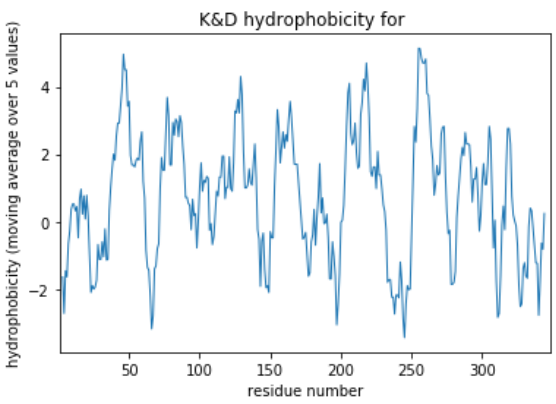
Part 2.

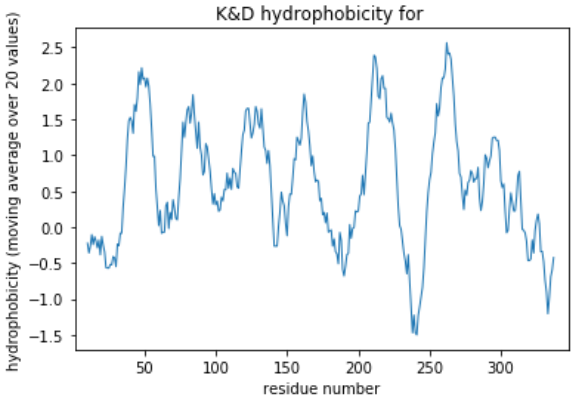
The python codes are in the hydropathy calculator.py file.



The first amino acid distribution graph is for Rhodopsin and the second one is amino acid frequencies in Uniprot. As seen above, Alanine is the most frequent one in Rhodopsin and it has a similar pattern also in Uniprot database. It is the second most frequent amino acid in whole database. When we look at the grey ones in the second graph, aliphatics, Leucine is the fourth frequent in Rhodopsin. The least frequent one is Cys which is Cysteine. Cysteine is one of the least frequent ones in Rhodopsin. So it can be said that it has also a similarity with database.

Part 3.





Window size: 5 ***Window size: 20***

Since the window size is smaller in the first graph, the change in hydrophobicity in each time is bigger. The frequency of delta of hydrophobicity is much greater in first graph when window size is 5. When window size is 20 the average tends to be more normalized rather than when it is 5. It can be seen on the y-axis that change is evident.

Also, the peak points are greater when window size is 5.

Those seven transmembrane helices regions intersect with the points of local peaks in the graph. The hydrophobicity of those regions are the maximum points through the whole sequence.

Seven transmembrane helices:

37, 61

74, 96

111, 133

153, 173

203, 224

253, 274

285, 309