

# **A DISSERTATION / THESIS TEMPLATE IN L<sup>A</sup>T<sub>E</sub>X**

by

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A Dissertation (Thesis) Submitted in Partial Fulfillment of the Requirements for the  
Degree of

The Degree

in

My Chosen Field

Middle Tennessee State University

December, 2020

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This page is optional. Students wishing to dedicate the thesis or dissertation to someone may do so using this page. This page does not include a heading, and the text should be brief and centered on the page. Pagination is centered, in lowercase Roman numerals.

## **ACKNOWLEDGMENTS**

This page is optional and can be used to include brief statements of appreciation or recognition. This page has the heading “ACKNOWLEDGEMENTS,” and the heading must be centered and written in all capital letters. Pagination is centered, in lowercase Roman numerals.

## **ABSTRACT**

Every thesis or dissertation is required to include an abstract. This should be approximately 350 words for dissertations and 150 words for theses. The student and the committee will determine the content of the abstract. The page must be titled “ABSTRACT,” and the heading must be centered and written in all capital letters. Pagination is centered, in lowercase Roman numerals.

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## CHAPTER I : PROLOGUE

---

This is the introduction chapter, use it to introduce the audience to what this Thesis/Dissertation represents. Maybe your work is biology related and deals with proteins. Good graphics help assist with the introduction, see Figures 1.1 and 1.2. You might also want to mention your related publications.

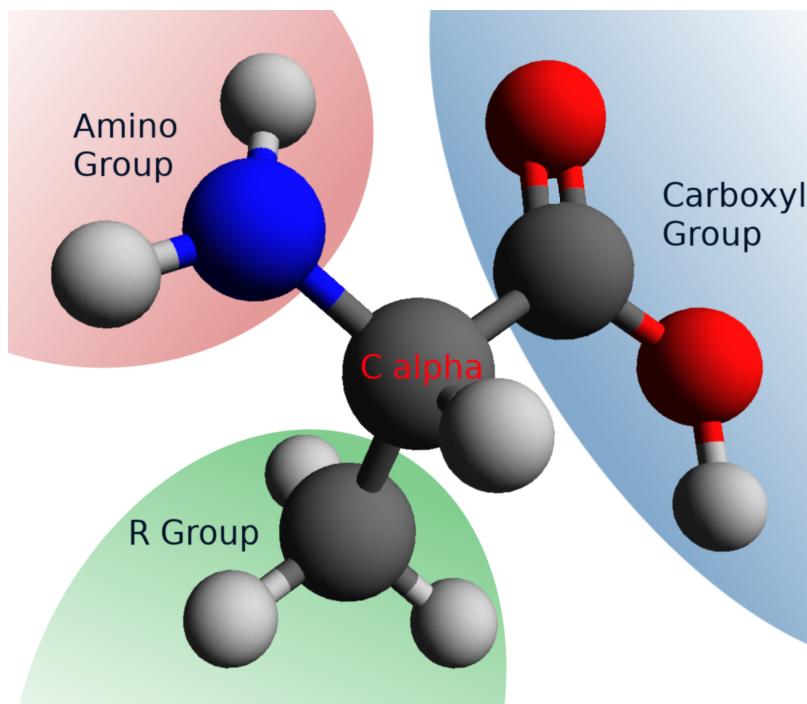


Figure 1.1: The amino acid Alanine showing the amino group (red shading) bound to the alpha carbon  $CH$  (center) that is bound to the carboxyl group (blue shading). The R group (green shading) for Alanine is  $CH_3$ . Carbon is depicted as dark gray, hydrogen is light gray, oxygen is red and nitrogen is blue. Amino acid produced by Avogadro (Hanwell et al., 2012).

The following are related publications:

“Still Working on this Awesome Paper” (In preparation)

Me, and You. “A Paper I Submitted and Currently Have a Preprint on BioRxiv.”  
BioRxiv, Cold Spring Harbor Laboratory, June 2020, the doc id and url. (Submitted  
for publication)

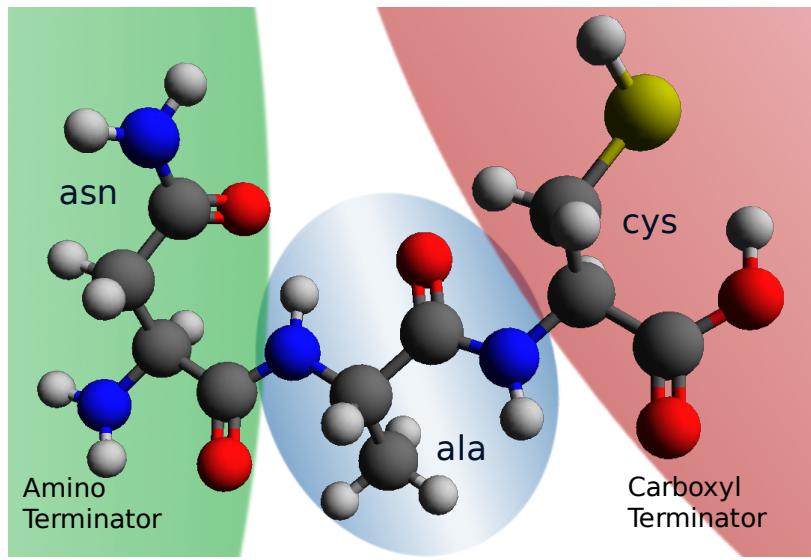


Figure 1.2: A simple protein chain with shading to distinguish each amino acid: Asparagine (green), Alanine (blue), and Cysteine (red). The amino terminal is to the left and the carboxyl terminal is to the right. Carbon is depicted as dark gray, hydrogen is light gray, oxygen is red, sulfur is yellow and nitrogen is blue. Protein chain produced by Avagadro (Hanwell et al., 2012).

Me, You, and Another ...

## CHAPTER II : BACKGROUND INFORMATION

---

### The First Subsection

This is the background chapter, make the case for your dissertation. more graphics help and break it down by subject with subsections and subsubsections.

### Another Section

More information on another aspect of the subject

# CHAPTER III : MAYBE A CHAPTER ON HOW WE GOT THE DATA

---

This research extends upon previously developed methods to determine something about some thing. A figure here helps get the message across.

## My New Approach

The pipeline of Stieh et al. (2013) is enhanced through the use of full structure assemblies, energy minimization, advanced compression techniques and a fully automatic execution environment. Notice the citation format, this is an inline citation used to call out a specific article, see the source code of this chapter. I may want to cite it as a matter of fact, in which case I want it to appear like this (Stieh et al., 2013).

More graphics help get the message across

### *Some Specific Details of Part A*

Structure modeling is facilitated through comparative modeling by Modeller (Sali and Blundell, 1993).

More Figures as needed

### *Some Specific Details of Part B*

Once theoretical models are generated by Modeller, the structures are energy minimized by Gromacs (Berendsen et al., 1995; Lindahl et al., 2001).

## CHAPTER IV : METHODS

---

### Background

Some background information about your specific methods will help readers understand where all this started.

#### *Dynamic Electrophoretic Fingerprinting*

Electrophoretic mobility (EM) is an experimental measure of surface charge used to characterize and separate micro-organisms (Mehrishi and Bauer, 2002; Richmond and Fisher, 1973). Researchers hypothesized the method could be applied across saline and pH ranges relevant to mucosal environments where transmission is common and results in systemic infection. The method was employed to study trimeric gp120/gp41 from clade B HIV-1 strain BX08 (Stieh et al., 2013) in the bound and unbound conformations by evaluating the difference between the two states. The results described surface charge variations across titrations indicating decreased gp120 surface charge in mucosal environments, complementing the positive charge of the CD4 receptor surface. This potentially could be the result of variations in gp120 protein structure and the interactions of surrounding solvent where blood plasma and mucous vary in pH and saline levels. This technique is used to validate the pipeline process in the methods that follow.

### My First New Method

With a colorized table. I would suggest <https://www.tablesgenerator.com/> as a place to generate tables of this nature.

### Results

These results are a product of ...

Check the source here to see how to manually insert hyphenation points in long character strings such as: Z242MPL25JAN03PCR23ENV1.1-DT and Z242MPL25JAN03PCR-

Table 4.1: Visually impelling tables make a greater impact.

| Unbound Data for Each Sequence |          |           |           |          |     |           |
|--------------------------------|----------|-----------|-----------|----------|-----|-----------|
| Model/pH                       | 3.0      | 3.1       | 3.2       | 3.3      | ... | 9.0       |
| Model_1                        | 0.008658 | -1.246752 | 0.441558  | 1.229436 | ... | -1.290042 |
| Model_2                        | 0.017316 | 1.25541   | -0.017316 | 0.580086 | ... | -1.16883  |
| ...                            | ...      | ...       | ...       | ...      | ... | ...       |
| Model_N                        | 0.019243 | 1.142856  | -1.55844  | 1.549782 | ... | 1.090908  |

|       |     |             |                                                                                                                          |
|-------|-----|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Seq_1 | PCA | <b>BESI</b> | BESI compares the first 2 principal components of each sequence against the first 2 principal components of the control. |
| Seq_2 | PCA |             |                                                                                                                          |
| ...   | ... |             |                                                                                                                          |
| Seq_N | PCA |             |                                                                                                                          |

33ENV1.1-DNT gp120. It's a little painful at first and especially if you manuscript contains a lot of them. Some minor programming skills in Python (Van Rossum and Drake Jr, 1995) can make easy work of it.

### ***Discussion***

The results here have shown ...

### **My Next Method**

My next method and how data is extracted; visually represented in Figure 4.1.

### ***Results***

The first set of results comes from ...

For the purposes of expressing these data, all theoretical data will be normalized for clarity using:

$$x' = \frac{x - set_{min}}{set_{max} - set_{min}}$$

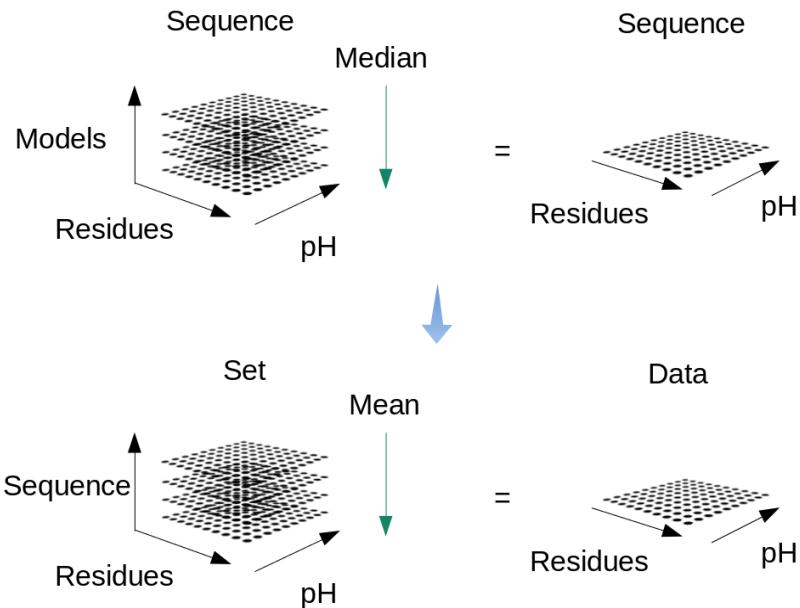


Figure 4.1: Visualization of the process to extract variance data from residue electrostatics. Models of residue data are reduced to 2 dimensions by taking the median of the set across models/residue to eliminate the effects of outliers on the data. Once each sequence/model set is processed, the mean across the sequence set is taken to produce the residue data for which the variance is extracted for each residue across the pH range.

Where  $x$  is the theoretical value,  $set_{min}$  is the minimum value of all theoretical data produced,  $set_{max}$  is the maximum value of all theoretical data produced, and  $x'$  is the normalized value returned.

### ***Discussion***

Motifs provide no evidence that the range of ...

## **Comparing Soandso to Supervised Machine Learning**

This section is presented as validation of the unsupervised methods ...

### ***Binary Classifier***

Figure 4.2 shows the model construct for the binary classifier using sixty-one inputs with a one hundred and twenty eight node hidden layer to a single node output. Figure 4.3 provides a visual representation of the binary classifier. Dropout layers are only used

during training to prevent over-fitting the data and are not depicted in the figure. The neural network is dense (fully meshed) and utilizes Rectified Linear Unit (ReLU) activation for the input and hidden layers. Output is sigmoid activated to complete the binary classifier.

```

model = keras.Sequential(
    [
        layers.Dense(128, input_dim=61, activation='relu'),
        layers.Dropout(0.5),
        layers.Dense(128, activation='relu'),
        layers.Dropout(0.5),
        layers.Dense(1, activation='sigmoid')
    ]
)

model.compile(loss='binary_crossentropy',
               optimizer='rmsprop',
               metrics=['accuracy'])

history = model.fit(x_train, y_train,
                     epochs=100, batch_size=50,
                     validation_data=(x_val, y_val),
                     verbose=1)

test_data = np.genfromtxt('inputdata.txt', delimiter=' ')
test_data_labels = np.genfromtxt('sequence.list', delimiter=' ')
results = model.predict(test_data)

```

Figure 4.2: Model construct of a binary classifier using 61 inputs tied to a 128 node hidden layer that feeds a single output node.

### ***Results***

Scoring by the binary classifier can be see in Table 4.2 for all 252 ...

This is an example of a multi-page table:

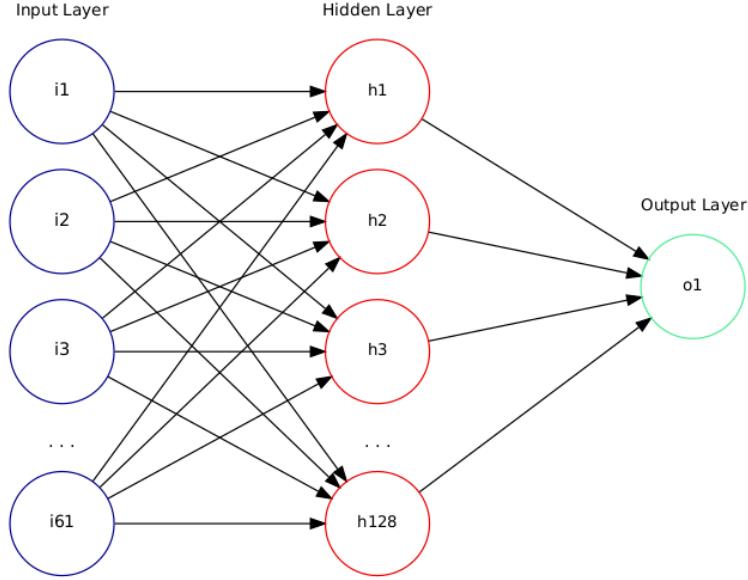


Figure 4.3: Graphic representation of binary classifier showing individual layers. Dropout layers are not expressed and are only used during training to control over and under fitting.

Table 4.2: Scoring from binary classifier showing under-fitting by the neural network.

| Sequence                  | Score  | Sequence               | Score  |
|---------------------------|--------|------------------------|--------|
| Z238FSW15A6_plasmid_6v    | 0.9819 | Z201FPL07feb03102-1    | 1      |
| Z238FSW15G4_plasmid_4i    | 0.9999 | Z201FPL07feb03103-1    | 1      |
| Z238FSW15H8_plasmid_3ii   | 1      | Z201FPL07feb03105-1    | 1      |
| Z238FSW29oct0215A11       | 1      | Z201FPL07feb0350-2     | 1      |
| Z238FSW29oct0215A6v       | 0.9767 | Z201FPL07feb0351-1     | 0.8955 |
| Z238FSW29oct0215G4        | 0.9999 | Z201FPL07feb0368-2     | 1      |
| Z238FSW29oct0215H8        | 1      | Z201FPL07feb0372-1     | 1      |
| Z238MPL17_plasmid_a       | 0.8942 | Z201FPL07feb0390-1     | 1      |
| Z238MPL9_plasmid_c        | 0.3827 | Z201FPL100_plasmid_8-1 | 1      |
| Z242FPL25JAN03PCR23ENV1.1 | 0.9998 | Z201FPL102_plasmid_7-1 | 1      |
| Z242FPL25JAN03PCR8ENV1.1  | 1      | Z201FPL103_plasmid_4-1 | 1      |
| Z242FPL25jan038_plasmid   | 1      | Z201FPL105_plasmid_3-1 | 1      |

Table 4.2 – *Continued on next page*

Table 4.2 – *Continued from previous page*

| <b>Sequence</b>                  | <b>Score</b> | <b>Sequence</b>           | <b>Score</b> |
|----------------------------------|--------------|---------------------------|--------------|
| Z242MPL25JAN0326                 | 0.8888       | Z201FPL50_plasmid_5-2     | 1            |
| Z242MPL25JAN0327-1               | 1            | Z201FPL51_plasmid_1-1     | 0.913        |
| Z242MPL25JAN0327-2               | 0.9999       | Z201FPL68_plasmid_6-2     | 1            |
| Z242MPL25JAN0327-3               | 1            | Z201FPL72_plasmid_9-1     | 1            |
| Z242MPL25JAN03PCR23ENV1.1-DT     | 1            | Z201FPL7FEB03ENV1.8       | 1            |
| Z242MPL25JAN03PCR33ENV1.1-DNT    | 0.0016       | Z201FPL7FEB03ENV2.1       | 1            |
| Z242MPL25jan0323_plasmid         | 1            | Z201FPL7FEB03ENV3.3       | 1            |
| Z242MPL25jan0326_plasmid         | 0.9648       | Z201FPL7FEB03ENV4.1       | 1            |
| Z242MPL25jan0328_plasmid_8-1     | 1            | Z201FPL7FEB03ENV5.2       | 1            |
| Z242MPL25jan0328_plasmid_8-2     | 1            | Z201FPL7FEB03ENV6.1       | 1            |
| Z242MPL25jan0328_plasmid_8-3     | 0.9998       | Z201FPL7FEB03ENV7.1       | 0.8914       |
| Z242MPL25jan0333_plasmid         | 0.0018       | Z201FPL90_plasmid_2-1     | 1            |
| Z242MPL26_plasmid                | 0.9942       | Z201FSW07feb03DNA13D1     | 1            |
| Z242MPL28_plasmid_8-1            | 1            | Z201FSWDNA13D1_plasmid_4i | 1            |
| Z242MPL28_plasmid_8-2            | 1            | Z201MPB7FEB03ENV2.1       | 1            |
| Z242MPL28_plasmid_8-3            | 1            | Z201MPB7FEB03ENV4.1       | 1            |
| Z292FCA12A52_plasmid_9v          | 1            | Z201MPB7FEB03ENV5.1       | 0.9999       |
| Z292FCA24may0512A52              | 1            | Z201MPL07feb0352a         | 1            |
| Z292FCA24may0512A52_plasmid_9v   | 1            | Z201MPL07feb0352aa        | 0.9995       |
| Z292FCA24may0512A58_plasmid_6v   | 0.9656       | Z201MPL07feb0352e         | 0.9998       |
| Z292FCA24may0512D10_plasmid_5iii | 1            | Z201MPL07feb0384c         | 0.9999       |
| Z292FCF12E26_plasmid_10iv        | 1            | Z201MPL52_plasmid_a       | 0.9999       |
| Z292FCF24may0512D18_plasmid_4i   | 1            | Z201MPL52_plasmid_aa      | 0.9999       |
| Z292FCF24may0512E26              | 1            | Z201MPL52_plasmid_e       | 0.9998       |
| Z292FCF24may0512E26_plasmid_10iv | 1            | Z201MPL7FEB03ENV2.1       | 0.9998       |
| Z292FPL24may05105_plasmid_5-1    | 1            | Z201MPL7FEB03ENV3.1       | 1            |
| Z292FPL24may05136_plasmid_7-1    | 1            | Z201MPL7FEB03ENV4.1       | 1            |
| Z292FPL24may05152_plasmid_1-3    | 0.9999       | Z201MPL84_plasmid_c       | 0.9957       |

Table 4.2 – *Continued on next page*

Table 4.2 – *Continued from previous page*

| <b>Sequence</b>                | <b>Score</b> | <b>Sequence</b>             | <b>Score</b> |
|--------------------------------|--------------|-----------------------------|--------------|
| Z292FPL24may05160_plasmid_4-1  | 1            | Z205FPB27MAR03ENV1.1        | 0.8165       |
| Z292FPL24may05164_plasmid_9-2  | 1            | Z205FPB27MAR03ENV4.2        | 0.7305       |
| Z292FPL24may05172_plasmid_6-1  | 1            | Z205FPL27MAR03ENV4.1        | 0.019        |
| Z292FPL24may0535_plasmid_3-3   | 1            | Z205FPL27MAR03ENV5.2        | 1            |
| Z292FSW24may0512E12_plasmid_3v | 0.9996       | Z205FPL27MAR03ENV6.3        | 0.6004       |
| Z292FSW24may0512E20_plasmid_2i | 1            | Z205MPB27MAR03ENV4.1        | 1            |
| Z292MPL113_plasmid_e           | 1            | Z205MPB27MAR03ENV6.1        | 1            |
| Z292MPL150_plasmid_b           | 1            | Z205MPB27MAR03ENV9.1        | 0.0816       |
| Z292MPL24may05113_plasmid_e    | 1            | Z205MPL27MAR03ENV1.1NF      | 1            |
| Z292MPL24may05113e             | 1            | Z205MPL27MAR03ENV2.3        | 0.341        |
| Z292MPL24may05150_plasmid_b    | 1            | Z205MPL27MAR03ENV3.1NF      | 0.9999       |
| Z292MPL24may05150b             | 1            | Z205MPL27MAR03ENV6.3        | 1            |
| R56FPL21apr05B6_plasmid_a      | 0.9777       | Z216FC17jan04RNAB37         | 0.9996       |
| R56FPL21apr05B6_plasmid_b      | 0.9807       | Z216FCF17jan04RNAB44        | 0.0097       |
| R56FPL21apr05E7_plasmid_a      | 0.5807       | Z216FCFRNA11B44_plasmid_2iv | 0.0064       |
| R56FPL21apr05E7_plasmid_b      | 0.9906       | Z216FCRNA11B37_plasmid_7i   | 0.9998       |
| R56MCA21aug0516_plasmid_9iii   | 0.9999       | Z216FPB112_plasmid_e        | 1            |
| R56MCA21aug053_plasmid_5i      | 1            | Z216FPB85_plasmid_f         | 0.9289       |
| R56MCA21aug056_plasmid_6iii    | 1            | Z216FPB98_plasmid_e         | 0.9447       |
| R56MCF21aug0511_plasmid_1v     | 1            | Z216FPL129_plasmid_6-1      | 1            |
| R56MCF21aug0514_plasmid_2iv    | 1            | Z216FPL138_plasmid_8-3      | 0.9963       |
| R56MCF21aug0519_plasmid_3ii    | 1            | Z216FPL17jan04112e          | 1            |
| R56MPL21apr05C2_plasmid_7-1    | 1            | Z216FPL17jan04129           | 1            |
| R56MPL21apr05C5_plasmid_6-4    | 1            | Z216FPL17jan04138           | 0.9872       |
| R56MPL21apr05G5_plasmid_5-3    | 1            | Z216FPL17jan04190           | 0.9994       |
| R56MPL21apr05H3_plasmid_1-3    | 1            | Z216FPL17jan046             | 0.0008       |
| R56MPL21apr05K4_plasmid_4-1    | 1            | Z216FPL17jan0483            | 0.0069       |
| R56MPL21apr05K6_plasmid_2-4    | 1            | Z216FPL17jan0485f           | 0.9793       |

Table 4.2 – *Continued on next page*

Table 4.2 – *Continued from previous page*

| <b>Sequence</b>             | <b>Score</b> | <b>Sequence</b>           | <b>Score</b> |
|-----------------------------|--------------|---------------------------|--------------|
| R56MPL21apr05P5_plasmid_8-1 | 1            | Z216FPL17jan0492          | 1            |
| Z153FPB13MAR02ENV1.1        | 0.828        | Z216FPL17jan0498e         | 0.8215       |
| Z153FPB13MAR02ENV2.1        | 0.9979       | Z216FPL190_plasmid_5-1    | 0.9999       |
| Z153FPB13MAR02ENV3.1        | 0.3384       | Z216FPL6_plasmid_4-4      | 0.0028       |
| Z153FPB13MAR02ENV4.1        | 0.9996       | Z216FPL83_plasmid_7-2     | 0.1336       |
| Z153FPB13MAR02ENV5.1        | 0.9989       | Z216FPL92_plasmid_1-1     | 0.9999       |
| Z153FPL13MAR02ENV1.1        | 0.9033       | Z216FSW17jan04DNA15       | 0.975        |
| Z153FPL13MAR02ENV2.1        | 0.2734       | Z216FSWDNA11I5_plasmid_5v | 0.9916       |
| Z153FPL13MAR02ENV3.1        | 0.0002       | Z216MPL133_plasmid        | 0.9964       |
| Z153FPL13MAR02ENV4.1        | 0.9996       | Z221FPB7MAR03ENV10.3      | 1            |
| Z153FPL13MAR02ENV5.1        | 0.0015       | Z221FPB7MAR03ENV11.3      | 1            |
| Z153FPL13MAR02ENV6.1        | 0.0014       | Z221FPB7MAR03ENV6.4       | 1            |
| Z153MPB13MAR02ENV1.1        | 0.9998       | Z221FPB7MAR03ENV9.1       | 0.935        |
| Z153MPB13MAR02ENV2.1        | 0.8576       | Z221FPL08mar0335          | 0.9796       |
| Z153MPB13MAR02ENV3.1        | 0.9998       | Z221FPL08mar0344          | 0.0004       |
| Z153MPB13MAR02ENV4.1        | 1            | Z221FPL08mar0348          | 0.4223       |
| Z153MPB13MAR02ENV5.1        | 0.9999       | Z221FPL08mar0351          | 0.9989       |
| Z153MPL13MAR02ENV1.1        | 0.9996       | Z221FPL08mar0355          | 0.0619       |
| Z153MPL13MAR02ENV2.1        | 0.9995       | Z221FPL08mar0371          | 0.9597       |
| Z153MPL13MAR02ENV3.1        | 0.9631       | Z221FPL08mar0380          | 1            |
| Z153MPL13MAR02ENV4.1        | 0.9997       | Z221FPL35_plasmid_7-1     | 0.8827       |
| Z153MPL13MAR02ENV5.1        | 0.9996       | Z221FPL44_plasmid_4-1     | 0.0008       |
| Z185FPB24AUG02ENV1.1        | 0            | Z221FPL48_plasmid_5-1     | 0.3918       |
| Z185FPB24AUG02ENV2.1        | 0            | Z221FPL51_plasmid_2-2     | 0.9996       |
| Z185FPB24AUG02ENV3.1        | 0            | Z221FPL55_plasmid_6-2     | 0.0259       |
| Z185FPB24AUG02ENV4.1        | 0            | Z221FPL71_plasmid_9-1     | 0.9746       |
| Z185FPB24AUG02ENV5.1        | 0            | Z221FPL7MAR03ENV1.2       | 0.9677       |
| Z185FPL17AUG02ENV1.1        | 0.0003       | Z221FPL7MAR03ENV10.4      | 0.9999       |

Table 4.2 – *Continued on next page*

Table 4.2 – *Continued from previous page*

| <b>Sequence</b>             | <b>Score</b> | <b>Sequence</b>            | <b>Score</b> |
|-----------------------------|--------------|----------------------------|--------------|
| Z185FPL17AUG02ENV2.1        | 0            | Z221FPL7MAR03ENV2.3        | 1            |
| Z185FPL17AUG02ENV3.1        | 0.0018       | Z221FPL7MAR03ENV3.3        | 0.9987       |
| Z185FPL17AUG02ENV4.1        | 0            | Z221FPL80_plasmid_8-3      | 1            |
| Z185FPL17AUG02ENV5.1        | 0            | Z221FSW08mar0314H16iii     | 0.7743       |
| Z185MPB17AUG02ENV1.2        | 0.0038       | Z221FSW08mar0314H16iv      | 0.9668       |
| Z185MPB17AUG02ENV1.5        | 0.0021       | Z221FSW14H16_plasmid_6iii  | 0.9665       |
| Z185MPB17AUG02ENV7.4        | 0            | Z221FSW14H16iv_plasmid_6iv | 0.9941       |
| Z185MPB17AUG02ENV7.5        | 0            | Z221MPB7MAR03ENV4.1        | 0.9832       |
| Z185MPB17AUG02ENV7.6        | 0            | Z221MPB7MAR03ENV5.4        | 0.8951       |
| Z185MPB17AUG02ENVB17        | 0            | Z221MPB7MAR03ENV6.4        | 0.2915       |
| Z185MPB17AUG02ENVB6         | 0            | Z221MPL08mar0375a          | 0.8709       |
| Z185MPB17AUG02ENVC17        | 0            | Z221MPL08mar0375f          | 0.9939       |
| Z185MPB17AUG02ENVC18        | 0            | Z221MPL75_plasmid_a        | 0.9284       |
| Z185MPB17AUG02ENVC8         | 0.0034       | Z221MPL75_plasmid_f        | 0.9941       |
| Z201FCA07feb0313C8          | 0.9999       | Z221MPL7MAR03ENV2.1        | 0.9861       |
| Z201FCA07feb03DNA13G10      | 1            | Z221MPL7MAR03ENV4.2        | 0.9195       |
| Z201FCA13C8_plasmid_2iii    | 0.9999       | Z221MPL7MAR03ENV6.4        | 0.8982       |
| Z201FCADNA13G10_plasmid_6i  | 1            | Z238FCA15C6_plasmid_1v     | 0.8263       |
| Z201FCF07feb03DNA13C18      | 1            | Z238FCA29oct0215C6         | 0.8369       |
| Z201FCF07feb03DNA13G13      | 1            | Z238FCF15A39_plasmid_9ii   | 1            |
| Z201FCF07feb03DNA13H13      | 0.9999       | Z238FCF15C13_plasmid_2ii   | 1            |
| Z201FCF07feb03DNA13H9       | 0.4086       | Z238FCF29oct0215A39        | 1            |
| Z201FCFDNA13C18_plasmid_3ii | 1            | Z238FCF29oct0215C13        | 1            |
| Z201FCFDNA13G13_plasmid_7i  | 1            | Z238FPL12_plasmid_1-2      | 1            |
| Z201FCFDNA13H13_plasmid_10i | 0.9991       | Z238FPL16_plasmid_2-3      | 1            |
| Z201FCFDNA13H9_plasmid_8v   | 0.3429       | Z238FPL29nov0212           | 1            |
| Z201FPB7FEB03ENV1.1         | 1            | Z238FPL29nov0216           | 1            |
| Z201FPB7FEB03ENV5.1         | 1            | Z238FPL29nov024            | 1            |

Table 4.2 – *Continued on next page*

Table 4.2 – *Continued from previous page*

| <b>Sequence</b>     | <b>Score</b> | <b>Sequence</b>          | <b>Score</b> |
|---------------------|--------------|--------------------------|--------------|
| Z201FPB7FEB03ENV6.1 | 0.9996       | Z238FPL4_plasmid_6-1     | 1            |
| Z201FPL07feb03100-1 | 1            | Z238FSW15A11_plasmid_7ii | 1            |

***Discussion***

Comparing Soandso to artificial neural networks designed to ...

## CHAPTER V : DISCUSSIONS

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Discuss my methods and the value they present.

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## APPENDICES

## APPENDIX A : MY THING

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Its the Appendix, Appendix A specifically.

## APPENDIX B : MY OTHER THING

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### Appendix B