

Supporting Information for:

Two-Dimensional Combinatorial Screening (2DCS) of a Bacterial rRNA A-site Like Motif Library: Defining Privileged Asymmetric Internal Loops that Bind Aminoglycosides

Tuan Tran and Matthew D. Disney

Department of Chemistry and The Center of Excellence in Bioinformatics and Life Sciences,
University at Buffalo, The State University of New York, 657 Natural Sciences Complex Buffalo,
NY 14260

*Author to whom correspondence should be addressed: mddisney@buffalo.edu

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- I. Sequences of all RNAs selected to bind aminoglycosides
- II. Trends in the selected RNA space for each aminoglycoside that have Z score ≥ 1.95 ($\geq 95\%$ confidence)
- III. Trends in the RNA space that are unique to each aminoglycoside and have Z score ≥ 2.6 ($\geq 99\%$ confidence)

I. Selected sequences:

A. Selected Kanamycin derivative's (10) sequences

1. GGGAGAGGGUUUAAUGAAGUCUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
2. GGGAGAGGGUUUAAUGUAGACUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
3. GGGAGAGGGUUUAAUGUAUACUACGAAAGUAGAGGCAUUGGAUCCGCAAGG
4. GGGAGAGGGUUUAAUGUAGACUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
5. GGGAGAGGGUUUAAUGAUUACUACGAAAGUAGCUGCAUUGGAUCCGCAAGG
6. GGGAGAGGGUUUAAUGUUUACUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
7. GGGAGAGGGUUUAAUGGAUACUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
8. GGGAGAGGGUUUAAUGUCGUCUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
9. GGGAGAGGGUUUAAUGAGUGCUACGAAAGUAGUUGCAUUGGAUCCGCAAGG
10. GGGAGAGGGUUUAAUGGCCUCUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
11. GGGAGAGGGUUUAAUGCGCCCUACGAAAGUAGCGUCAUUGGAUCCGCAAGG
12. GGGAGAGGGUUUAAUGCGAUCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
13. GGGAGAGGGUUUAAUGUCAACUACGAAAGUAGUCGCAUUGGAUCCGCAAGG
14. GGGAGAGGGUUUAAUGGGUUCUACGAAAGUAGUAGCAUUGGAUCCGCAAGG
15. GGGAGAGGGUUUAAUGUCAUCUACGAAAGUAGCGUCAUUGGAUCCGCAAGG
16. GGGAGAGGGUUUAAUGCCUUCUACGAAAGUAGGUUCAUUGGAUCCGCAAGG
17. GGGAGAGGGUUUAAUGGGGGCUACGAAAGUAGAACCAUUGGAUCCGCAAGG
18. GGGAGAGGGUUUAAUGUGUACUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
19. GGGAGAGGGUUUAAUGGCGGCUACGAAAGUAGGAUCAUUGGAUCCGCAAGG
20. GGGAGAGGGUUUAAUGAUGCCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
21. GGGAGAGGGUUUAAUGUUCUCUACGAAAGUAGGGUCAUUGGAUCCGCAAGG
22. GGGAGAGGGUUUAAUGUACCCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
23. GGGAGAGGGUUUAAUGAACUCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
24. GGGAGAGGGUUUAAUGUAGACUACGAAAGUAGAAACAUUGGAUCCGCAAGG
25. GGGAGAGGGUUUAAUGAAUACUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
26. GGGAGAGGGUUUAAUGAUAACUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
27. GGGAGAGGGUUUAAUGGAUUCUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
28. GGGAGAGGGUUUAAUGAUGACUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
29. GGGAGAGGGUUUAAUGUUUCCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
30. GGGAGAGGGUUUAAUGAGGUCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
31. GGGAGAGGGUUUAAUGAUUGCUACGAAAGUAGAUCCAUUGGAUCCGCAAGG
32. GGGAGAGGGUUUAAUGUGGGCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
33. GGGAGAGGGUUUAAUGGGGGCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
34. GGGAGAGGGUUUAAUGCGAGCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
35. GGGAGAGGGUUUAAUGAUGACUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
36. GGGAGAGGGUUUAAUGCUUGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
37. GGGAGAGGGUUUAAUGCCUGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
38. GGGAGAGGGUUUAAUGGAGCCUACGAAAGUAGCGCCAUUGGAUCCGCAAGG
39. GGGAGAGGGUUUAAUGUUGACUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
40. GGGAGAGGGUUUAAUGUUGGCUACGAAAGUAGGGCCAUUGGAUCCGCAAGG

B. Selected Tobramycin derivative's (11) sequences

1. GGGAGAGGGUUUAAUGGGCUCUACGAAAGUAGUCGCAUUGGAUCCGCAAGG
2. GGGAGAGGGUUUAAUGAUUCCUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
3. GGGAGAGGGUUUAAUGGGUACUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
4. GGGAGAGGGUUUAAUGGACGCUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
5. GGGAGAGGGUUUAAUGGGAGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
6. GGGAGAGGGUUUAAUGAGGGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
7. GGGAGAGGGUUUAAUGGUGACUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
8. GGGAGAGGGUUUAAUGAAUGCUACGAAAGUAGGCGCAUUGGAUCCGCAAGG
9. GGGAGAGGGUUUAAUGAUAACUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
10. GGGAGAGGGUUUAAUGGAAGCUACGAAAGUAGAGGCAUUGGAUCCGCAAGG
11. GGGAGAGGGUUUAAUGCGGCCUACGAAAGUAGCGCCAUUGGAUCCGCAAGG
12. GGGAGAGGGUUUAAUGUAUUCUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
13. GGGAGAGGGUUUAAUGCUUUCUACGAAAGUAGUUGCAUUGGAUCCGCAAGG
14. GGGAGAGGGUUUAAUGUUCUCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
15. GGGAGAGGGUUUAAUGUGAUCUACGAAAGUAGGACCAUUGGAUCCGCAAGG
16. GGGAGAGGGUUUAAUGACGCCUACGAAAGUAGUGCCAUUGGAUCCGCAAGG
17. GGGAGAGGGUUUAAUGCACACUACGAAAGUAGUCGCAUUGGAUCCGCAAGG
18. GGGAGAGGGUUUAAUGGCGGCUACGAAAGUAGUGCCAUUGGAUCCGCAAGG
19. GGGAGAGGGUUUAAUGGAGUCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
20. GGGAGAGGGUUUAAUGCGAACUACGAAAGUAGCACCAUUGGAUCCGCAAGG
21. GGGAGAGGGUUUAAUGGUGGCUACGAAAGUAGGCGCAUUGGAUCCGCAAGG
22. GGGAGAGGGUUUAAUGAUCUCUACGAAAGUAGCAUCAUUGGAUCCGCAAGG
23. GGGAGAGGGUUUAAUGUACCCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
24. GGGAGAGGGUUUAAUGGGCACUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
25. GGGAGAGGGUUUAAUGACUUCUACGAAAGUAGUCGCAUUGGAUCCGCAAGG
26. GGGAGAGGGUUUAAUGACACUACGAAAGUAGAAUCAUUGGAUCCGCAAGG
27. GGGAGAGGGUUUAAUGAACGCUACGAAAGUAGUUGCAUUGGAUCCGCAAGG

C. Selected Neamine derivative's (12) sequences

1. GGGAGAGGGUUUAAUGACGGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
2. GGGAGAGGGUUUAAUGACGACUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
3. GGGAGAGGGUUUAAUGGUUUCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
4. GGGAGAGGGUUUAAUGACUACUACGAAAGUAGGCGCAUUGGAUCCGCAAGG
5. GGGAGAGGGUUUAAUGGUUUCUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
6. GGGAGAGGGUUUAAUGAUAACUACGAAAGUAGUCGCAUUGGAUCCGCAAGG
7. GGGAGAGGGUUUAAUGACUACUACGAAAGUAGGCGCAUUGGAUCCGCAAGG
8. GGGAGAGGGUUUAAUGGAUUCUACGAAAGUAGAGGCAUUGGAUCCGCAAGG

9. GGGAGAGGGUUUAAUGGUGUCUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
10. GGGAGAGGGUUUAAUGAUUGCUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
11. GGGAGAGGGUUUAAUGUCCUCUACGAAAGUAGGGCCAUUGGAUCCGCAAGG
12. GGGAGAGGGUUUAAUGUGUUCUACGAAAGUAGAGGCAUUGGAUCCGCAAGG
13. GGGAGAGGGUUUAAUGUGAACUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
14. GGGAGAGGGUUUAAUGACGUCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
15. GGGAGAGGGUUUAAUGGAUUCUACGAAAGUAGCAGCAUUGGAUCCGCAAGG
16. GGGAGAGGGUUUAAUGACGGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
17. GGGAGAGGGUUUAAUGAGUUCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
18. GGGAGAGGGUUUAAUGGUUGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
19. GGGAGAGGGUUUAAUGGAGCCUACGAAAGUAGCGUCAUUGGAUCCGCAAGG
20. GGGAGAGGGUUUAAUGAAUGCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
21. GGGAGAGGGUUUAAUGGGGGCUACGAAAGUAGCUGCAUUGGAUCCGCAAGG
22. GGGAGAGGGUUUAAUGAGUUCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
23. GGGAGAGGGUUUAAUGGUCCCUACGAAAGUAGAGUCAUUGGAUCCGCAAGG
24. GGGAGAGGGUUUAAUGACCUCUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
25. GGGAGAGGGUUUAAUGUGUACUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
26. GGGAGAGGGUUUAAUGAUAGCUACGAAAGUAGUCGCAUUGGAUCCGCAAGG
27. GGGAGAGGGUUUAAUGGUAACUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
28. GGGAGAGGGUUUAAUGGUCCCUACGAAAGUAGUGUCAUUGGAUCCGCAAGG
29. GGGAGAGGGUUUAAUGGAGACUACGAAAGUAGCAGCAUUGGAUCCGCAAGG
30. GGGAGAGGGUUUAAUGGUAUCUACGAAAGUAGUCGCAUUGGAUCCGCAAGG
31. GGGAGAGGGUUUAAUGUCGUCUACGAAAGUAGCUGCAUUGGAUCCGCAAGG
32. GGGAGAGGGUUUAAUGUUAUCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
33. GGGAGAGGGUUUAAUGUACCCUACGAAAGUAGCUGCAUUGGAUCCGCAAGG
34. GGGAGAGGGUUUAAUGGAACCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
35. GGGAGAGGGUUUAAUGAACCCUACGAAAGUAGCGUCAUUGGAUCCGCAAGG
36. GGGAGAGGGUUUAAUGACCCCUACGAAAGUAGUACCAUUGGAUCCGCAAGG

D. Selected Neomycin derivative's (13) sequences

1. GGGAGAGGGUUUAAUGACUACUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
2. GGGAGAGGGUUUAAUGAACACUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
3. GGGAGAGGGUUUAAUGUCUUCUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
4. GGGAGAGGGUUUAAUGUUUACUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
5. GGGAGAGGGUUUAAUGUACCCUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
6. GGGAGAGGGUUUAAUGGGGACUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
7. GGGAGAGGGUUUAAUGUACCCUACGAAAGUAGGCGCAUUGGAUCCGCAAGG
8. GGGAGAGGGUUUAAUGUCUGCUACGAAAGUAGGUACAUUGGAUCCGCAAGG
9. GGGAGAGGGUUUAAUGGACUCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG

10. GGGAGAGGGUUUAAUGCGGGCUACGAAAGUAGUAACAUUGGAUCCGCAAGG
11. GGGAGAGGGUUUAAUGAGUCCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
12. GGGAGAGGGUUUAAUGAUAUCUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
13. GGGAGAGGGUUUAAUGCCUUCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
14. GGGAGAGGGUUUAAUGUCUUCUACGAAAGUAGCGCCAUUGGAUCCGCAAGG
15. GGGAGAGGGUUUAAUGUAGACUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
16. GGGAGAGGGUUUAAUGCGCGCUACGAAAGUAGAGACAUUGGAUCCGCAAGG
17. GGGAGAGGGUUUAAUGUUCUCUACGAAAGUAGCCGCAUUGGAUCCGCAAGG
18. GGGAGAGGGUUUAAUGUCACCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
19. GGGAGAGGGUUUAAUGCUUGCUACGAAAGUAGUGUCAUUGGAUCCGCAAGG
20. GGGAGAGGGUUUAAUGGAGUCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
21. GGGAGAGGGUUUAAUGGGUUCUACGAAAGUAGCAGCAUUGGAUCCGCAAGG
22. GGGAGAGGGUUUAAUGACUUCUACGAAAGUAGUGCCAUUGGAUCCGCAAGG
23. GGGAGAGGGUUUAAUGUUCUCUACGAAAGUAGUUGCAUUGGAUCCGCAAGG
24. GGGAGAGGGUUUAAUGUCCCCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
25. GGGAGAGGGUUUAAUGGCCUCUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
26. GGGAGAGGGUUUAAUGAGGACUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
27. GGGAGAGGGUUUAAUGAGGUCUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
28. GGGAGAGGGUUUAAUGGGUACUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
29. GGGAGAGGGUUUAAUGUCCGCUACGAAAGUAGAUUCAUUGGAUCCGCAAGG
30. GGGAGAGGGUUUAAUGGUCCCUACGAAAGUAGGACCAUUGGAUCCGCAAGG
31. GGGAGAGGGUUUAAUGGUGGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
32. GGGAGAGGGUUUAAUGGUGGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
33. GGGAGAGGGUUUAAUGAACACUACGAAAGUAGUAACAUUGGAUCCGCAAGG
34. GGGAGAGGGUUUAAUGAGUACUACGAAAGUAGUGCCAUUGGAUCCGCAAGG
35. GGGAGAGGGUUUAAUGCCUUCUACGAAAGUAGUGCCAUUGGAUCCGCAAGG
36. GGGAGAGGGUUUAAUGGGGACUACGAAAGUAGUGGCAUUGGAUCCGCAAGG
37. GGGAGAGGGUUUAAUGGUCUCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
38. GGGAGAGGGUUUAAUGUGGUCUACGAAAGUAGUUGCAUUGGAUCCGCAAGG
39. GGGAGAGGGUUUAAUGCAAACUACGAAAGUAGCGCCAUUGGAUCCGCAAGG
40. GGGAGAGGGUUUAAUGGUUACUACGAAAGUAGGGUCAUUGGAUCCGCAAGG
41. GGGAGAGGGUUUAAUGGUGGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
42. GGGAGAGGGUUUAAUGAUGACUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
43. GGGAGAGGGUUUAAUGUAAUCUACGAAAGUAGGGGCAUUGGAUCCGCAAGG
44. GGGAGAGGGUUUAAUGAAUGCUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
45. GGGAGAGGGUUUAAUGGCUCCUACGAAAGUAGUACCAUUGGAUCCGCAAGG
46. GGGAGAGGGUUUAAUGGAUACUACGAAAGUAGGUGCAUUGGAUCCGCAAGG
47. GGGAGAGGGUUUAAUGGUAUCUACGAAAGUAGAGGCAUUGGAUCCGCAAGG
48. GGGAGAGGGUUUAAUGUGGGCUACGAAAGUAGCGGCAUUGGAUCCGCAAGG
49. GGGAGAGGGUUUAAUGGUCCCUACGAAAGUAGAUGCAUUGGAUCCGCAAGG

II. Trends in the selected RNA space for each aminoglycoside that have Z score ≥ 1.95 ($\geq 95\%$ confidence)

*Trends that are in bold and underlined overlap with at least one other aminoglycoside.

KANAMYCIN TRENDS

One Base Trends

1. $\begin{matrix} 5' \text{-NNNN-3} \\ 3 \text{-GNN-5} \end{matrix}$ **Z-Score: 6.91**
2. $\begin{matrix} 5' \text{-NNNN-3} \\ 3 \text{-NGN-5} \end{matrix}$ **Z-Score: 5.46**
3. $\begin{matrix} 5' \text{-NNGN-3} \\ 3 \text{-NNN-5} \end{matrix}$ Z-Score: 2.18

Two Base Trends

4. $\begin{matrix} 5' \text{-NNNN-3} \\ 3 \text{-GGN-5} \end{matrix}$ **Z-Score: 11.3**
5. $\begin{matrix} 5' \text{-UNNN-3} \\ 3 \text{-NGN-5} \end{matrix}$ **Z-Score: 6.17**
6. $\begin{matrix} 5' \text{-NNNA-3} \\ 3 \text{-GNN-5} \end{matrix}$ **Z-Score: 6.17**
7. $\begin{matrix} 5' \text{-UNNN-3} \\ 3 \text{-GNN-5} \end{matrix}$ **Z-Score: 5.52**
8. $\begin{matrix} 5' \text{-NNGN-3} \\ 3 \text{-NGN-5} \end{matrix}$ **Z-Score: 5.52**
9. $\begin{matrix} 5' \text{-NNUN-3} \\ 3 \text{-NNG-5} \end{matrix}$ **Z-Score: 5.52**
10. $\begin{matrix} 5' \text{-NNGN-3} \\ 3 \text{-GNN-5} \end{matrix}$ **Z-Score: 5.52**
11. $\begin{matrix} 5' \text{-ANNN-3} \\ 3 \text{-GNN-5} \end{matrix}$ **Z-Score: 4.87**
12. $\begin{matrix} 5' \text{-NNNN-3} \\ 3 \text{-GNU-5} \end{matrix}$ **Z-Score: 4.87**
13. $\begin{matrix} 5' \text{-NUNN-3} \\ 3 \text{-GNN-5} \end{matrix}$ **Z-Score: 4.22**
14. $\begin{matrix} 5' \text{-NNNA-3} \\ 3 \text{-NGN-5} \end{matrix}$ **Z-Score: 4.22**
15. $\begin{matrix} 5' \text{-NNNN-3} \\ 3 \text{-NGC-5} \end{matrix}$ **Z-Score: 4.22**
16. $\begin{matrix} 5' \text{-NNNN-3} \\ 3 \text{-GNC-5} \end{matrix}$ **Z-Score: 4.22**
17. $\begin{matrix} 5' \text{-NNNN-3} \\ 3 \text{-GNG-5} \end{matrix}$ **Z-Score: 4.22**
18. $\begin{matrix} 5' \text{-UNNA-3} \\ 3 \text{-NNN-5} \end{matrix}$ Z-Score: 3.57
19. $\begin{matrix} 5' \text{-NUNN-3} \\ 3 \text{-NGN-5} \end{matrix}$ **Z-Score: 3.57**
20. $\begin{matrix} 5' \text{-NANN-3} \\ 3 \text{-GNN-5} \end{matrix}$ **Z-Score: 3.57**

21. $\begin{matrix} 5' \text{-NGNN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 3.57**
22. $\begin{matrix} 5' \text{-NNNU-3} \\ 3' \text{-NGN-5} \end{matrix}$ **Z-Score: 3.57**
23. $\begin{matrix} 5' \text{-NNNU-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 3.57**
24. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-NGG-5} \end{matrix}$ Z-Score: 3.57
25. $\begin{matrix} 5' \text{-UNGN-3} \\ 3' \text{-NNN-5} \end{matrix}$ **Z-Score: 2.92**
26. $\begin{matrix} 5' \text{-ANNN-3} \\ 3' \text{-NGN-5} \end{matrix}$ **Z-Score: 2.92**
27. $\begin{matrix} 5' \text{-NANN-3} \\ 3' \text{-NGN-5} \end{matrix}$ Z-Score: 2.92
28. $\begin{matrix} 5' \text{-NGNN-3} \\ 3' \text{-NGN-5} \end{matrix}$ **Z-Score: 2.92**

Three Base Trends

29. $\begin{matrix} 5' \text{-UNNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 10.4**
30. $\begin{matrix} 5' \text{-NNGN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 10.4**
31. $\begin{matrix} 5' \text{-NNNA-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 10.4**
32. $\begin{matrix} 5' \text{-UNNA-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 8.02
33. $\begin{matrix} 5' \text{-ANNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 8.02**
34. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GGU-5} \end{matrix}$ **Z-Score: 8.02**
35. $\begin{matrix} 5' \text{-NUNA-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 6.77
36. $\begin{matrix} 5' \text{-NGNN-3} \\ 3' \text{-GNU-5} \end{matrix}$ **Z-Score: 6.77**
37. $\begin{matrix} 5' \text{-NANN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 6.77**
38. $\begin{matrix} 5' \text{-NUNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 6.77**
39. $\begin{matrix} 5' \text{-NGNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 6.77**
40. $\begin{matrix} 5' \text{-NNNU-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 6.77**
41. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GGC-5} \end{matrix}$ **Z-Score: 6.77**
42. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GGG-5} \end{matrix}$ **Z-Score: 6.77**
43. $\begin{matrix} 5' \text{-UUNN-3} \\ 3' \text{-NGN-5} \end{matrix}$ **Z-Score: 5.52**
44. $\begin{matrix} 5' \text{-AUNN-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 5.52

45. $\begin{matrix} 5' & \text{UNGN} & 3' \\ & | & \\ 3' & \text{NGN} & 5' \end{matrix}$ **Z-Score: 5.52**
46. $\begin{matrix} 5' & \text{ANGN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 5.52
47. $\begin{matrix} 5' & \text{UNGN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ **Z-Score: 5.52**
48. $\begin{matrix} 5' & \text{UNAN} & 3' \\ & | & \\ 3' & \text{NGN} & 5' \end{matrix}$ Z-Score: 5.52
49. $\begin{matrix} 5' & \text{ANAN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 5.52
50. $\begin{matrix} 5' & \text{UNNN} & 3' \\ & | & \\ 3' & \text{NGG} & 5' \end{matrix}$ **Z-Score: 5.52**
51. $\begin{matrix} 5' & \text{ANNN} & 3' \\ & | & \\ 3' & \text{GNC} & 5' \end{matrix}$ **Z-Score: 5.52**
52. $\begin{matrix} 5' & \text{NUNA} & 3' \\ & | & \\ 3' & \text{NGN} & 5' \end{matrix}$ Z-Score: 5.52
53. $\begin{matrix} 5' & \text{NANN} & 3' \\ & | & \\ 3' & \text{GNC} & 5' \end{matrix}$ Z-Score: 5.52

Four Base Trends

54. $\begin{matrix} 5' & \text{UNNA} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ **Z-Score: 11.8**
55. $\begin{matrix} 5' & \text{NUNA} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ **Z-Score: 11.8**
56. $\begin{matrix} 5' & \text{AUNA} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 9.45
57. $\begin{matrix} 5' & \text{ANGN} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ **Z-Score: 9.45**
58. $\begin{matrix} 5' & \text{UNUN} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ **Z-Score: 9.45**
59. $\begin{matrix} 5' & \text{UNGN} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ **Z-Score: 9.45**
60. $\begin{matrix} 5' & \text{ANNA} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ **Z-Score: 9.45**
61. $\begin{matrix} 5' & \text{ANNN} & 3' \\ & | & \\ 3' & \text{GGC} & 5' \end{matrix}$ **Z-Score: 9.45**
62. $\begin{matrix} 5' & \text{NGNG} & 3' \\ & | & \\ 3' & \text{GNU} & 5' \end{matrix}$ **Z-Score: 9.45**
63. $\begin{matrix} 5' & \text{NGNN} & 3' \\ & | & \\ 3' & \text{GGU} & 5' \end{matrix}$ **Z-Score: 9.45**
64. $\begin{matrix} 5' & \text{NNGA} & 3' \\ & | & \\ 3' & \text{GNC} & 5' \end{matrix}$ Z-Score: 9.45
65. $\begin{matrix} 5' & \text{NNUA} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ Z-Score: 9.45
66. $\begin{matrix} 5' & \text{NNGA} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ **Z-Score: 9.45**
67. $\begin{matrix} 5' & \text{NNGN} & 3' \\ & | & \\ 3' & \text{GGC} & 5' \end{matrix}$ **Z-Score: 9.45**
68. $\begin{matrix} 5' & \text{UAGA} & 3' \\ & | & \\ 3' & \text{NNN} & 5' \end{matrix}$ Z-Score: 7.04

69. $\begin{matrix} 5' \text{-AUGN-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 7.04
70. $\begin{matrix} 5' \text{-AUNA-3} \\ 3' \text{-NNC-5} \end{matrix}$ Z-Score: 7.04
71. $\begin{matrix} 5' \text{-AUNA-3} \\ 3' \text{-NGN-5} \end{matrix}$ Z-Score: 7.04
72. $\begin{matrix} 5' \text{-UANA-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 7.04
73. $\begin{matrix} 5' \text{-UUNN-3} \\ 3' \text{-NGG-5} \end{matrix}$ **Z-Score: 7.04**
74. $\begin{matrix} 5' \text{-AUNN-3} \\ 3' \text{-GNC-5} \end{matrix}$ **Z-Score: 7.04**
75. $\begin{matrix} 5' \text{-UANN-3} \\ 3' \text{-GNC-5} \end{matrix}$ Z-Score: 7.04
76. $\begin{matrix} 5' \text{-AANN-3} \\ 3' \text{-GGN-5} \end{matrix}$ Z-Score: 7.04
77. $\begin{matrix} 5' \text{-AUNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 7.04**
78. $\begin{matrix} 5' \text{-UANN-3} \\ 3' \text{-GGN-5} \end{matrix}$ Z-Score: 7.04

TOBRAMYCIN TRENDS

One Base Trends

1. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 5.43**

Two Base Trends

2. $\begin{matrix} 5' \text{-GNNN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 5.00**
3. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GNU-5} \end{matrix}$ **Z-Score: 5.00**
4. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GCN-5} \end{matrix}$ **Z-Score: 5.00**
5. $\begin{matrix} 5' \text{-NANN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 4.21**
6. $\begin{matrix} 5' \text{-NNCN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 4.21**
7. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GNG-5} \end{matrix}$ **Z-Score: 4.21**
8. $\begin{matrix} 5' \text{-ANNN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 3.41**
9. $\begin{matrix} 5' \text{-NUNN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 3.41**
10. $\begin{matrix} 5' \text{-NNUN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 3.41**
11. $\begin{matrix} 5' \text{-NNNU-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 3.41**
12. $\begin{matrix} 5' \text{-NNNG-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 3.41

13. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 3.41**
14. $\begin{matrix} 5' \text{-GNNN-3} \\ 3' \text{-NNG-5} \end{matrix}$ **Z-Score: 2.62**
15. $\begin{matrix} 5' \text{-GNNN-3} \\ 3' \text{-NGN-5} \end{matrix}$ **Z-Score: 2.62**
16. $\begin{matrix} 5' \text{-NACN-3} \\ 3' \text{-NNN-5} \end{matrix}$ Z-Score: 2.62
17. $\begin{matrix} 5' \text{-NGNN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 2.62**
18. $\begin{matrix} 5' \text{-NNCN-3} \\ 3' \text{-NNU-5} \end{matrix}$ Z-Score: 2.62
19. $\begin{matrix} 5' \text{-NNGN-3} \\ 3' \text{-NGN-5} \end{matrix}$ **Z-Score: 2.62**
20. $\begin{matrix} 5' \text{-NNNU-3} \\ 3' \text{-NNU-5} \end{matrix}$ Z-Score: 2.62
21. $\begin{matrix} 5' \text{-NNNG-3} \\ 3' \text{-NNG-5} \end{matrix}$ Z-Score: 2.62
22. $\begin{matrix} 5' \text{-NNNA-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 2.62**
23. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-NGU-5} \end{matrix}$ **Z-Score: 2.62**
24. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GUN-5} \end{matrix}$ **Z-Score: 2.62**

Three Base Trends

25. $\begin{matrix} 5' \text{-GNNN-3} \\ 3' \text{-GNG-5} \end{matrix}$ **Z-Score: 7.03**
26. $\begin{matrix} 5' \text{-NNCN-3} \\ 3' \text{-GNU-5} \end{matrix}$ **Z-Score: 7.03**
27. $\begin{matrix} 5' \text{-NNNU-3} \\ 3' \text{-GNU-5} \end{matrix}$ **Z-Score: 7.03**
28. $\begin{matrix} 5' \text{-NNNG-3} \\ 3' \text{-GNG-5} \end{matrix}$ Z-Score: 7.03
29. $\begin{matrix} 5' \text{-GGNN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 5.51**
30. $\begin{matrix} 5' \text{-ANNN-3} \\ 3' \text{-GCN-5} \end{matrix}$ **Z-Score: 5.51**
31. $\begin{matrix} 5' \text{-GNNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 5.51**
32. $\begin{matrix} 5' \text{-NACN-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 5.51
33. $\begin{matrix} 5' \text{-NANN-3} \\ 3' \text{-GNU-5} \end{matrix}$ **Z-Score: 5.51**
34. $\begin{matrix} 5' \text{-NNUN-3} \\ 3' \text{-GCN-5} \end{matrix}$ Z-Score: 5.51
35. $\begin{matrix} 5' \text{-NNCN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 5.51**
36. $\begin{matrix} 5' \text{-AUNN-3} \\ 3' \text{-NNC-5} \end{matrix}$ Z-Score: 3.97

37. $\begin{matrix} 5' & \text{ANUN} & 3' \\ & | & | \\ 3' & \text{NCN} & 5' \end{matrix}$ Z-Score: 3.97
38. $\begin{matrix} 5' & \text{GNGN} & 3' \\ & | & | \\ 3' & \text{NGN} & 5' \end{matrix}$ Z-Score: 3.97
39. $\begin{matrix} 5' & \text{ANUN} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ **Z-Score: 3.97**
40. $\begin{matrix} 5' & \text{GNCN} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 3.97
41. $\begin{matrix} 5' & \text{GNGN} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ **Z-Score: 3.97**
42. $\begin{matrix} 5' & \text{GNNG} & 3' \\ & | & | \\ 3' & \text{NNG} & 5' \end{matrix}$ Z-Score: 3.97
43. $\begin{matrix} 5' & \text{ANNG} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 3.97
44. $\begin{matrix} 5' & \text{GNNA} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 3.97
45. $\begin{matrix} 5' & \text{GNNG} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 3.97
46. $\begin{matrix} 5' & \text{NACN} & 3' \\ & | & | \\ 3' & \text{NNU} & 5' \end{matrix}$ Z-Score: 3.97
47. $\begin{matrix} 5' & \text{NANG} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 3.97
48. $\begin{matrix} 5' & \text{NGNN} & 3' \\ & | & | \\ 3' & \text{GUN} & 5' \end{matrix}$ Z-Score: 3.97
49. $\begin{matrix} 5' & \text{NGNN} & 3' \\ & | & | \\ 3' & \text{GNG} & 5' \end{matrix}$ Z-Score: 3.97

Four Base Trends

50. $\begin{matrix} 5' & \text{ANUN} & 3' \\ & | & | \\ 3' & \text{GCN} & 5' \end{matrix}$ Z-Score: 8.72
51. $\begin{matrix} 5' & \text{GNNG} & 3' \\ & | & | \\ 3' & \text{GNG} & 5' \end{matrix}$ Z-Score: 8.72
52. $\begin{matrix} 5' & \text{NACN} & 3' \\ & | & | \\ 3' & \text{GNU} & 5' \end{matrix}$ **Z-Score: 8.72**
53. $\begin{matrix} 5' & \text{NGNN} & 3' \\ & | & | \\ 3' & \text{GUG} & 5' \end{matrix}$ **Z-Score: 8.72**
54. $\begin{matrix} 5' & \text{GUGN} & 3' \\ & | & | \\ 3' & \text{NNG} & 5' \end{matrix}$ **Z-Score: 5.75**
55. $\begin{matrix} 5' & \text{GUGN} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ **Z-Score: 5.75**
56. $\begin{matrix} 5' & \text{GGCN} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 5.75
57. $\begin{matrix} 5' & \text{AANG} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 5.75
58. $\begin{matrix} 5' & \text{GGNA} & 3' \\ & | & | \\ 3' & \text{GNN} & 5' \end{matrix}$ **Z-Score: 5.75**
59. $\begin{matrix} 5' & \text{AUNNN} & 3' \\ & | & | \\ 3' & \text{NCC} & 5' \end{matrix}$ Z-Score: 5.75
60. $\begin{matrix} 5' & \text{GGNN} & 3' \\ & | & | \\ 3' & \text{NUG} & 5' \end{matrix}$ Z-Score: 5.75

61. $\begin{matrix} 5' \text{-AUNN-3'} \\ 3' \text{-GNC-5'} \end{matrix}$ **Z-Score: 5.75**
62. $\begin{matrix} 5' \text{-CGNN-3'} \\ 3' \text{-CNC-5'} \end{matrix}$ Z-Score: 5.75
63. $\begin{matrix} 5' \text{-GUNN-3'} \\ 3' \text{-GNG-5'} \end{matrix}$ **Z-Score: 5.75**
64. $\begin{matrix} 5' \text{-GGNN-3'} \\ 3' \text{-GNG-5'} \end{matrix}$ Z-Score: 5.75
65. $\begin{matrix} 5' \text{-AUNN-3'} \\ 3' \text{-GCN-5'} \end{matrix}$ Z-Score: 5.75
66. $\begin{matrix} 5' \text{-GANN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ Z-Score: 5.75
67. $\begin{matrix} 5' \text{-GGNN-3'} \\ 3' \text{-GUN-5'} \end{matrix}$ **Z-Score: 5.75**
68. $\begin{matrix} 5' \text{-UNCN-3'} \\ 3' \text{-NGU-5'} \end{matrix}$ **Z-Score: 5.75**
69. $\begin{matrix} 5' \text{-GNGN-3'} \\ 3' \text{-NGU-5'} \end{matrix}$ **Z-Score: 5.75**
70. $\begin{matrix} 5' \text{-UNCN-3'} \\ 3' \text{-GNU-5'} \end{matrix}$ **Z-Score: 5.75**
71. $\begin{matrix} 5' \text{-GNGN-3'} \\ 3' \text{-GNG-5'} \end{matrix}$ Z-Score: 5.75
72. $\begin{matrix} 5' \text{-ANCN-3'} \\ 3' \text{-UAN-5'} \end{matrix}$ Z-Score: 5.75
73. $\begin{matrix} 5' \text{-UNCN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ **Z-Score: 5.75**
74. $\begin{matrix} 5' \text{-GNCN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ Z-Score: 5.75

NEAMINE TRENDS

One Base Trends

1. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 7.67**
2. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ **Z-Score: 2.68**
3. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-NNC-5'} \end{matrix}$ Z-Score: 2.30

Two Base Trends

4. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-GNC-5'} \end{matrix}$ **Z-Score: 7.35**
5. $\begin{matrix} 5' \text{-ANNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 6.67**
6. $\begin{matrix} 5' \text{-NNUN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 6.67**
7. $\begin{matrix} 5' \text{-NNNU-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 6.67**
8. $\begin{matrix} 5' \text{-GNNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 5.99**

9. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ **Z-Score: 5.99**
10. $\begin{matrix} 5' \text{-NUNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 5.31**
11. $\begin{matrix} 5' \text{-NNNA-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 4.62**
12. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-GNG-5'} \end{matrix}$ **Z-Score: 4.62**
13. $\begin{matrix} 5' \text{-ACNN-3'} \\ 3' \text{-NNN-5'} \end{matrix}$ Z-Score: 3.94
14. $\begin{matrix} 5' \text{-GUNN-3'} \\ 3' \text{-NNN-5'} \end{matrix}$ **Z-Score: 3.94**
15. $\begin{matrix} 5' \text{-GNNN-3'} \\ 3' \text{-NNC-5'} \end{matrix}$ Z-Score: 3.94
16. $\begin{matrix} 5' \text{GNNN-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ **Z-Score: 3.94**
17. $\begin{matrix} 5' \text{-NCNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 3.94
18. $\begin{matrix} 5' \text{-NNAN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 3.94
19. $\begin{matrix} 5' \text{-NNGN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 3.94**
20. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-GUN-5'} \end{matrix}$ **Z-Score: 3.94**
21. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-GCN-5'} \end{matrix}$ **Z-Score: 3.94**
22. $\begin{matrix} 5' \text{-NUU-3'} \\ 3' \text{-NNN-5'} \end{matrix}$ Z-Score: 3.25
23. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-NGC-5'} \end{matrix}$ **Z-Score: 3.25**
24. $\begin{matrix} 5' \text{-GNNU-3'} \\ 3' \text{-NNN-5'} \end{matrix}$ Z-Score: 2.57
25. $\begin{matrix} 5' \text{-ANNN-3'} \\ 3' \text{-NNG-5'} \end{matrix}$ Z-Score: 2.57
26. $\begin{matrix} 5' \text{-ANNN-3'} \\ 3' \text{-NCN-5'} \end{matrix}$ Z-Score: 2.57
27. $\begin{matrix} 5' \text{-UNNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 2.57**
28. $\begin{matrix} 5' \text{-NUAN-3'} \\ 3' \text{-NNN-5'} \end{matrix}$ Z-Score: 2.57

Three Base Trends

29. $\begin{matrix} 5' \text{-ACNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 8.53
30. $\begin{matrix} 5' \text{-GNNN-3'} \\ 3' \text{-GNC-5'} \end{matrix}$ Z-Score: 8.53
31. $\begin{matrix} 5' \text{-NNUU-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 8.53**
32. $\begin{matrix} 5' \text{-GUNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 7.22**

33. $\begin{matrix} 5' \text{-GNNU-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 7.22**
34. $\begin{matrix} 5' \text{-ANNN-3} \\ 3' \text{-GNG-5} \end{matrix}$ Z-Score: 7.22
35. $\begin{matrix} 5' \text{-ANNN-3} \\ 3' \text{-GCN-5} \end{matrix}$ **Z-Score: 7.22**
36. $\begin{matrix} 5' \text{-NUAN-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 7.22
37. $\begin{matrix} 5' \text{-NNUN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 7.22**
38. $\begin{matrix} 5' \text{-ACNN-3} \\ 3' \text{-NNG-5} \end{matrix}$ Z-Score: 5.90
39. $\begin{matrix} 5' \text{-GUNN-3} \\ 3' \text{-NGN-5} \end{matrix}$ Z-Score: 5.90
40. $\begin{matrix} 5' \text{-ANUN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 5.90**
41. $\begin{matrix} 5' \text{-GNUN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 5.90**
42. $\begin{matrix} 5' \text{-GNNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 5.90**
43. $\begin{matrix} 5' \text{-NCGN-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 5.90
44. $\begin{matrix} 5' \text{-NUNN-3} \\ 3' \text{-GNC-5} \end{matrix}$ Z-Score: 5.90
45. $\begin{matrix} 5' \text{-NCNN-3} \\ 3' \text{-GNG-5} \end{matrix}$ Z-Score: 5.90
46. $\begin{matrix} 5' \text{-NNUN-3} \\ 3' \text{-GNG-5} \end{matrix}$ **Z-Score: 5.90**
47. $\begin{matrix} 5' \text{-NNGN-3} \\ 3' \text{-GUN-5} \end{matrix}$ Z-Score: 5.90
48. $\begin{matrix} 5' \text{-NNNU-3} \\ 3' \text{-GNC-5} \end{matrix}$ Z-Score: 5.90
49. $\begin{matrix} 5' \text{-NNNU-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 5.90**
50. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GGC-5} \end{matrix}$ **Z-Score: 5.90**
51. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GUG-5} \end{matrix}$ **Z-Score: 5.90**
52. $\begin{matrix} 5' \text{-ACGN-3} \\ 3' \text{-NNN-5} \end{matrix}$ Z-Score: 4.58
53. $\begin{matrix} 5' \text{-GUNU-3} \\ 3' \text{-NNN-5} \end{matrix}$ Z-Score: 4.58

Four Base Trends

54. $\begin{matrix} 5' \text{-ACNN-3} \\ 3' \text{-GNG-5} \end{matrix}$ Z-Score: 12.5
55. $\begin{matrix} 5' \text{-ACGN-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 10.0
56. $\begin{matrix} 5' \text{-GUNU-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 10.0**

57. $\begin{matrix} 5' \text{-ACNN-3} \\ 3' \text{-GCN-5} \end{matrix}$ Z-Score: 10.0
58. $\begin{matrix} 5' \text{-GNUU-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 10.0**
59. $\begin{matrix} 5' \text{-ANNA-3} \\ 3' \text{-GCN-5} \end{matrix}$ Z-Score: 10.0
60. $\begin{matrix} 5' \text{-ANNN-3} \\ 3' \text{-GUG-5} \end{matrix}$ **Z-Score: 10.0**
61. $\begin{matrix} 5' \text{-NCGN-3} \\ 3' \text{-GUN-5} \end{matrix}$ **Z-Score: 10.0**
62. $\begin{matrix} 5' \text{-NNUU-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 10.0**
63. $\begin{matrix} 5' \text{-ACGN-3} \\ 3' \text{-NNG-5} \end{matrix}$ Z-Score: 7.46
64. $\begin{matrix} 5' \text{-ACGN-3} \\ 3' \text{-NUN-5} \end{matrix}$ Z-Score: 7.46
65. $\begin{matrix} 5' \text{-GUUN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 7.46**
66. $\begin{matrix} 5' \text{-ACNA-3} \\ 3' \text{-NCN-5} \end{matrix}$ Z-Score: 7.46
67. $\begin{matrix} 5' \text{-ACNA-3} \\ 3' \text{-GNN-5} \end{matrix}$ Z-Score: 7.46
68. $\begin{matrix} 5' \text{-ACNN-3} \\ 3' \text{-NUG-5} \end{matrix}$ Z-Score: 7.46
69. $\begin{matrix} 5' \text{-GANN-3} \\ 3' \text{-GNC-5} \end{matrix}$ Z-Score: 7.46
70. $\begin{matrix} 5' \text{-GUNN-3} \\ 3' \text{-GNC-5} \end{matrix}$ Z-Score: 7.46
71. $\begin{matrix} 5' \text{-ACNN-3} \\ 3' \text{-GUN-5} \end{matrix}$ **Z-Score: 7.46**
72. $\begin{matrix} 5' \text{-UGNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 7.46**
73. $\begin{matrix} 5' \text{-GUNN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 7.46**
74. $\begin{matrix} 5' \text{-GNUU-3} \\ 3' \text{-NNC-5} \end{matrix}$ **Z-Score: 7.46**
75. $\begin{matrix} 5' \text{-ANGN-3} \\ 3' \text{-NUG-5} \end{matrix}$ Z-Score: 7.46
76. $\begin{matrix} 5' \text{-ANUN-3} \\ 3' \text{-GNG-5} \end{matrix}$ **Z-Score: 7.46**
77. $\begin{matrix} 5' \text{-ANGN-3} \\ 3' \text{-GNG-5} \end{matrix}$ Z-Score: 7.46
78. $\begin{matrix} 5' \text{-GNUN-3} \\ 3' \text{-GNC-5} \end{matrix}$ **Z-Score: 7.46**

NEOMYCIN TRENDS

One Base Trends

1. $\begin{matrix} 5' \text{-NNNN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 7.48**

2. $\begin{matrix} 5'-NNNN-3' \\ 3'-NGN-5' \end{matrix}$ **Z-Score: 4.19**

Two Base Trends

3. $\begin{matrix} 5'-NNNN-3' \\ 3'-GGN-5' \end{matrix}$ **Z-Score: 8.16**
4. $\begin{matrix} 5'-GNNN-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 6.41**
5. $\begin{matrix} 5'-NNNU-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 6.41**
6. $\begin{matrix} 5'-NNNN-3' \\ 3'-GNC-5' \end{matrix}$ **Z-Score: 6.41**
7. $\begin{matrix} 5'-UNNN-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 5.24**
8. $\begin{matrix} 5'-NNGN-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 5.24**
9. $\begin{matrix} 5'-NUNN-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 4.66**
10. $\begin{matrix} 5'-NNNN-3' \\ 3'-GNG-5' \end{matrix}$ **Z-Score: 4.66**
11. $\begin{matrix} 5'-NNNN-3' \\ 3'-GUN-5' \end{matrix}$ **Z-Score: 4.66**
12. $\begin{matrix} 5'-NNCN-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 4.07**
13. $\begin{matrix} 5'-NNNA-3' \\ 3'-NGN-5' \end{matrix}$ **Z-Score: 4.07**
14. $\begin{matrix} 5'-NNNA-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 4.07**
15. $\begin{matrix} 5'-NNNN-3' \\ 3'-NGU-5' \end{matrix}$ **Z-Score: 4.07**
16. $\begin{matrix} 5'-NNNN-3' \\ 3'-NGC-5' \end{matrix}$ **Z-Score: 4.07**
17. $\begin{matrix} 5'-GNNN-3' \\ 3'-NNG-5' \end{matrix}$ **Z-Score: 3.48**
18. $\begin{matrix} 5'-NANN-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 3.48**
19. $\begin{matrix} 5'-NGNN-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 3.48**
20. $\begin{matrix} 5'-NNUN-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 3.48**
21. $\begin{matrix} 5'-NNNU-3' \\ 3'-NGN-5' \end{matrix}$ **Z-Score: 3.48**
22. $\begin{matrix} 5'-GUNN-3' \\ 3'-NNN-5' \end{matrix}$ **Z-Score: 2.90**
23. $\begin{matrix} 5'-ANNN-3' \\ 3'-NGN-5' \end{matrix}$ **Z-Score: 2.90**
24. $\begin{matrix} 5'-ANNN-3' \\ 3'-GNN-5' \end{matrix}$ **Z-Score: 2.90**
25. $\begin{matrix} 5'-NGNN-3' \\ 3'-NGN-5' \end{matrix}$ **Z-Score: 2.90**

26. $\begin{matrix} 5' \text{-NNUN-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ **Z-Score: 2.90**
27. $\begin{matrix} 5' \text{-NNGN-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ **Z-Score: 2.90**

Three Base Trends

28. $\begin{matrix} 5' \text{-NNGN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ **Z-Score: 8.20**
29. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-GGC-5'} \end{matrix}$ **Z-Score: 8.20**
30. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-GUG-5'} \end{matrix}$ **Z-Score: 8.20**
31. $\begin{matrix} 5' \text{-GNNN-3'} \\ 3' \text{-GNG-5'} \end{matrix}$ **Z-Score: 7.08**
32. $\begin{matrix} 5' \text{-GNNN-3'} \\ 3' \text{-GUN-5'} \end{matrix}$ **Z-Score: 7.08**
33. $\begin{matrix} 5' \text{-NNNA-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ **Z-Score: 7.08**
34. $\begin{matrix} 5' \text{-GUNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 5.96**
35. $\begin{matrix} 5' \text{-GNGN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 5.96**
36. $\begin{matrix} 5' \text{-GNNU-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 5.96**
37. $\begin{matrix} 5' \text{-GNNN-3'} \\ 3' \text{-NUG-5'} \end{matrix}$ Z-Score: 5.96
38. $\begin{matrix} 5' \text{-UNNN-3'} \\ 3' \text{-GNC-5'} \end{matrix}$ Z-Score: 5.96
39. $\begin{matrix} 5' \text{-ANNN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ **Z-Score: 5.96**
40. $\begin{matrix} 5' \text{-GNNN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ **Z-Score: 5.96**
41. $\begin{matrix} 5' \text{-NGGN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 5.96**
42. $\begin{matrix} 5' \text{-NGNN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ **Z-Score: 5.96**
43. $\begin{matrix} 5' \text{-NNNA-3'} \\ 3' \text{-NGC-5'} \end{matrix}$ Z-Score: 5.96
44. $\begin{matrix} 5' \text{-NNNA-3'} \\ 3' \text{-GNC-5'} \end{matrix}$ Z-Score: 5.96
45. $\begin{matrix} 5' \text{-NNNU-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ **Z-Score: 5.96**
46. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-GGU-5'} \end{matrix}$ **Z-Score: 5.96**
47. $\begin{matrix} 5' \text{-GUNN-3'} \\ 3' \text{-NNG-5'} \end{matrix}$ **Z-Score: 4.83**
48. $\begin{matrix} 5' \text{-UNCN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 4.83
49. $\begin{matrix} 5' \text{-ANNA-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ Z-Score: 4.83

50. $\begin{matrix} 5' \text{-UNNU-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 4.83**
51. $\begin{matrix} 5' \text{-ANNN-3} \\ 3' \text{-GNC-5} \end{matrix}$ **Z-Score: 4.83**
52. $\begin{matrix} 5' \text{-UNNN-3} \\ 3' \text{-GCN-5} \end{matrix}$ Z-Score: 4.83

Four Base Trends

53. $\begin{matrix} 5' \text{-GNNN-3} \\ 3' \text{-GUG-5} \end{matrix}$ **Z-Score: 12.7**
54. $\begin{matrix} 5' \text{-NGGN-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 10.6**
55. $\begin{matrix} 5' \text{-NNGA-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 10.6**
56. $\begin{matrix} 5' \text{-NNNA-3} \\ 3' \text{-GGC-5} \end{matrix}$ **Z-Score: 10.6**
57. $\begin{matrix} 5' \text{-GUNN-3} \\ 3' \text{-GUN-5} \end{matrix}$ **Z-Score: 8.46**
58. $\begin{matrix} 5' \text{-ANNA-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 8.46**
59. $\begin{matrix} 5' \text{-GNNU-3} \\ 3' \text{-GGN-5} \end{matrix}$ **Z-Score: 8.46**
60. $\begin{matrix} 5' \text{-ANNN-3} \\ 3' \text{-GGC-5} \end{matrix}$ **Z-Score: 8.46**
61. $\begin{matrix} 5' \text{-UNNN-3} \\ 3' \text{-GCC-5} \end{matrix}$ Z-Score: 8.46
62. $\begin{matrix} 5' \text{-NGGN-3} \\ 3' \text{-GNU-5} \end{matrix}$ **Z-Score: 8.46**
63. $\begin{matrix} 5' \text{-NNUN-3} \\ 3' \text{-GUG-5} \end{matrix}$ **Z-Score: 8.46**
64. $\begin{matrix} 5' \text{-NNGN-3} \\ 3' \text{-GGU-5} \end{matrix}$ **Z-Score: 8.46**
65. $\begin{matrix} 5' \text{-NNGN-3} \\ 3' \text{-GGC-5} \end{matrix}$ **Z-Score: 8.46**
66. $\begin{matrix} 5' \text{-NNNG-3} \\ 3' \text{-GUG-5} \end{matrix}$ **Z-Score: 8.46**
67. $\begin{matrix} 5' \text{-GUGG-3} \\ 3' \text{-NNN-5} \end{matrix}$ Z-Score: 6.28
68. $\begin{matrix} 5' \text{-GUGN-3} \\ 3' \text{-NNG-5} \end{matrix}$ **Z-Score: 6.28**
69. $\begin{matrix} 5' \text{-GUGN-3} \\ 3' \text{-NUN-5} \end{matrix}$ Z-Score: 6.28
70. $\begin{matrix} 5' \text{-GUGN-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 6.28**
71. $\begin{matrix} 5' \text{-GUNG-3} \\ 3' \text{-NNG-5} \end{matrix}$ **Z-Score: 6.28**
72. $\begin{matrix} 5' \text{-GUNG-3} \\ 3' \text{-NUN-5} \end{matrix}$ **Z-Score: 6.28**
73. $\begin{matrix} 5' \text{-GUNG-3} \\ 3' \text{-GNN-5} \end{matrix}$ **Z-Score: 6.28**

74. $\begin{matrix} 5' \text{-GGNA-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ **Z-Score: 6.28**
75. $\begin{matrix} 5' \text{-AGNN-3'} \\ 3' \text{-NGU-5'} \end{matrix}$ Z-Score: 6.28
76. $\begin{matrix} 5' \text{-GUNN-3'} \\ 3' \text{-NUG-5'} \end{matrix}$ **Z-Score: 6.28**
77. $\begin{matrix} 5' \text{-GUNN-3'} \\ 3' \text{-GNG-5'} \end{matrix}$ **Z-Score: 6.28**

III. Trends in the RNA space that are unique to each aminoglycoside and have Z score ≥ 2.6 ($\geq 99\%$ confidence)

KANAMYCIN TRENDS

Two Base Trends

1. $\begin{matrix} 5' \text{-UNNA-3'} \\ 3' \text{-NNN-5'} \end{matrix}$ Z-Score: 3.57
2. $\begin{matrix} 5' \text{-NNNN-3'} \\ 3' \text{-NGG-5'} \end{matrix}$ Z-Score: 3.57
3. $\begin{matrix} 5' \text{-NANN-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ Z-Score: 2.92

Three Base Trends

4. $\begin{matrix} 5' \text{-UNNA-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 8.02
5. $\begin{matrix} 5' \text{-NUNA-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 6.77
6. $\begin{matrix} 5' \text{-AUNN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 5.52
7. $\begin{matrix} 5' \text{-ANGN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 5.52
8. $\begin{matrix} 5' \text{-UNAN-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ Z-Score: 5.52
9. $\begin{matrix} 5' \text{-ANAN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 5.52
10. $\begin{matrix} 5' \text{-NUNA-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ Z-Score: 5.52
11. $\begin{matrix} 5' \text{-NANN-3'} \\ 3' \text{-GNC-5'} \end{matrix}$ Z-Score: 5.52

Four Base Trends

12. $\begin{matrix} 5' \text{-AUNA-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 9.45
13. $\begin{matrix} 5' \text{-NNGA-3'} \\ 3' \text{-GNC-5'} \end{matrix}$ Z-Score: 9.45
14. $\begin{matrix} 5' \text{-NNUA-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ Z-Score: 9.45
15. $\begin{matrix} 5' \text{-UAGA-3'} \\ 3' \text{-NNN-5'} \end{matrix}$ Z-Score: 7.04
16. $\begin{matrix} 5' \text{-AUGN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 7.04
17. $\begin{matrix} 5' \text{-AUNA-3'} \\ 3' \text{-NNC-5'} \end{matrix}$ Z-Score: 7.04

18. $\begin{matrix} 5' \text{-AUNA-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ Z-Score: 7.04
19. $\begin{matrix} 5' \text{-UANA-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 7.04
20. $\begin{matrix} 5' \text{-UANN-3'} \\ 3' \text{-GNC-5'} \end{matrix}$ Z-Score: 7.04
21. $\begin{matrix} 5' \text{-AANN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ Z-Score: 7.04
22. $\begin{matrix} 5' \text{-UANN-3'} \\ 3' \text{-GGN-5'} \end{matrix}$ Z-Score: 7.04

TOBRAMYCIN TRENDS

Two Base Trends

1. $\begin{matrix} 5' \text{-NNNG-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 3.41
2. $\begin{matrix} 5' \text{-NACN-3'} \\ 3' \text{-NNN-5'} \end{matrix}$ Z-Score: 2.62
3. $\begin{matrix} 5' \text{-NNCN-3'} \\ 3' \text{-NNU-5'} \end{matrix}$ Z-Score: 2.62
4. $\begin{matrix} 5' \text{-NNNU-3'} \\ 3' \text{-NNU-5'} \end{matrix}$ Z-Score: 2.62
5. $\begin{matrix} 5' \text{-NNNG-3'} \\ 3' \text{-NNG-5'} \end{matrix}$ Z-Score: 2.62

Three Base Trends

6. $\begin{matrix} 5' \text{-NNNG-3'} \\ 3' \text{-GNG-5'} \end{matrix}$ Z-Score: 7.03
7. $\begin{matrix} 5' \text{-NACN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 5.51
8. $\begin{matrix} 5' \text{-NNUN-3'} \\ 3' \text{-GCN-5'} \end{matrix}$ Z-Score: 5.51
9. $\begin{matrix} 5' \text{-AUNN-3'} \\ 3' \text{-NNC-5'} \end{matrix}$ Z-Score: 3.97
10. $\begin{matrix} 5' \text{-ANUN-3'} \\ 3' \text{-NCN-5'} \end{matrix}$ Z-Score: 3.97
11. $\begin{matrix} 5' \text{-GNGN-3'} \\ 3' \text{-NGN-5'} \end{matrix}$ Z-Score: 3.97
12. $\begin{matrix} 5' \text{-GNCN-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 3.97
13. $\begin{matrix} 5' \text{-GNNG-3'} \\ 3' \text{-NNG-5'} \end{matrix}$ Z-Score: 3.97
14. $\begin{matrix} 5' \text{-ANNG-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 3.97
15. $\begin{matrix} 5' \text{-GNNA-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 3.97
16. $\begin{matrix} 5' \text{-GNNG-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 3.97
17. $\begin{matrix} 5' \text{-NACN-3'} \\ 3' \text{-NNU-5'} \end{matrix}$ Z-Score: 3.97
18. $\begin{matrix} 5' \text{-NANG-3'} \\ 3' \text{-GNN-5'} \end{matrix}$ Z-Score: 3.97

19. $\begin{matrix} 5' & \text{NGNN} & 3' \\ & | & \\ 3' & \text{GUN} & 5' \end{matrix}$ Z-Score: 3.97

20. $\begin{matrix} 5' & \text{NGNN} & 3' \\ & | & \\ 3' & \text{GNG} & 5' \end{matrix}$ Z-Score: 3.97

Four Base Trends

21. $\begin{matrix} 5' & \text{ANUN} & 3' \\ & | & \\ 3' & \text{GCN} & 5' \end{matrix}$ Z-Score: 8.72

22. $\begin{matrix} 5' & \text{GNNG} & 3' \\ & | & \\ 3' & \text{GNG} & 5' \end{matrix}$ Z-Score: 8.72

23. $\begin{matrix} 5' & \text{GGCN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 5.75

24. $\begin{matrix} 5' & \text{AANG} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 5.75

25. $\begin{matrix} 5' & \text{AUNNN} & 3' \\ & | & \\ 3' & \text{NCC} & 5' \end{matrix}$ Z-Score: 5.75

26. $\begin{matrix} 5' & \text{GGNN} & 3' \\ & | & \\ 3' & \text{NUG} & 5' \end{matrix}$ Z-Score: 5.75

27. $\begin{matrix} 5' & \text{CGNN} & 3' \\ & | & \\ 3' & \text{CNC} & 5' \end{matrix}$ Z-Score: 5.75

28. $\begin{matrix} 5' & \text{GGNN} & 3' \\ & | & \\ 3' & \text{GNG} & 5' \end{matrix}$ Z-Score: 5.75

29. $\begin{matrix} 5' & \text{AUNN} & 3' \\ & | & \\ 3' & \text{GCN} & 5' \end{matrix}$ Z-Score: 5.75

30. $\begin{matrix} 5' & \text{GANN} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ Z-Score: 5.75

31. $\begin{matrix} 5' & \text{GNGN} & 3' \\ & | & \\ 3' & \text{GNG} & 5' \end{matrix}$ Z-Score: 5.75

32. $\begin{matrix} 5' & \text{ANCN} & 3' \\ & | & \\ 3' & \text{UAN} & 5' \end{matrix}$ Z-Score: 5.75

33. $\begin{matrix} 5' & \text{GNCN} & 3' \\ & | & \\ 3' & \text{GGN} & 5' \end{matrix}$ Z-Score: 5.75

NEAMINE TRENDS

Two Base Trends

1. $\begin{matrix} 5' & \text{ACNN} & 3' \\ & | & \\ 3' & \text{NNN} & 5' \end{matrix}$ Z-Score: 3.94

2. $\begin{matrix} 5' & \text{GNNN} & 3' \\ & | & \\ 3' & \text{NNC} & 5' \end{matrix}$ Z-Score: 3.94

3. $\begin{matrix} 5' & \text{NCNN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 3.94

4. $\begin{matrix} 5' & \text{NNAN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 3.94

5. $\begin{matrix} 5' & \text{NUU} & 3' \\ & | & \\ 3' & \text{NNN} & 5' \end{matrix}$ Z-Score: 3.25

6. $\begin{matrix} 5' & \text{GNNU} & 3' \\ & | & \\ 3' & \text{NNN} & 5' \end{matrix}$ Z-Score: 2.57

7. $\begin{matrix} 5' & \text{ANNN} & 3' \\ & | & \\ 3' & \text{NNG} & 5' \end{matrix}$ Z-Score: 2.57

8. $\begin{matrix} 5' & \text{ANNN} & 3' \\ & | & \\ 3' & \text{NCN} & 5' \end{matrix}$ Z-Score: 2.57

9. $\begin{matrix} 5' & \text{NUAN} & 3' \\ & | & \\ 3' & \text{NNN} & 5' \end{matrix}$ Z-Score: 2.57

Three Base Trends

10. $\begin{matrix} 5' & \text{ACNN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 8.53

11. $\begin{matrix} 5' & \text{GNNN} & 3' \\ & | & \\ 3' & \text{GNC} & 5' \end{matrix}$ Z-Score: 8.53

12. $\begin{matrix} 5' & \text{ANNN} & 3' \\ & | & \\ 3' & \text{GNG} & 5' \end{matrix}$ Z-Score: 7.22

13. $\begin{matrix} 5' & \text{NUAN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 7.22

14. $\begin{matrix} 5' & \text{ACNN} & 3' \\ & | & \\ 3' & \text{NNG} & 5' \end{matrix}$ Z-Score: 5.90

15. $\begin{matrix} 5' & \text{GUNN} & 3' \\ & | & \\ 3' & \text{NGN} & 5' \end{matrix}$ Z-Score: 5.90

16. $\begin{matrix} 5' & \text{NCGN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 5.90

17. $\begin{matrix} 5' & \text{NUNN} & 3' \\ & | & \\ 3' & \text{GNC} & 5' \end{matrix}$ Z-Score: 5.90

18. $\begin{matrix} 5' & \text{NCNN} & 3' \\ & | & \\ 3' & \text{GNG} & 5' \end{matrix}$ Z-Score: 5.90

19. $\begin{matrix} 5' & \text{NNGN} & 3' \\ & | & \\ 3' & \text{GUN} & 5' \end{matrix}$ Z-Score: 5.90

20. $\begin{matrix} 5' & \text{ACGN} & 3' \\ & | & \\ 3' & \text{NNN} & 5' \end{matrix}$ Z-Score: 4.58

21. $\begin{matrix} 5' & \text{GUNU} & 3' \\ & | & \\ 3' & \text{NNN} & 5' \end{matrix}$ Z-Score: 4.58

Four Base Trends

22. $\begin{matrix} 5' & \text{ACNN} & 3' \\ & | & \\ 3' & \text{GNG} & 5' \end{matrix}$ Z-Score: 12.5

23. $\begin{matrix} 5' & \text{ACGN} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 10.0

24. $\begin{matrix} 5' & \text{ACNN} & 3' \\ & | & \\ 3' & \text{GCN} & 5' \end{matrix}$ Z-Score: 10.0

25. $\begin{matrix} 5' & \text{ANNA} & 3' \\ & | & \\ 3' & \text{GCN} & 5' \end{matrix}$ Z-Score: 10.0

26. $\begin{matrix} 5' & \text{ACGN} & 3' \\ & | & \\ 3' & \text{NNG} & 5' \end{matrix}$ Z-Score: 7.46

27. $\begin{matrix} 5' & \text{ACGN} & 3' \\ & | & \\ 3' & \text{NUN} & 5' \end{matrix}$ Z-Score: 7.46

28. $\begin{matrix} 5' & \text{ACNA} & 3' \\ & | & \\ 3' & \text{NCN} & 5' \end{matrix}$ Z-Score: 7.46

29. $\begin{matrix} 5' & \text{ACNA} & 3' \\ & | & \\ 3' & \text{GNN} & 5' \end{matrix}$ Z-Score: 7.46

30. $\begin{matrix} 5' & \text{ACNN} & 3' \\ & | & \\ 3' & \text{NUG} & 5' \end{matrix}$ Z-Score: 7.46

31. $\begin{matrix} 5' & \text{GANN} & 3' \\ & | & \\ 3' & \text{GNC} & 5' \end{matrix}$ Z-Score: 7.46

32. $\begin{matrix} 5' & \text{GUNN} & 3' \\ & | & \\ 3' & \text{GNC} & 5' \end{matrix}$ Z-Score: 7.46

33. $\begin{matrix} 5' \text{-ANGN-} \\ 3' \text{-NUG-} \end{matrix}$ Z-Score: 7.46
34. $\begin{matrix} 5' \text{-ANGN-} \\ 3' \text{-GNG-} \end{matrix}$ Z-Score: 7.46

NEOMYCIN TRENDS

Three Base Trends

1. $\begin{matrix} 5' \text{-GNNN-} \\ 3' \text{-NUG-} \end{matrix}$ Z-Score: 5.96
2. $\begin{matrix} 5' \text{-UNNN-} \\ 3' \text{-GNC-} \end{matrix}$ Z-Score: 5.96
3. $\begin{matrix} 5' \text{-NNNA-} \\ 3' \text{-NGC-} \end{matrix}$ Z-Score: 5.96
4. $\begin{matrix} 5' \text{-NNNA-} \\ 3' \text{-GNC-} \end{matrix}$ Z-Score: 5.96
5. $\begin{matrix} 5' \text{-UNCN-} \\ 3' \text{-GNN-} \end{matrix}$ Z-Score: 4.83
6. $\begin{matrix} 5' \text{-ANNA-} \\ 3' \text{-NGN-} \end{matrix}$ Z-Score: 4.83
7. $\begin{matrix} 5' \text{-UNNN-} \\ 3' \text{-GCN-} \end{matrix}$ Z-Score: 4.83

Four Base Trends

8. $\begin{matrix} 5' \text{-UNNN-} \\ 3' \text{-GCC-} \end{matrix}$ Z-Score: 8.46
9. $\begin{matrix} 5' \text{-GUGG-} \\ 3' \text{-NNN-} \end{matrix}$ Z-Score: 6.28
10. $\begin{matrix} 5' \text{-GUGN-} \\ 3' \text{-NUN-} \end{matrix}$ Z-Score: 6.28
11. $\begin{matrix} 5' \text{-AGNN-} \\ 3' \text{-NGU-} \end{matrix}$ Z-Score: 6.28