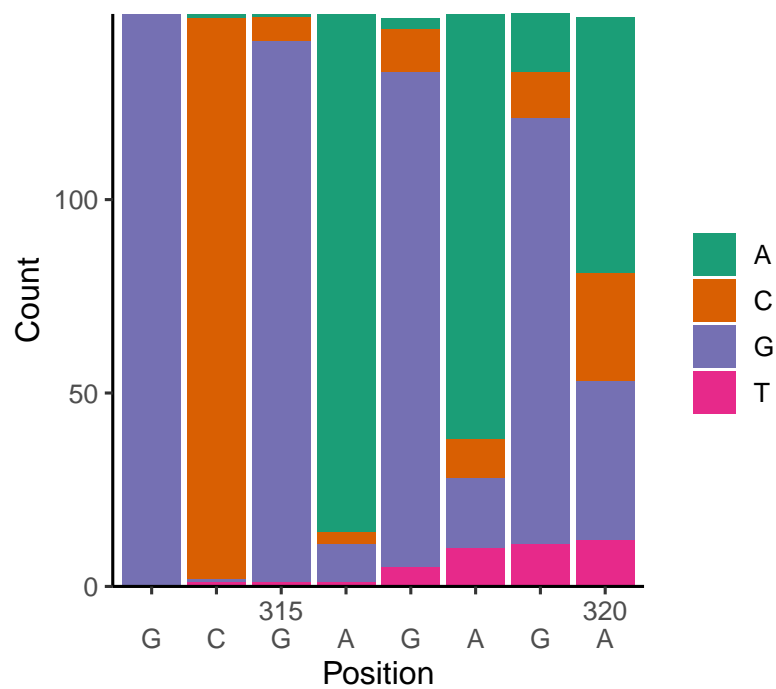
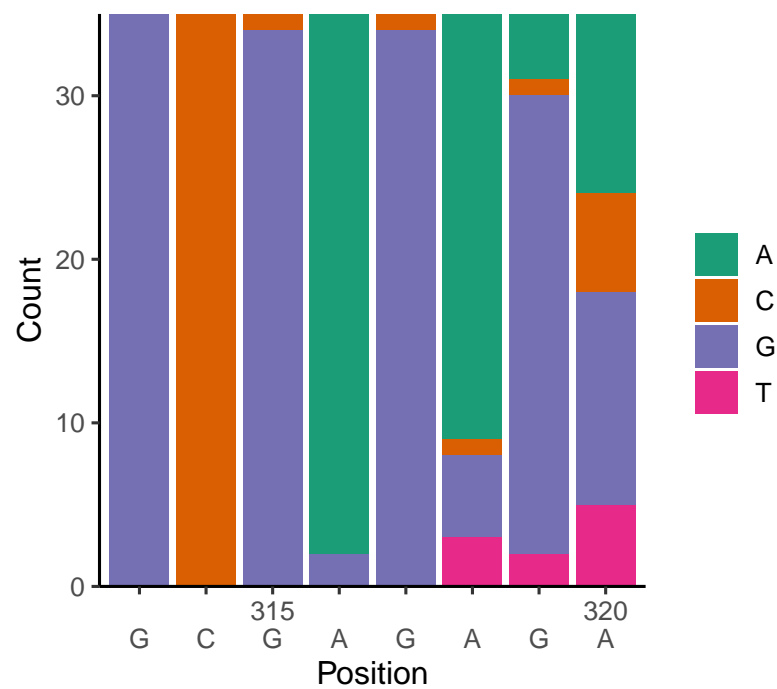


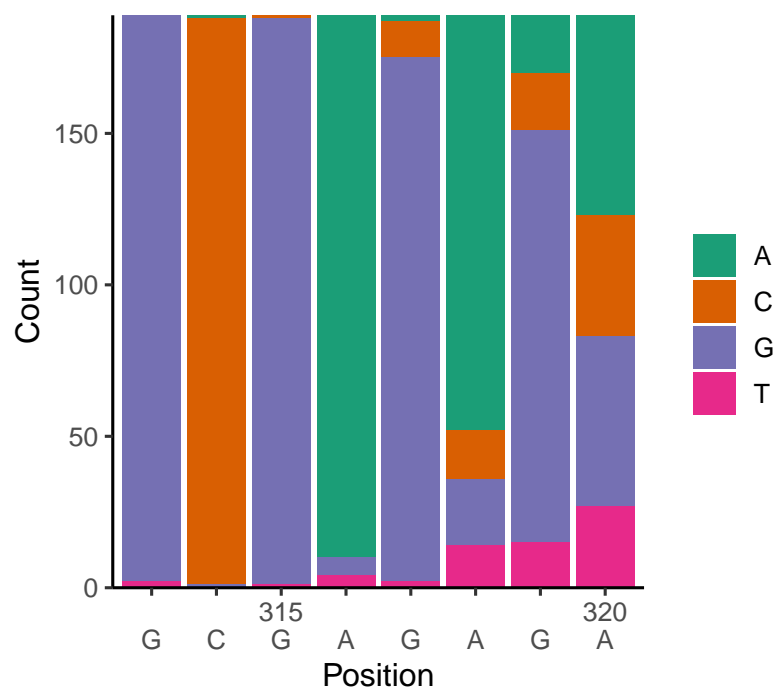
Gene IGHV1-69\*08\_C191T



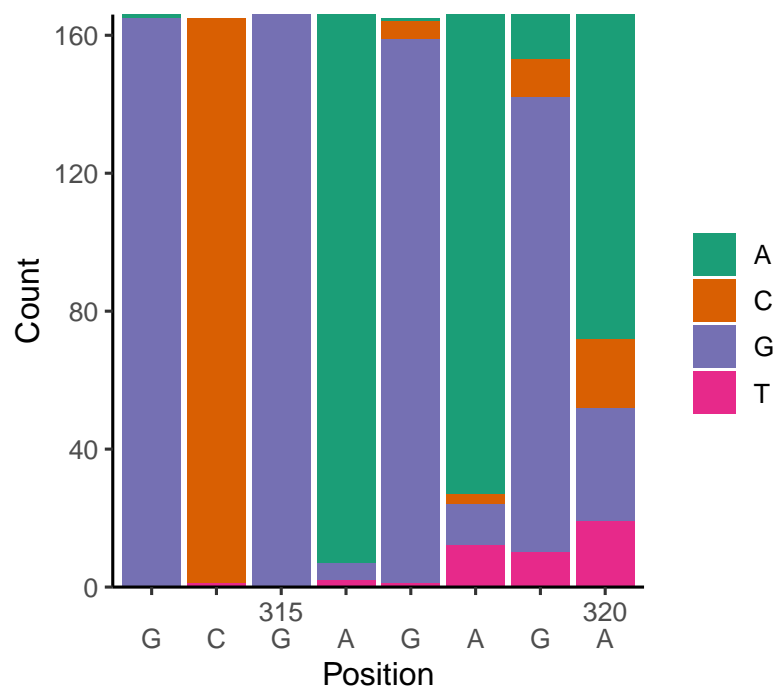
Gene IGHV3-53\*04\_C241G\_G273A\_C300



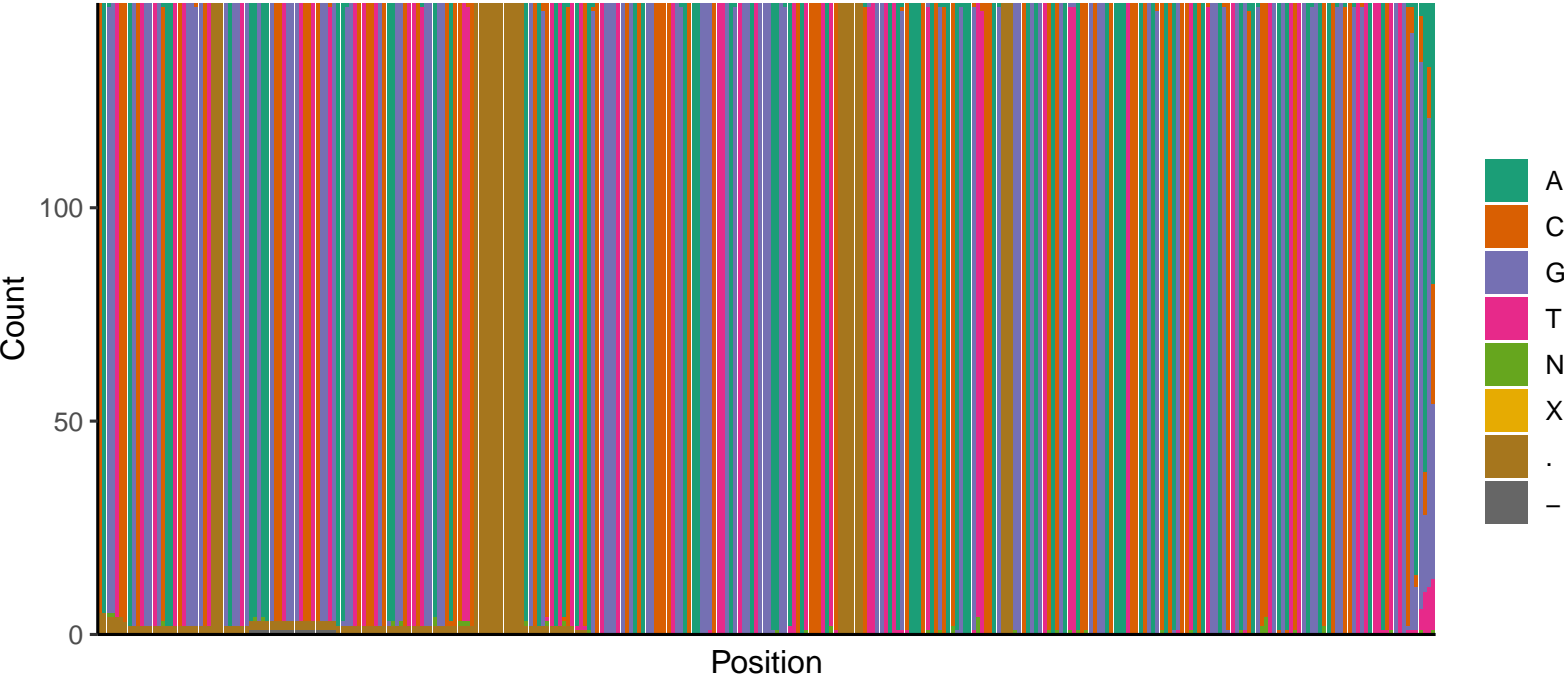
Gene IGHV1-69\*12\_G48A



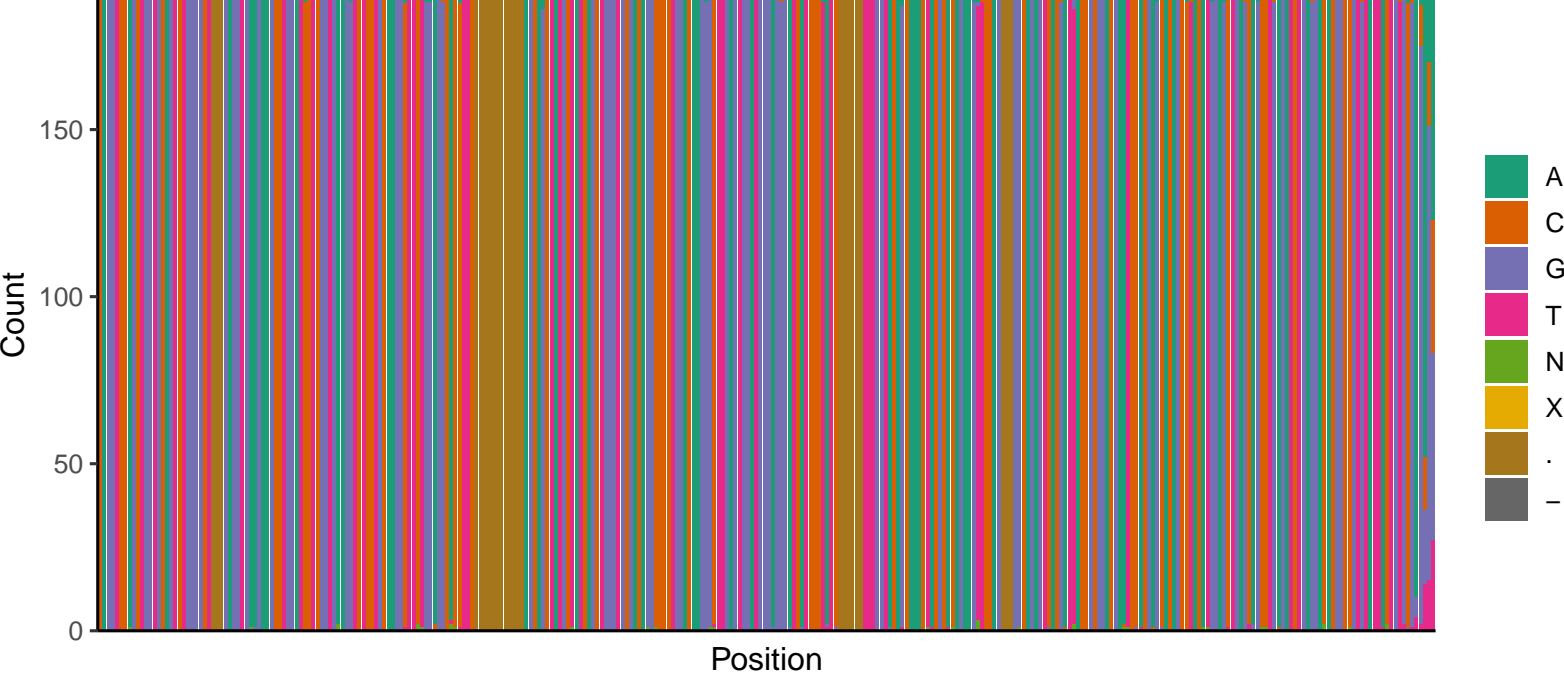
Gene IGHV3-48\*01\_A39C



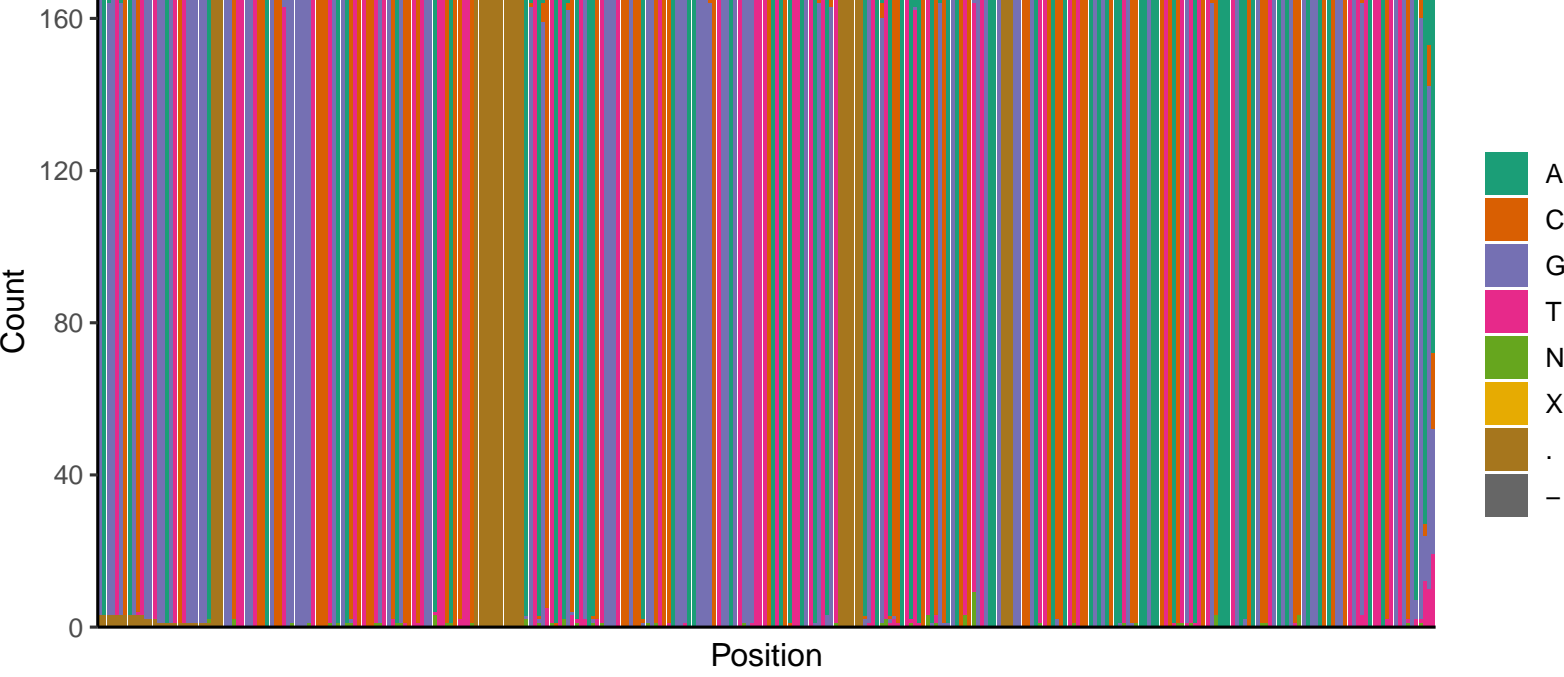
Gene IGHV1-69\*08\_C191T



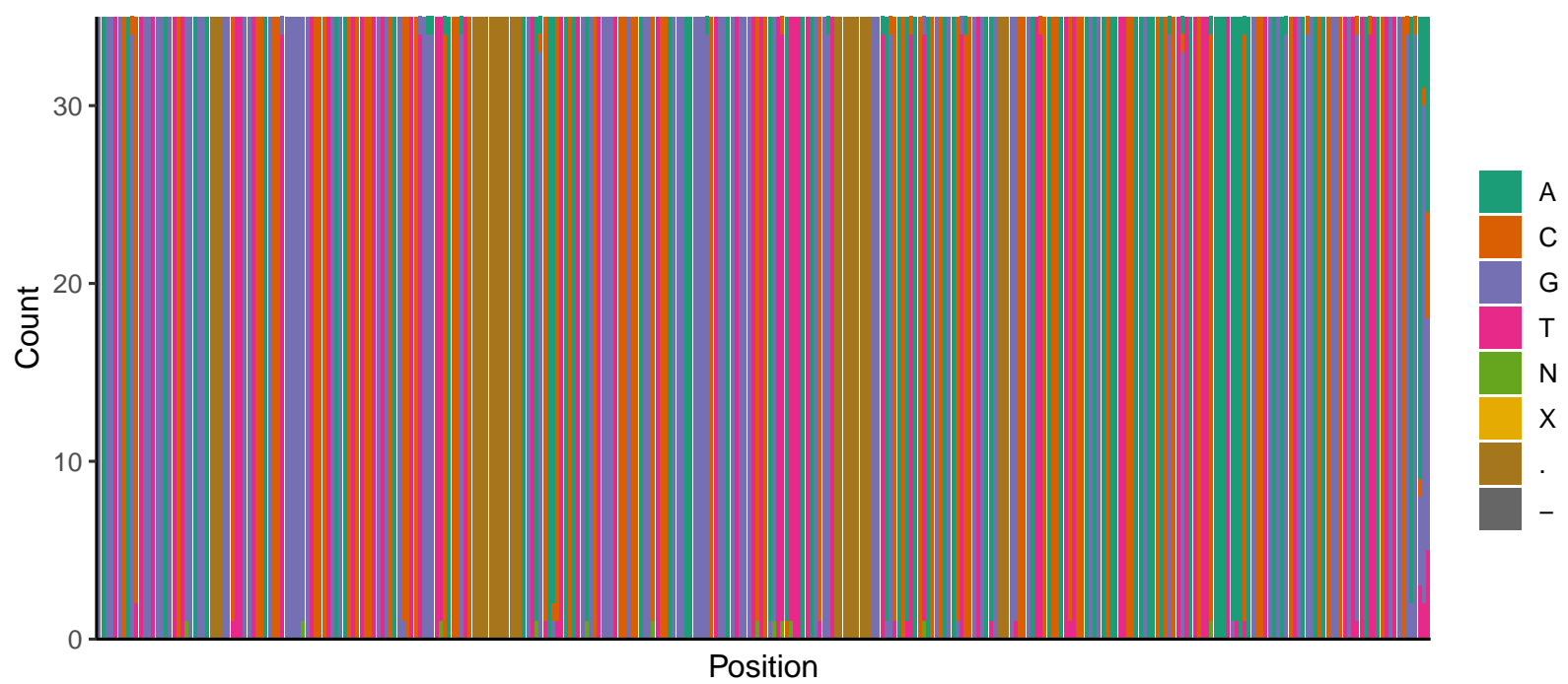
Gene IGHV1-69\*12\_G48A



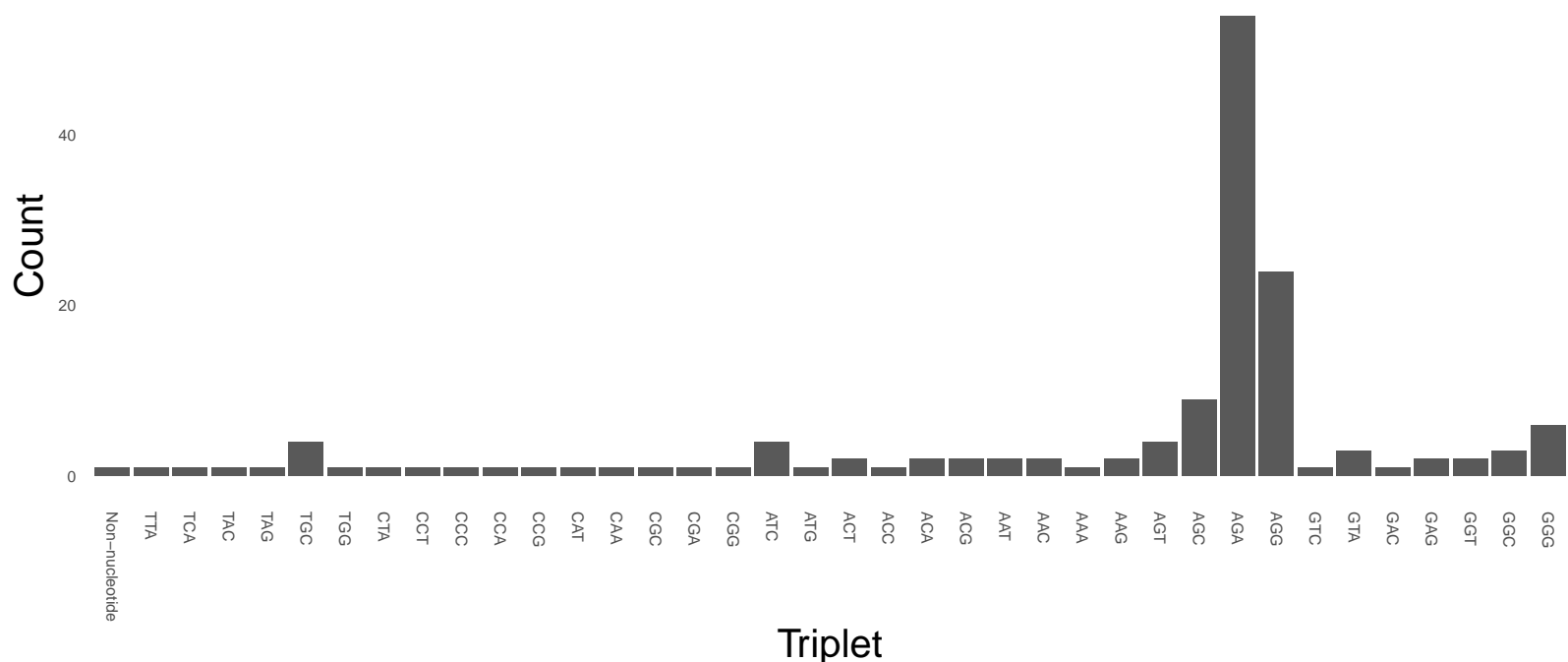
Gene IGHV3-48\*01\_A39C



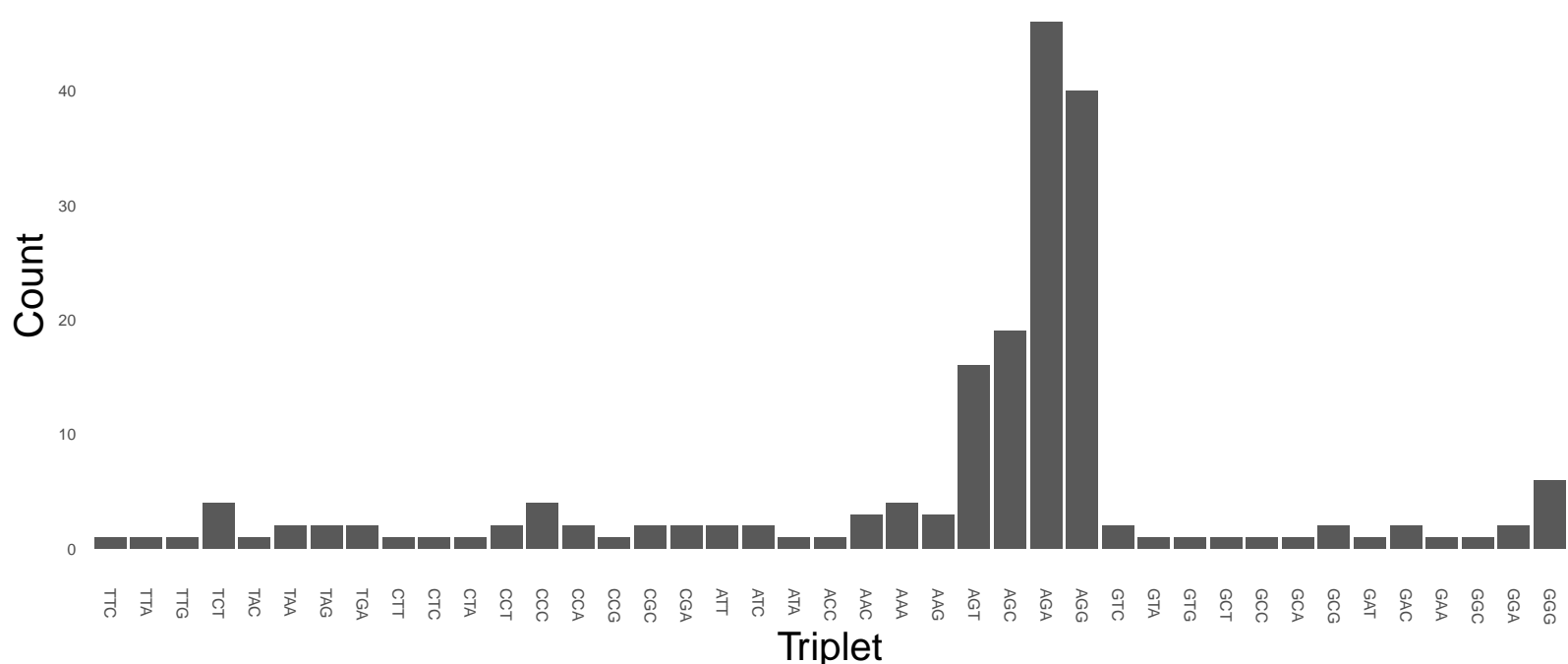
Gene IGHV3-53\*04\_C241G\_G273A\_C300T



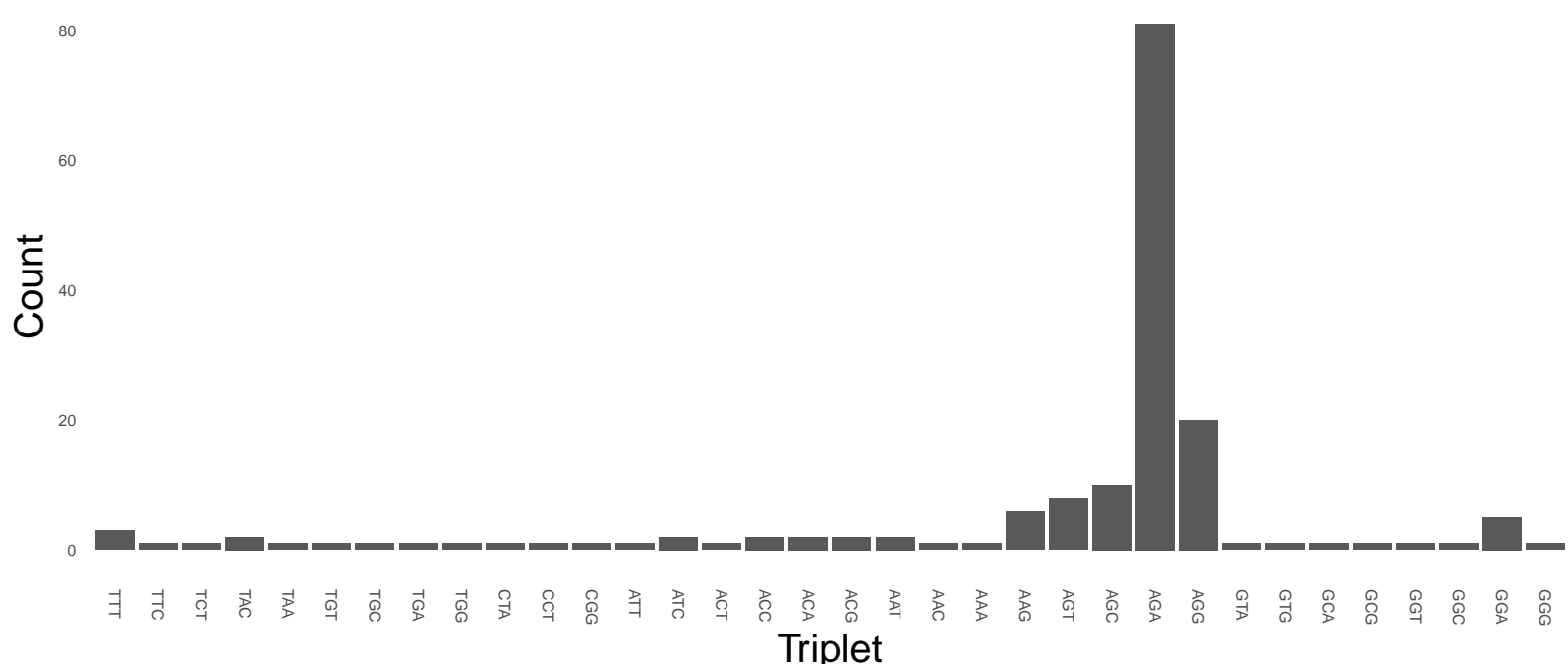
IGHV1-69\*08\_C191T- Final 3 nucleotides as a triplet



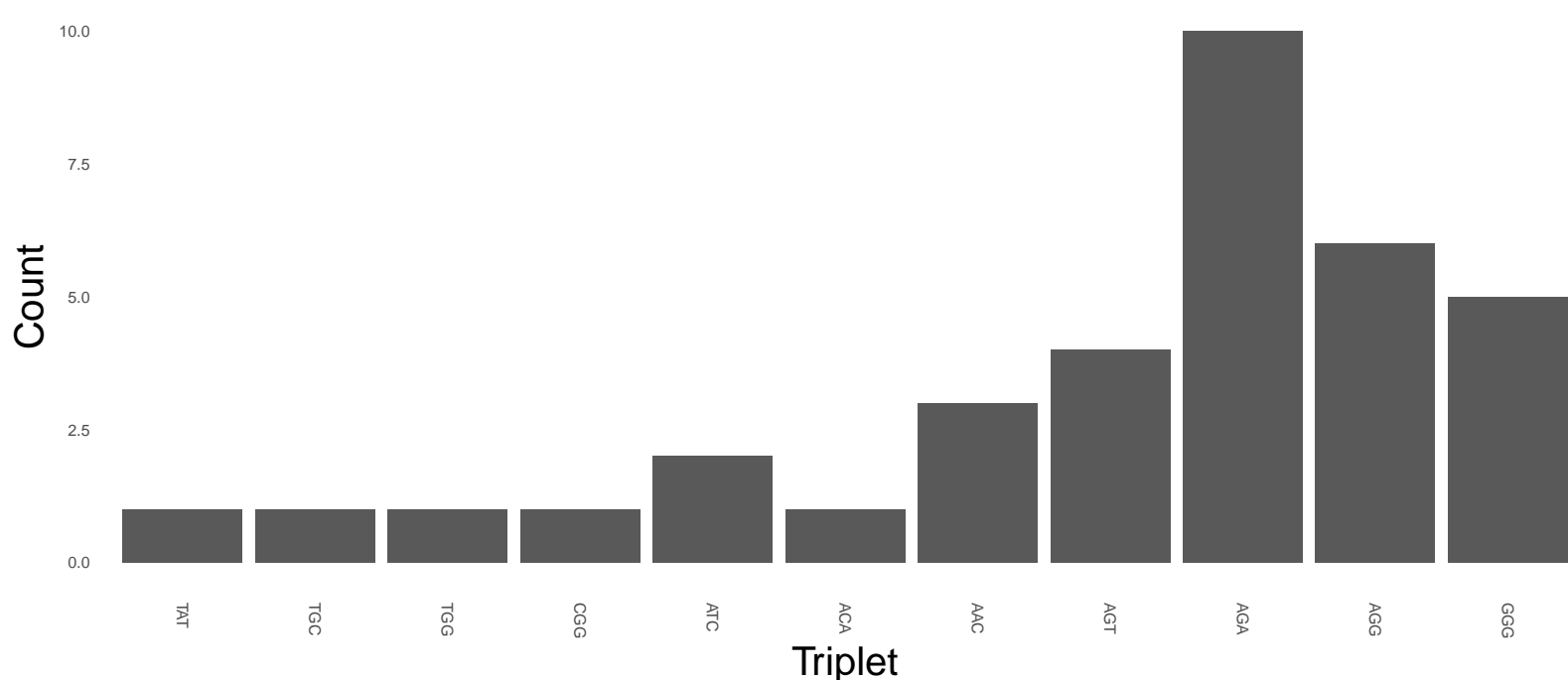
IGHV1-69\*12\_G48A- Final 3 nucleotides as a triplet



IGHV3-48\*01\_A39C- Final 3 nucleotides as a triplet

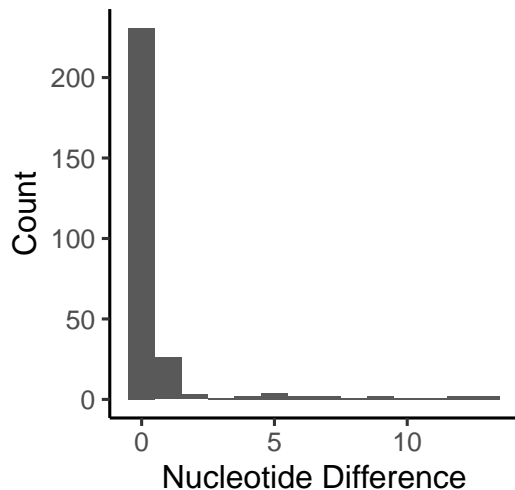


IGHV3-53\*04\_C241G\_G273A\_C300T- Final 3 nucleotides as a triplet



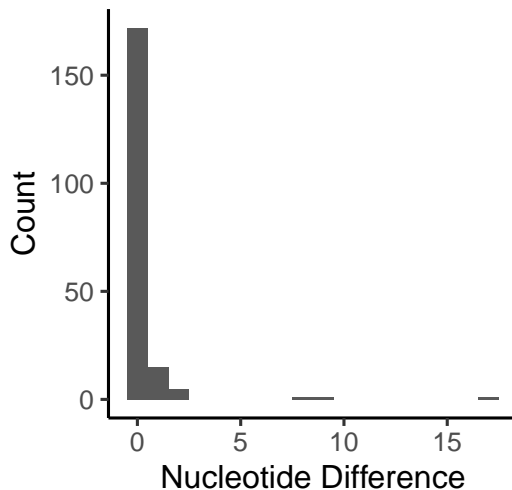
### IGHV1-2\*02

280 sequences assigned  
231 (82.5%) exact matches, in which:  
230 unique CDR3  
6 unique J



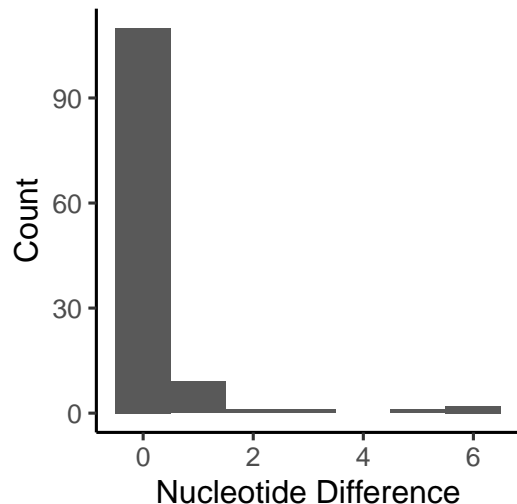
### IGHV1-8\*03

196 sequences assigned  
172 (87.8%) exact matches, in which:  
171 unique CDR3  
5 unique J



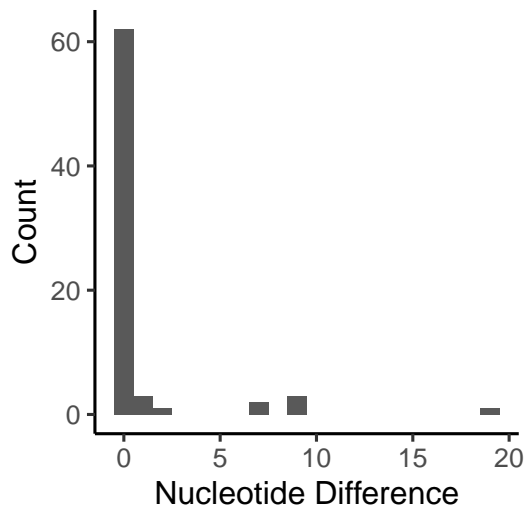
### IGHV1-46\*03

124 sequences assigned  
110 (88.7%) exact matches, in which:  
109 unique CDR3  
5 unique J



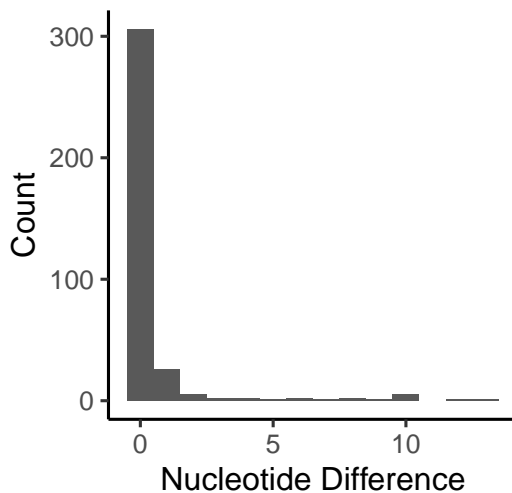
### IGHV1-2\*04

72 sequences assigned  
62 (86.1%) exact matches, in which:  
62 unique CDR3  
5 unique J



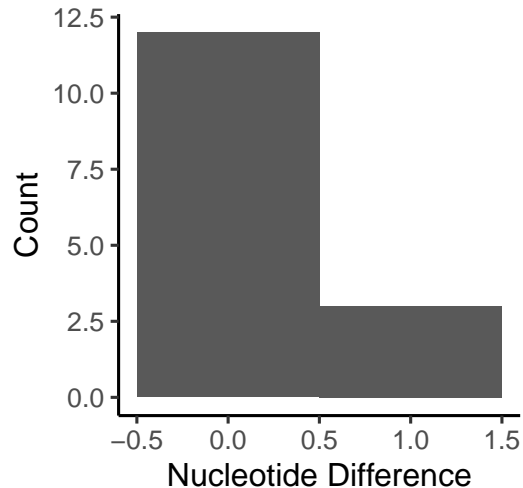
### IGHV1-18\*01

355 sequences assigned  
306 (86.2%) exact matches, in which:  
305 unique CDR3  
6 unique J



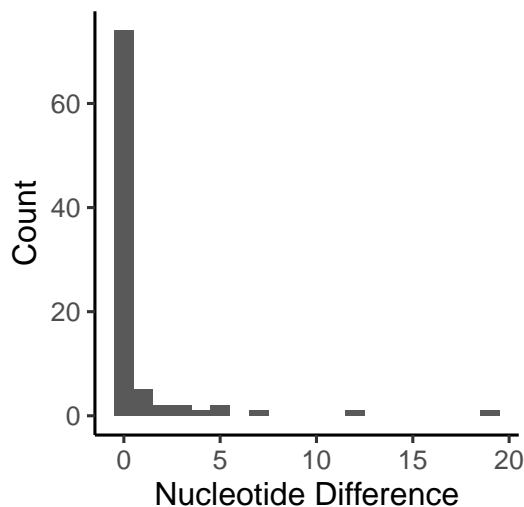
### IGHV1-58\*02

15 sequences assigned  
12 (80%) exact matches, in which:  
11 unique CDR3  
4 unique J



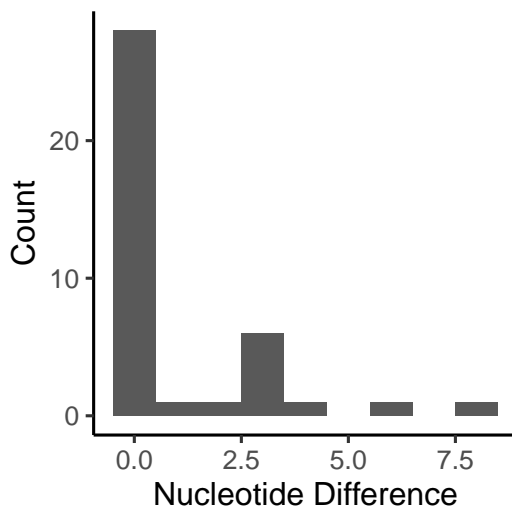
### IGHV1-3\*01

89 sequences assigned  
74 (83.1%) exact matches, in which:  
74 unique CDR3  
5 unique J



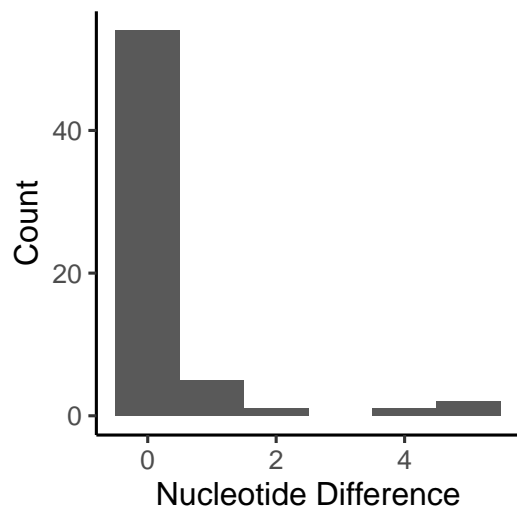
### IGHV1-24\*01

39 sequences assigned  
28 (71.8%) exact matches, in which:  
28 unique CDR3  
5 unique J



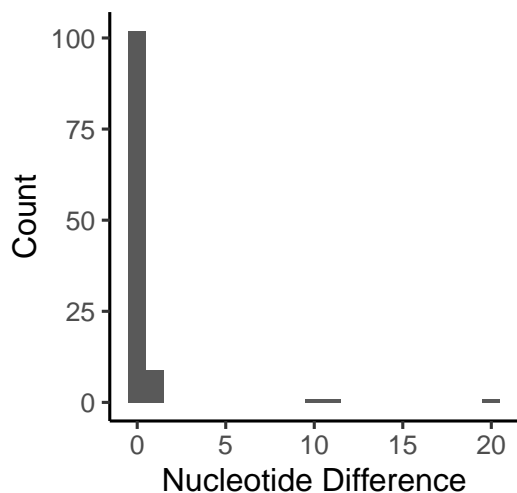
### IGHV1-69-2\*01

63 sequences assigned  
54 (85.7%) exact matches, in which:  
54 unique CDR3  
4 unique J



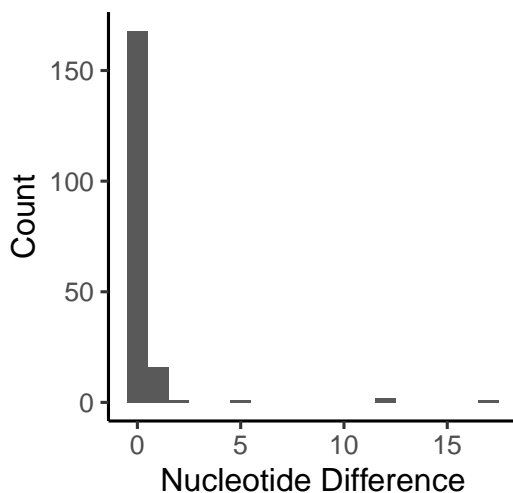
### IGHV1–69\*10

114 sequences assigned  
102 (89.5%) exact matches, in which:  
102 unique CDR3  
6 unique J



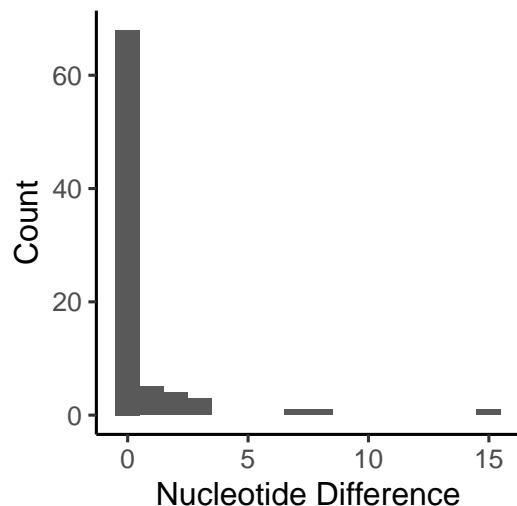
### IGHV1–69\*12\_G48A

189 sequences assigned  
168 (88.9%) exact matches, in which:  
167 unique CDR3  
6 unique J



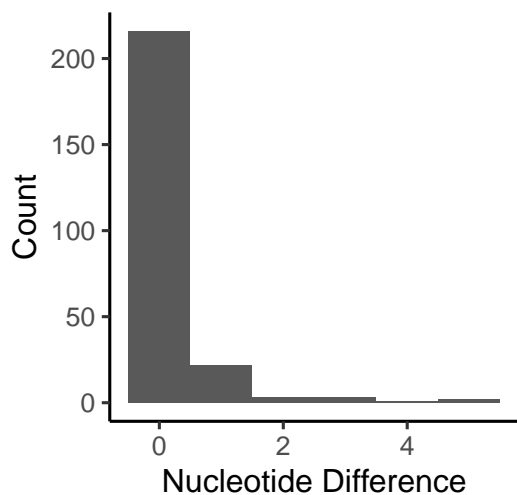
### IGHV2–26\*01

83 sequences assigned  
68 (81.9%) exact matches, in which:  
68 unique CDR3  
5 unique J



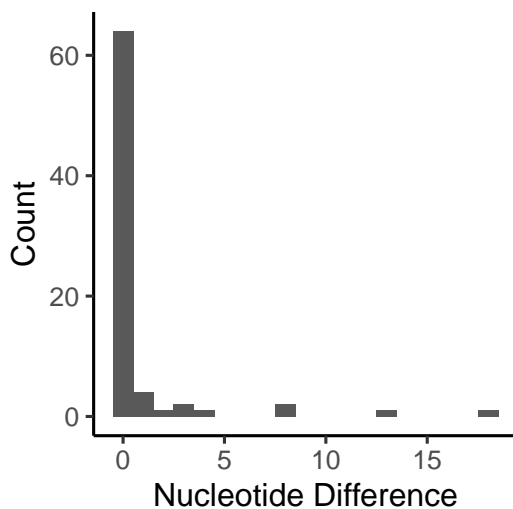
### IGHV1–69\*12

247 sequences assigned  
216 (87.4%) exact matches, in which:  
216 unique CDR3  
6 unique J



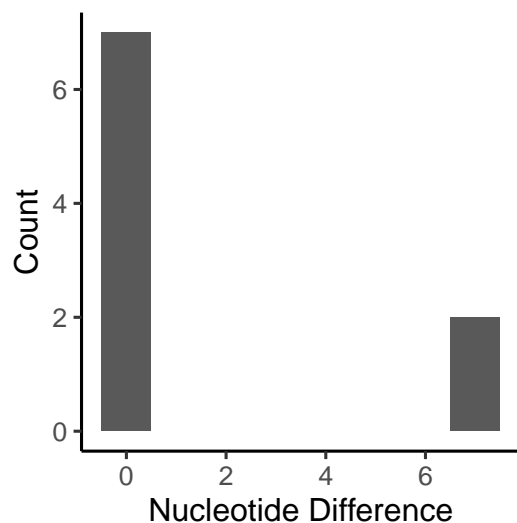
### IGHV2–5\*01

76 sequences assigned  
64 (84.2%) exact matches, in which:  
64 unique CDR3  
5 unique J



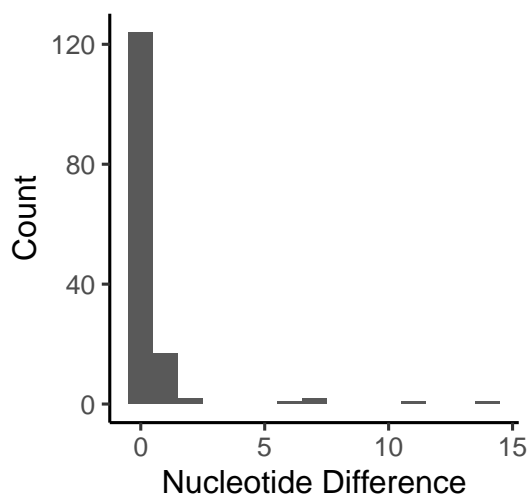
### IGHV2–70\*04

9 sequences assigned  
7 (77.8%) exact matches, in which:  
7 unique CDR3  
4 unique J



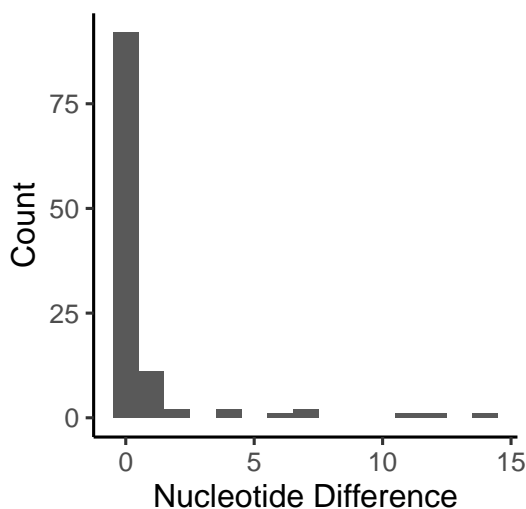
### IGHV1–69\*08\_C191T

148 sequences assigned  
124 (83.8%) exact matches, in which:  
123 unique CDR3  
6 unique J



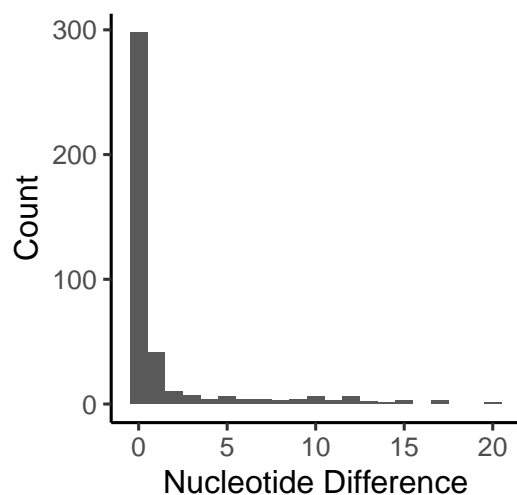
### IGHV2–5\*02

115 sequences assigned  
92 (80%) exact matches, in which:  
92 unique CDR3  
5 unique J



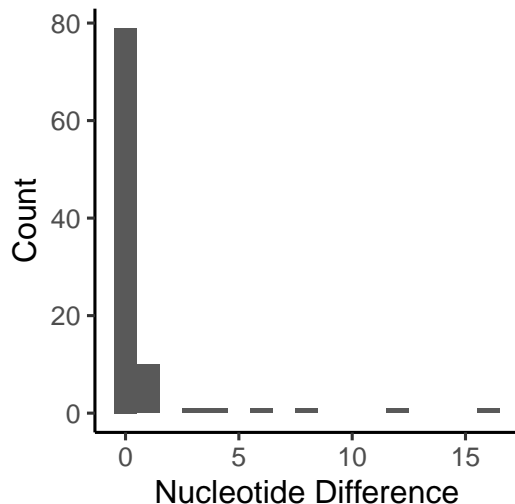
### IGHV3–7\*01

411 sequences assigned  
298 (72.5%) exact matches, in which:  
298 unique CDR3  
6 unique J



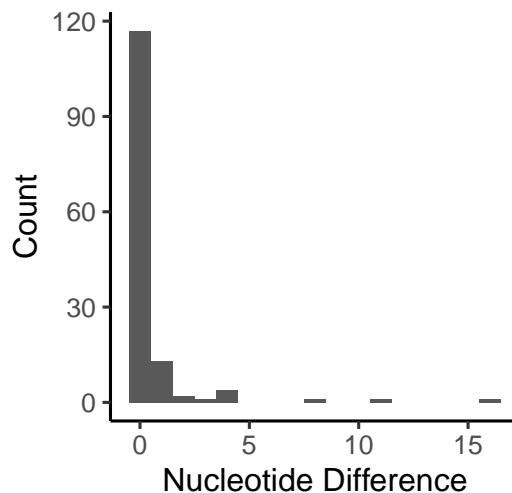
### IGHV3-9\*03

95 sequences assigned  
79 (83.2%) exact matches, in which:  
78 unique CDR3  
4 unique J



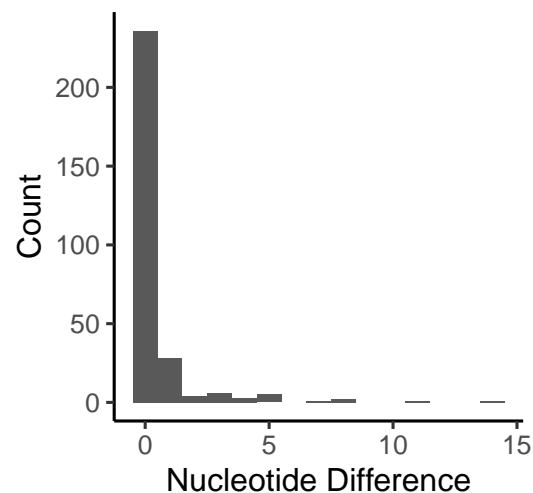
### IGHV3-15\*01

141 sequences assigned  
117 (83%) exact matches, in which:  
117 unique CDR3  
6 unique J



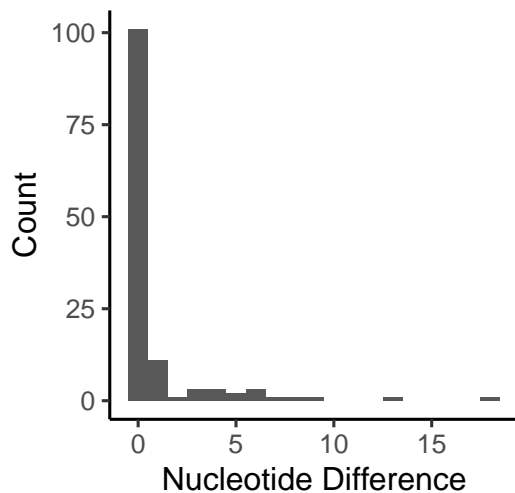
### IGHV3-21\*03

288 sequences assigned  
236 (81.9%) exact matches, in which:  
236 unique CDR3  
6 unique J



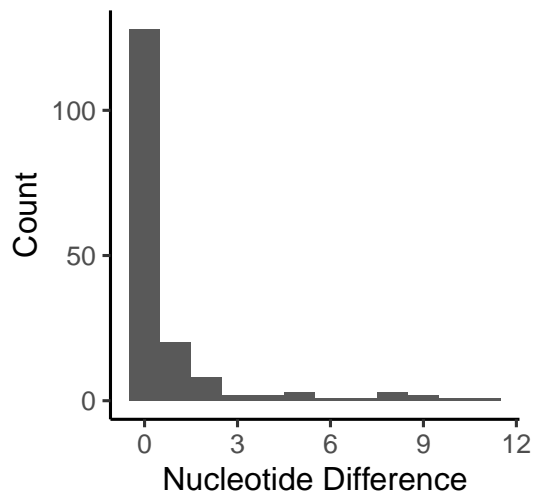
### IGHV3-11\*04

130 sequences assigned  
101 (77.7%) exact matches, in which:  
101 unique CDR3  
6 unique J



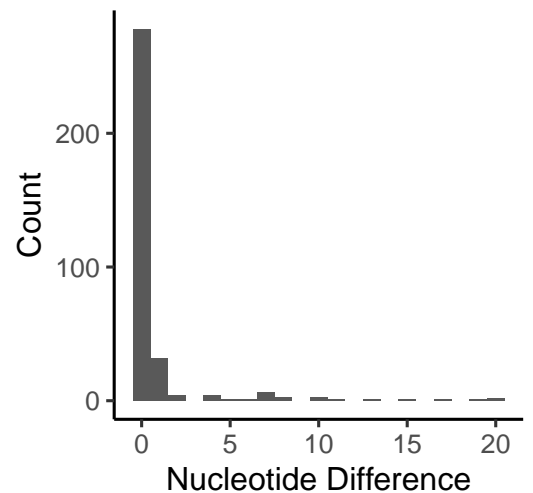
### IGHV3-20\*04

173 sequences assigned  
128 (74%) exact matches, in which:  
127 unique CDR3  
6 unique J



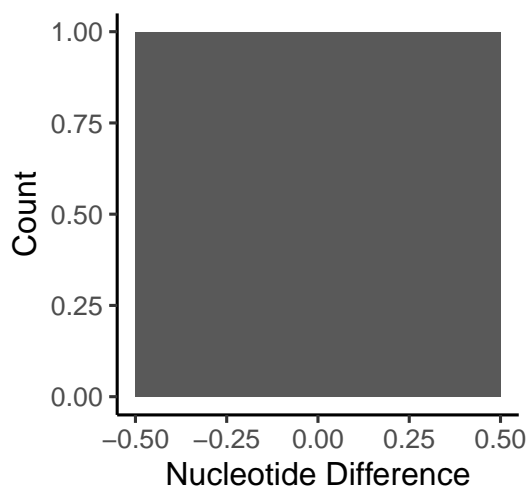
### IGHV3-23\*01

343 sequences assigned  
278 (81%) exact matches, in which:  
278 unique CDR3  
6 unique J



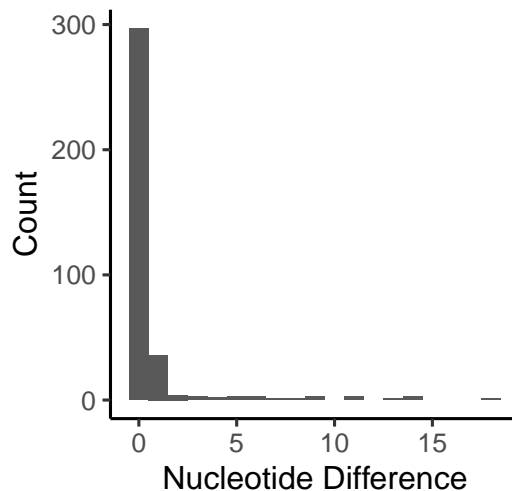
### IGHV3-13\*03

1 sequences assigned  
1 (100%) exact matches, in which:  
1 unique CDR3  
1 unique J



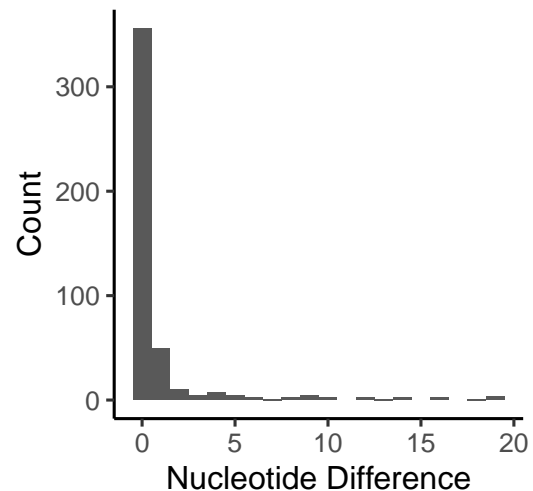
### IGHV3-21\*01

362 sequences assigned  
297 (82%) exact matches, in which:  
295 unique CDR3  
6 unique J



### IGHV3-23\*04

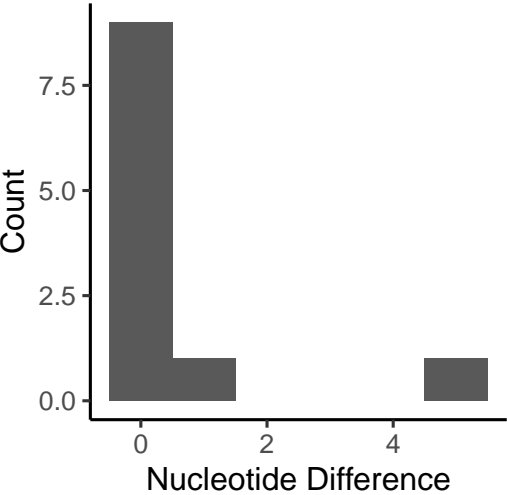
455 sequences assigned  
356 (78.2%) exact matches, in which:  
354 unique CDR3  
6 unique J





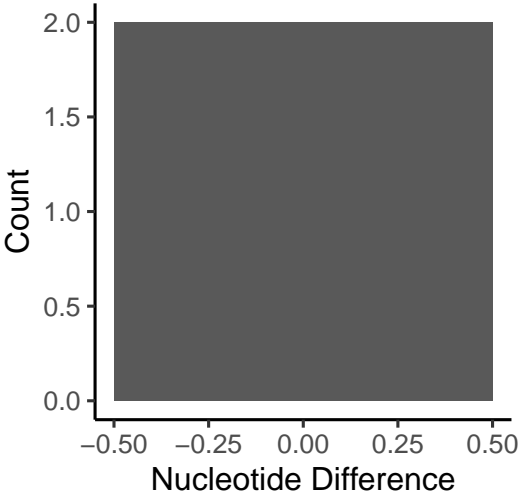
IGHV3-30-3\*01

11 sequences assigned  
9 (81.8%) exact matches, in which:  
9 unique CDR3  
4 unique J



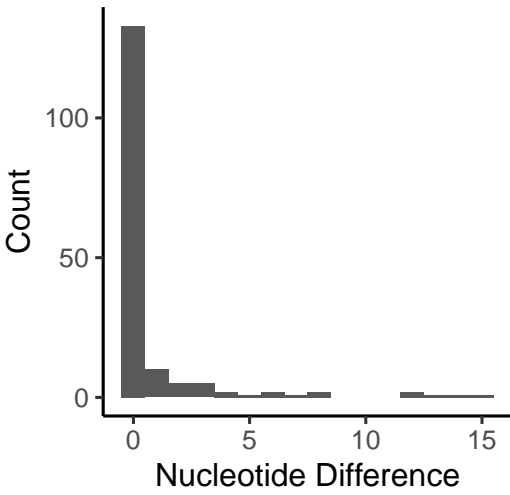
IGHV3-38-3\*01

2 sequences assigned  
2 (100%) exact matches, in which:  
2 unique CDR3  
2 unique J



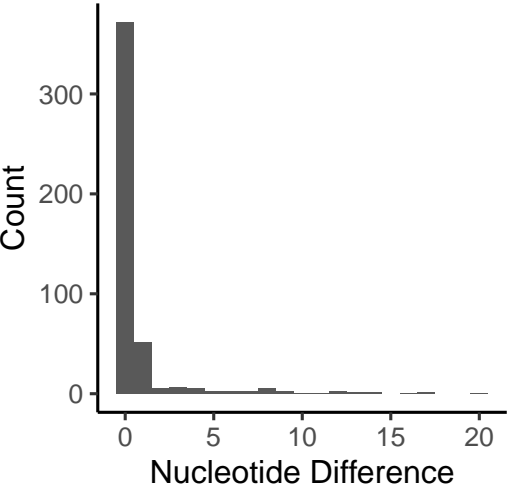
IGHV3-48\*01\_A39C

166 sequences assigned  
133 (80.1%) exact matches, in which:  
133 unique CDR3  
6 unique J



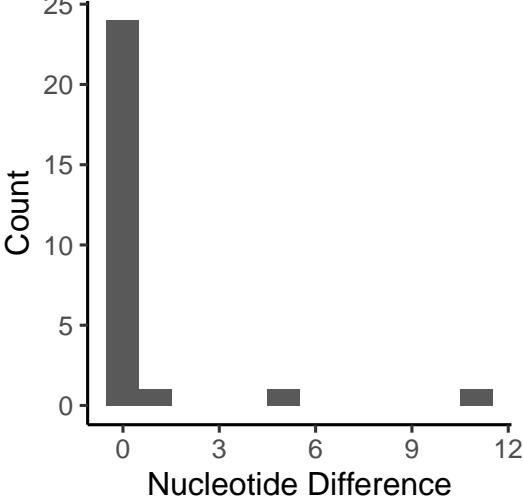
IGHV3-30\*02

477 sequences assigned  
372 (78%) exact matches, in which:  
369 unique CDR3  
6 unique J



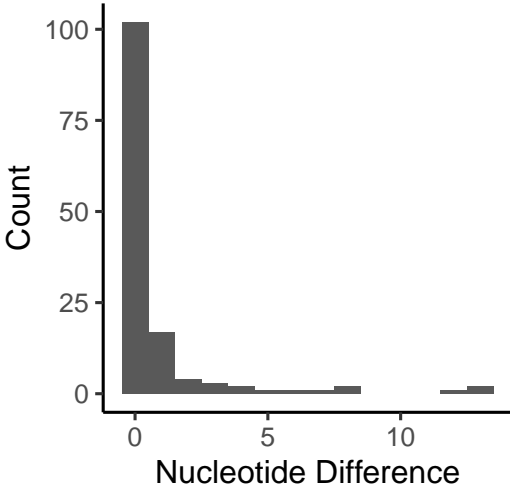
IGHV3-43\*01

27 sequences assigned  
24 (88.9%) exact matches, in which:  
24 unique CDR3  
5 unique J



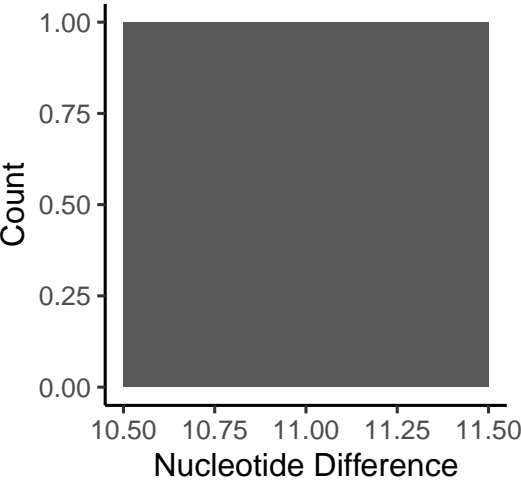
IGHV3-49\*04

137 sequences assigned  
102 (74.5%) exact matches, in which:  
102 unique CDR3  
5 unique J



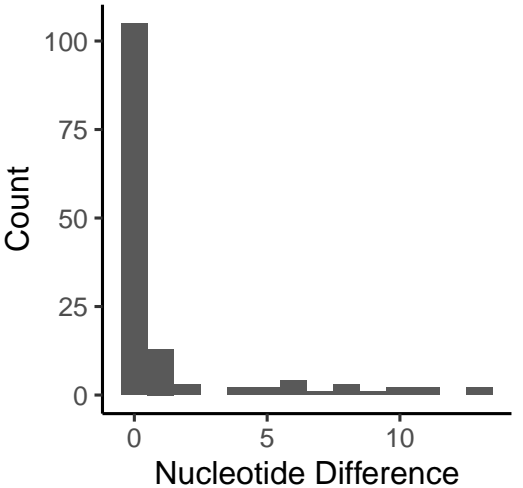
IGHV3-33\*05

1 sequences assigned  
No exact matches.



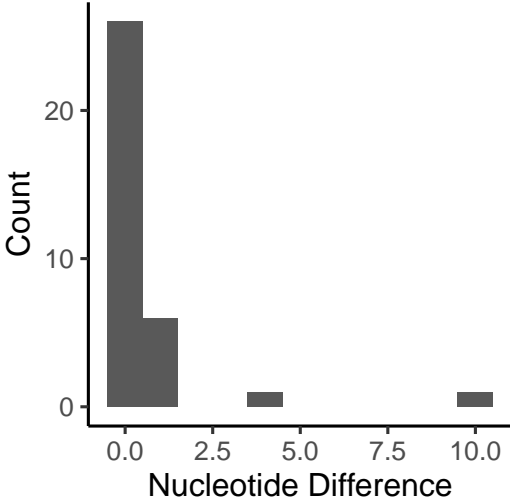
IGHV3-48\*01

141 sequences assigned  
105 (74.5%) exact matches, in which:  
103 unique CDR3  
5 unique J



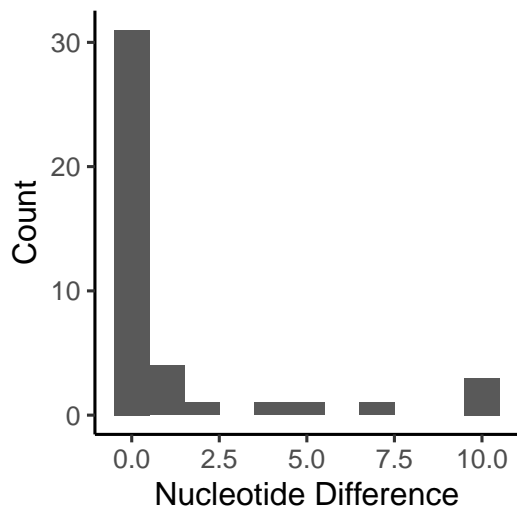
IGHV3-53\*04\_C241G\_G2

35 sequences assigned  
26 (74.3%) exact matches, in which:  
26 unique CDR3  
5 unique J



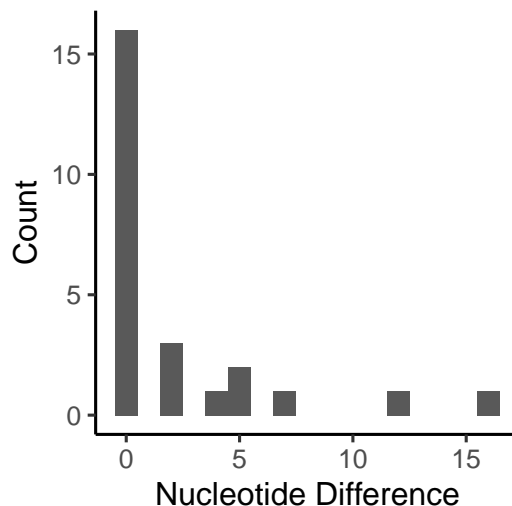
### IGHV3-64\*01

43 sequences assigned  
31 (72.1%) exact matches, in which:  
31 unique CDR3  
5 unique J



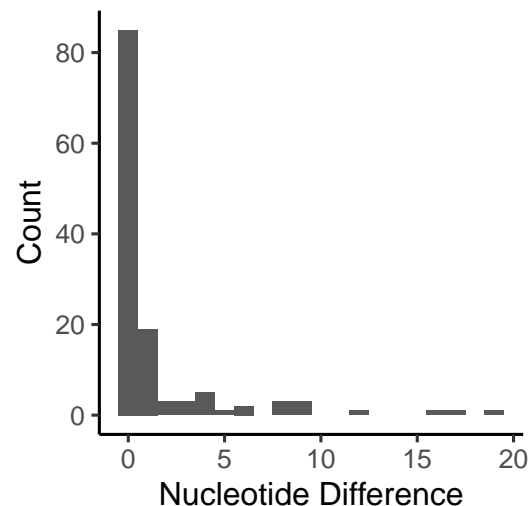
### IGHV3-72\*01

25 sequences assigned  
16 (64%) exact matches, in which:  
16 unique CDR3  
3 unique J



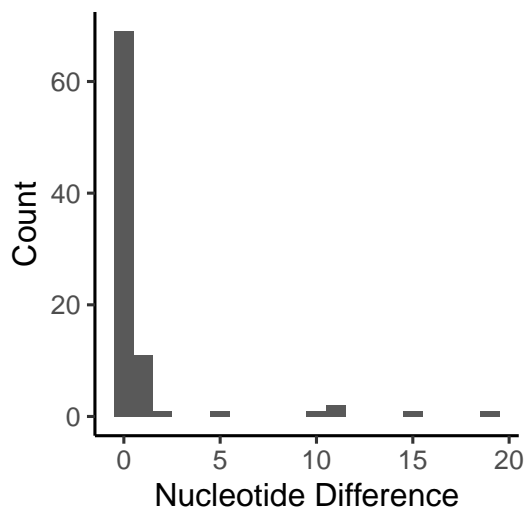
### IGHV3-74\*01

129 sequences assigned  
85 (65.9%) exact matches, in which:  
85 unique CDR3  
6 unique J



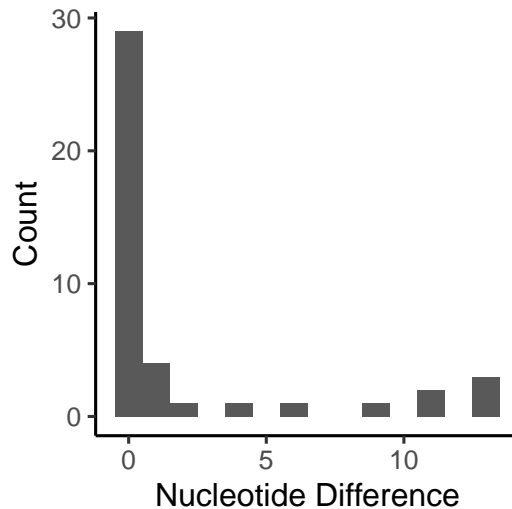
### IGHV3-66\*02

88 sequences assigned  
69 (78.4%) exact matches, in which:  
69 unique CDR3  
5 unique J



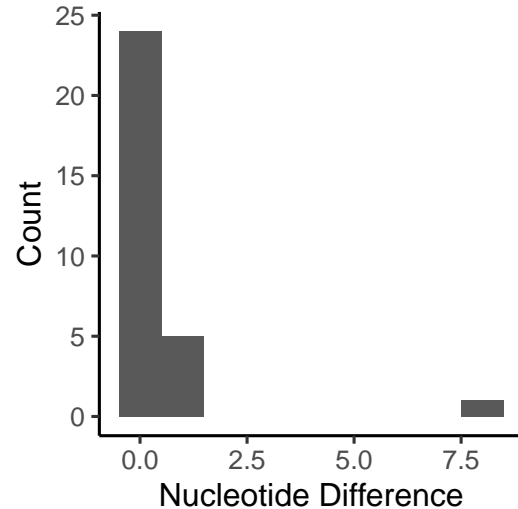
### IGHV3-73\*01

42 sequences assigned  
29 (69%) exact matches, in which:  
29 unique CDR3  
5 unique J



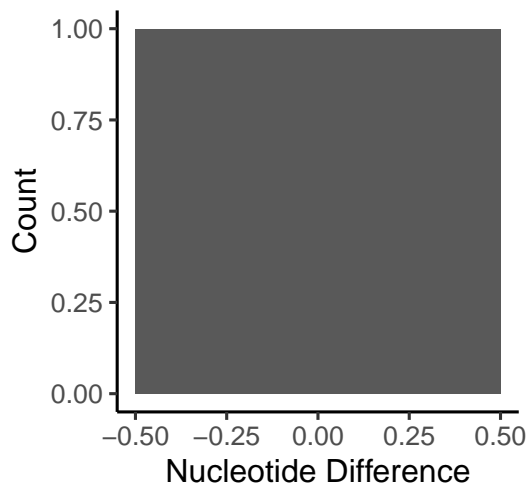
### IGHV3-43D\*03

30 sequences assigned  
24 (80%) exact matches, in which:  
24 unique CDR3  
5 unique J



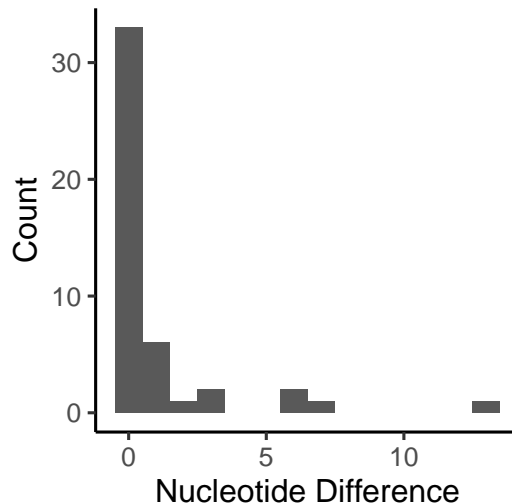
### IGHV3-69-1\*02

1 sequences assigned  
1 (100%) exact matches, in which:  
1 unique CDR3  
0 unique J



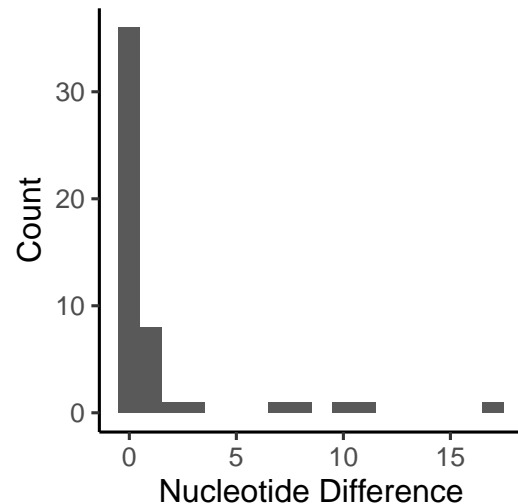
### IGHV3-73\*02

46 sequences assigned  
33 (71.7%) exact matches, in which:  
33 unique CDR3  
4 unique J



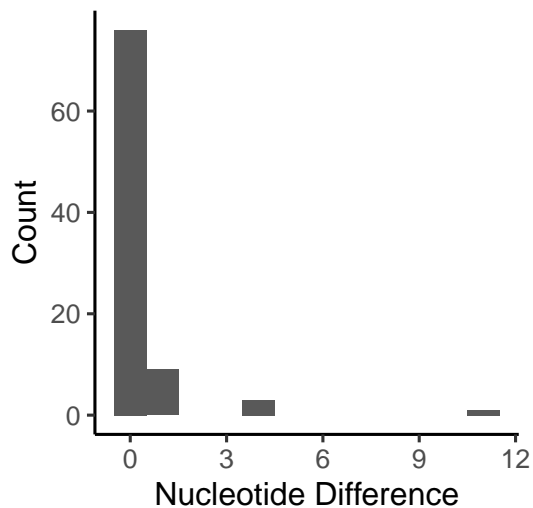
### IGHV3-43D\*04

51 sequences assigned  
36 (70.6%) exact matches, in which:  
36 unique CDR3  
6 unique J



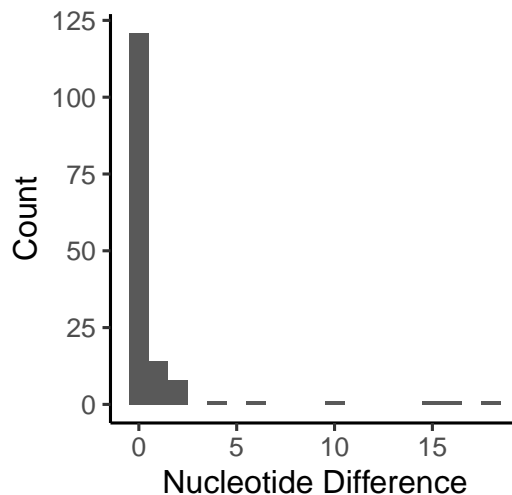
### IGHV4-4\*02

89 sequences assigned  
76 (85.4%) exact matches, in which:  
76 unique CDR3  
5 unique J



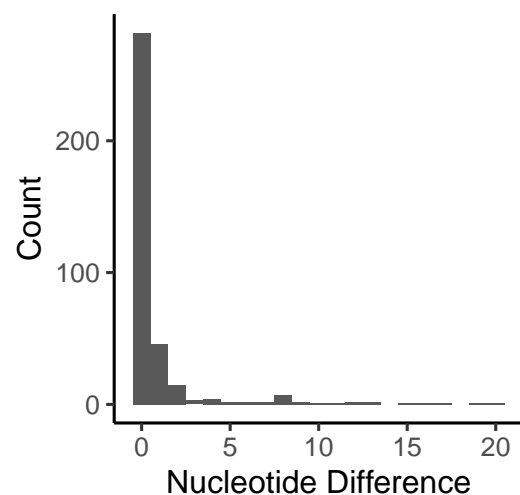
### IGHV4-30-4\*08

149 sequences assigned  
121 (81.2%) exact matches, in which:  
121 unique CDR3  
6 unique J



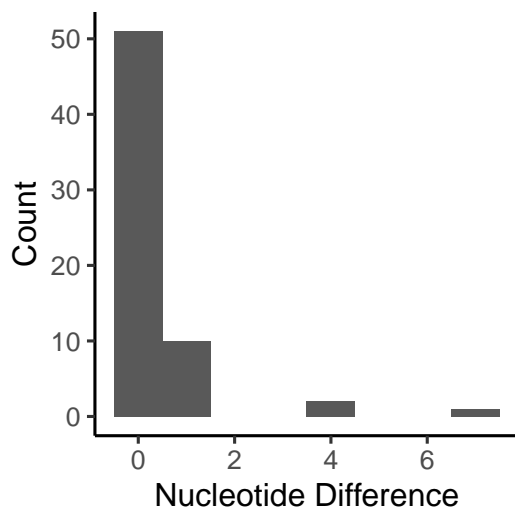
### IGHV4-38-2\*02

376 sequences assigned  
282 (75%) exact matches, in which:  
280 unique CDR3  
6 unique J



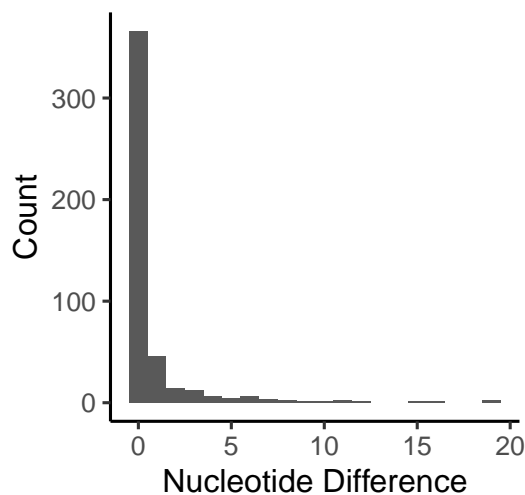
### IGHV4-4\*07

64 sequences assigned  
51 (79.7%) exact matches, in which:  
51 unique CDR3  
5 unique J



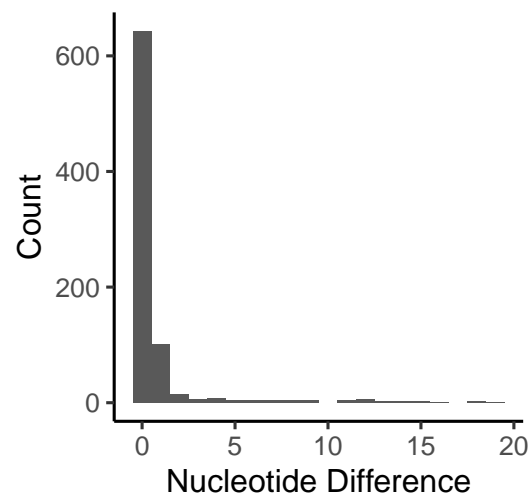
### IGHV4-34\*01

470 sequences assigned  
366 (77.9%) exact matches, in which:  
362 unique CDR3  
6 unique J



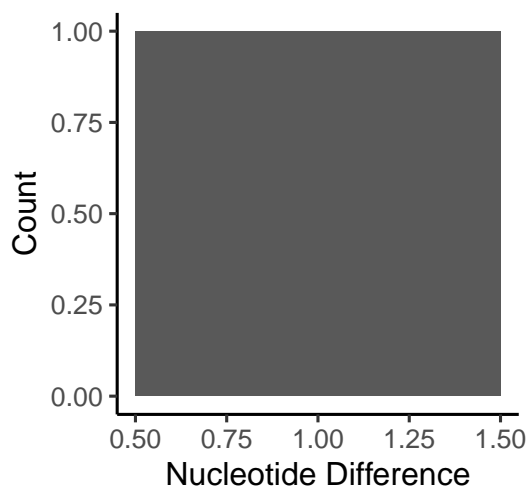
### IGHV4-39\*01

817 sequences assigned  
643 (78.7%) exact matches, in which:  
641 unique CDR3  
6 unique J



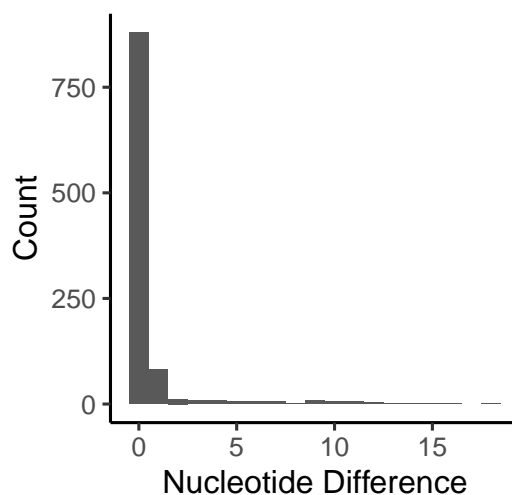
### IGHV4-30-2\*05

1 sequences assigned  
No exact matches.



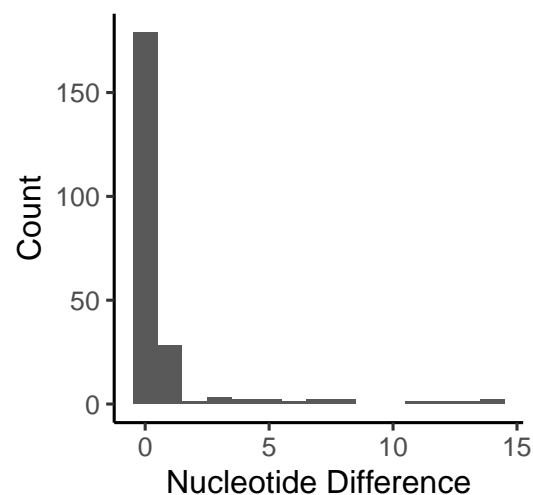
### IGHV4-38-2\*01

1041 sequences assigned  
880 (84.5%) exact matches, in which:  
879 unique CDR3  
6 unique J



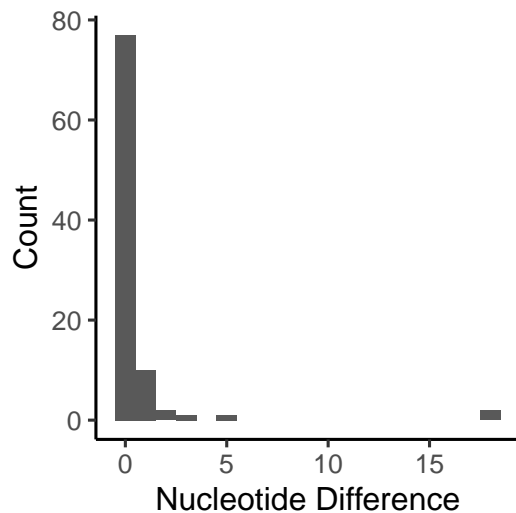
### IGHV4-59\*01

225 sequences assigned  
179 (79.6%) exact matches, in which:  
177 unique CDR3  
6 unique J



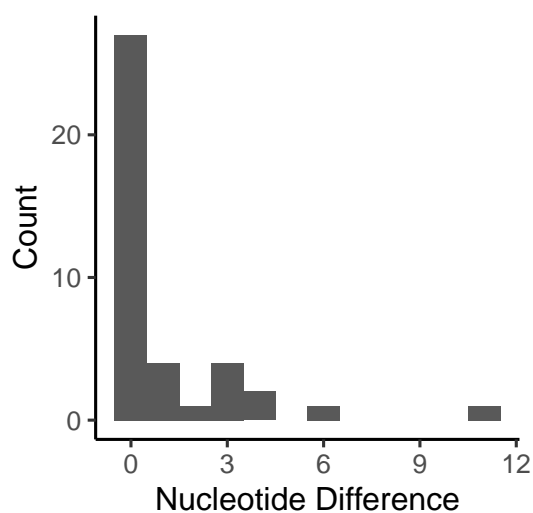
## IGHV4-59\*08

94 sequences assigned  
77 (81.9%) exact matches, in which:  
77 unique CDR3  
6 unique J



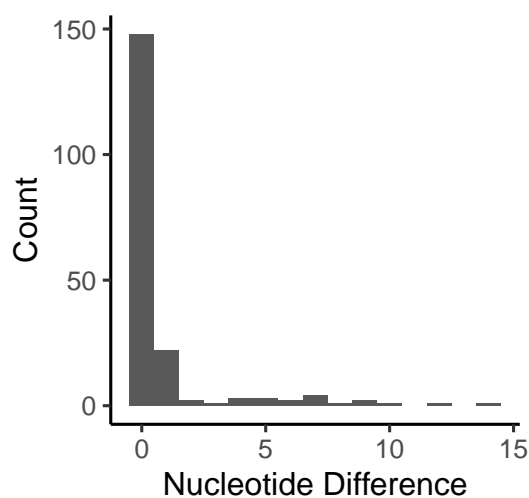
## IGHV6-1\*01

41 sequences assigned  
27 (65.9%) exact matches, in which:  
27 unique CDR3  
4 unique J



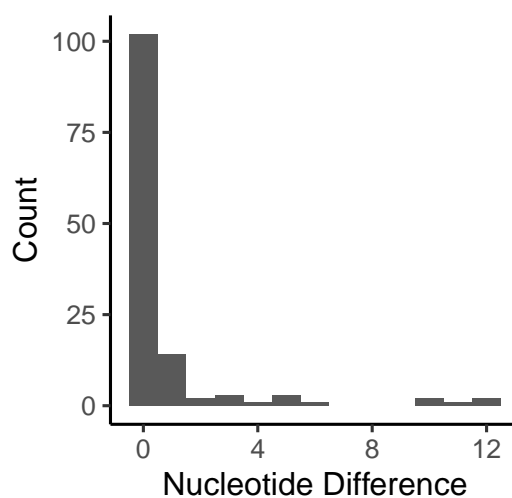
## IGHV4-61\*02

194 sequences assigned  
148 (76.3%) exact matches, in which:  
147 unique CDR3  
6 unique J



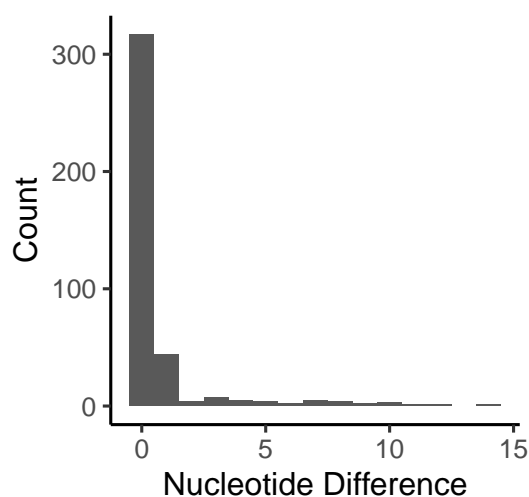
## IGHV7-4-1\*02

131 sequences assigned  
102 (77.9%) exact matches, in which:  
102 unique CDR3  
6 unique J

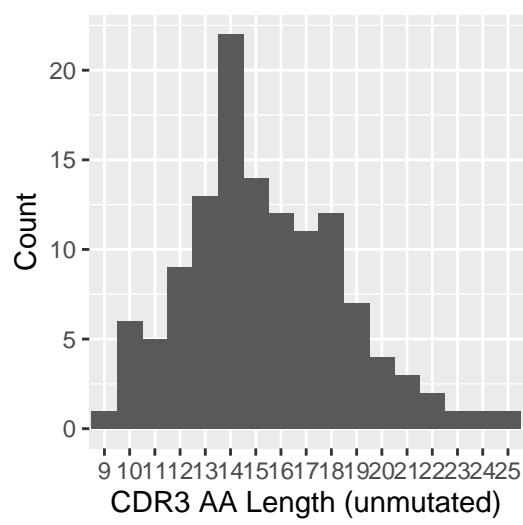


## IGHV5-51\*01

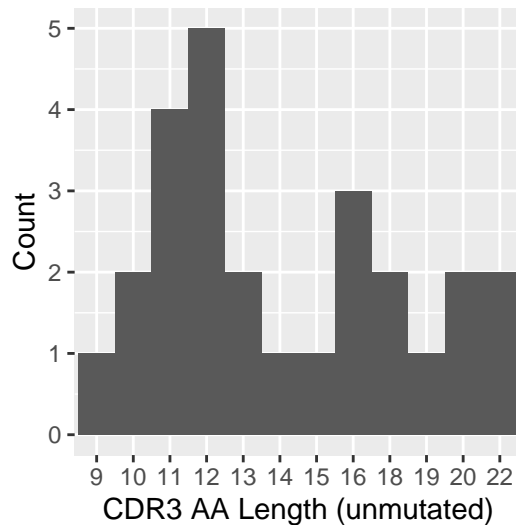
404 sequences assigned  
317 (78.5%) exact matches, in which:  
317 unique CDR3  
6 unique J



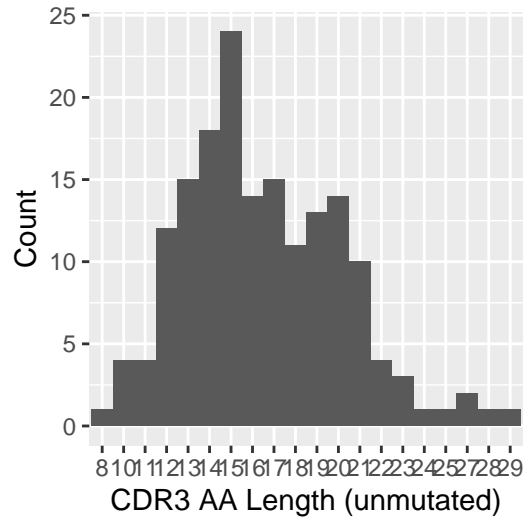
IGHV1-69\*08\_C191T



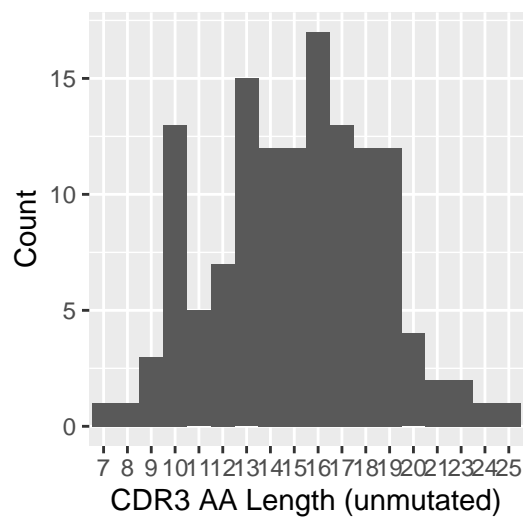
IGHV3-53\*04\_C241G\_G273A\_C300T



IGHV1-69\*12\_G48A



IGHV3-48\*01\_A39C



Allele Usage

