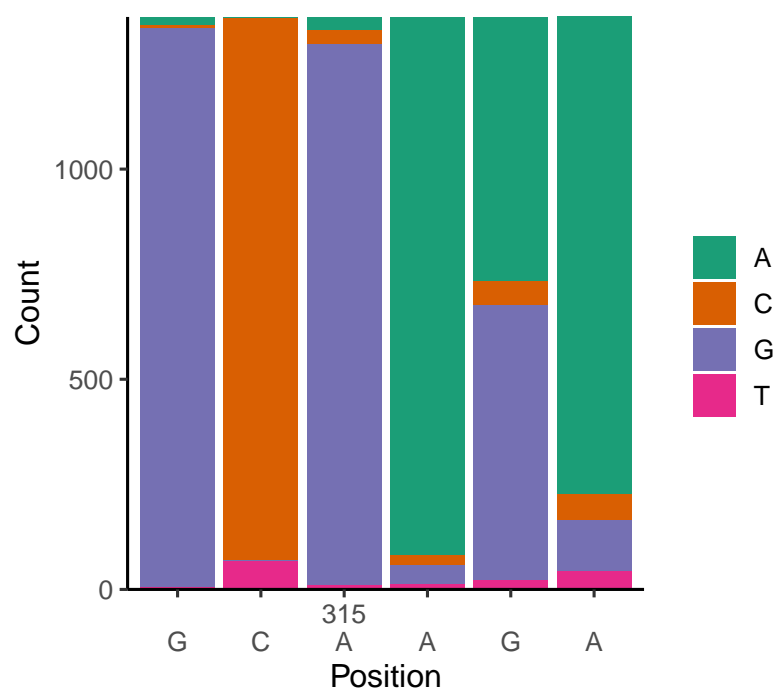
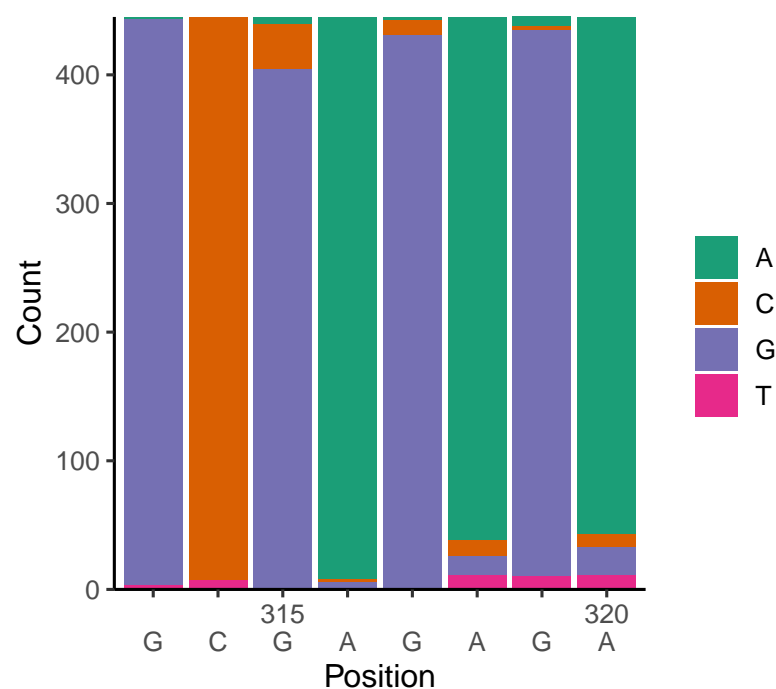


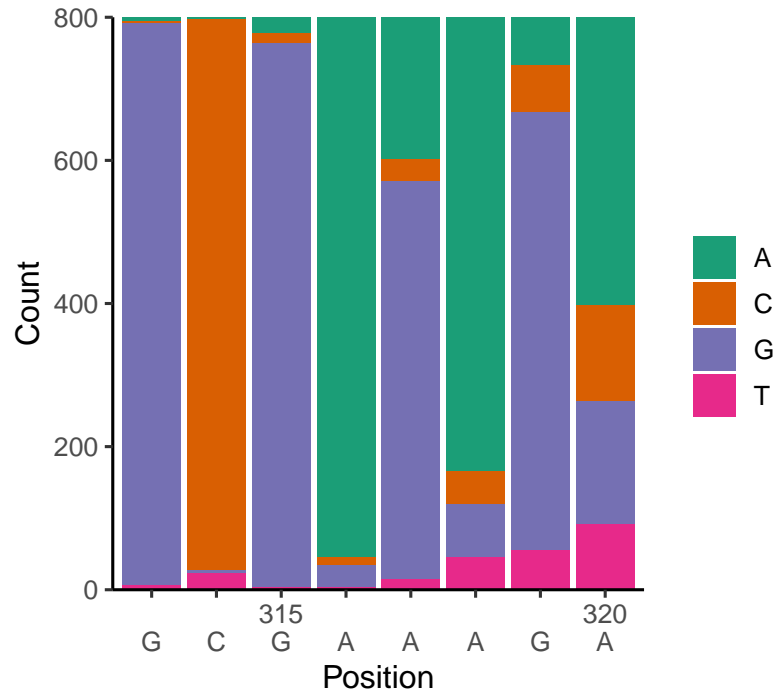
Gene IGHV3-74\*01\_02\_C246T\_G247T\_



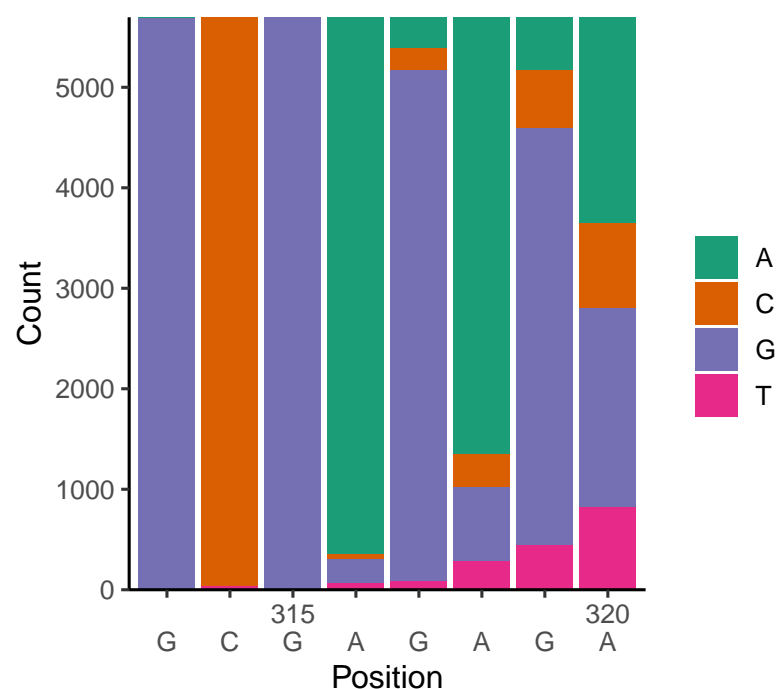
Gene IGHV4/OR15-8\*01\_C193A



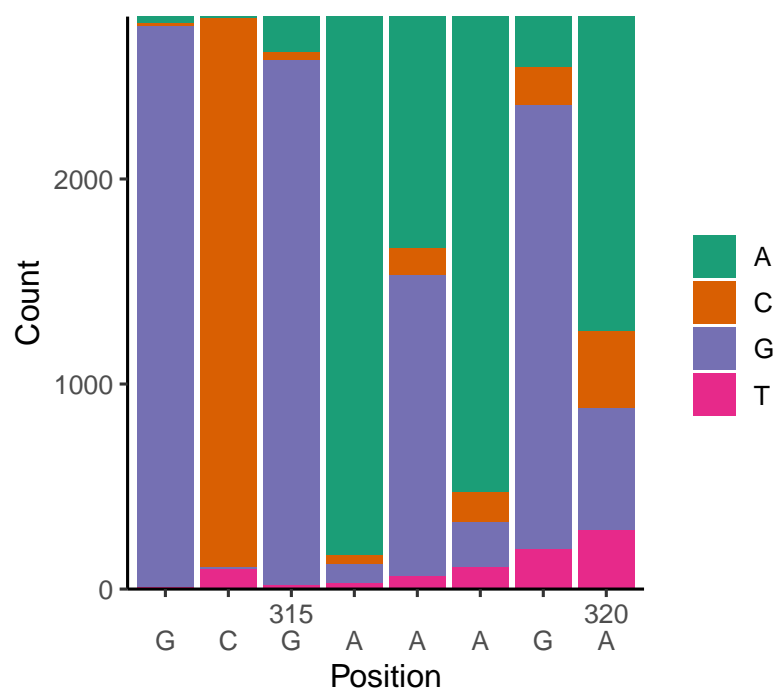
Gene IGHV3-NL1\*01\_C141G\_T201C\_G2



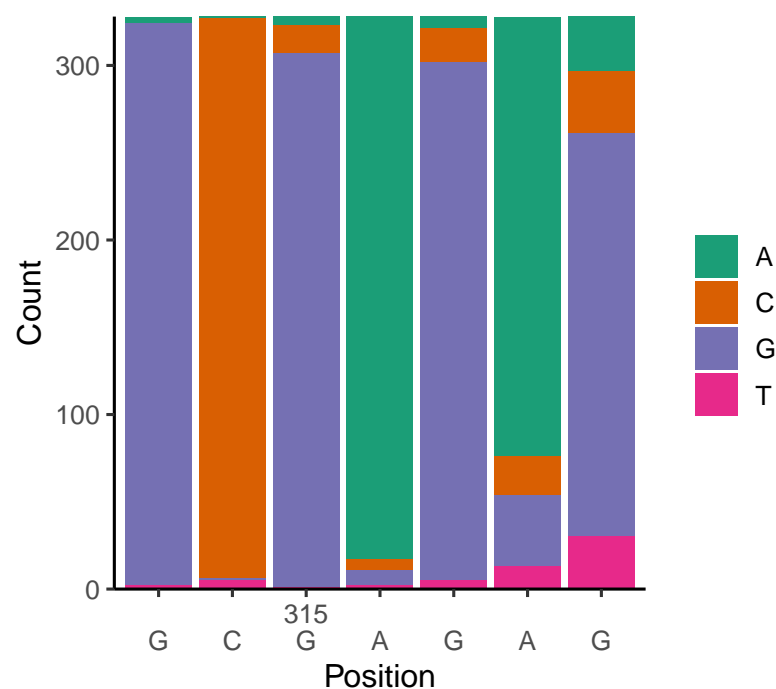
Gene IGHV6-1\*01\_02\_A315G



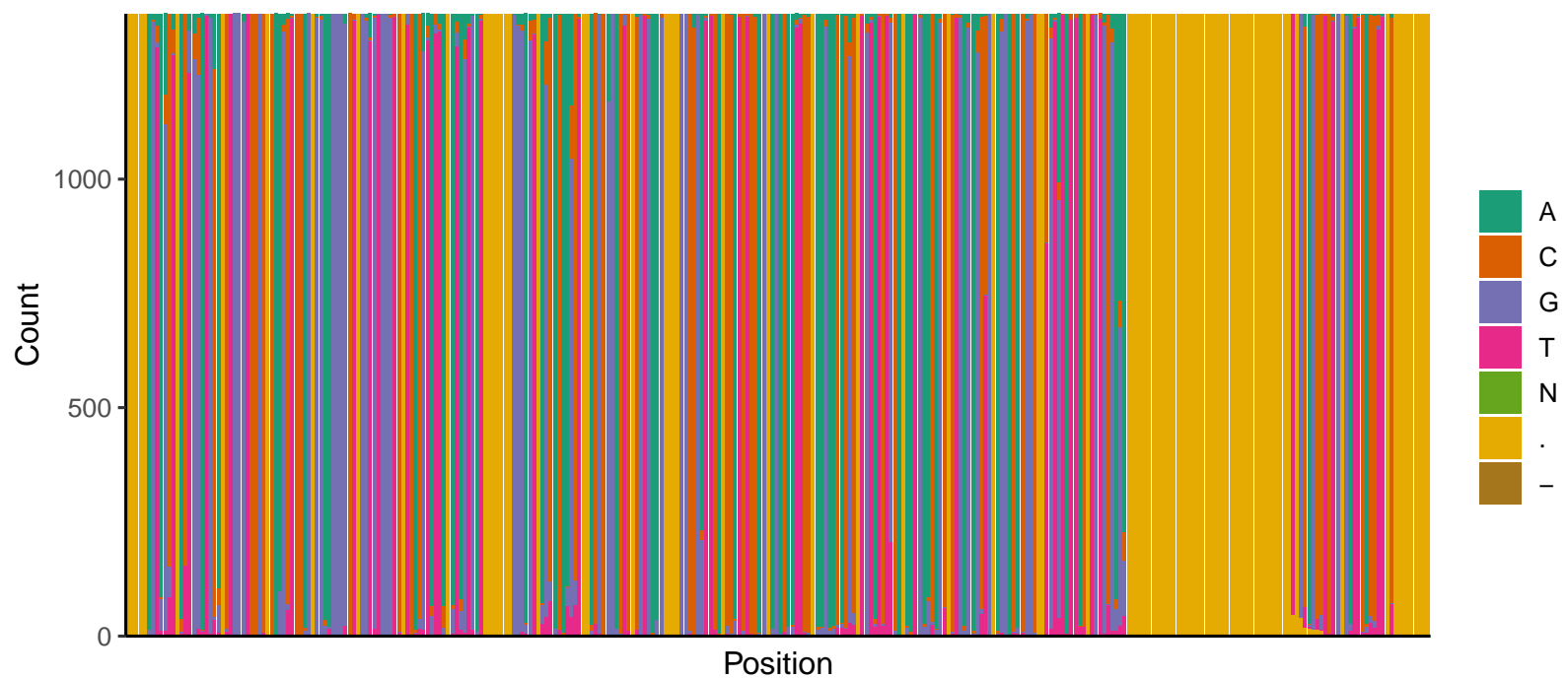
Gene IGHV3-NL1\*01\_C141G\_T164C\_T



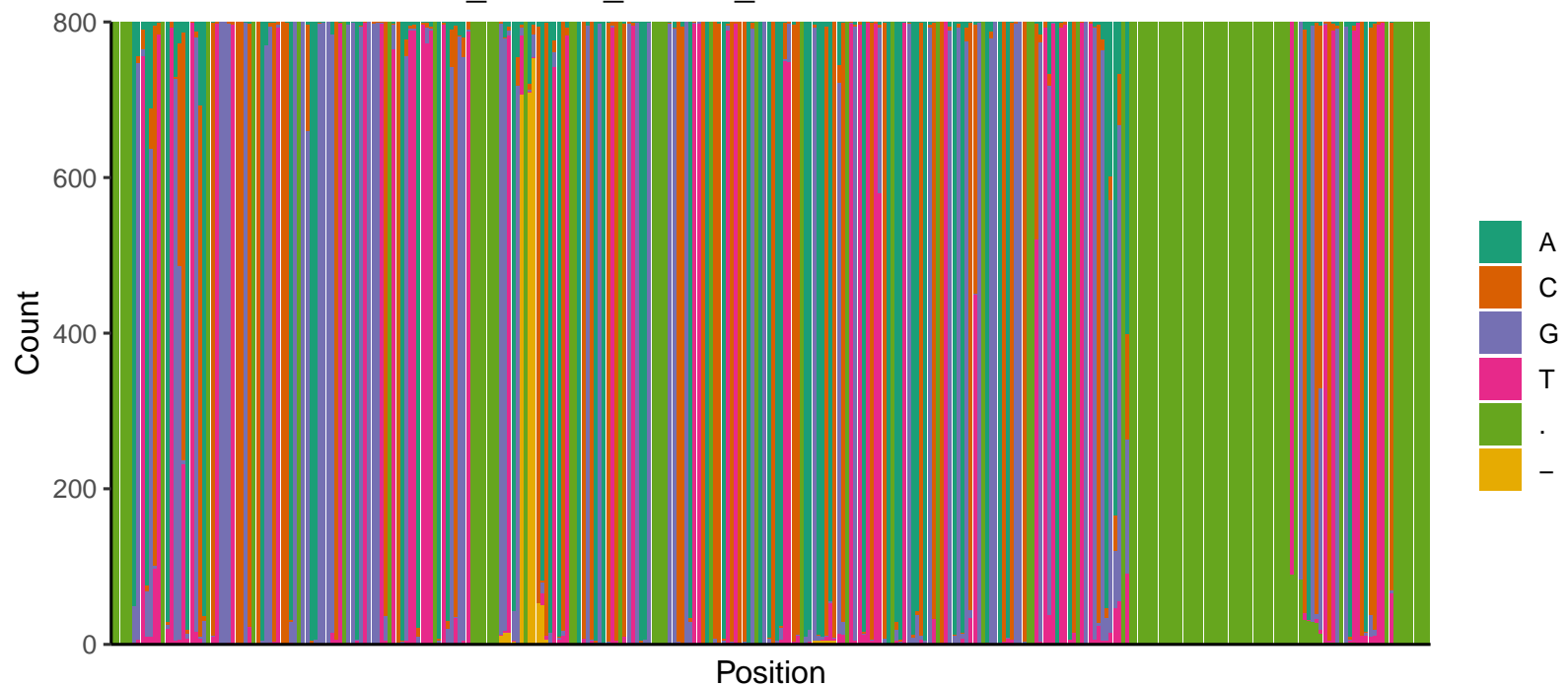
Gene IGHV4-4\*02\_03\_T120C



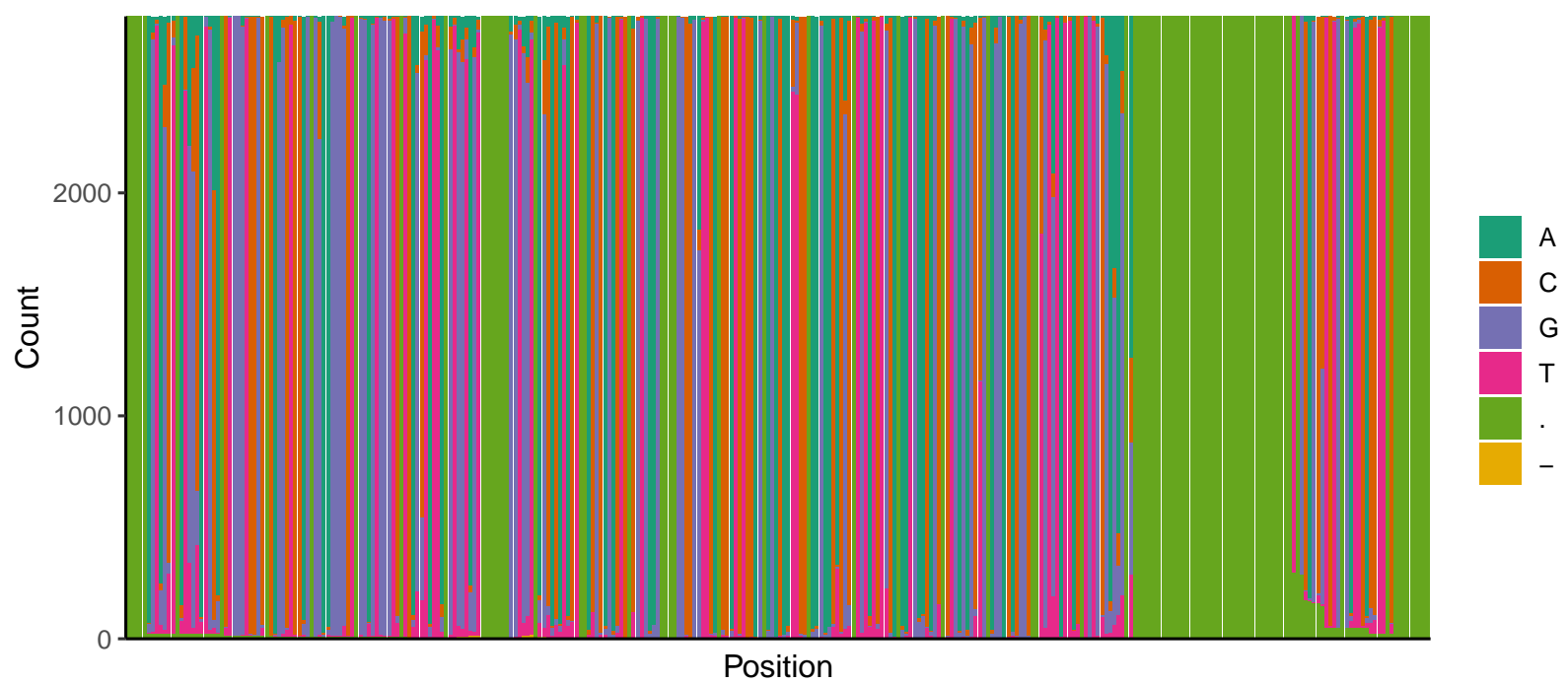
Gene IGHV3-74\*01\_02\_C246T\_G247T\_T279C\_C288T



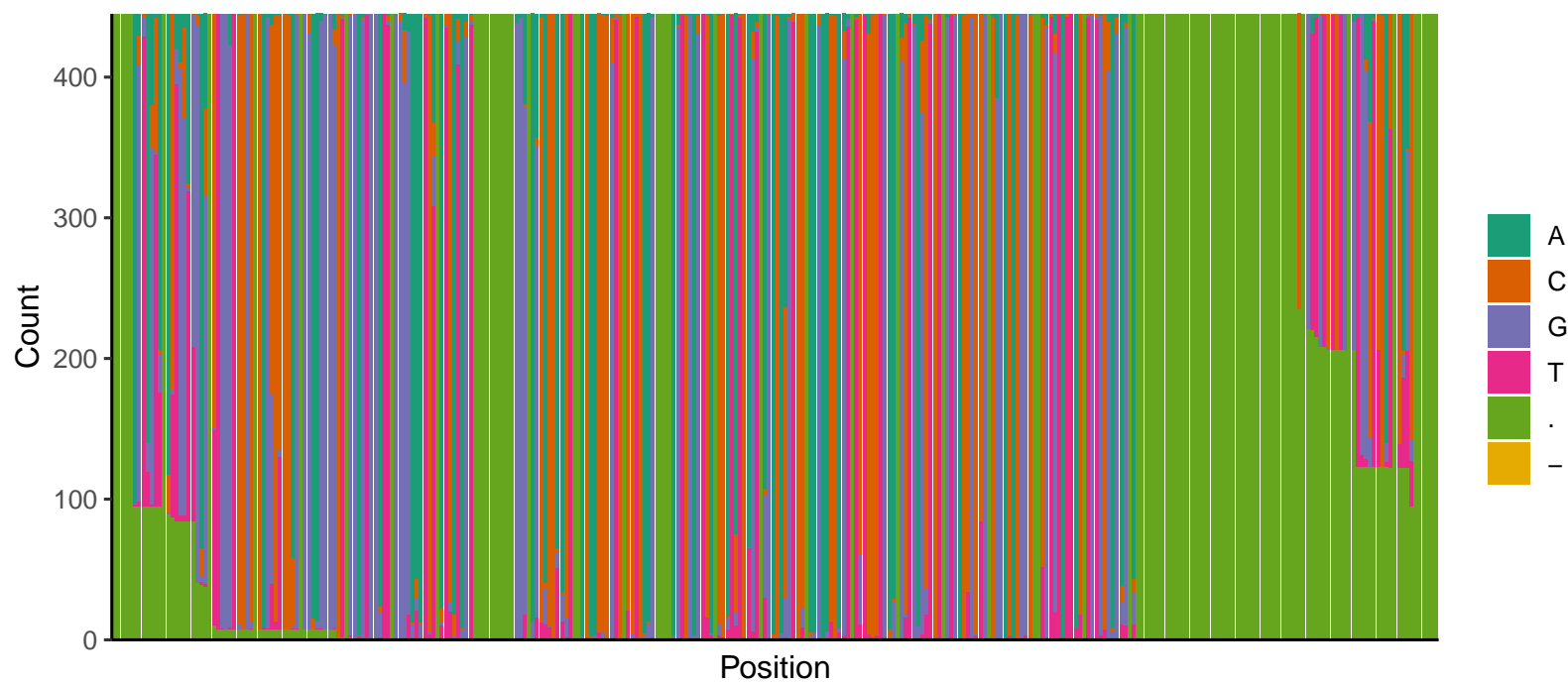
Gene IGHV3-NL1\*01\_C141G\_T201C\_G267T



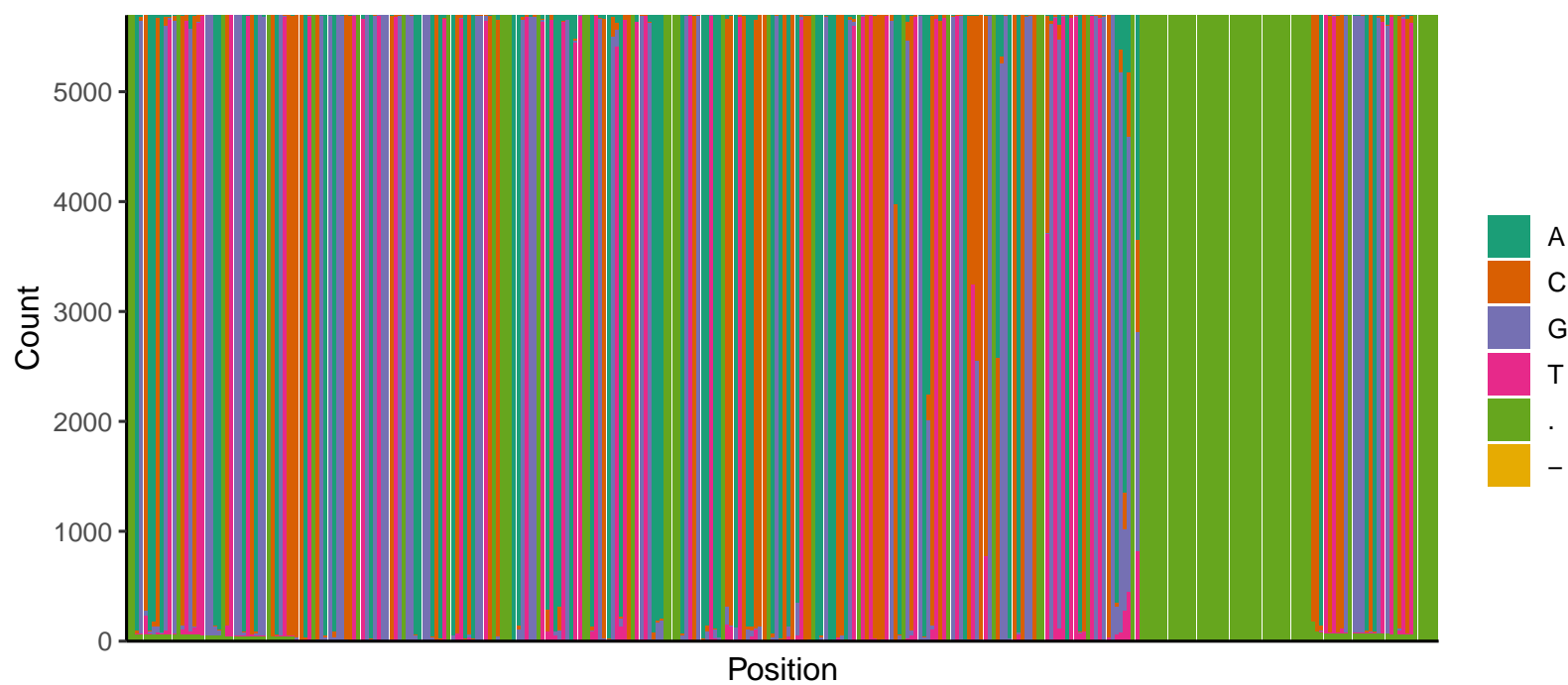
Gene IGHV3-NL1\*01\_C141G\_T164C\_T169A\_A170G\_A172G\_C174T\_G175A\_A187G\_T



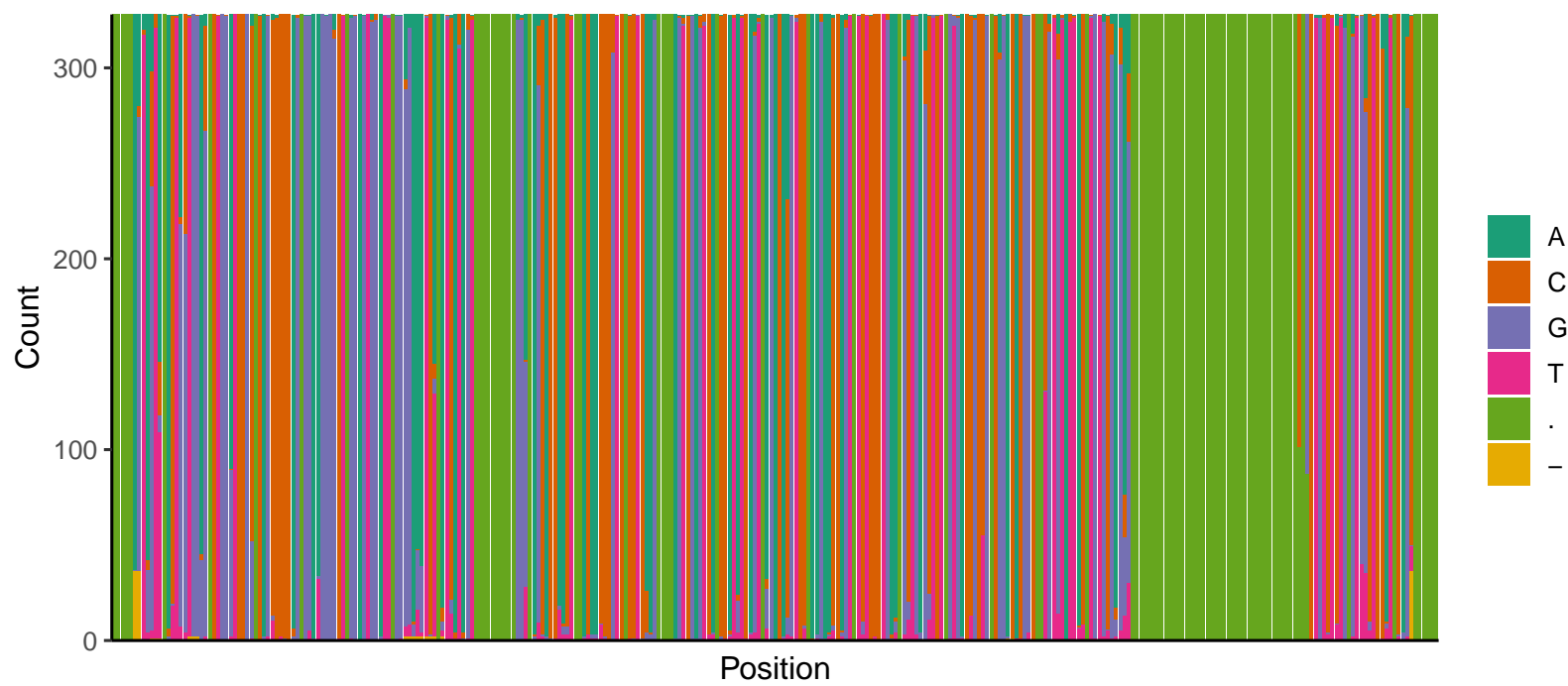
Gene IGHV4/OR15-8\*01\_C193A



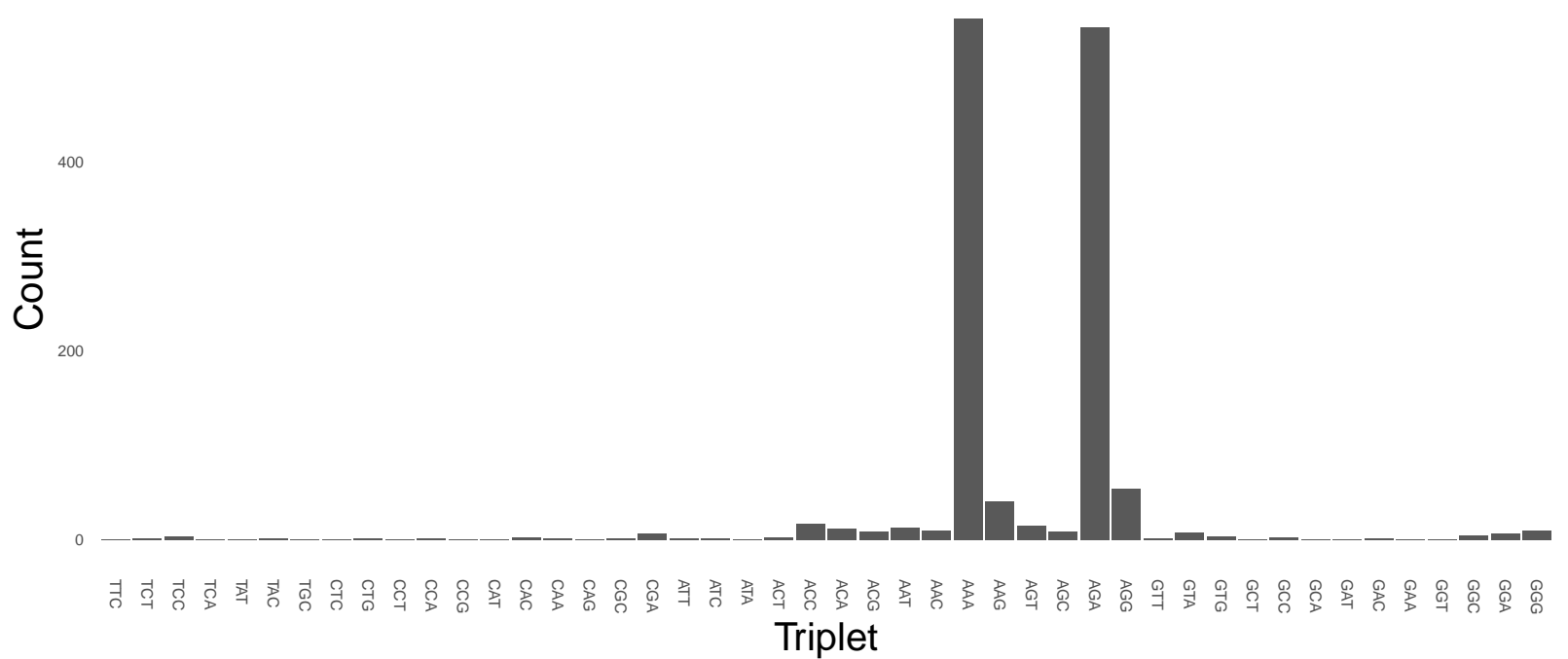
Gene IGHV6-1\*01\_02\_A315G



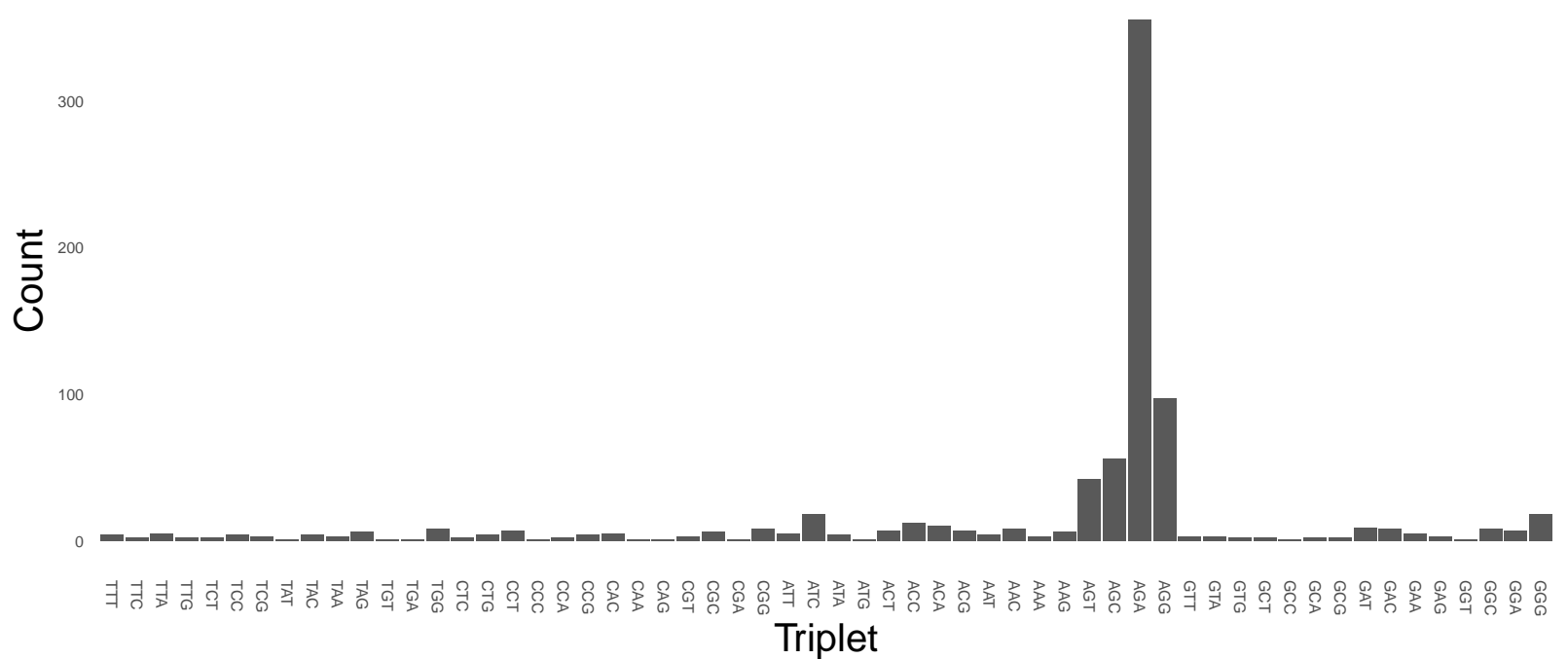
Gene IGHV4-4\*02\_03\_T120C



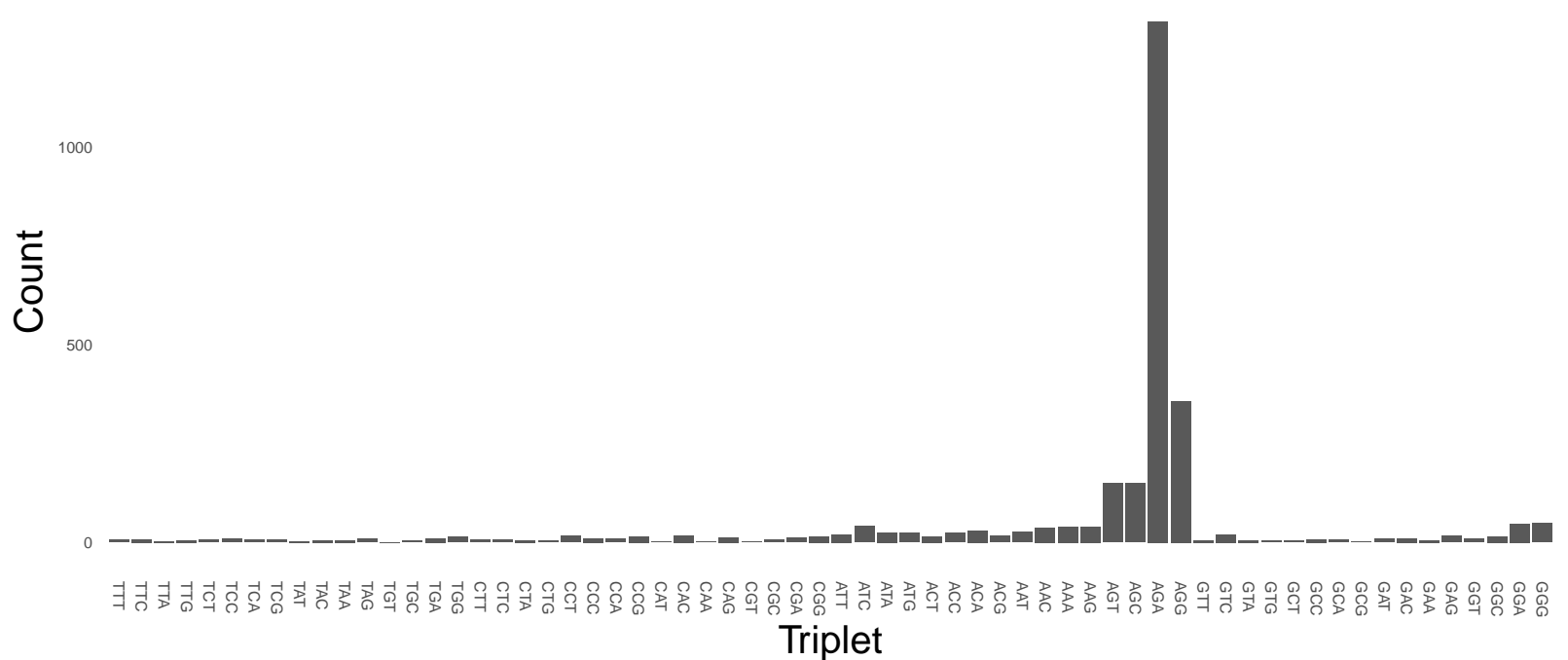
IGHV3-74\*01\_02\_C246T\_G247T\_T279C\_C288T- Final 3 nucleotides as a triplet



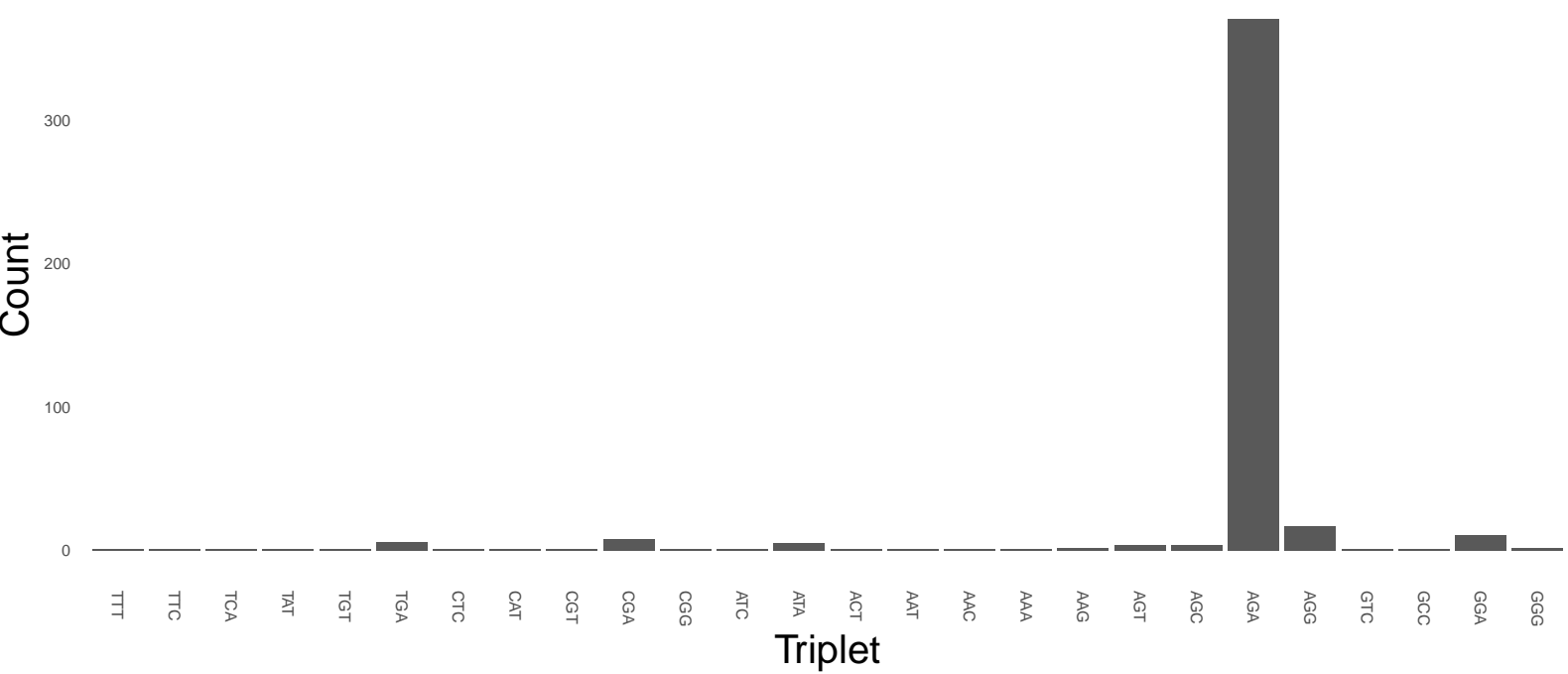
IGHV3-NL1\*01\_C141G\_T201C\_G267T- Final 3 nucleotides as a triplet



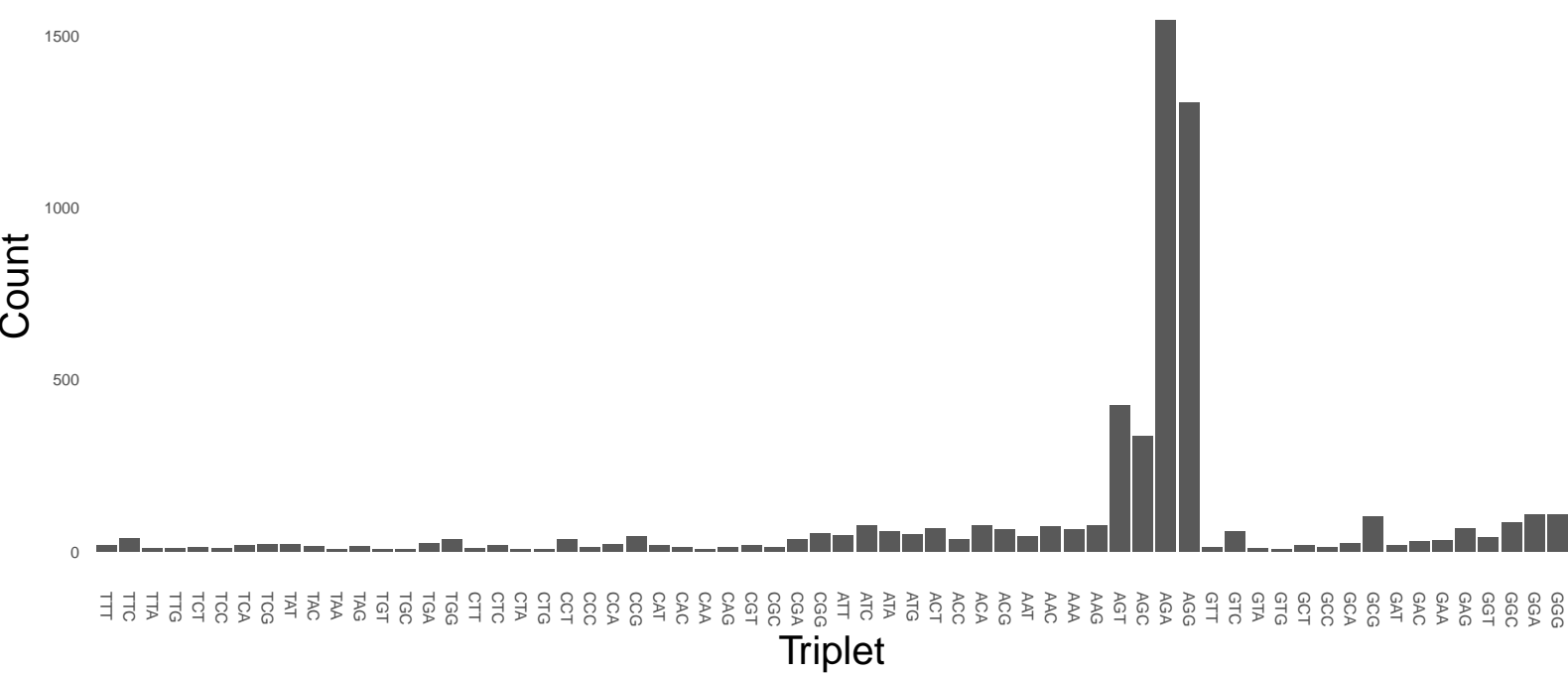
IGHV3-NL1\*01\_C141G\_T164C\_T169A\_A170G\_A172G\_C174T\_G175A\_A187G\_T201C- Final 3 nucleotides as a triplet



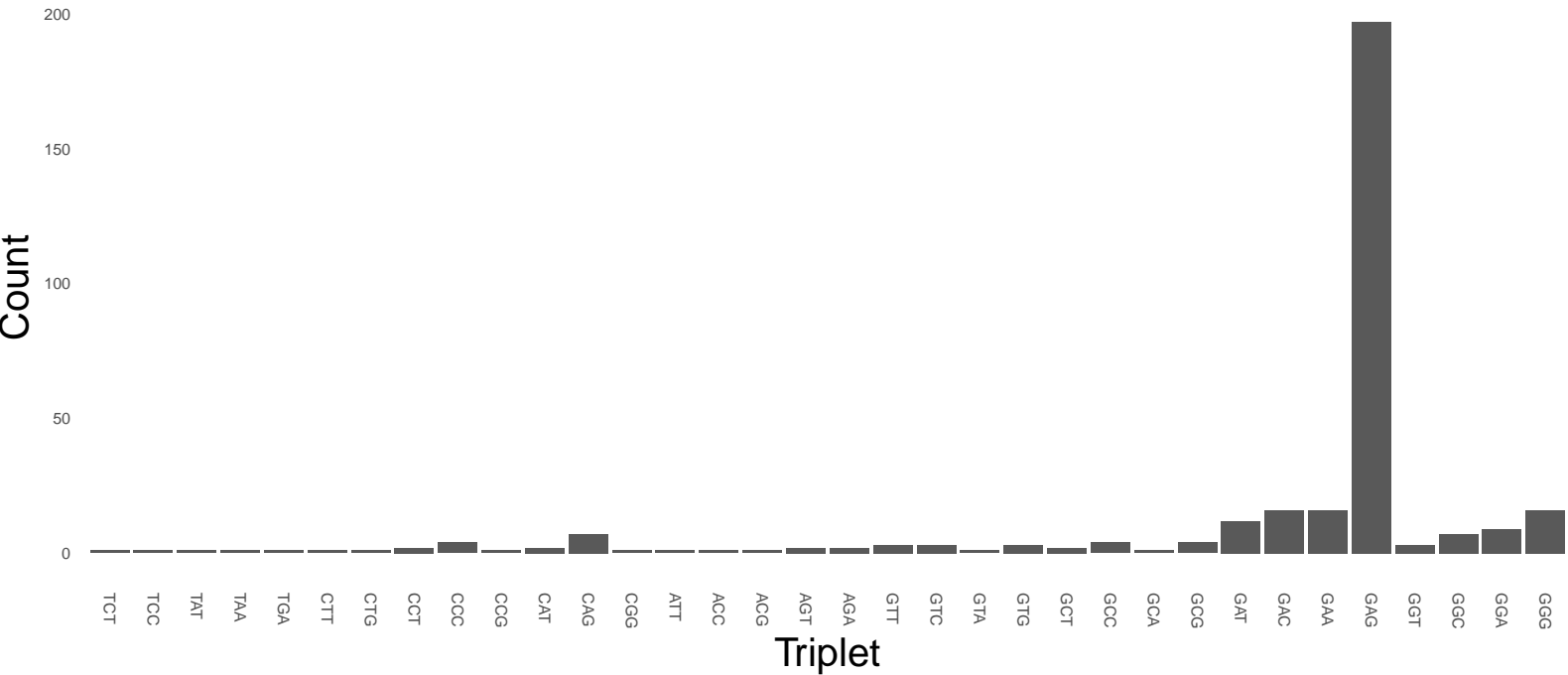
IGHV4/OR15-8\*01\_C193A- Final 3 nucleotides as a triplet



IGHV6-1\*01\_02\_A315G- Final 3 nucleotides as a triplet

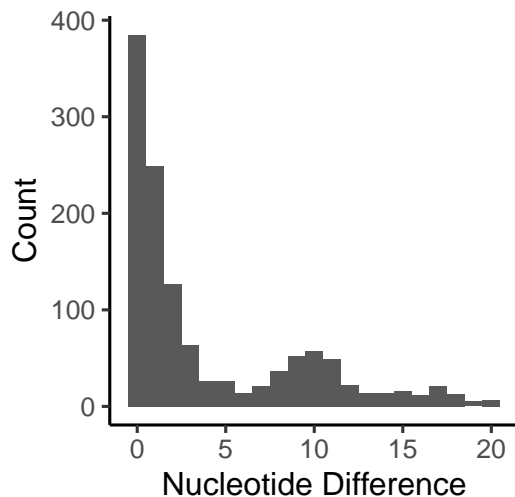


IGHV4-4\*02\_03\_T120C- Final 3 nucleotides as a triplet



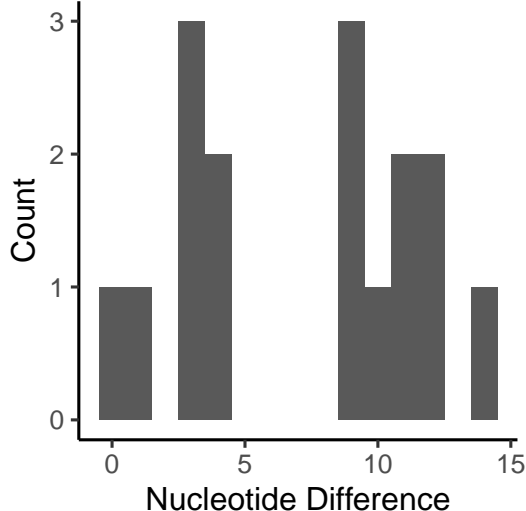
### IGHV1-2\*04

1252 sequences assigned  
385 (30.8%) exact matches, in which:  
327 unique CDR3  
7 unique J



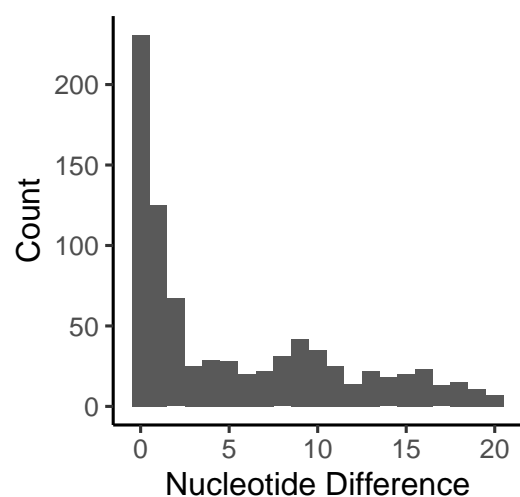
### IGHV1-8\*01

18 sequences assigned  
1 (5.6%) exact matches, in which:  
1 unique CDR3  
1 unique J



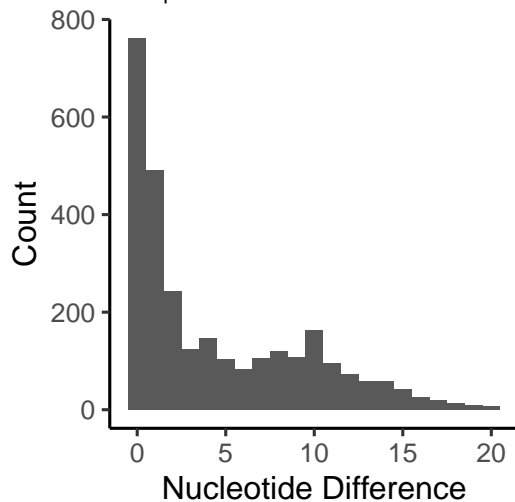
### IGHV1-24\*01

847 sequences assigned  
231 (27.3%) exact matches, in which:  
218 unique CDR3  
7 unique J



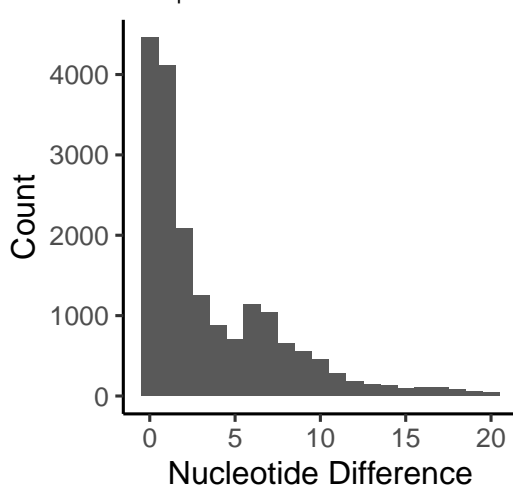
### IGHV1-2\*06

2889 sequences assigned  
762 (26.4%) exact matches, in which:  
658 unique CDR3  
7 unique J



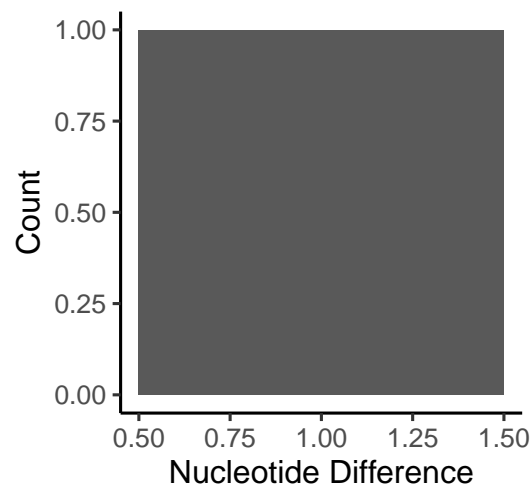
### IGHV1-18\*01

18825 sequences assigned  
4458 (23.7%) exact matches, in which:  
3666 unique CDR3  
7 unique J



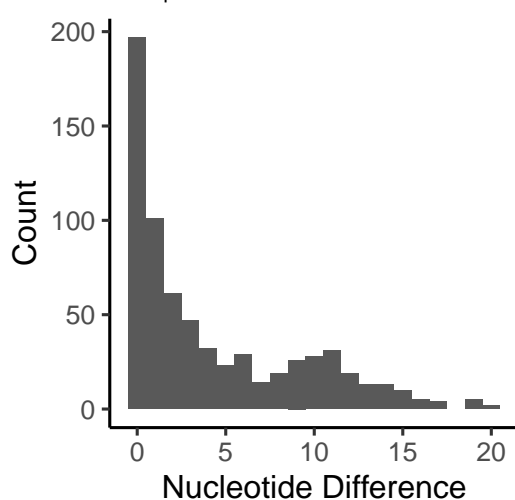
### IGHV1-38-4\*01

1 sequences assigned  
No exact matches.



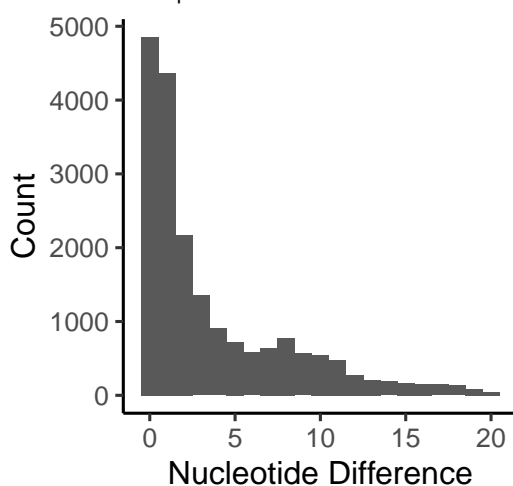
### IGHV1-3\*01\_05

691 sequences assigned  
197 (28.5%) exact matches, in which:  
190 unique CDR3  
7 unique J



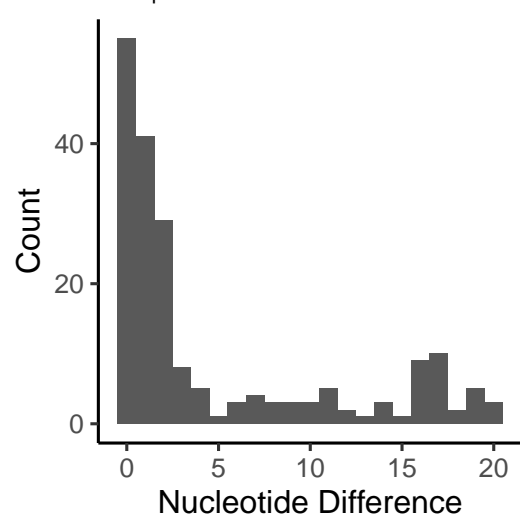
### IGHV1-18\*04

19641 sequences assigned  
4854 (24.7%) exact matches, in which:  
3966 unique CDR3  
7 unique J



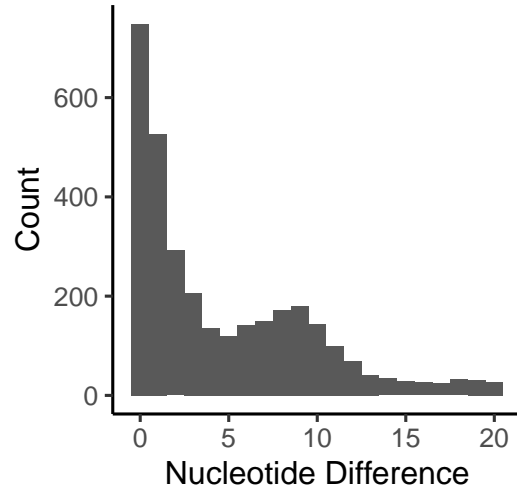
### IGHV1-45\*02

209 sequences assigned  
55 (26.3%) exact matches, in which:  
46 unique CDR3  
5 unique J



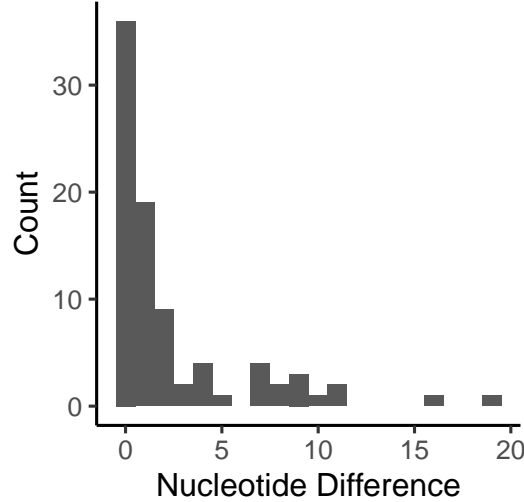
### IGHV1-46\*01

3340 sequences assigned  
749 (22.4%) exact matches, in which:  
663 unique CDR3  
7 unique J



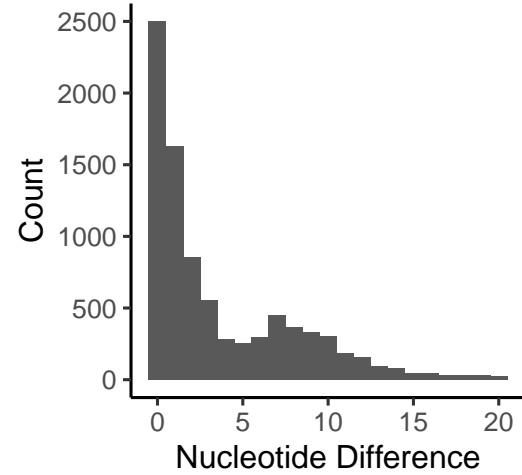
### IGHV1-58\*01\_03

85 sequences assigned  
36 (42.4%) exact matches, in which:  
35 unique CDR3  
6 unique J



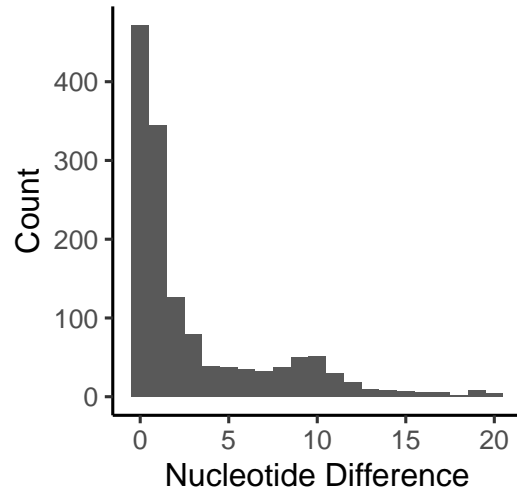
### IGHV1-69\*06\_14

8655 sequences assigned  
2500 (28.9%) exact matches, in which:  
2192 unique CDR3  
7 unique J



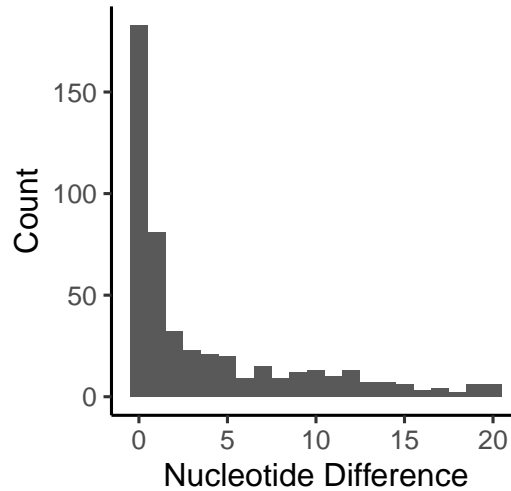
### IGHV1-46\*03

1422 sequences assigned  
472 (33.2%) exact matches, in which:  
373 unique CDR3  
6 unique J



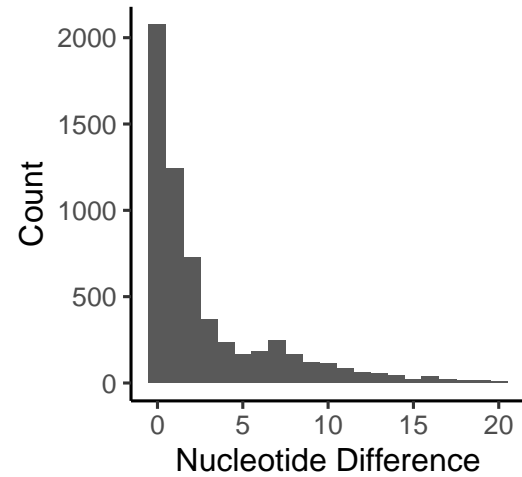
### IGHV1-69-2\*01

487 sequences assigned  
183 (37.6%) exact matches, in which:  
172 unique CDR3  
7 unique J



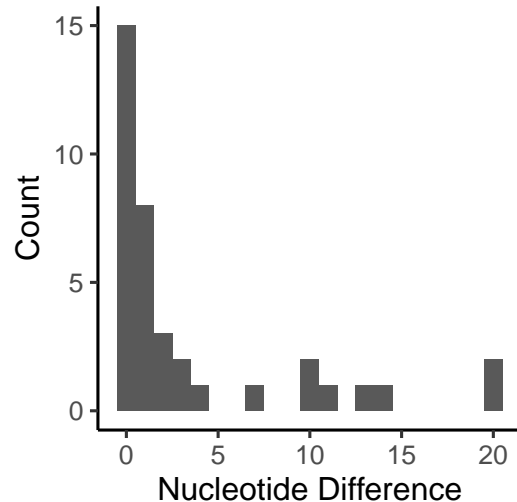
### IGHV1-69\*15\_18

6030 sequences assigned  
2075 (34.4%) exact matches, in which:  
1853 unique CDR3  
7 unique J



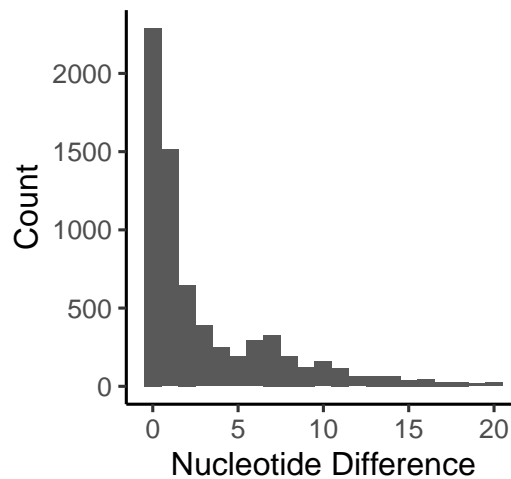
### IGHV1-58\*02

37 sequences assigned  
15 (40.5%) exact matches, in which:  
14 unique CDR3  
3 unique J



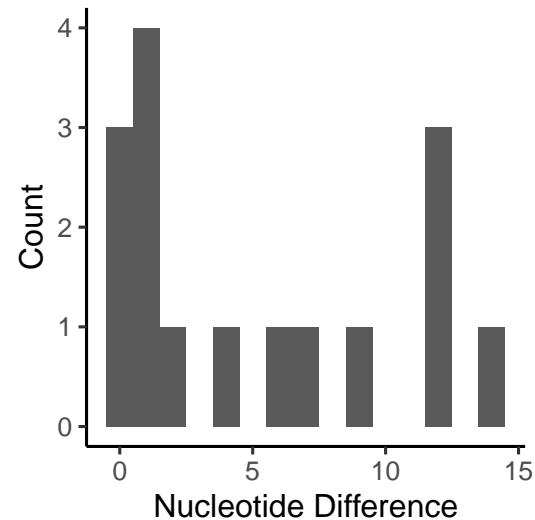
### IGHV1-69\*01\_12\_13

6993 sequences assigned  
2290 (32.7%) exact matches, in which:  
2046 unique CDR3  
7 unique J



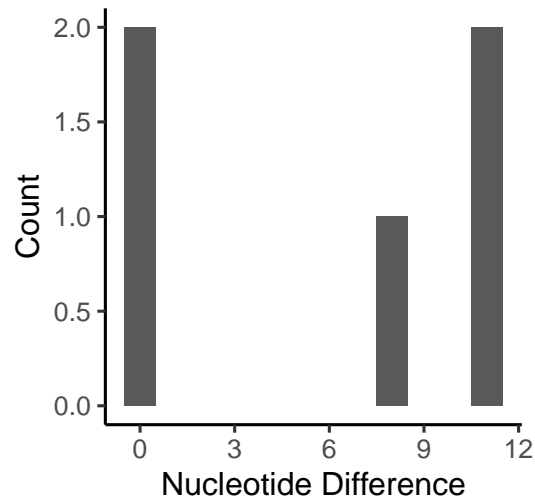
### IGHV2-5\*02

17 sequences assigned  
3 (17.6%) exact matches, in which:  
3 unique CDR3  
1 unique J



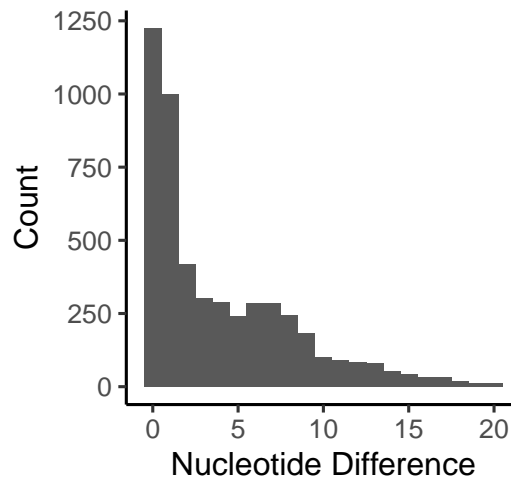
### IGHV2-70\*01

5 sequences assigned  
2 (40%) exact matches, in which:  
2 unique CDR3  
2 unique J



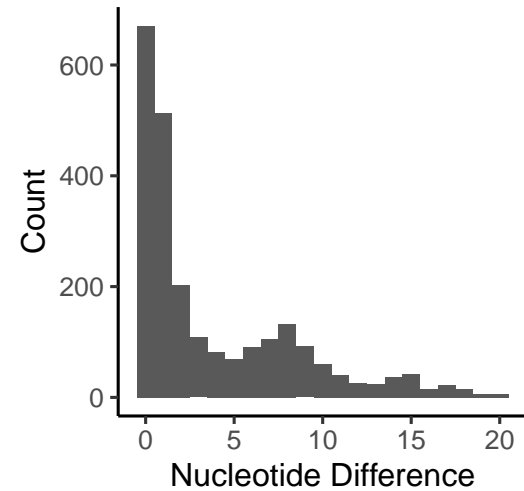
### IGHV3-7\*05

5094 sequences assigned  
1224 (24%) exact matches, in which:  
1042 unique CDR3  
7 unique J



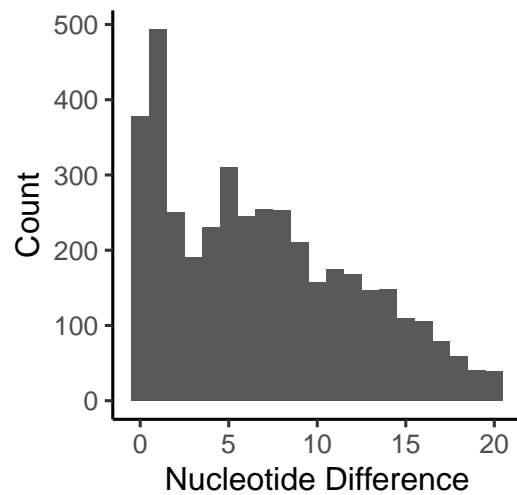
### IGHV3-13\*04

2407 sequences assigned  
671 (27.9%) exact matches, in which:  
532 unique CDR3  
7 unique J



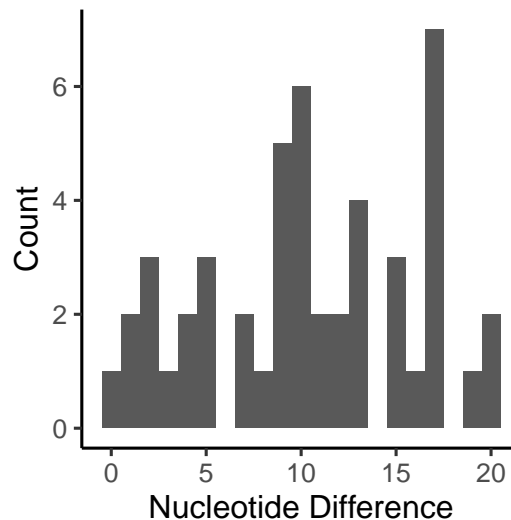
### IGHV3-7\*01

4139 sequences assigned  
378 (9.1%) exact matches, in which:  
373 unique CDR3  
7 unique J



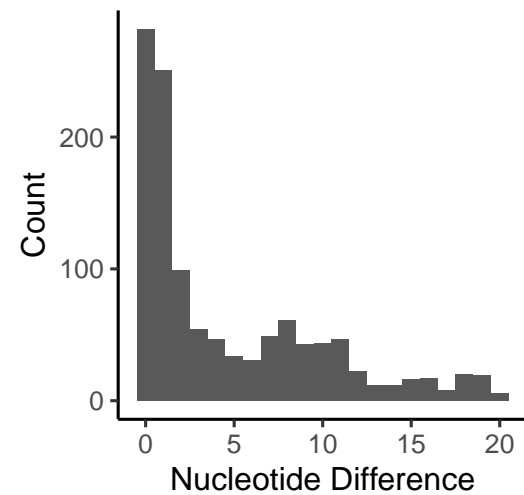
### IGHV3-9\*01

59 sequences assigned  
1 (1.7%) exact matches, in which:  
1 unique CDR3  
1 unique J



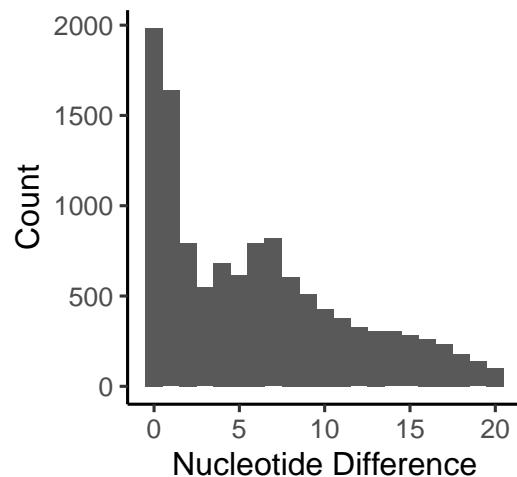
### IGHV3-13\*05

1205 sequences assigned  
282 (23.4%) exact matches, in which:  
218 unique CDR3  
6 unique J



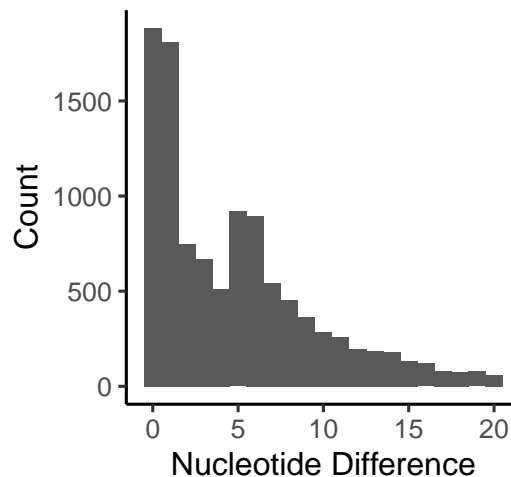
### IGHV3-7\*03

12372 sequences assigned  
1984 (16%) exact matches, in which:  
1652 unique CDR3  
7 unique J



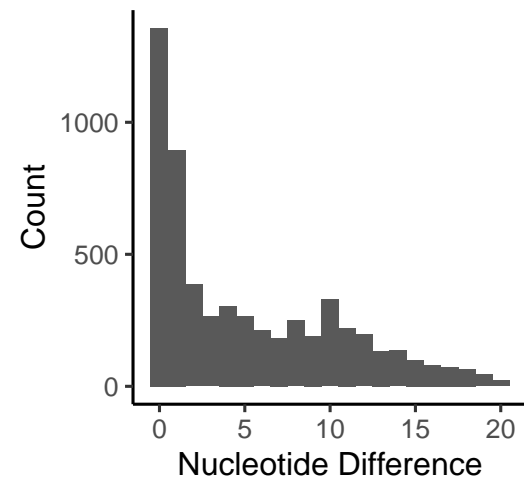
### IGHV3-11\*06

10634 sequences assigned  
1883 (17.7%) exact matches, in which:  
1620 unique CDR3  
7 unique J



### IGHV3-15\*01\_02

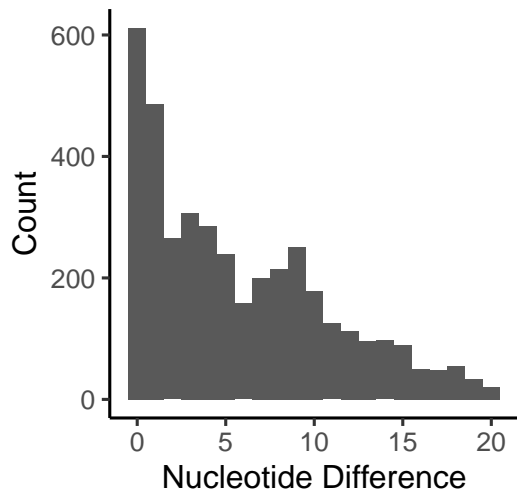
5886 sequences assigned  
1357 (23.1%) exact matches, in which:  
1118 unique CDR3  
7 unique J





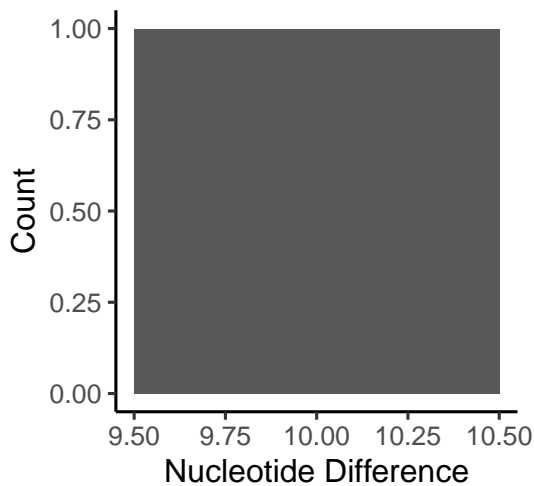
### IGHV3-20\*03\_04

3983 sequences assigned  
612 (15.4%) exact matches, in which:  
485 unique CDR3  
7 unique J



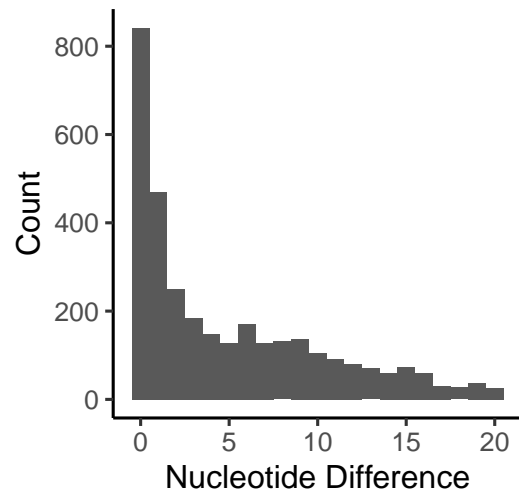
### IGHV3-22\*01\_02

1 sequences assigned  
No exact matches.



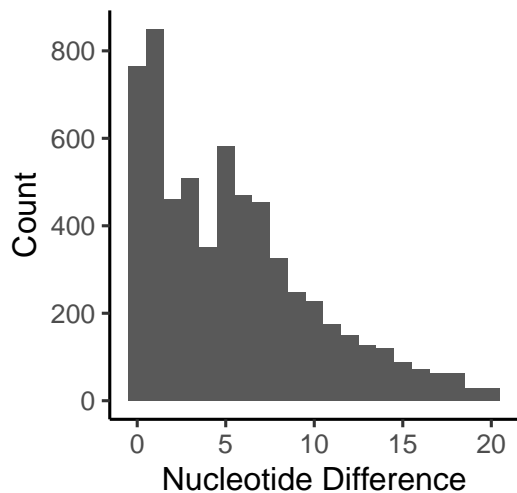
### IGHV3-30\*03

3341 sequences assigned  
842 (25.2%) exact matches, in which:  
829 unique CDR3  
7 unique J



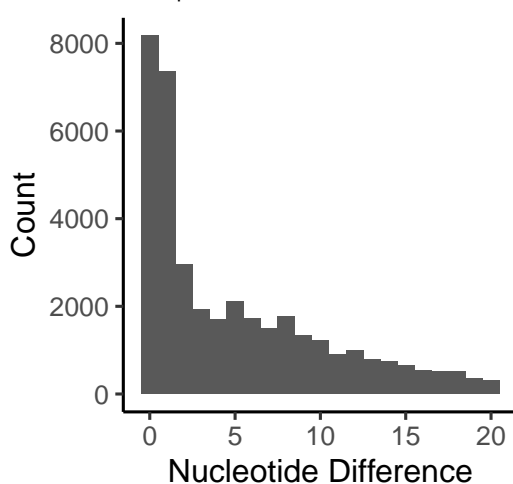
### IGHV3-21\*04

6262 sequences assigned  
764 (12.2%) exact matches, in which:  
735 unique CDR3  
7 unique J



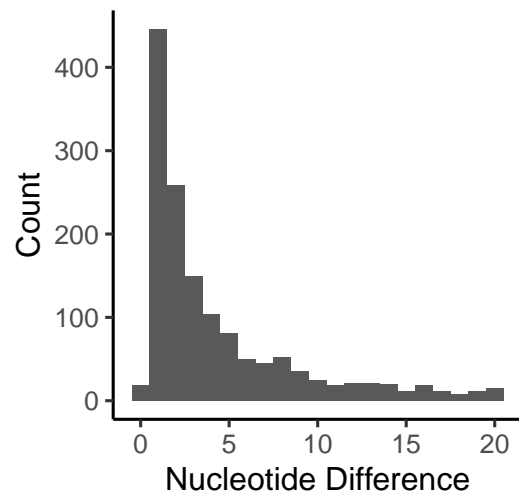
### IGHV3-23\*01\_04

39328 sequences assigned  
8174 (20.8%) exact matches, in which:  
6191 unique CDR3  
7 unique J



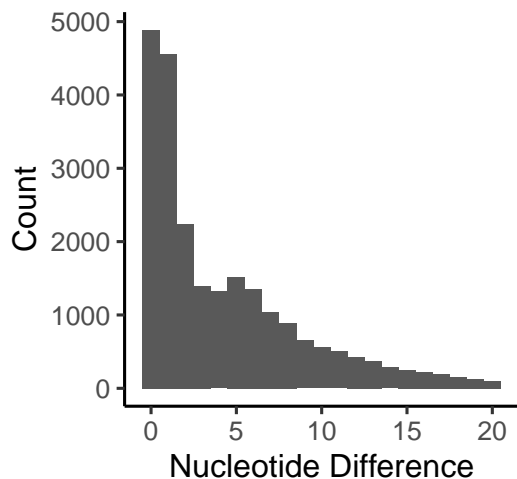
### IGHV3-30\*19

1452 sequences assigned  
18 (1.2%) exact matches, in which:  
18 unique CDR3  
5 unique J



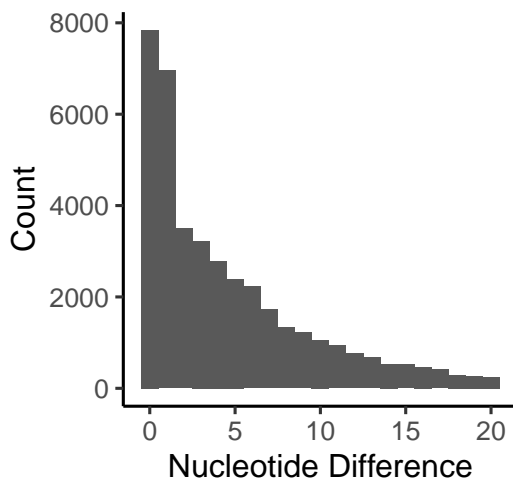
### IGHV3-21\*01\_02

23400 sequences assigned  
4885 (20.9%) exact matches, in which:  
3953 unique CDR3  
7 unique J



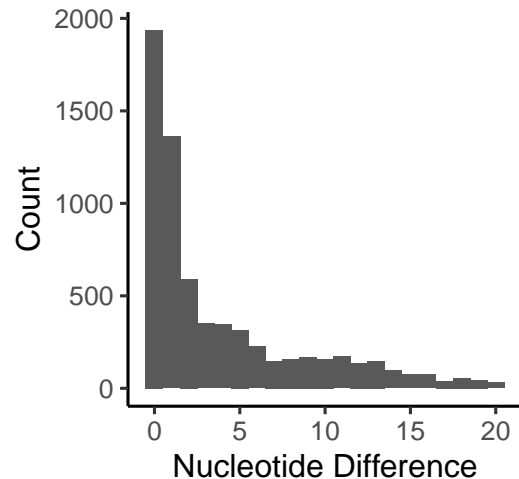
### IGHV3-30-3\*01

40156 sequences assigned  
7842 (19.5%) exact matches, in which:  
6466 unique CDR3  
7 unique J



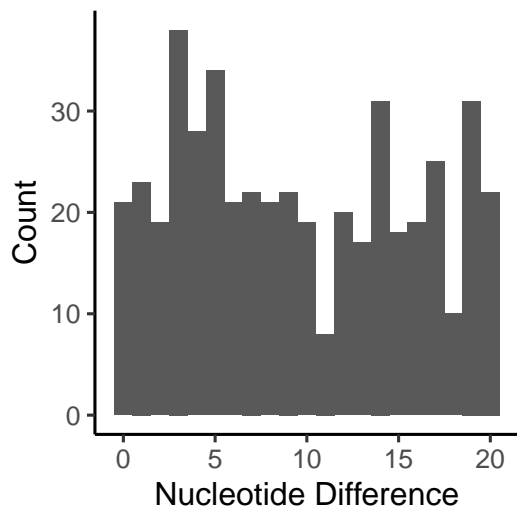
### IGHV3-33\*01

6806 sequences assigned  
1937 (28.5%) exact matches, in which:  
1498 unique CDR3  
7 unique J



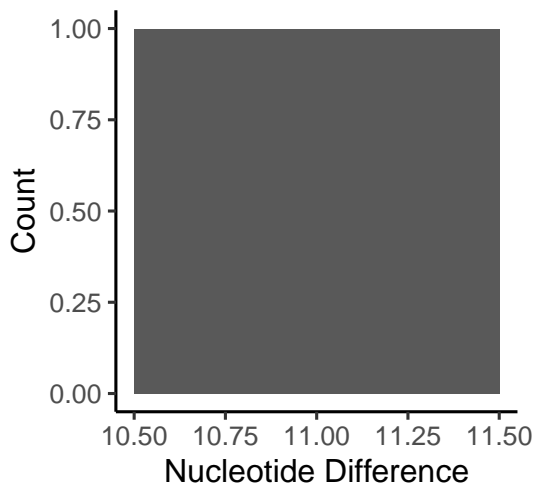
### IGHV3-33\*05

528 sequences assigned  
21 (4%) exact matches, in which:  
21 unique CDR3  
6 unique J



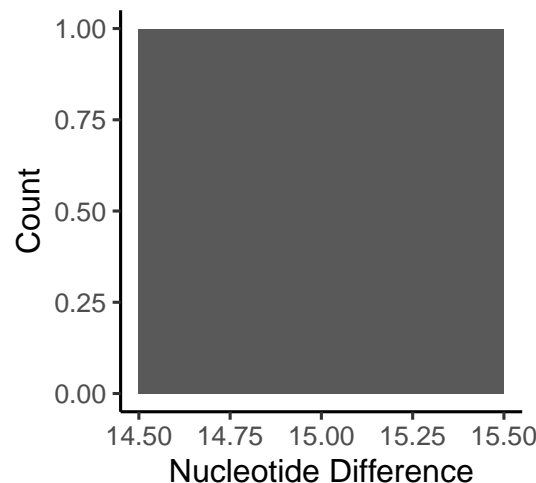
### IGHV3-35\*01

1 sequences assigned  
No exact matches.



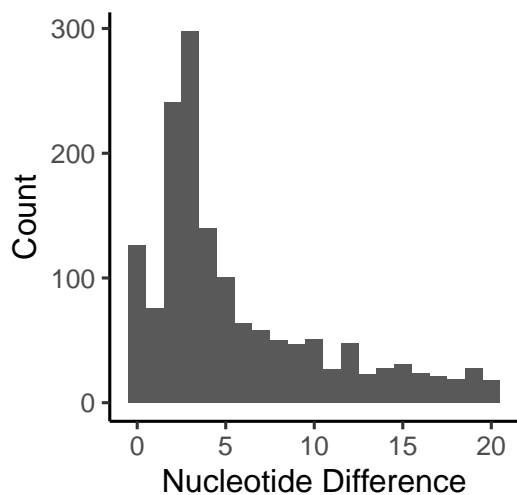
### IGHV3-38\*02

3 sequences assigned  
No exact matches.



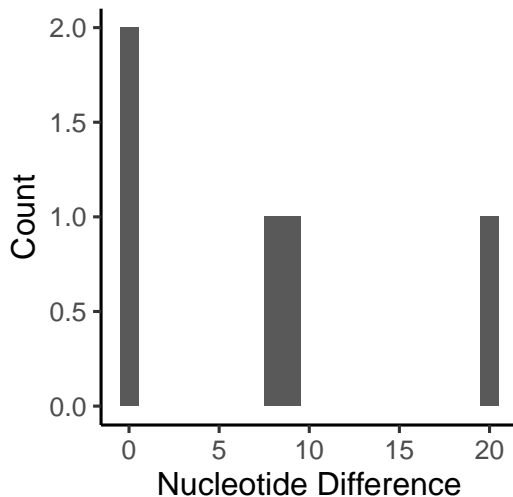
### IGHV3-33\*06

1620 sequences assigned  
126 (7.8%) exact matches, in which:  
125 unique CDR3  
7 unique J



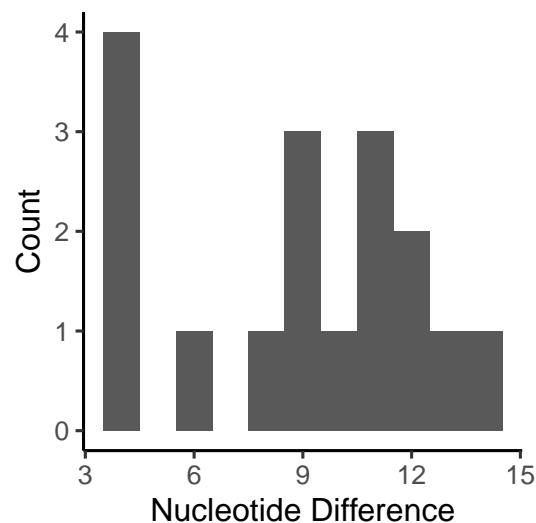
### IGHV3-35\*02

5 sequences assigned  
2 (40%) exact matches, in which:  
1 unique CDR3  
1 unique J



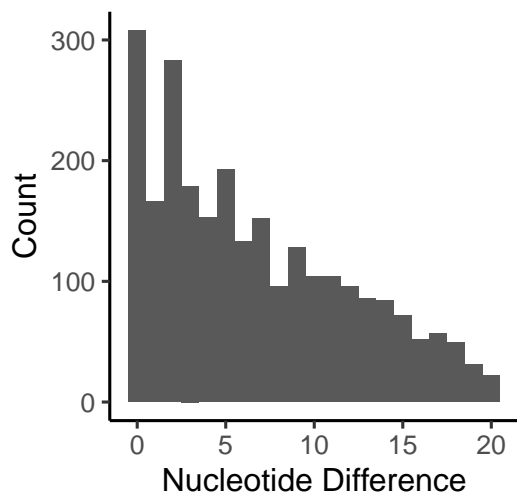
### IGHV3-38\*03

17 sequences assigned  
No exact matches.



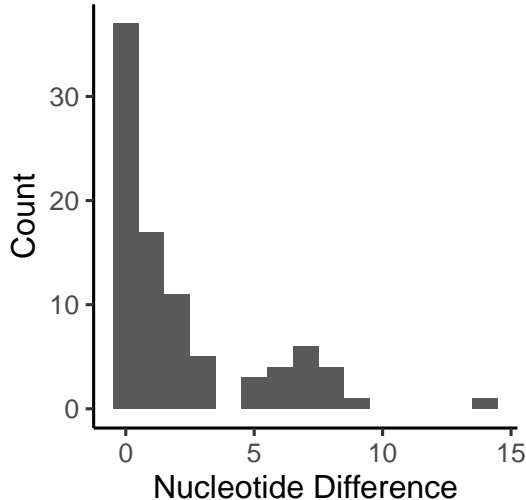
### IGHV3-33\*08

2663 sequences assigned  
308 (11.6%) exact matches, in which:  
291 unique CDR3  
7 unique J



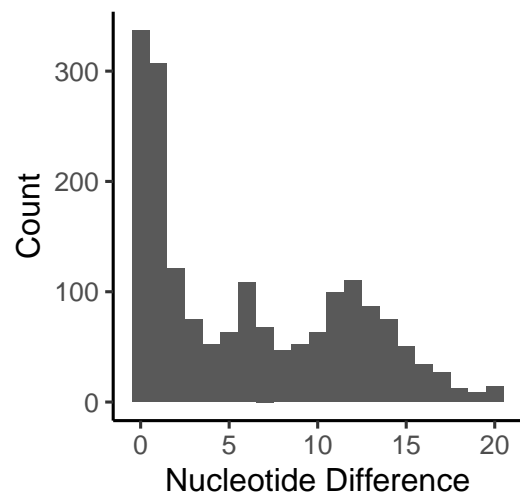
### IGHV3-38-3\*01

89 sequences assigned  
37 (41.6%) exact matches, in which:  
37 unique CDR3  
5 unique J



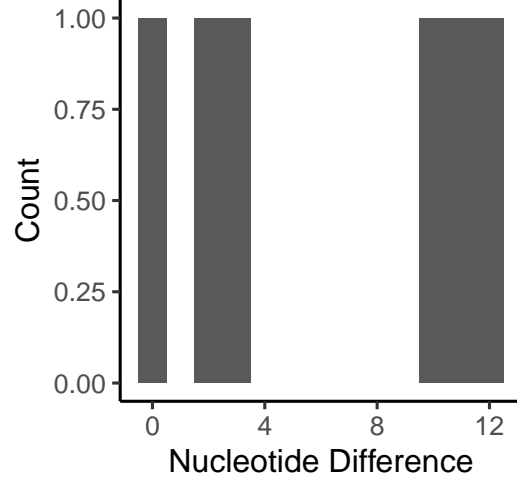
### IGHV3-43\*01

1834 sequences assigned  
337 (18.4%) exact matches, in which:  
264 unique CDR3  
7 unique J



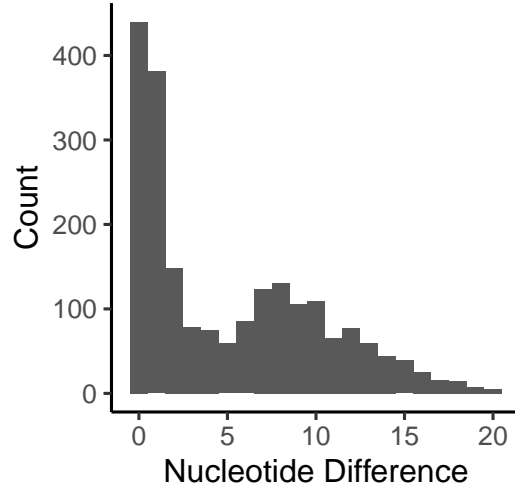
### IGHV3-47\*02

6 sequences assigned  
1 (16.7%) exact matches, in which:  
1 unique CDR3  
1 unique J



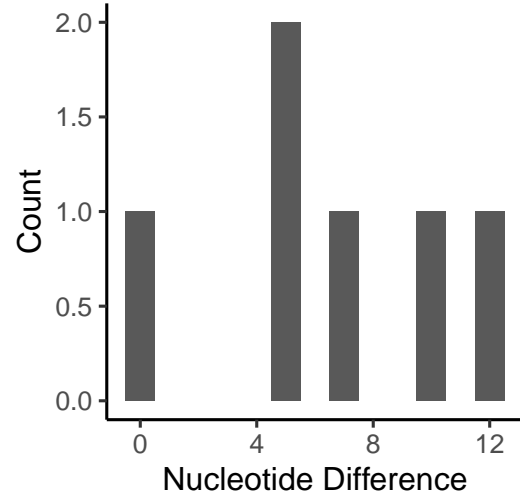
### IGHV3-49\*04

2163 sequences assigned  
440 (20.3%) exact matches, in which:  
336 unique CDR3  
7 unique J



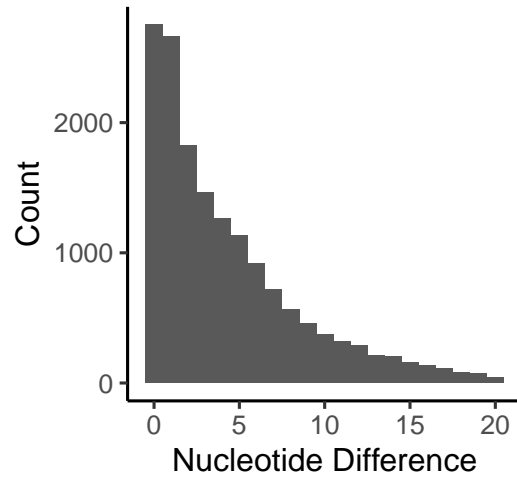
### IGHV3-52\*01\_03

6 sequences assigned  
1 (16.7%) exact matches, in which:  
1 unique CDR3  
1 unique J



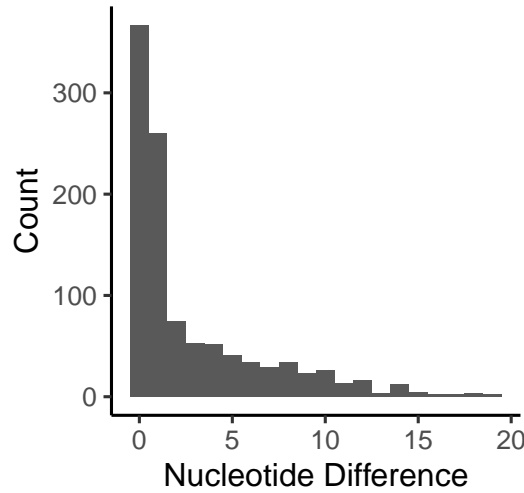
### IGHV3-48\*01

15988 sequences assigned  
2752 (17.2%) exact matches, in which:  
2209 unique CDR3  
7 unique J



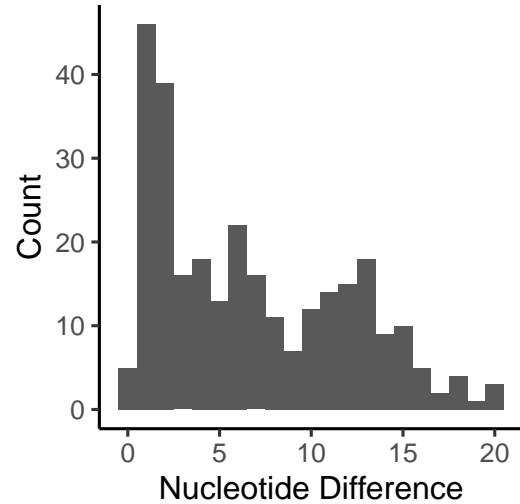
### IGHV3-49\*03\_05

1057 sequences assigned  
367 (34.7%) exact matches, in which:  
296 unique CDR3  
7 unique J



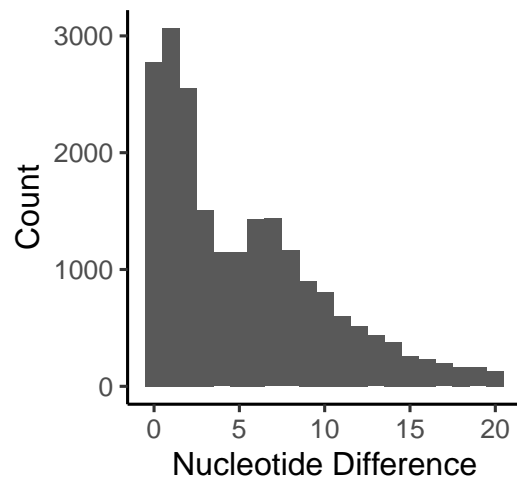
### IGHV3-53\*05

294 sequences assigned  
5 (1.7%) exact matches, in which:  
5 unique CDR3  
2 unique J



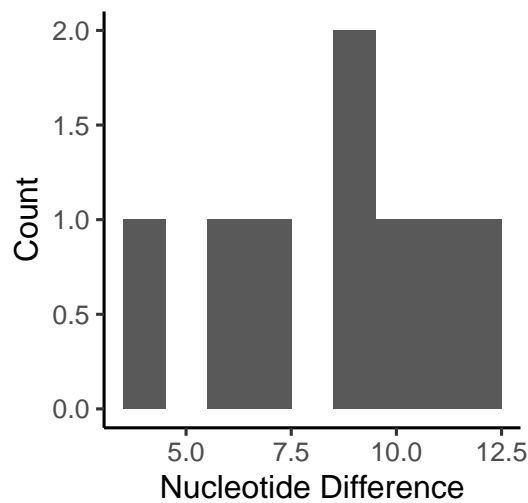
### IGHV3-48\*03

21578 sequences assigned  
2774 (12.9%) exact matches, in which:  
2148 unique CDR3  
7 unique J



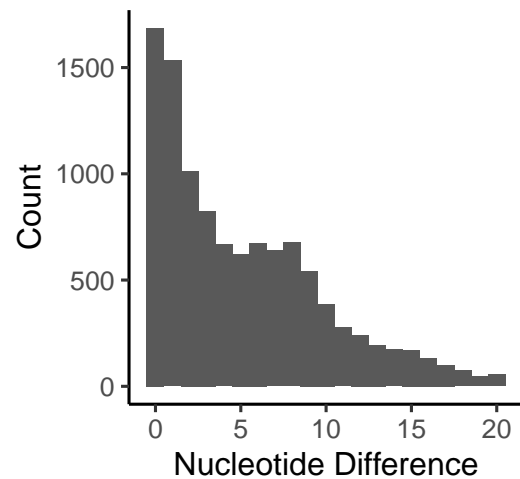
### IGHV3-52\*02

8 sequences assigned  
No exact matches.



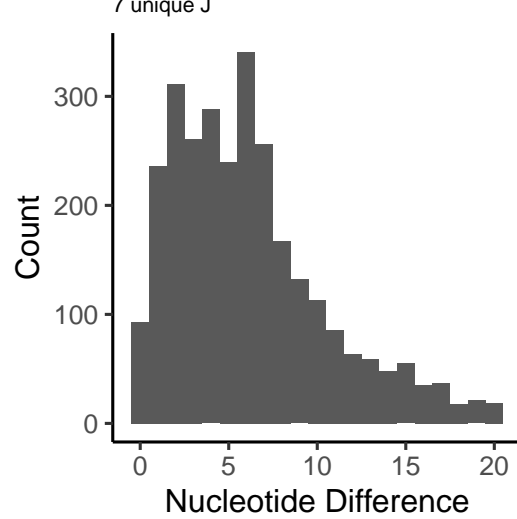
### IGHV3-53\*01\_02

10906 sequences assigned  
1686 (15.5%) exact matches, in which:  
1395 unique CDR3  
7 unique J



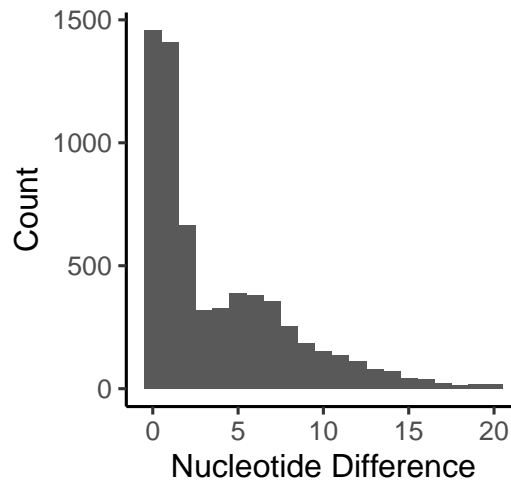
### IGHV3-64\*04

2971 sequences assigned  
93 (3.1%) exact matches, in which:  
93 unique CDR3  
7 unique J



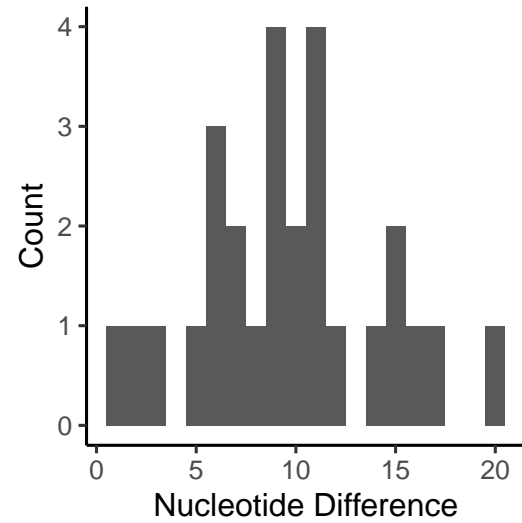
### IGHV3-66\*02

6493 sequences assigned  
1457 (22.4%) exact matches, in which:  
1176 unique CDR3  
7 unique J



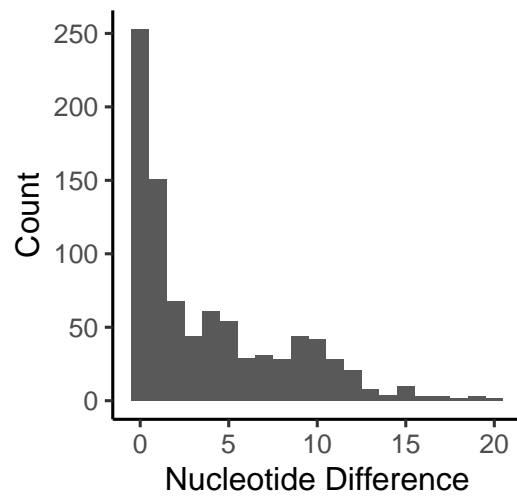
### IGHV3-69-1\*02

31 sequences assigned  
No exact matches.



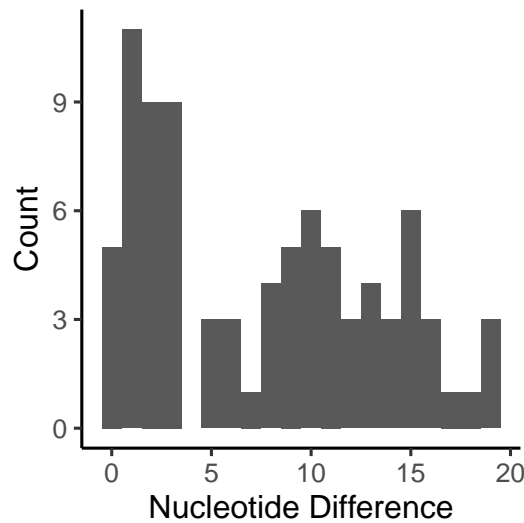
### IGHV3-64\*02\_07

901 sequences assigned  
253 (28.1%) exact matches, in which:  
194 unique CDR3  
7 unique J



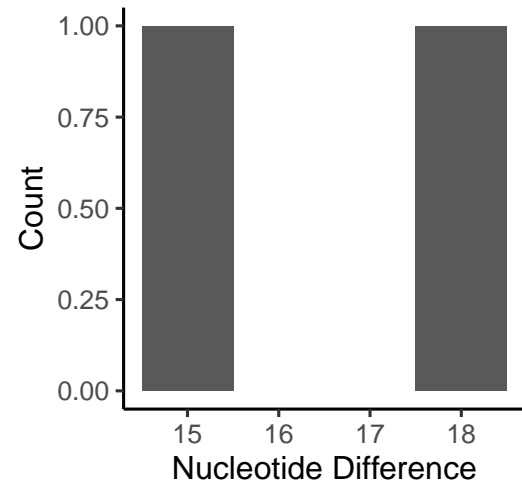
### IGHV3-66\*03

94 sequences assigned  
5 (5.3%) exact matches, in which:  
5 unique CDR3  
2 unique J



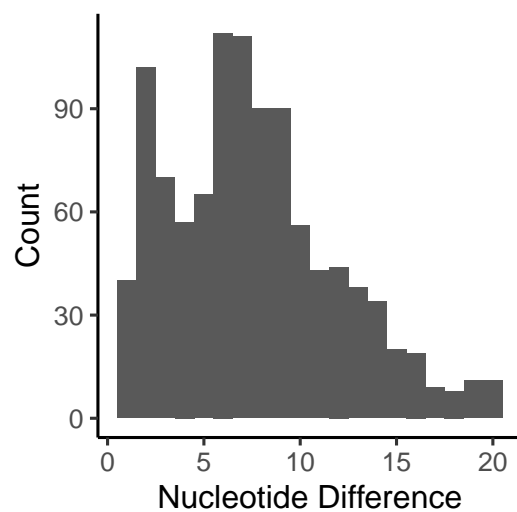
### IGHV3-71\*03

8 sequences assigned  
No exact matches.



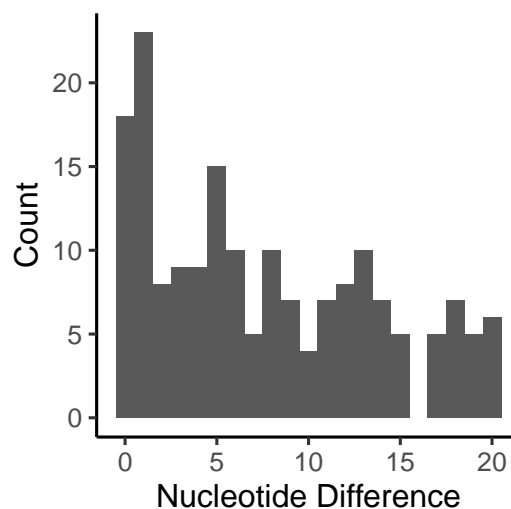
### IGHV3-66\*01

1061 sequences assigned  
No exact matches.



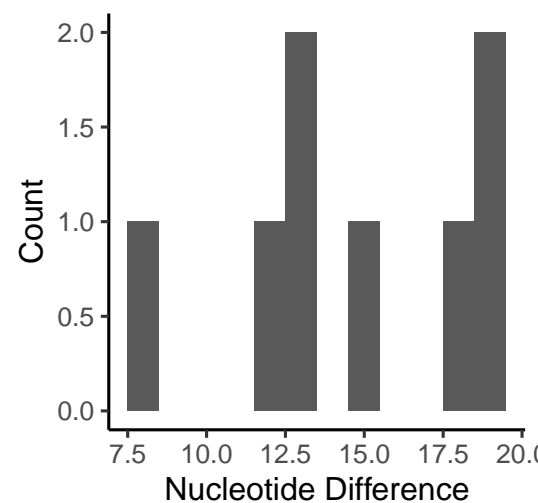
### IGHV3-69-1\*01

188 sequences assigned  
18 (9.6%) exact matches, in which:  
18 unique CDR3  
6 unique J



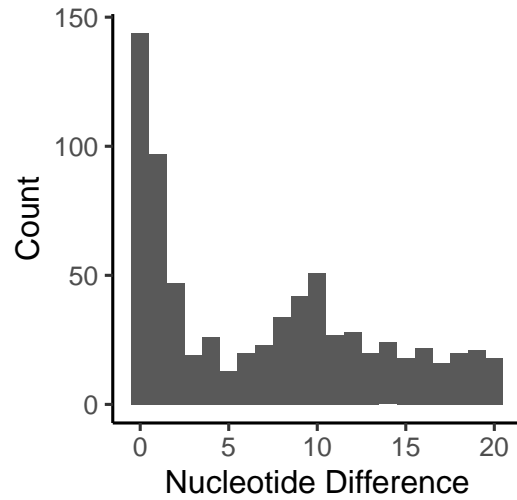
### IGHV3-71\*01\_04

11 sequences assigned  
No exact matches.



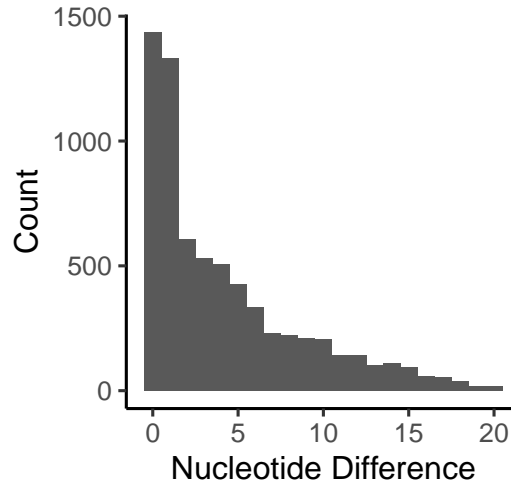
### IGHV3-72\*01

782 sequences assigned  
144 (18.4%) exact matches, in which:  
124 unique CDR3  
7 unique J



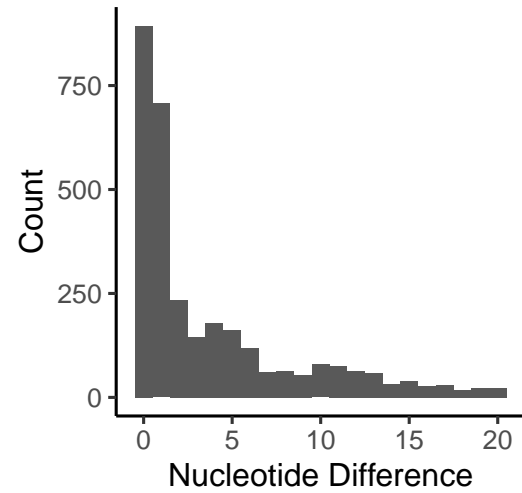
### IGHV3-74\*01\_02

7012 sequences assigned  
1435 (20.5%) exact matches, in which:  
1138 unique CDR3  
7 unique J



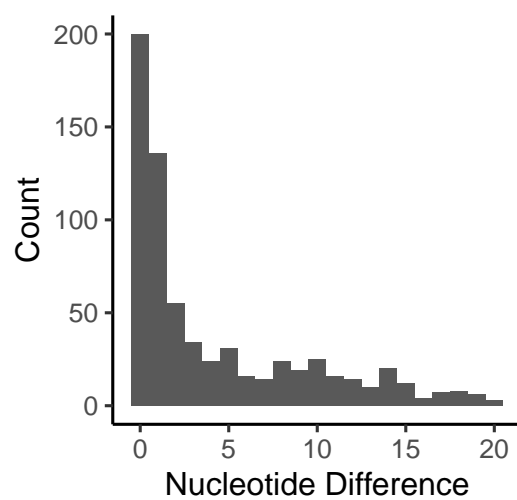
### IGHV3-64D\*06

3267 sequences assigned  
894 (27.4%) exact matches, in which:  
634 unique CDR3  
7 unique J



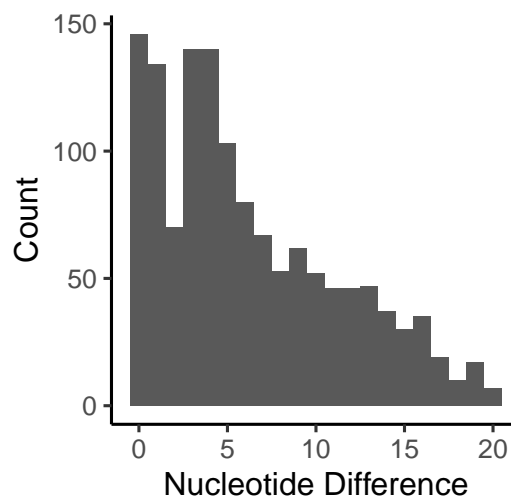
### IGHV3-73\*01\_02

695 sequences assigned  
200 (28.8%) exact matches, in which:  
167 unique CDR3  
7 unique J



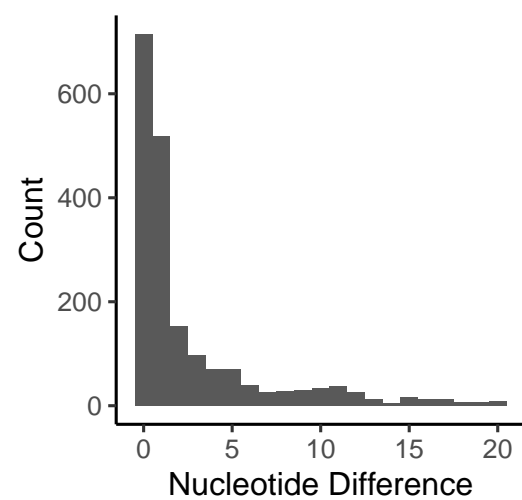
### IGHV3-74\*01\_02\_C246T

1362 sequences assigned  
146 (10.7%) exact matches, in which:  
145 unique CDR3  
7 unique J



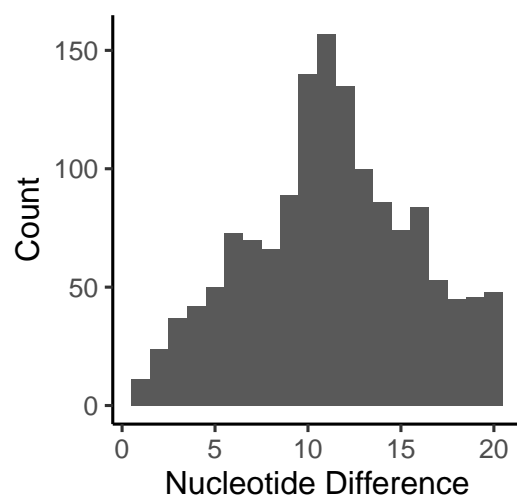
### IGHV3-64D\*09

1936 sequences assigned  
715 (36.9%) exact matches, in which:  
498 unique CDR3  
7 unique J



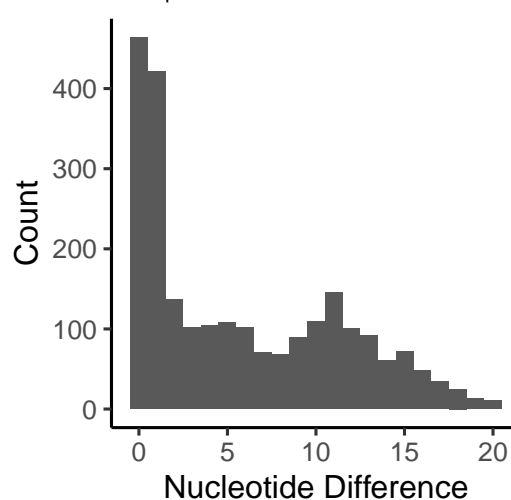
### IGHV3-74\*03

1768 sequences assigned  
No exact matches.



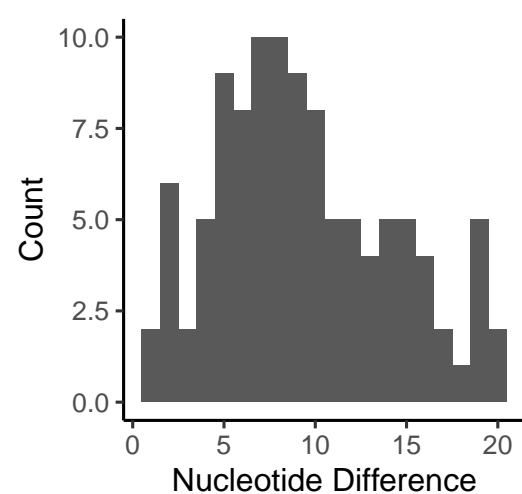
### IGHV3-43D\*04

2422 sequences assigned  
464 (19.2%) exact matches, in which:  
377 unique CDR3  
7 unique J



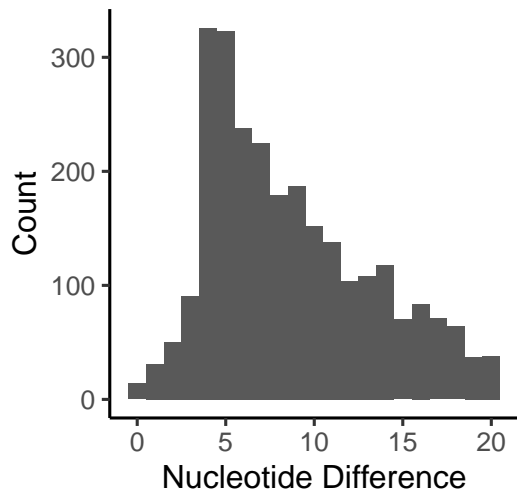
### IGHV3-NL1\*01

111 sequences assigned  
No exact matches.



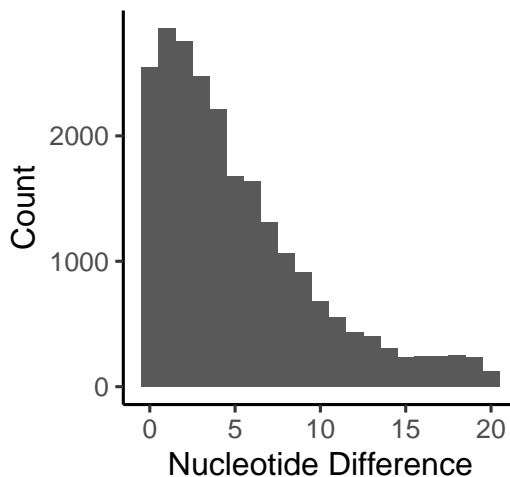
### IGHV3–NL1\*01\_C141G\_

2792 sequences assigned  
14 (0.5%) exact matches, in which:  
14 unique CDR3  
3 unique J



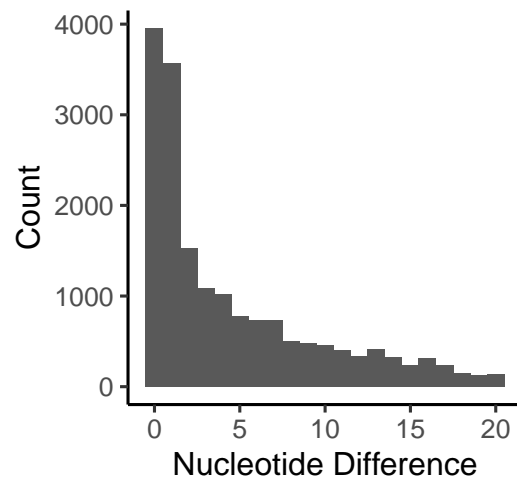
### IGHV4–4\*02\_03

23797 sequences assigned  
2544 (10.7%) exact matches, in which:  
1981 unique CDR3  
7 unique J



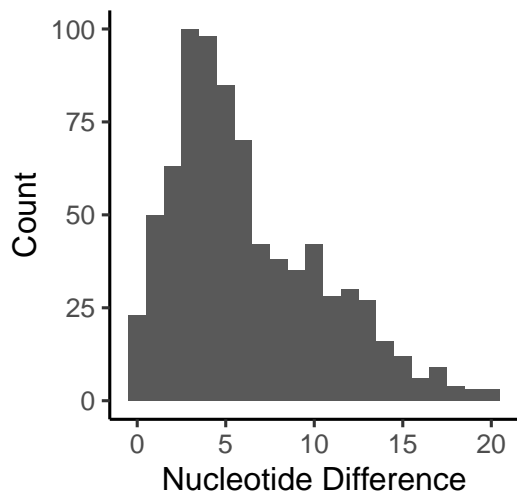
### IGHV4–30–4\*01

18218 sequences assigned  
3953 (21.7%) exact matches, in which:  
2798 unique CDR3  
7 unique J



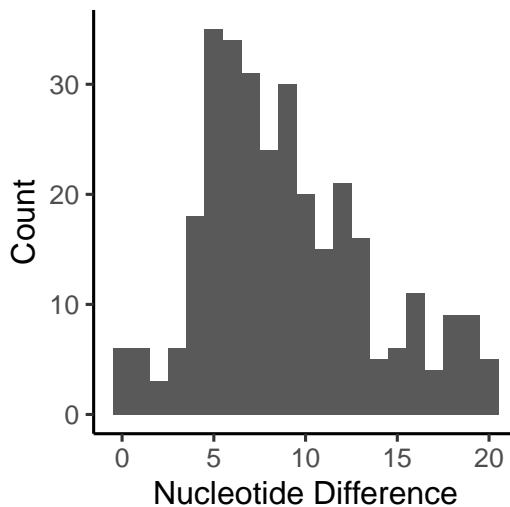
### IGHV3–NL1\*01\_C141G\_

800 sequences assigned  
23 (2.9%) exact matches, in which:  
23 unique CDR3  
4 unique J



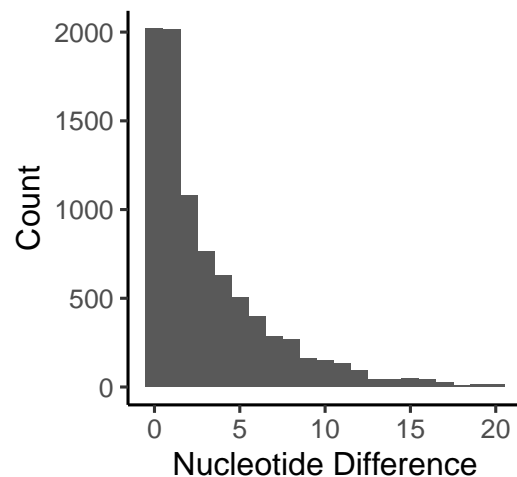
### IGHV4–4\*02\_03\_T120C

328 sequences assigned  
6 (1.8%) exact matches, in which:  
6 unique CDR3  
3 unique J



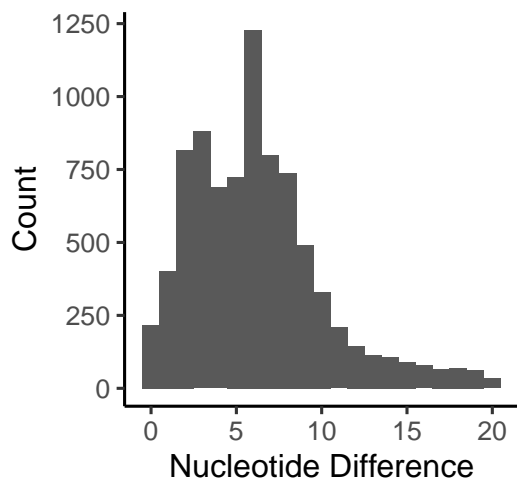
### IGHV4–30–2\*01

8811 sequences assigned  
2019 (22.9%) exact matches, in which:  
1467 unique CDR3  
7 unique J



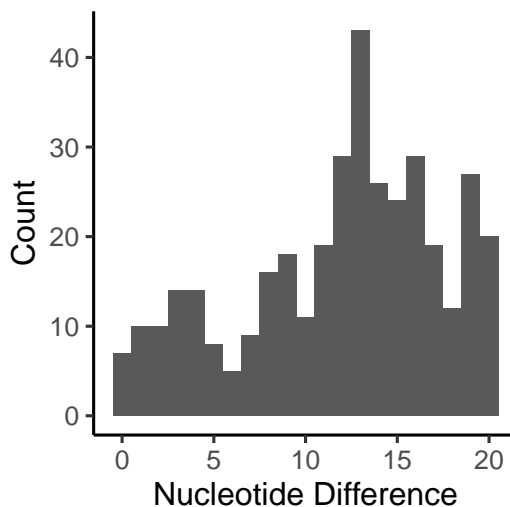
### IGHV4–4\*09

8363 sequences assigned  
216 (2.6%) exact matches, in which:  
209 unique CDR3  
7 unique J



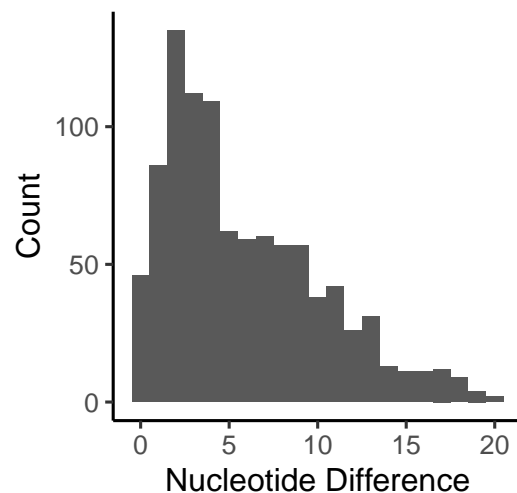
### IGHV4–28\*03

463 sequences assigned  
7 (1.5%) exact matches, in which:  
7 unique CDR3  
2 unique J



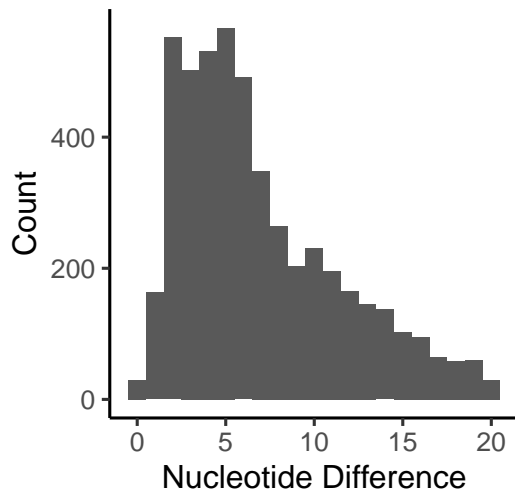
### IGHV4–30–2\*05

1003 sequences assigned  
46 (4.6%) exact matches, in which:  
46 unique CDR3  
6 unique J



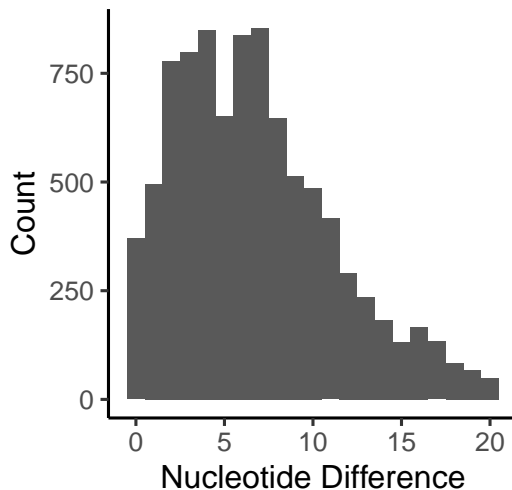
### IGHV4-30-4\*08

5113 sequences assigned  
30 (0.6%) exact matches, in which:  
28 unique CDR3  
5 unique J



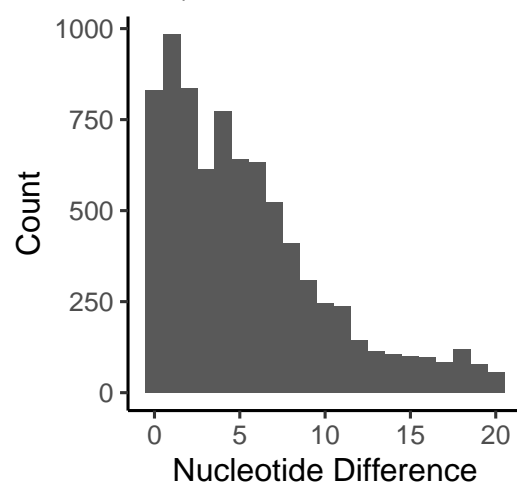
### IGHV4-38-2\*02

9167 sequences assigned  
370 (4%) exact matches, in which:  
332 unique CDR3  
7 unique J



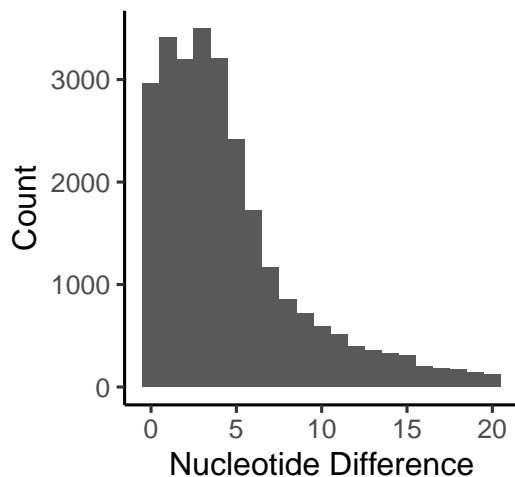
### IGHV4-59\*08

8088 sequences assigned  
832 (10.3%) exact matches, in which:  
749 unique CDR3  
7 unique J



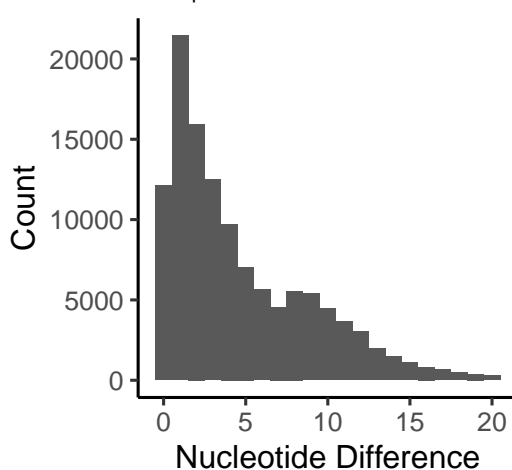
### IGHV4-31\*02

27292 sequences assigned  
2964 (10.9%) exact matches, in which:  
2196 unique CDR3  
7 unique J



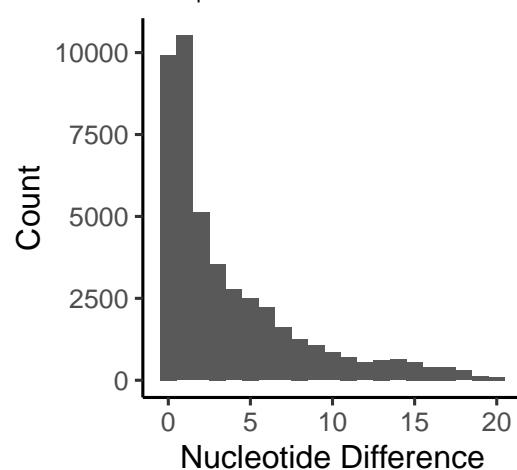
### IGHV4-39\*07

119525 sequences assigned  
12124 (10.1%) exact matches, in which:  
8021 unique CDR3  
7 unique J



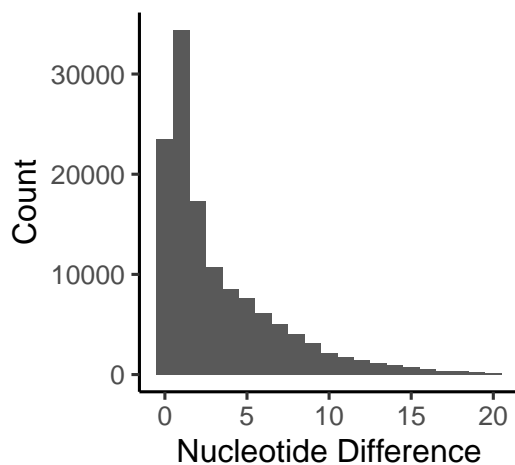
### IGHV4-59\*11

46077 sequences assigned  
9933 (21.6%) exact matches, in which:  
6915 unique CDR3  
7 unique J



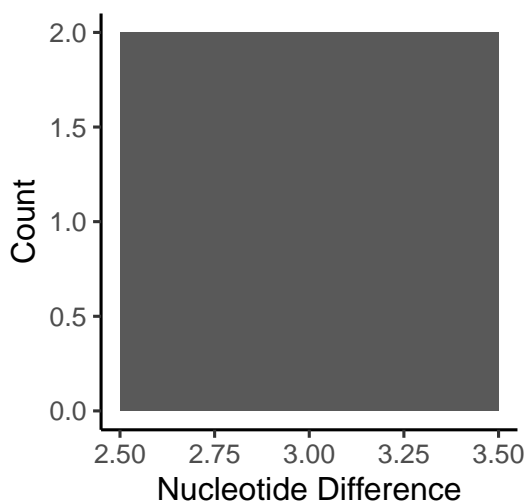
### IGHV4-34\*01\_02

131669 sequences assigned  
23542 (17.9%) exact matches, in which:  
14509 unique CDR3  
7 unique J



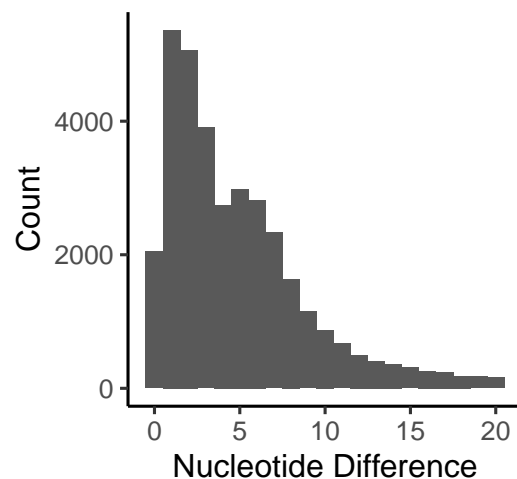
### IGHV4-55\*09

2 sequences assigned  
No exact matches.



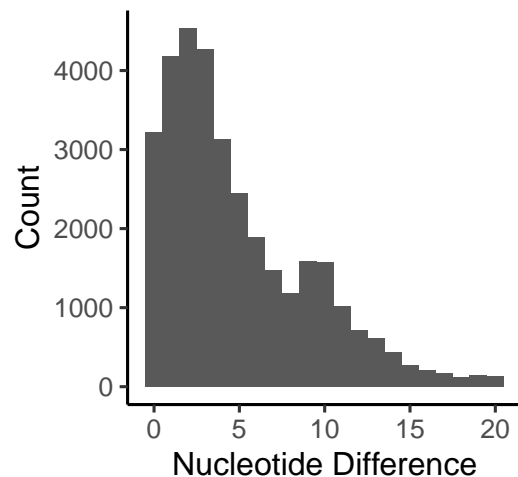
### IGHV4-59\*12

34747 sequences assigned  
2051 (5.9%) exact matches, in which:  
1836 unique CDR3  
7 unique J



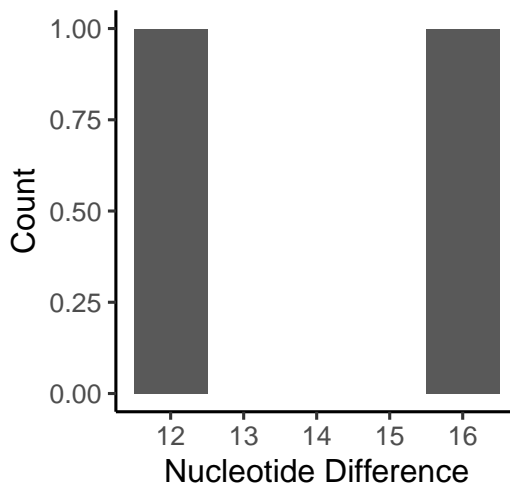
### IGHV4-61\*01

33549 sequences assigned  
3222 (9.6%) exact matches, in which:  
2560 unique CDR3  
7 unique J



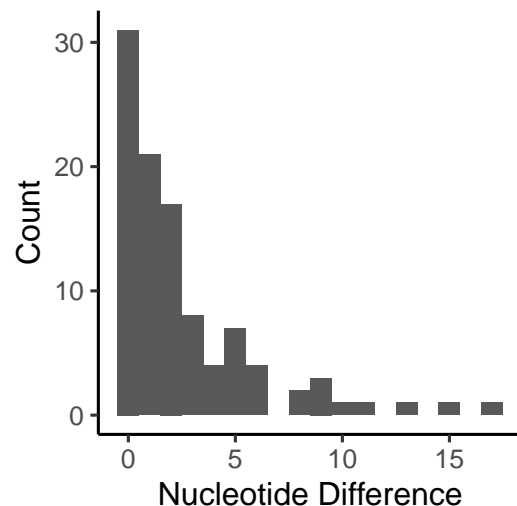
### IGHV1/OR15-2\*02\_03

2 sequences assigned  
No exact matches.



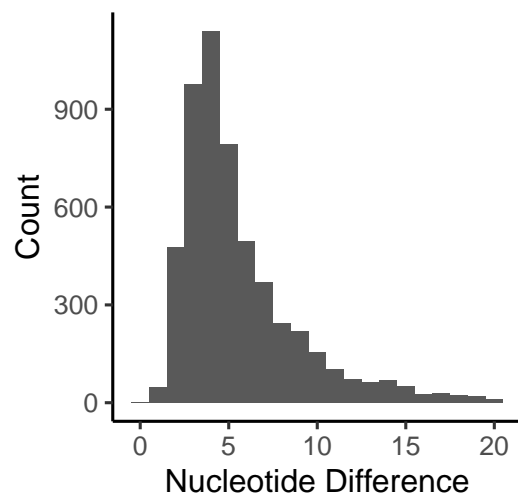
### IGHV5-51\*04

104 sequences assigned  
31 (29.8%) exact matches, in which:  
30 unique CDR3  
4 unique J



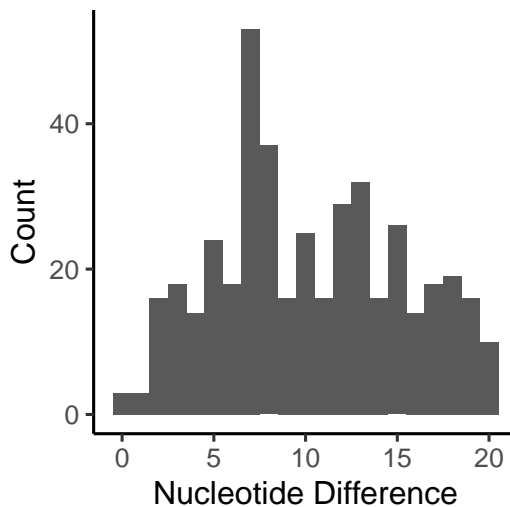
### IGHV4-61\*05

5427 sequences assigned  
3 (0.1%) exact matches, in which:  
3 unique CDR3  
1 unique J



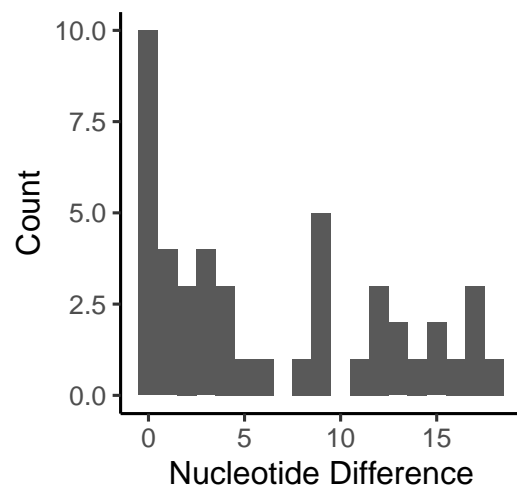
### IGHV4/OR15-8\*01\_C193/

445 sequences assigned  
3 (0.7%) exact matches, in which:  
3 unique CDR3  
3 unique J



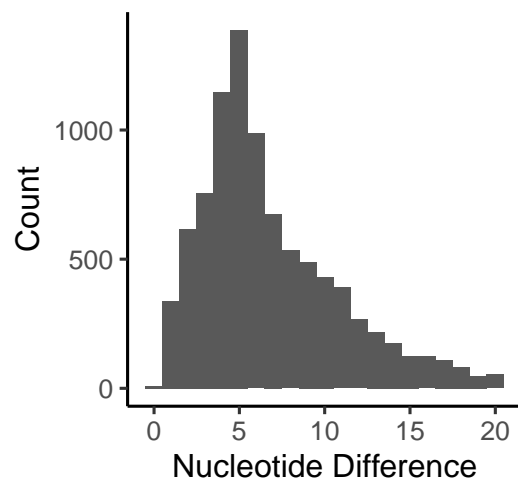
### IGHV5-51\*06

46 sequences assigned  
10 (21.7%) exact matches, in which:  
10 unique CDR3  
2 unique J



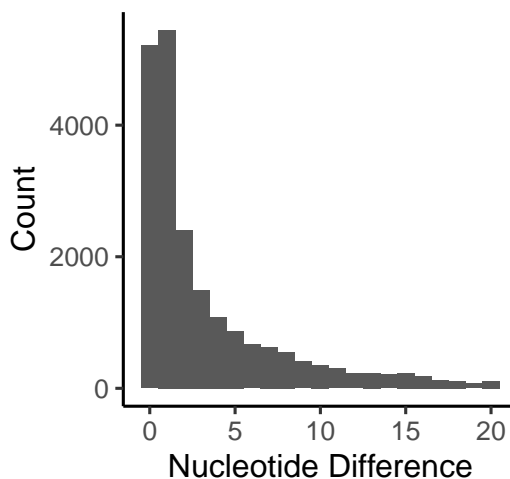
### IGHV4-61\*08

9055 sequences assigned  
8 (0.1%) exact matches, in which:  
8 unique CDR3  
4 unique J



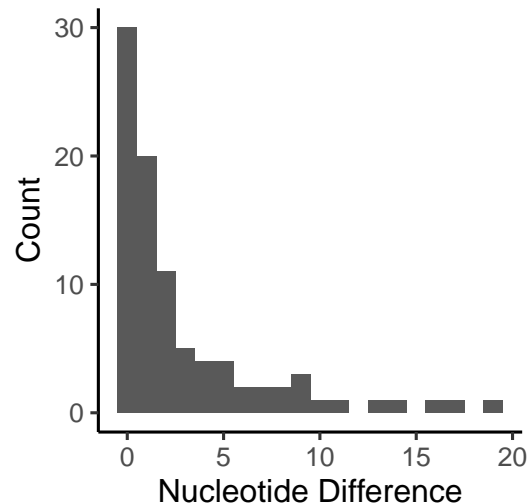
### IGHV5-10-1\*01\_03

21249 sequences assigned  
5212 (24.5%) exact matches, in which:  
4093 unique CDR3  
7 unique J



### IGHV5-51\*07

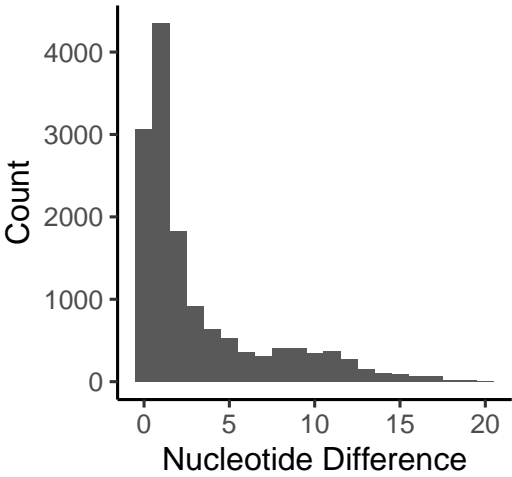
91 sequences assigned  
30 (33%) exact matches, in which:  
30 unique CDR3  
6 unique J





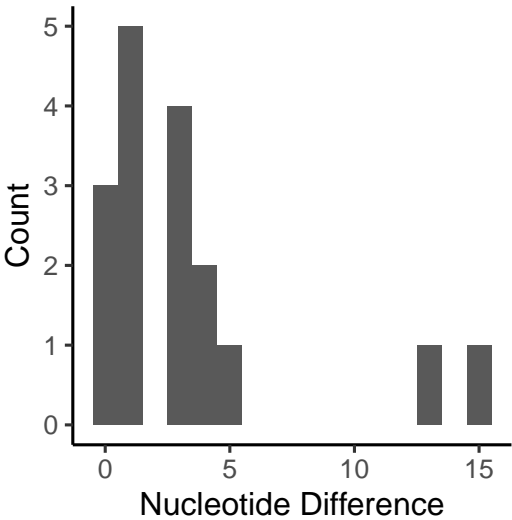
IGHV6-1\*01\_02

14348 sequences assigned  
3063 (21.3%) exact matches, in which:  
1849 unique CDR3  
7 unique J



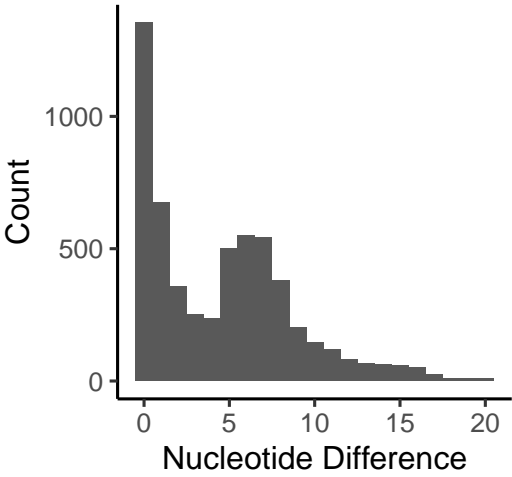
IGHV7-4-1\*01

17 sequences assigned  
3 (17.6%) exact matches, in which:  
2 unique CDR3  
2 unique J



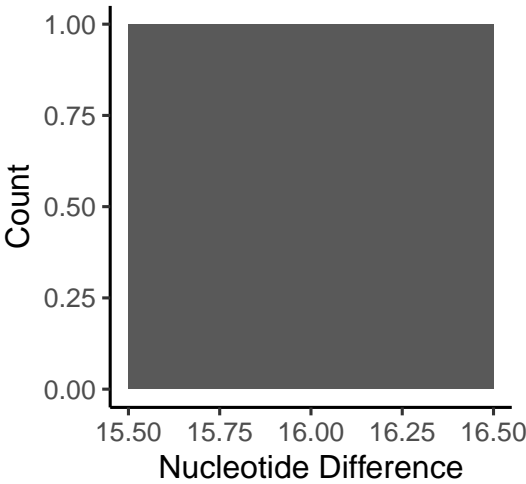
IGHV6-1\*01\_02\_A315G

5697 sequences assigned  
1354 (23.8%) exact matches, in which:  
1319 unique CDR3  
7 unique J

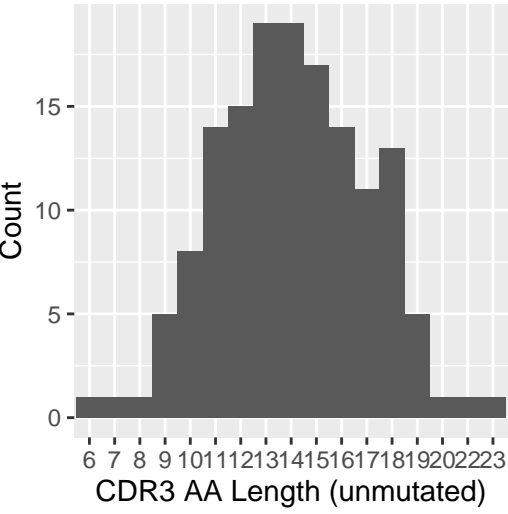


IGHV3/OR16-10\*01\_03

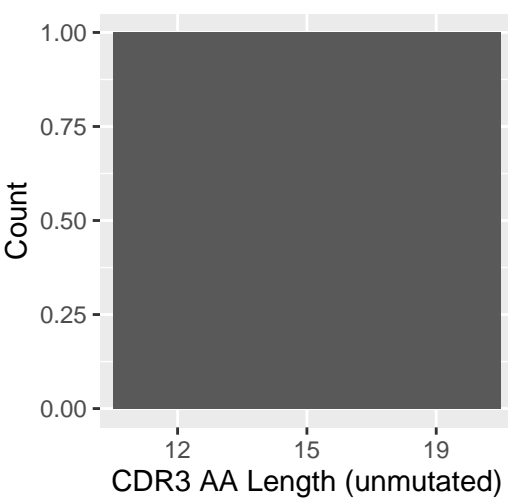
1 sequences assigned  
No exact matches.



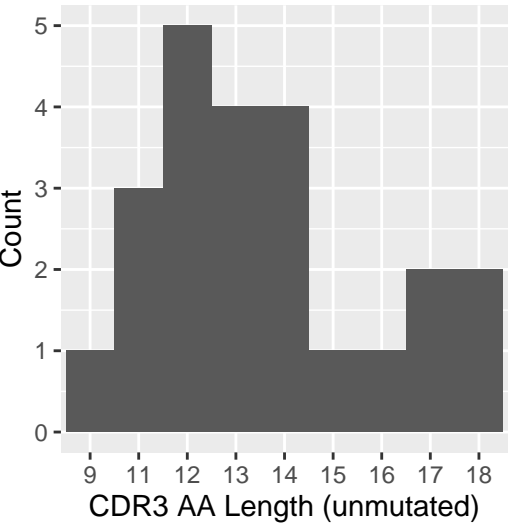
IGHV3-74\*01\_02\_C246T\_G:



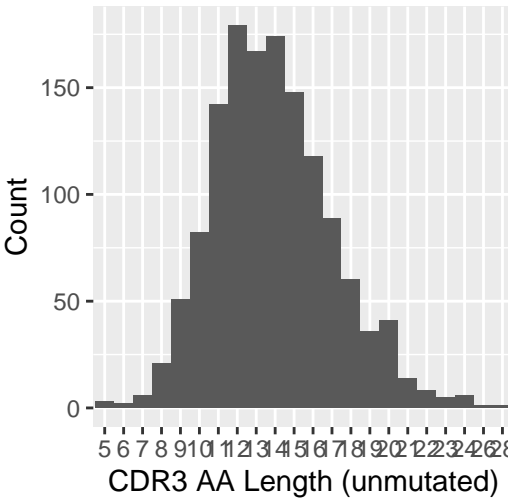
IGHV4/OR15-8\*01\_C193A



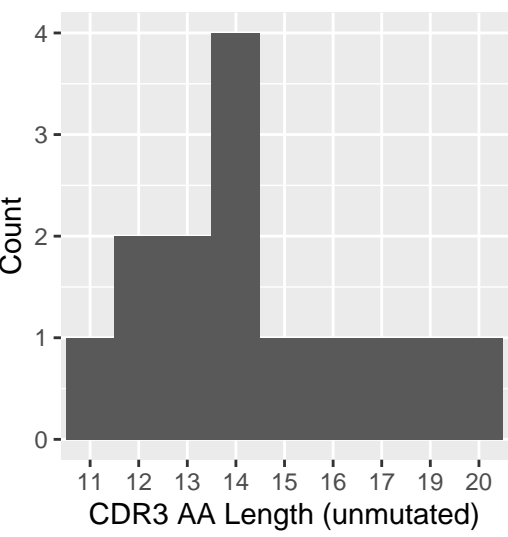
IGHV3-NL1\*01\_C141G\_T201



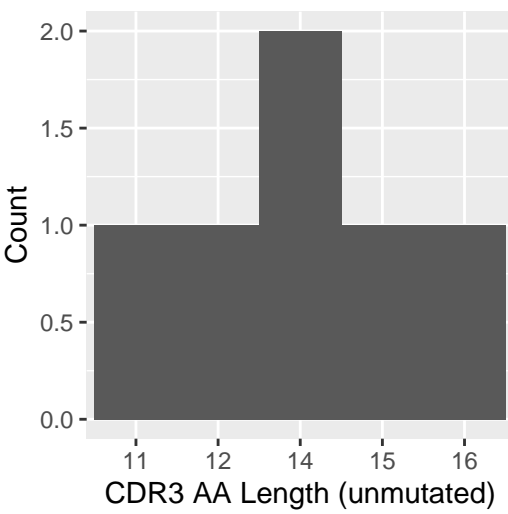
IGHV6-1\*01\_02\_A315G



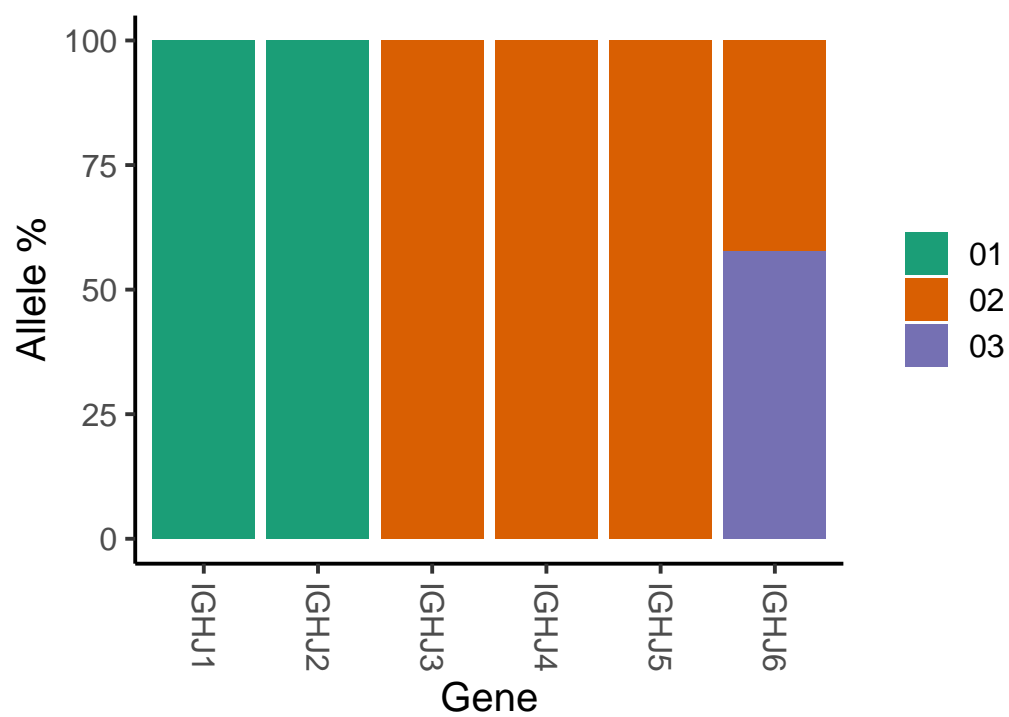
IGHV3-NL1\*01\_C141G\_T164



IGHV4-4\*02\_03\_T120C \_G175A\_A187G\_T201C



Allele Usage



## Sequence Count by IGHJ6 allele usage



Allele

02

03

10000

5000

-5000

[illegible]