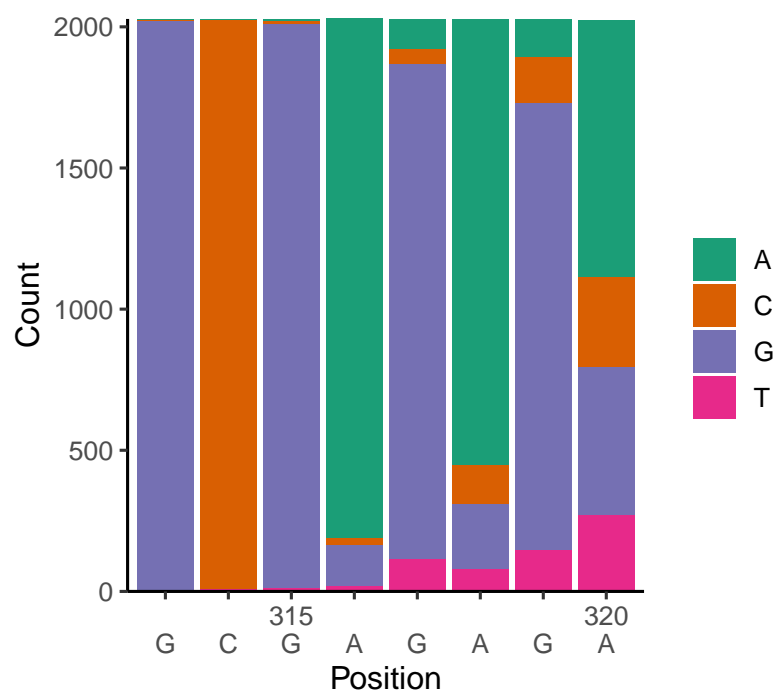
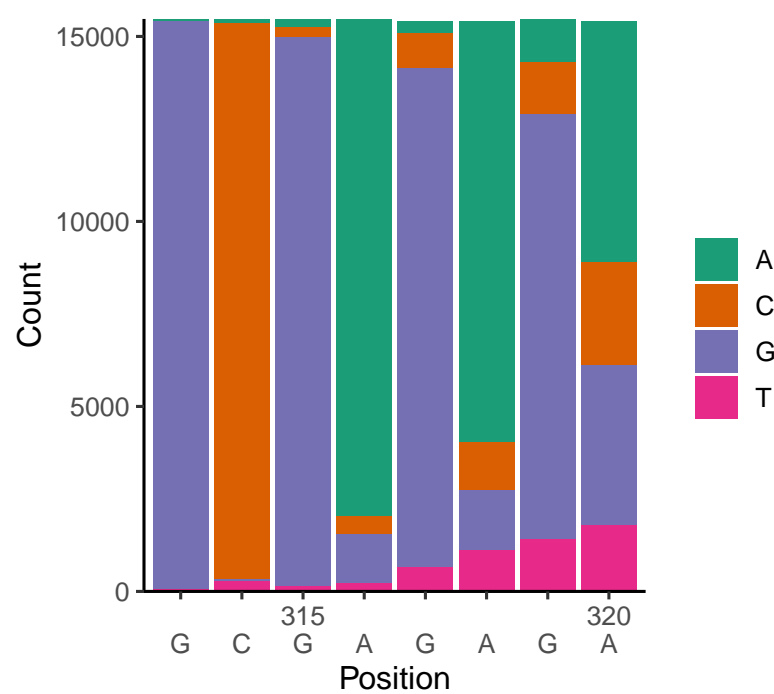


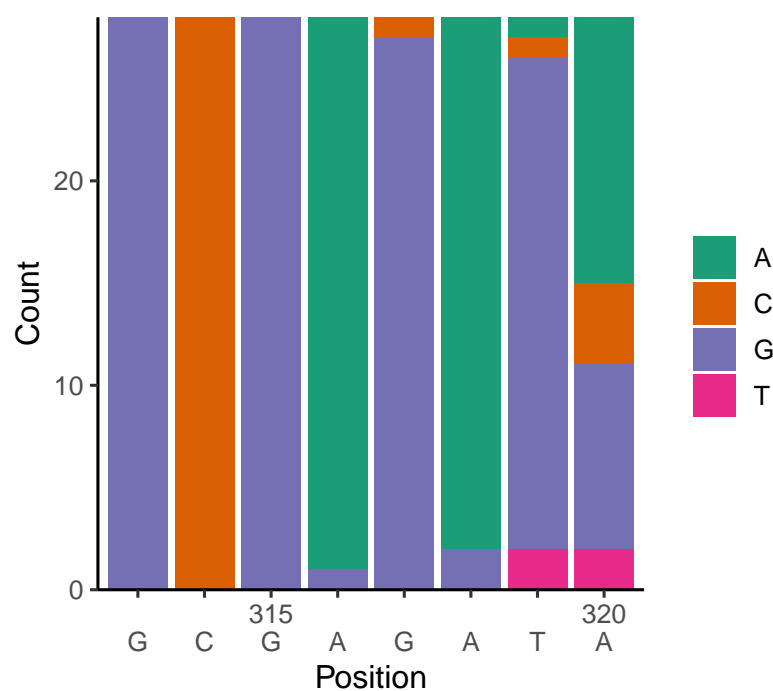
Gene IGHV1-24\*01\_A315G\_C317G



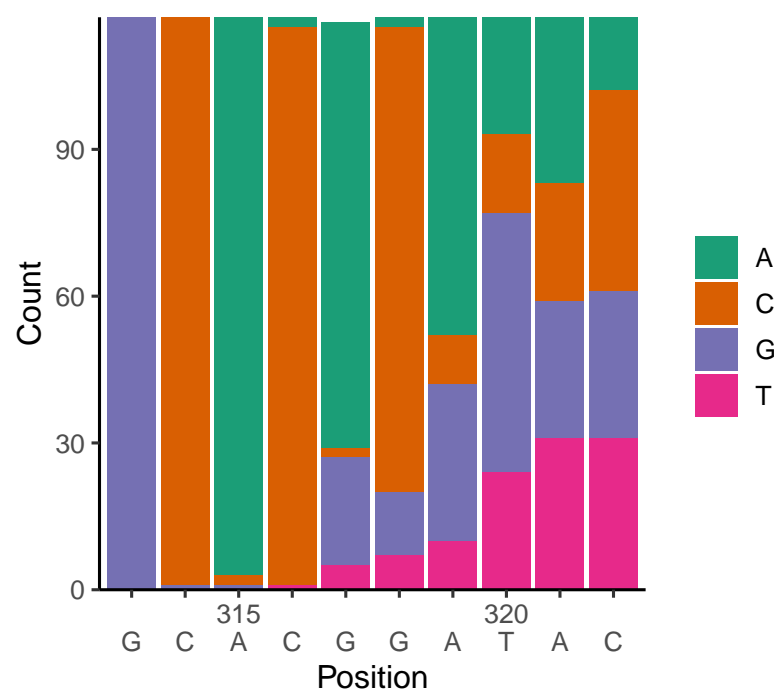
Gene IGHV1-69\*08\_C191T



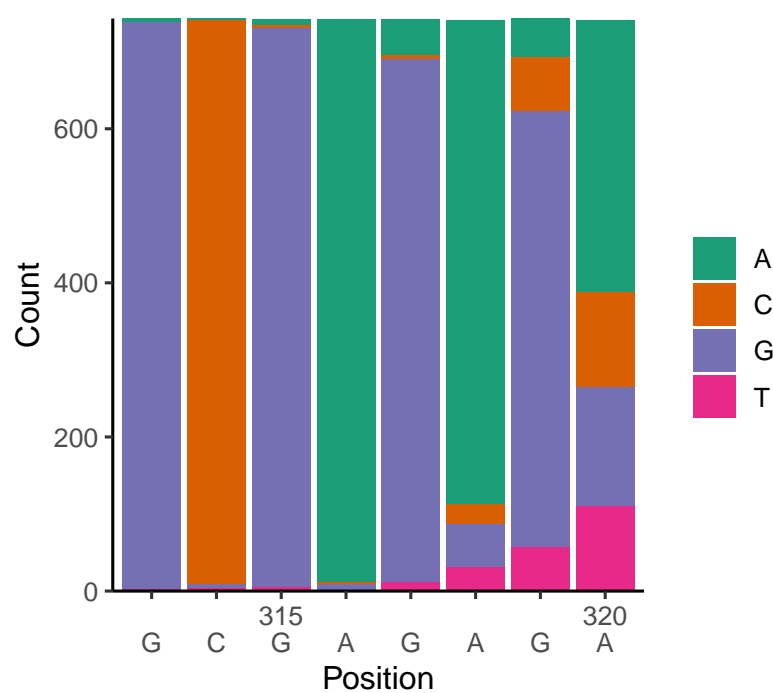
Gene IGHV1-45\*02\_A315G



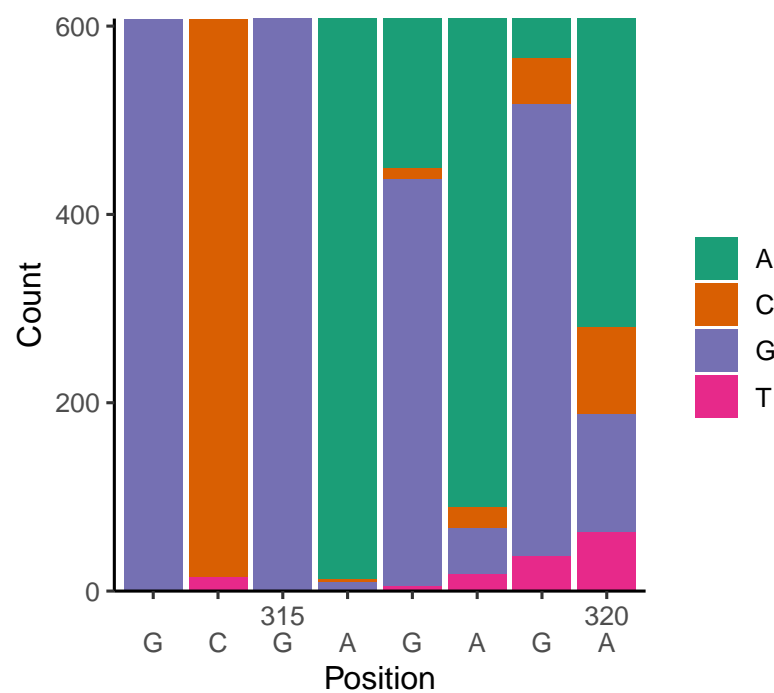
Gene IGHV2-70\*15\_G303A



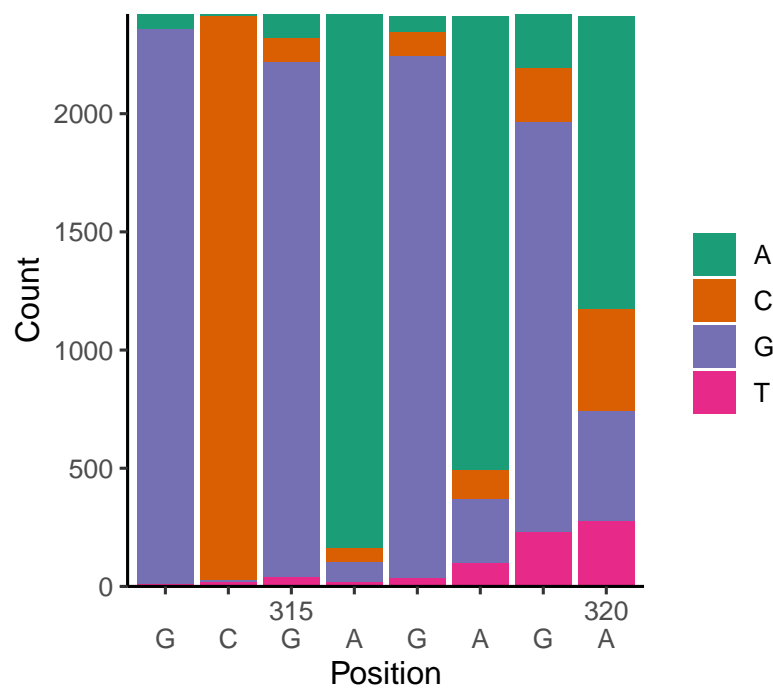
Gene IGHV1-58\*02\_G316A\_C317G



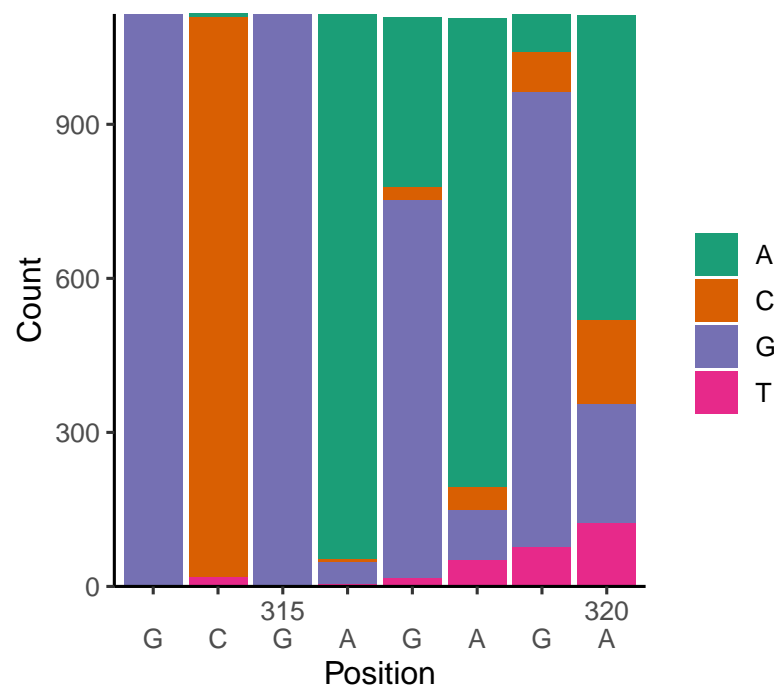
Gene IGHV3-13\*04\_A315G



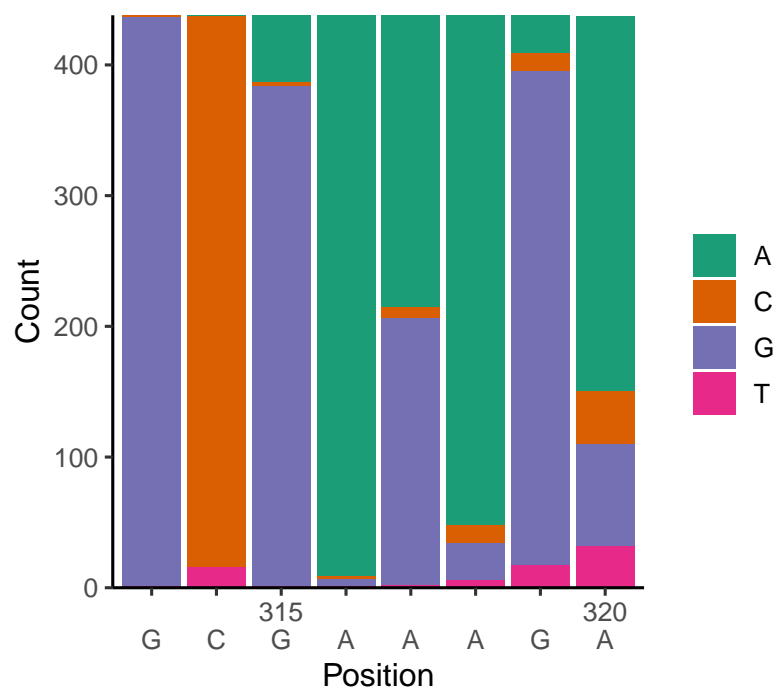
Gene IGHV3-30\*03\_T288C



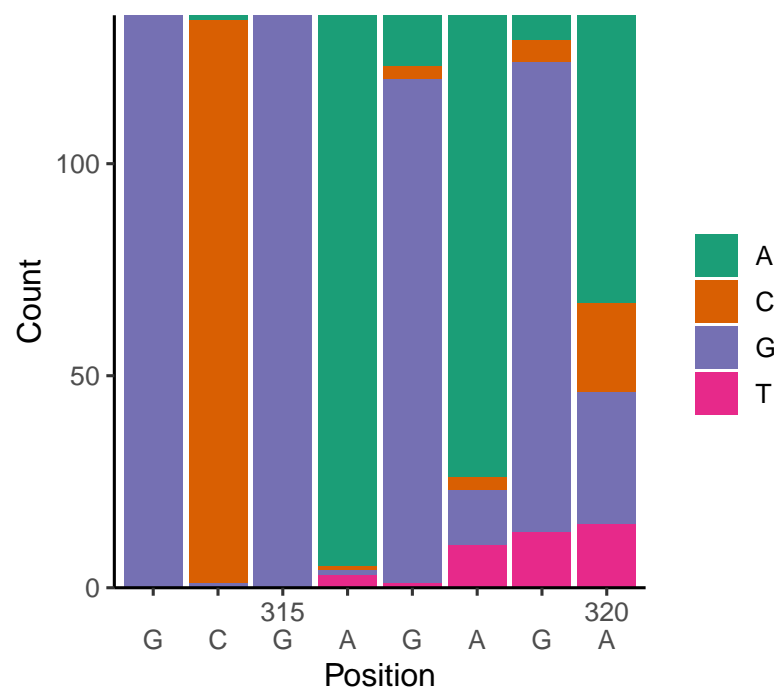
Gene IGHV3-74\*01\_A315G



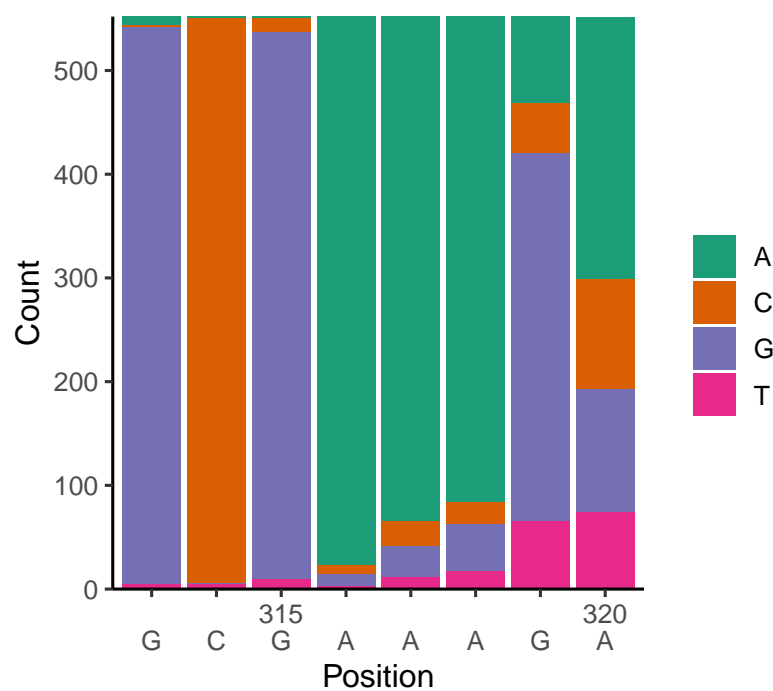
Gene IGHV3-53\*04\_T267G\_C300T\_G31



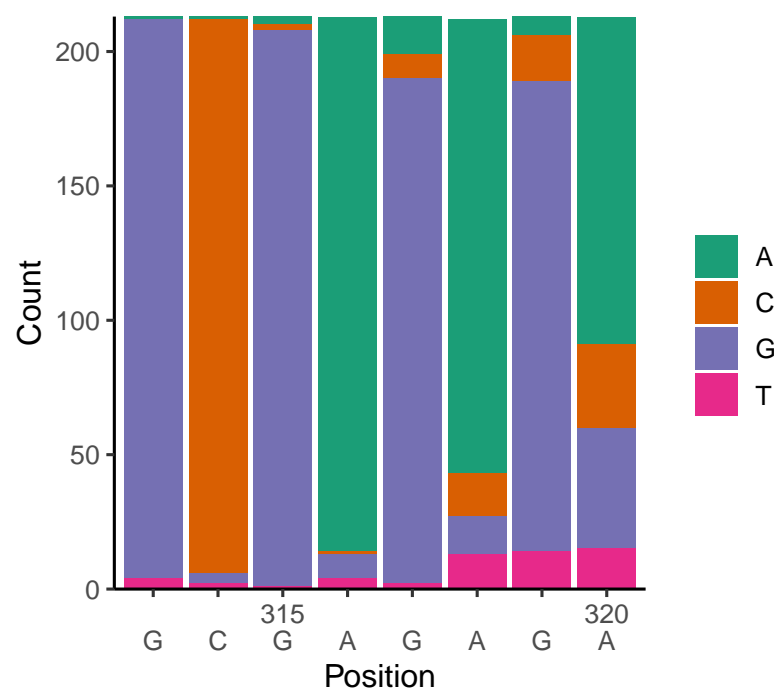
Gene IGHV3-NL1\*01\_G49A\_C159G\_T16



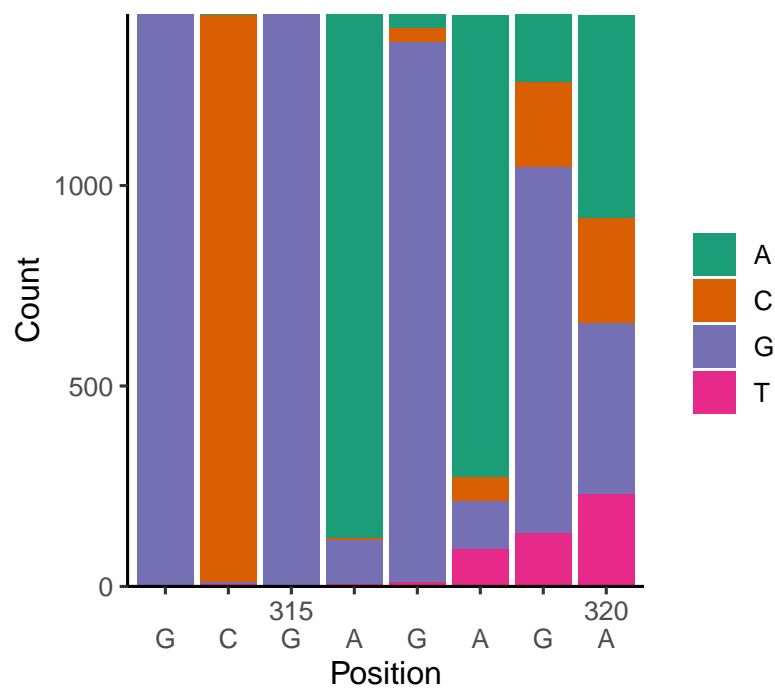
Gene IGHV3-53\*04\_T267G\_T288C\_G30



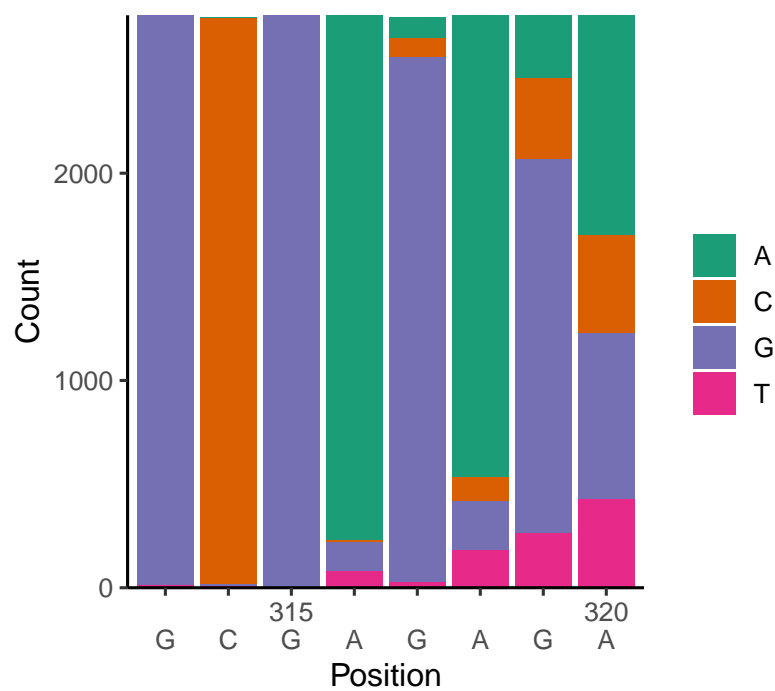
Gene IGHV3-NL1\*01\_G49A\_G75C\_T201



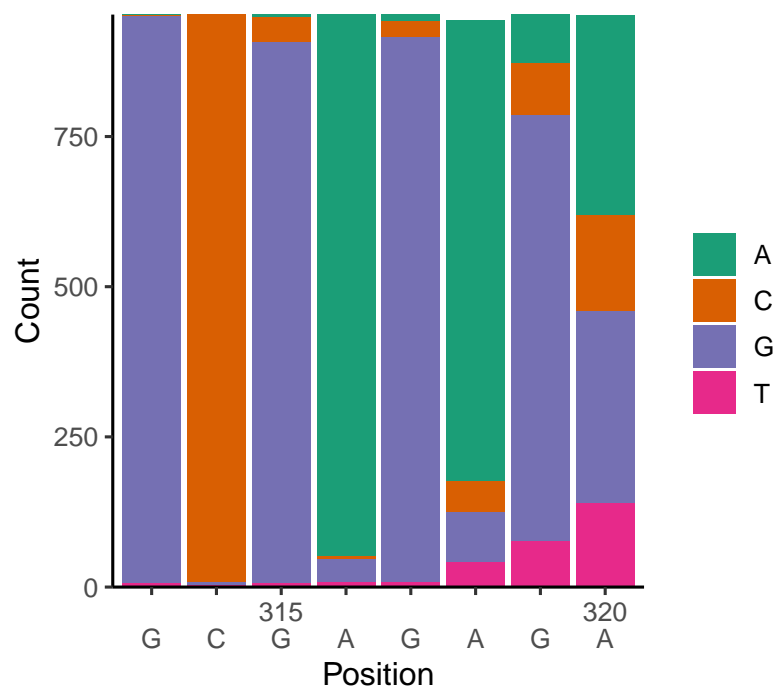
Gene IGHV4-30-2\*01\_C315G



Gene IGHV4-30-4\*01\_C315G



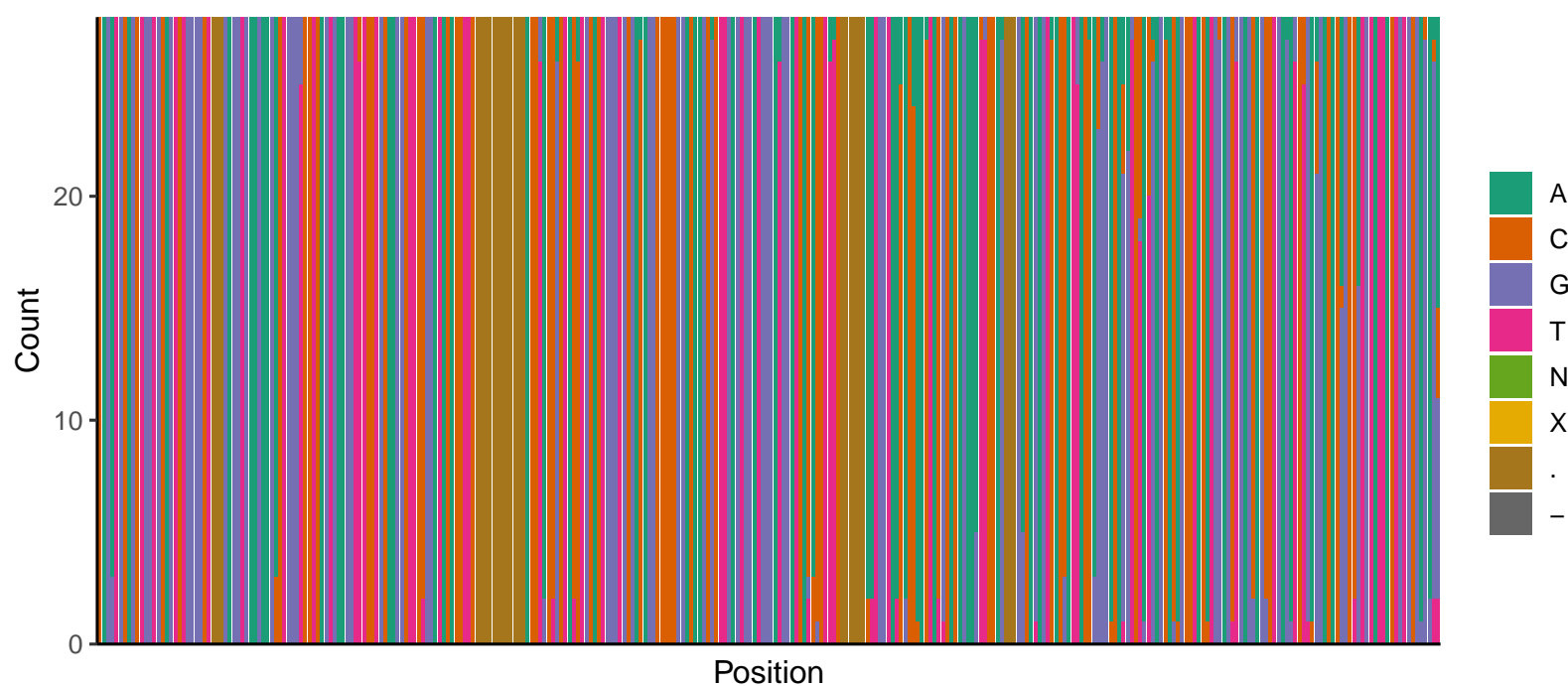
Gene IGHV4-38-2\*02\_A291G



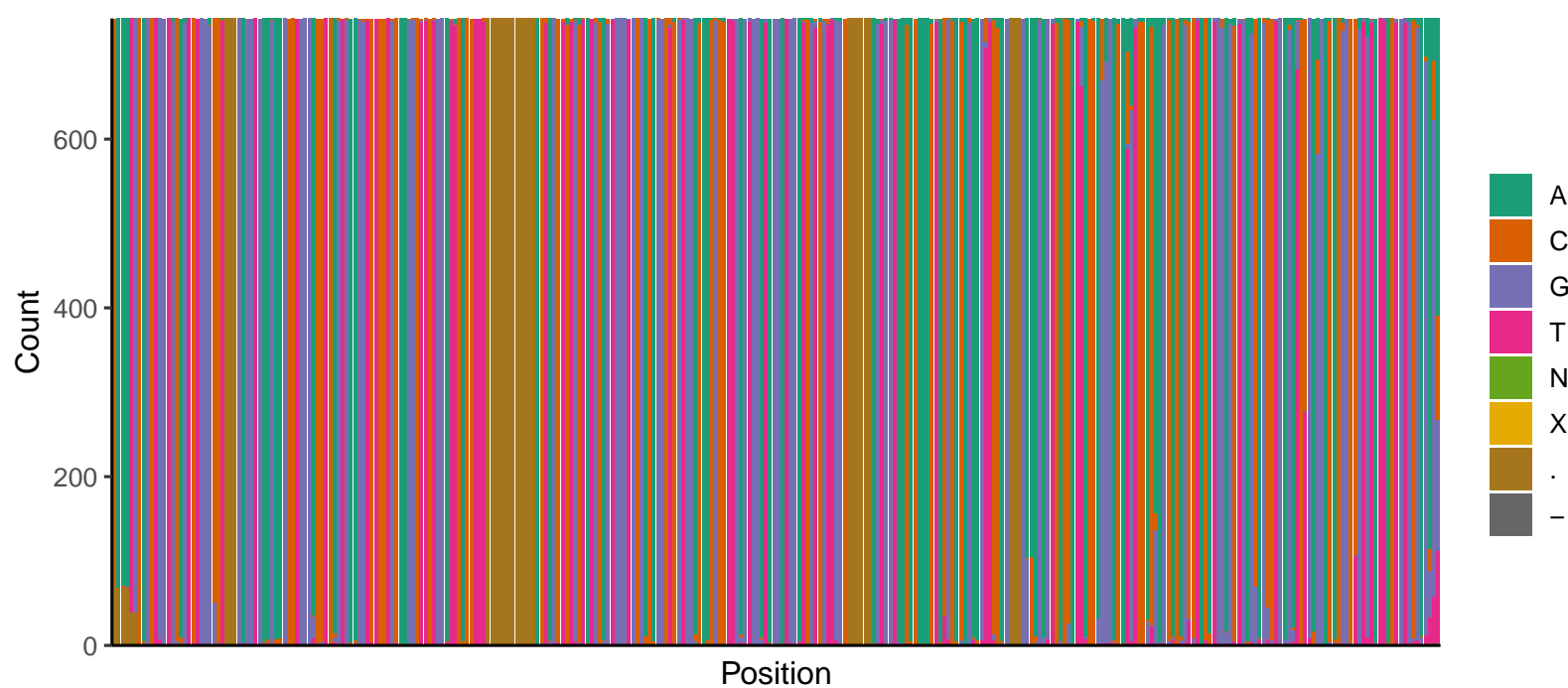
Gene IGHV1-24\*01\_A315G\_C317G



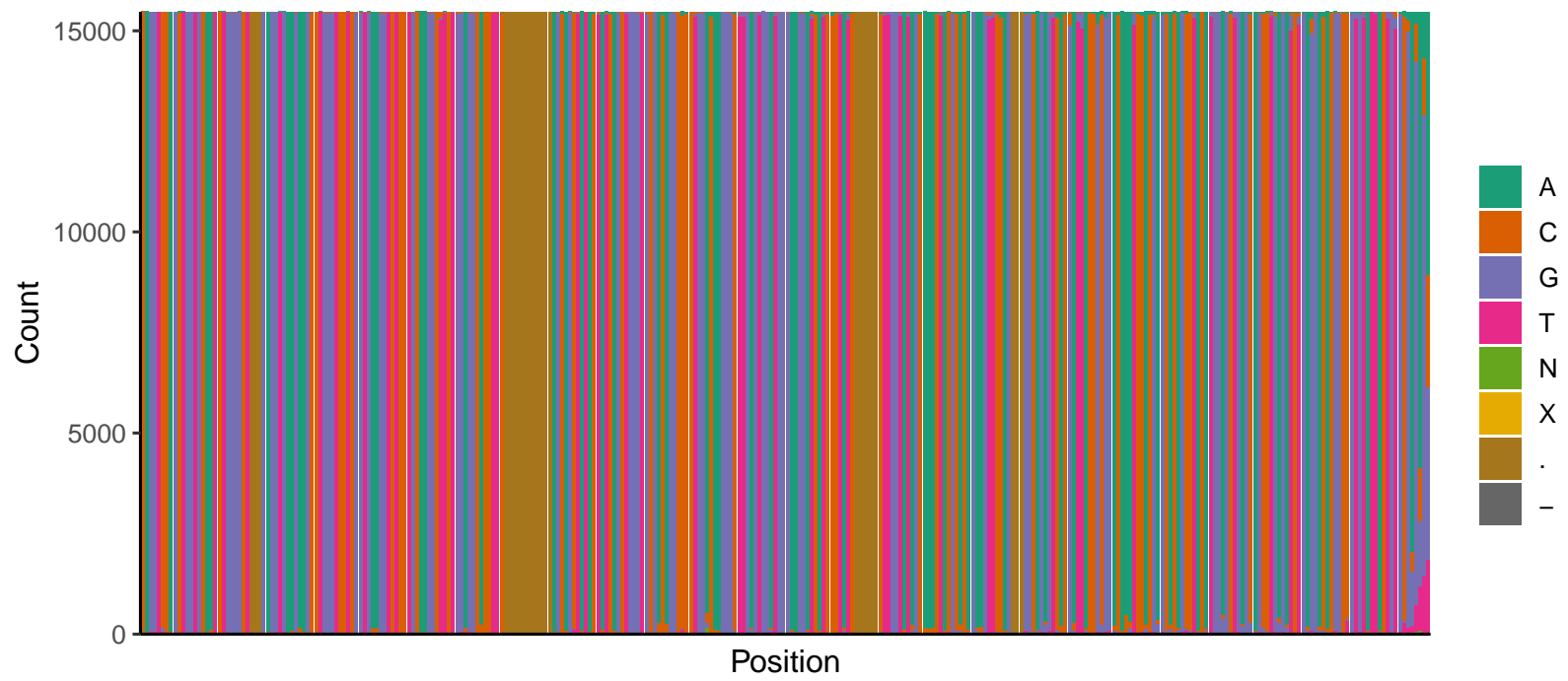
Gene IGHV1-45\*02\_A315G



Gene IGHV1-58\*02\_G316A\_C317G



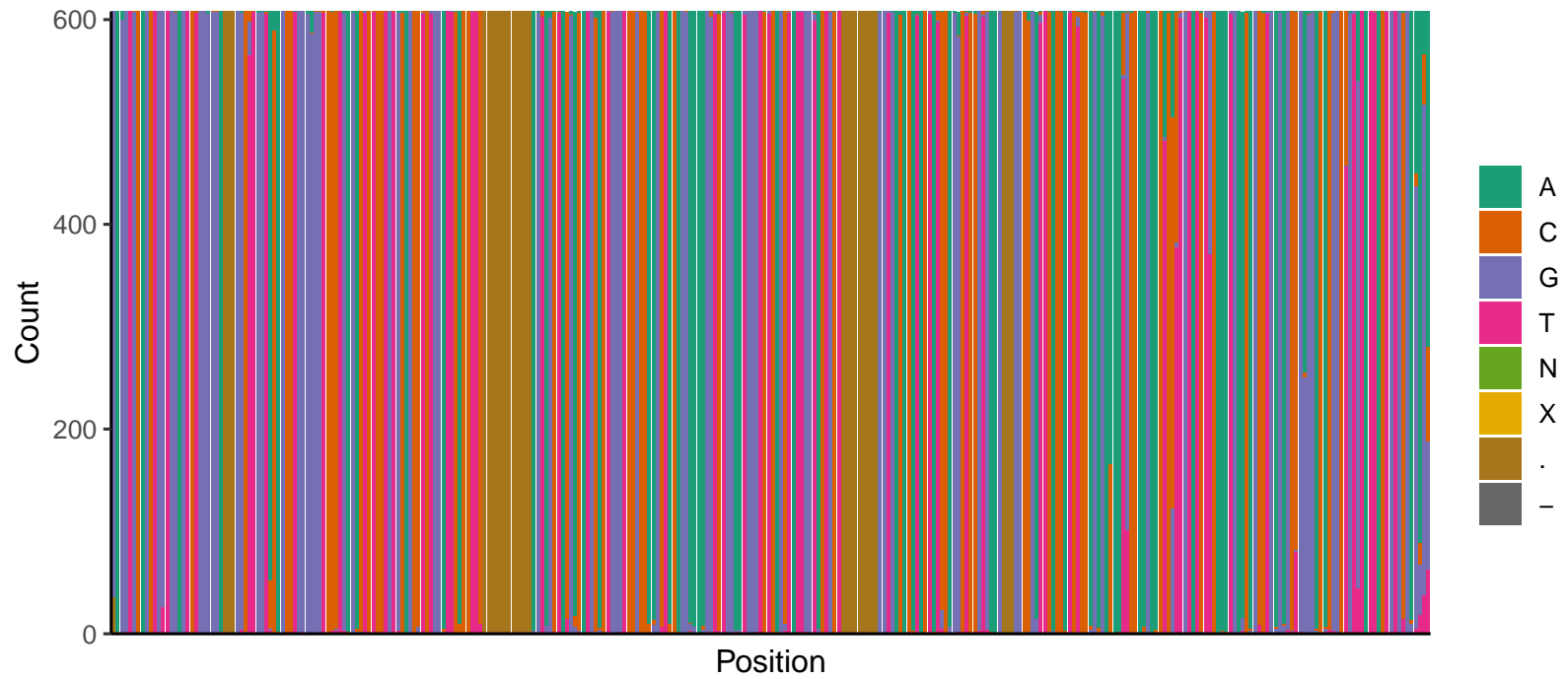
Gene IGHV1-69\*08\_C191T



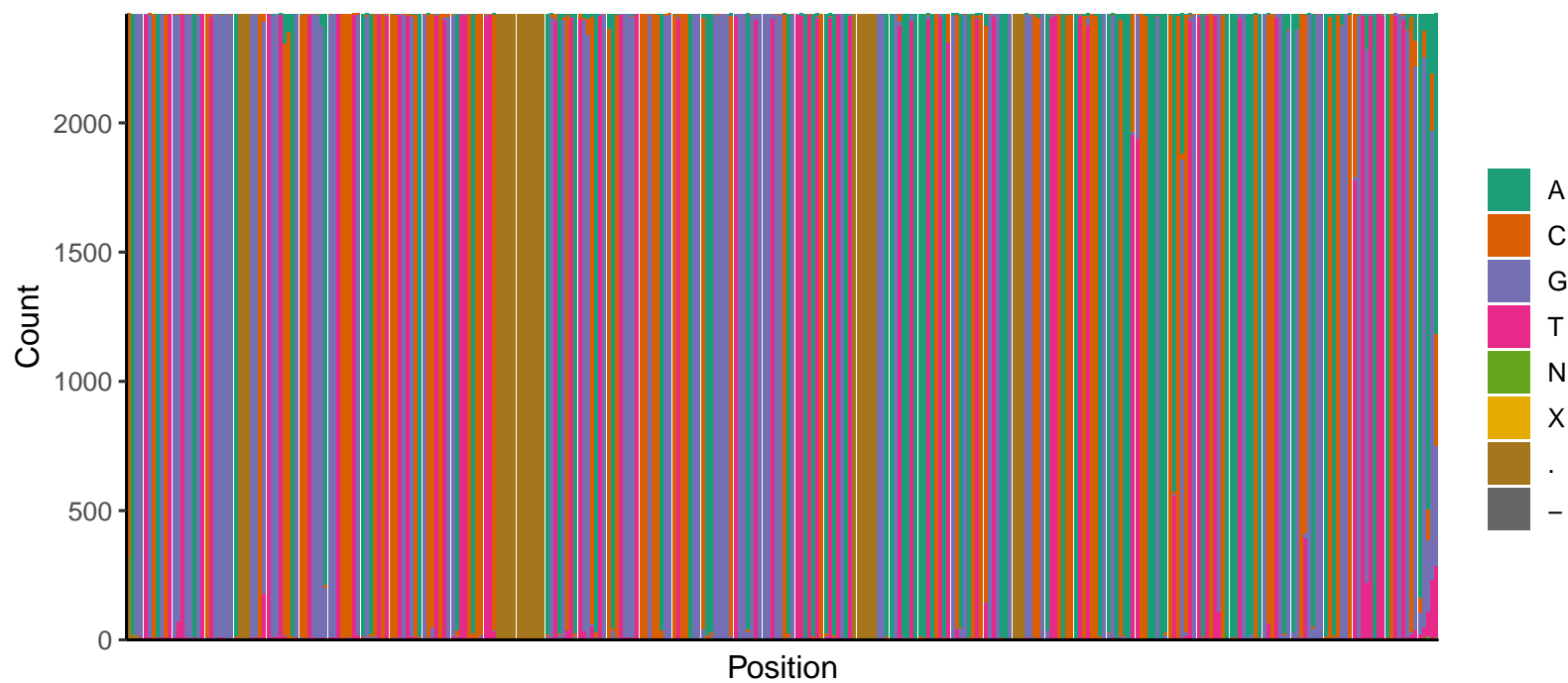
Gene IGHV2-70\*15\_G303A



Gene IGHV3-13\*04\_A315G



Gene IGHV3-30\*03\_T288C



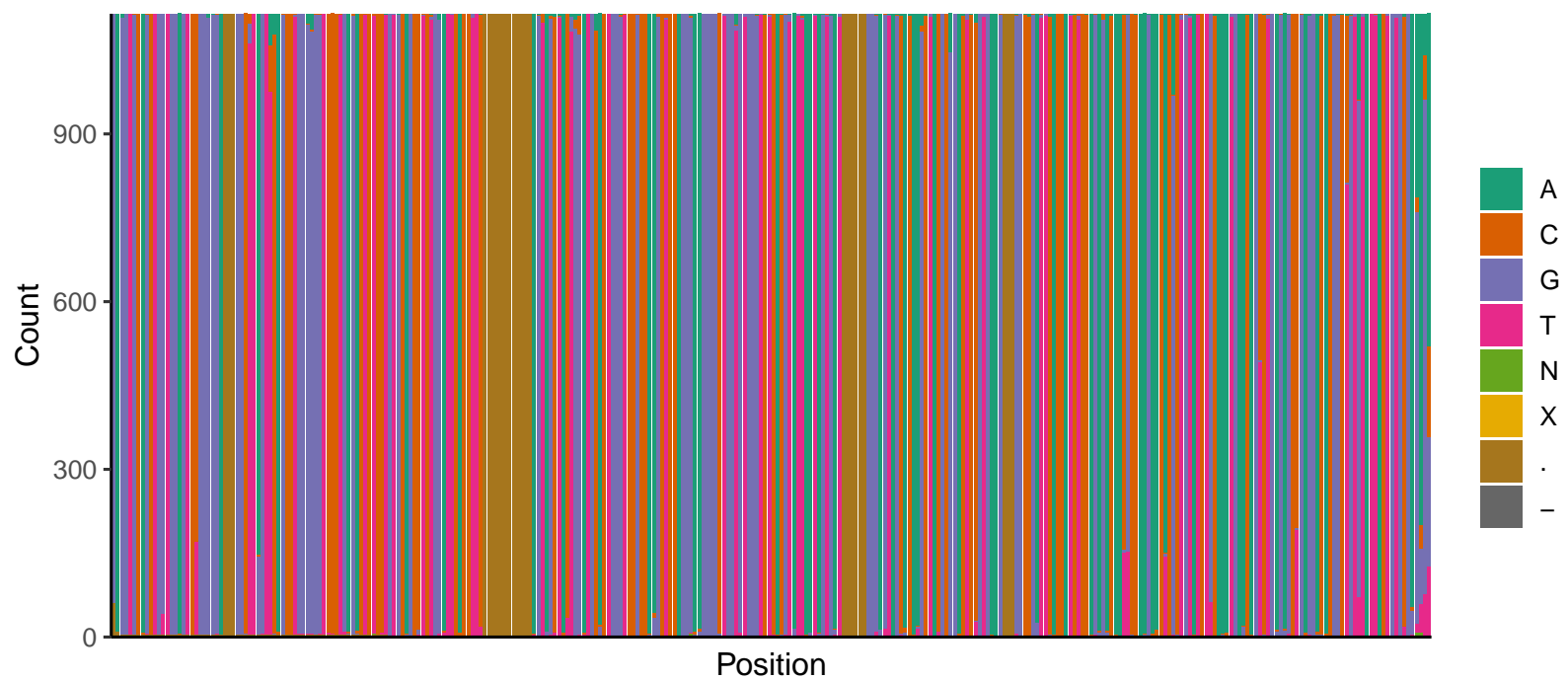
Gene IGHV3-53\*04\_T267G\_C300T\_G317A



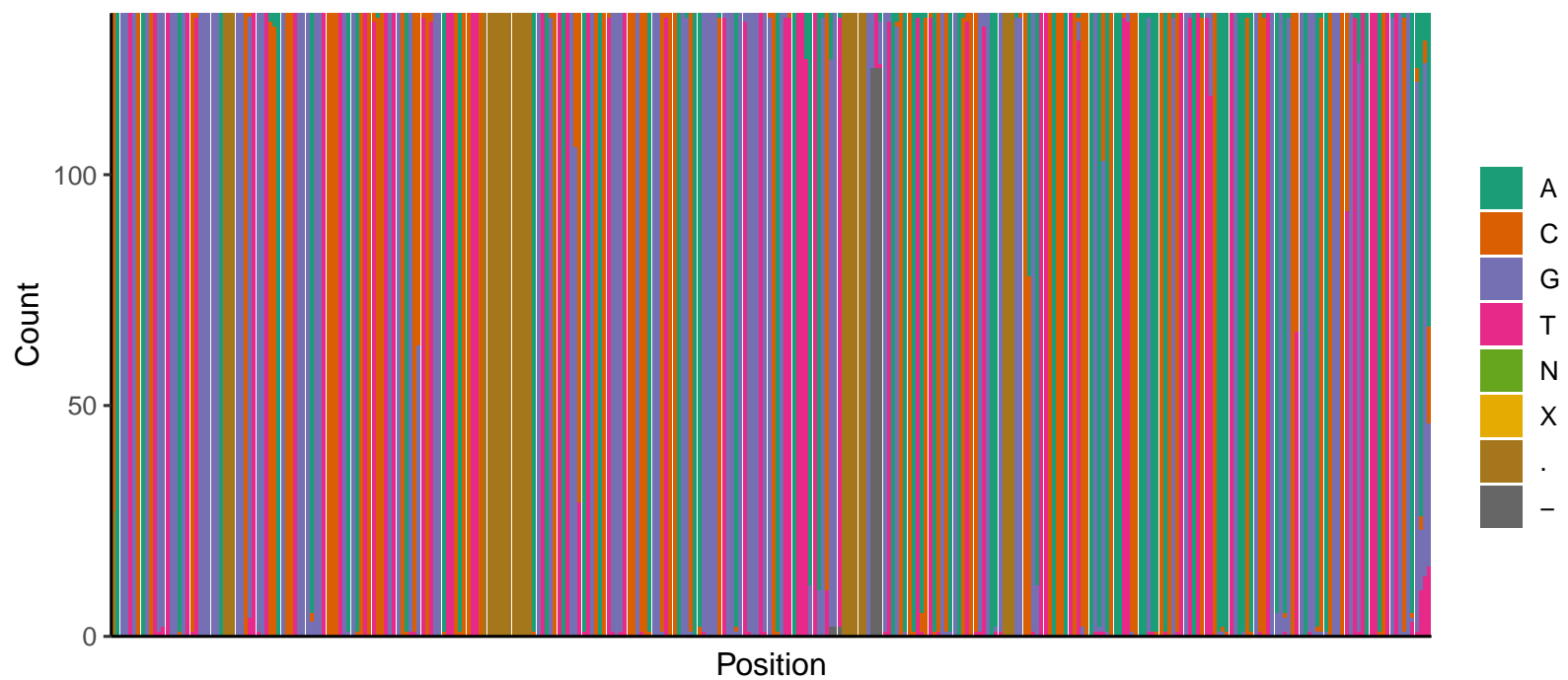
Gene IGHV3-53\*04\_T267G\_T288C\_G303A\_G317A



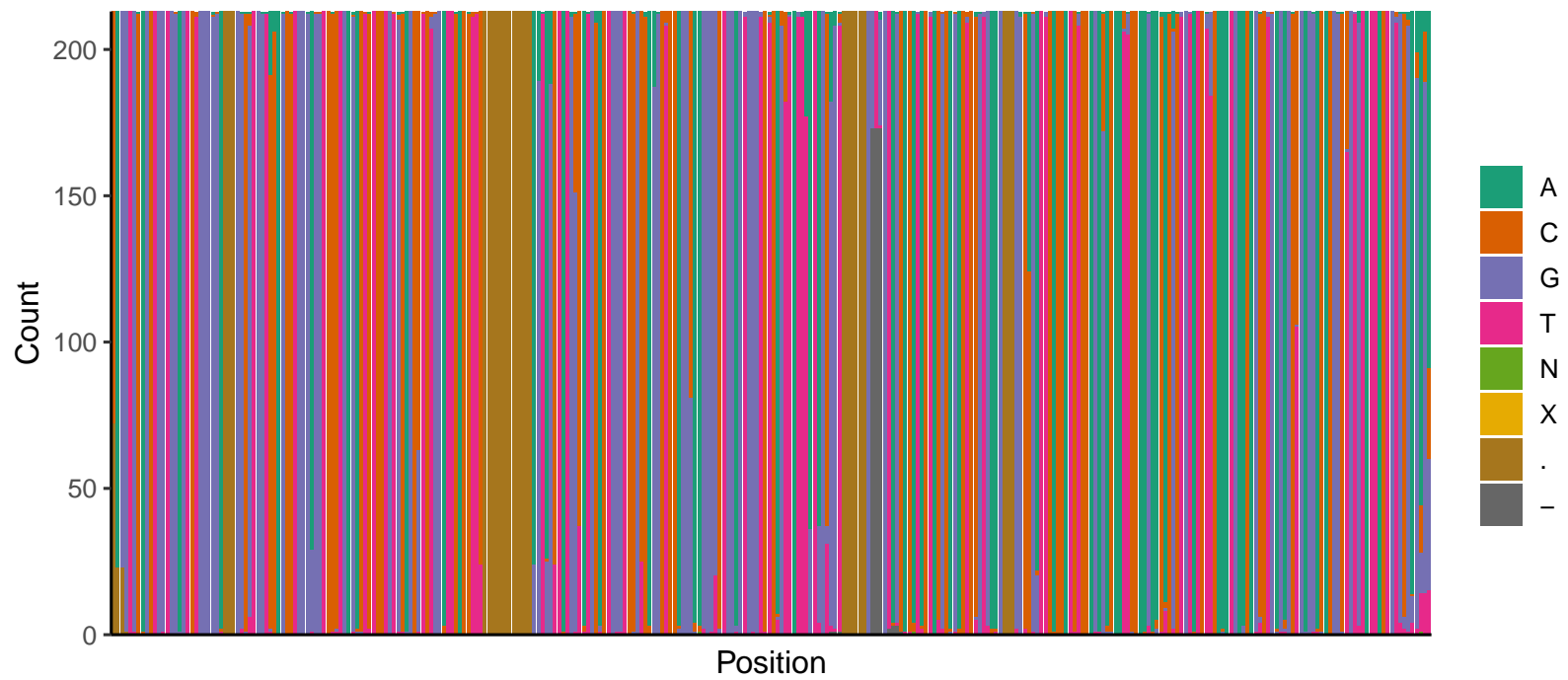
Gene IGHV3-74\*01\_A315G



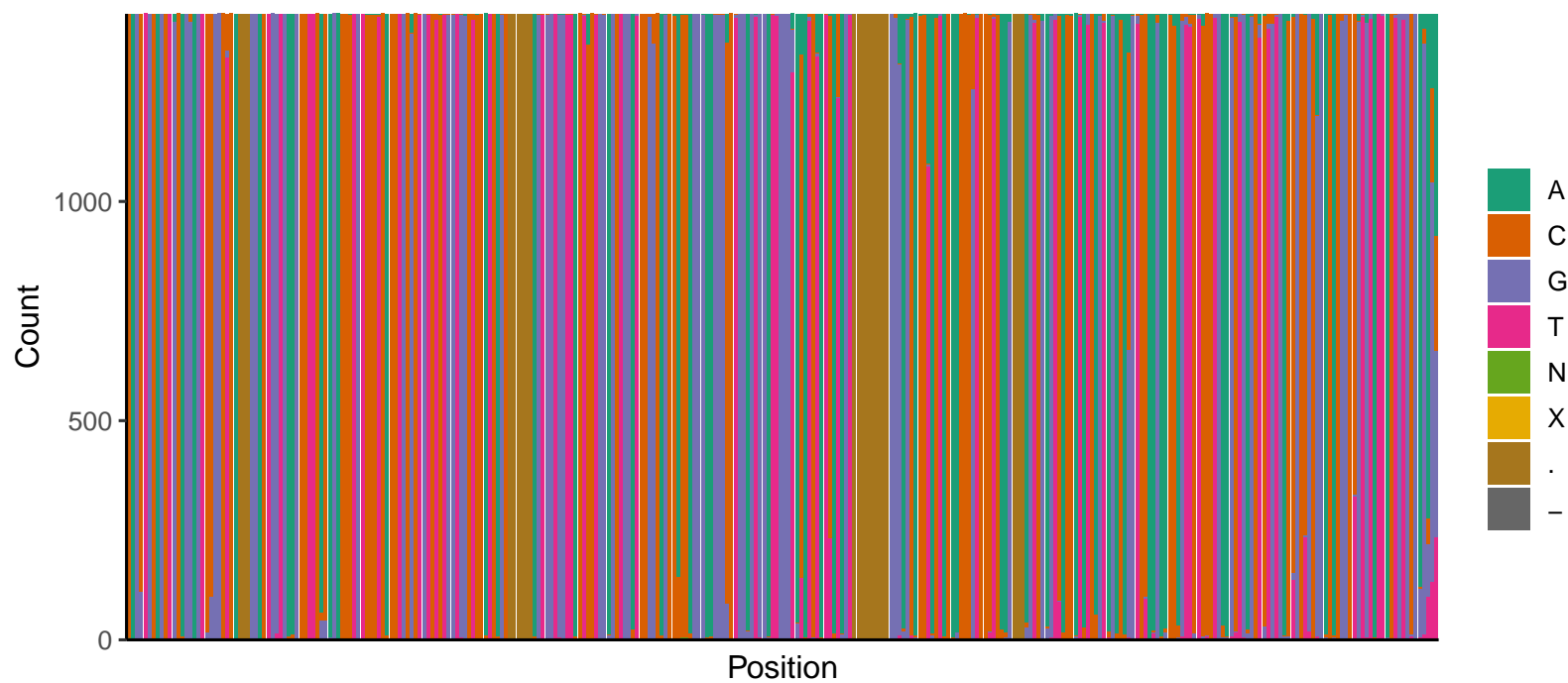
Gene IGHV3-NL1\*01\_G49A\_C159G\_T160G\_T201C\_C223A\_G267T\_T288C\_A317G



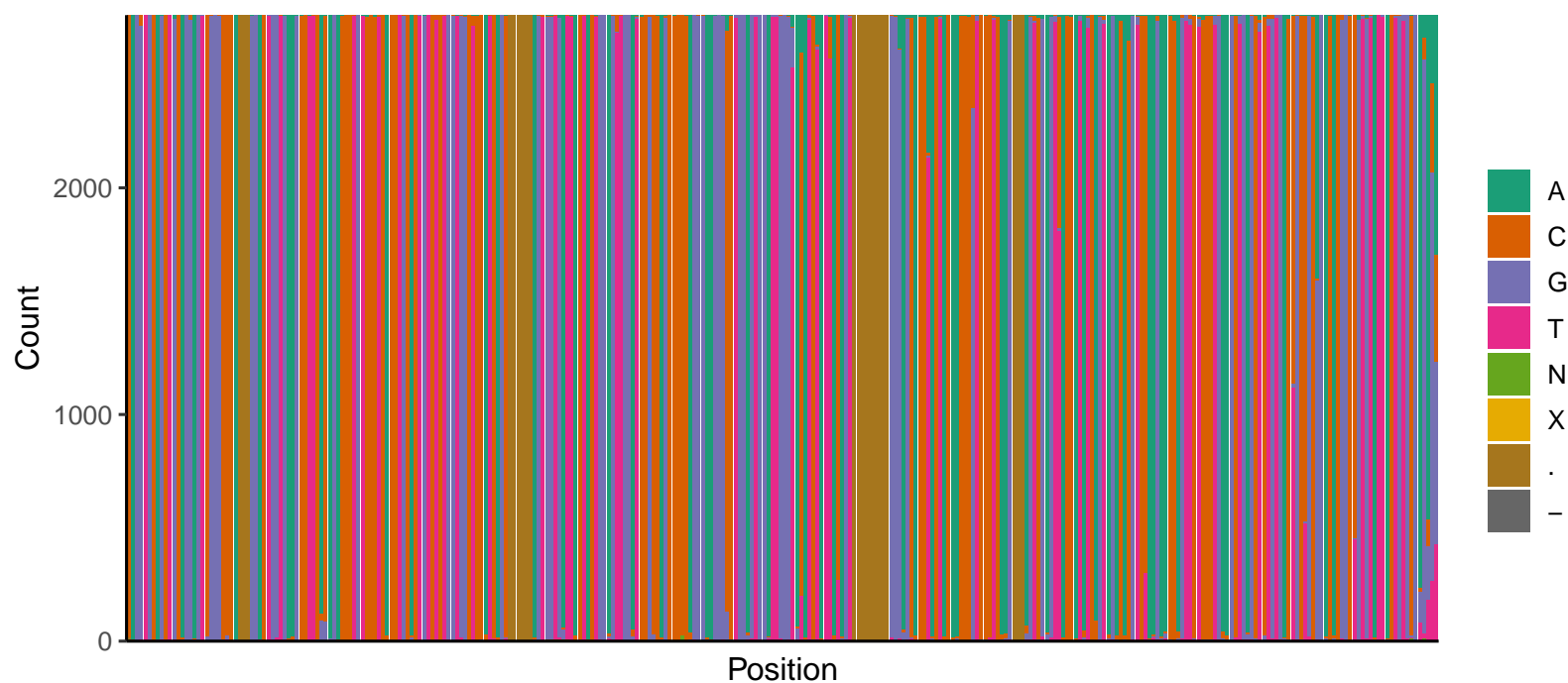
Gene IGHV3-NL1\*01\_G49A\_G75C\_T201C\_C223A\_G267T\_T288C\_A317G



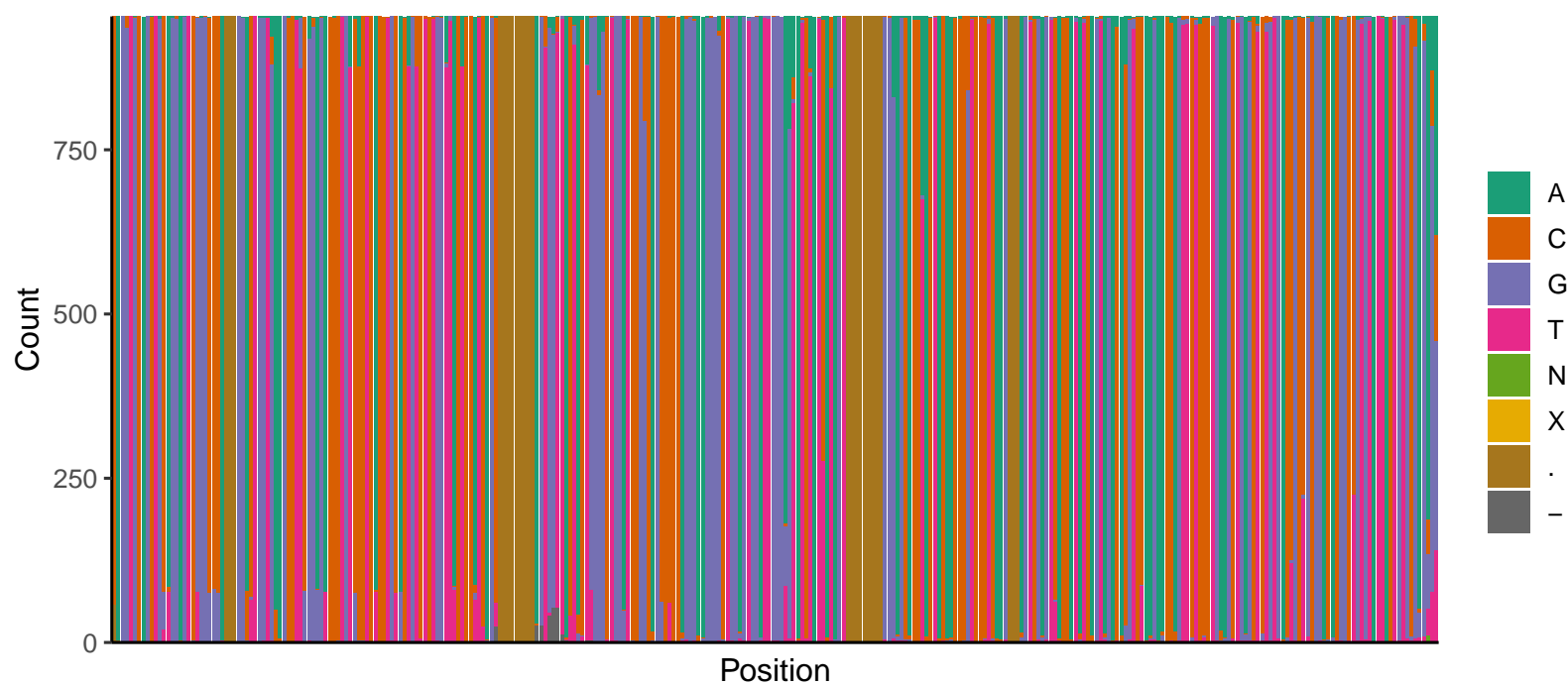
Gene IGHV4-30-2\*01\_C315G



Gene IGHV4-30-4\*01\_C315G

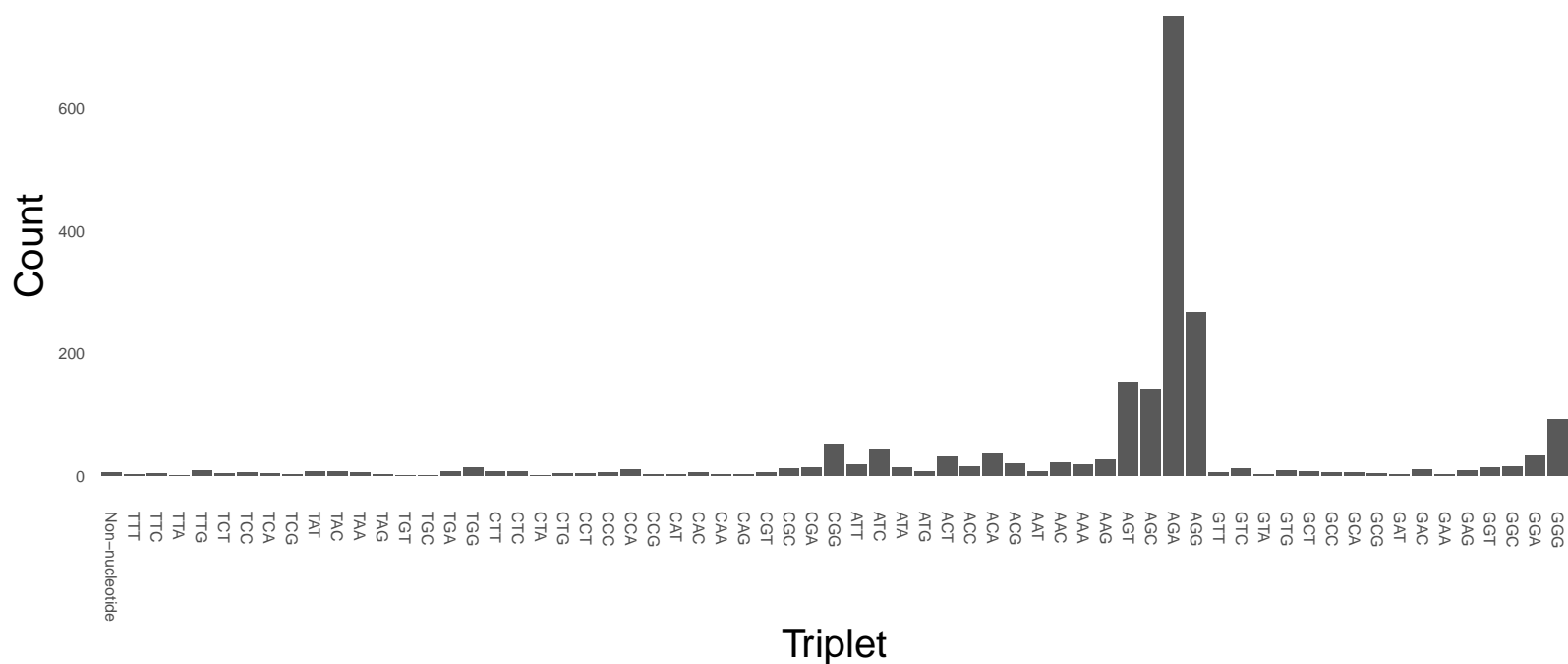


Gene IGHV4-38-2\*02\_A291G

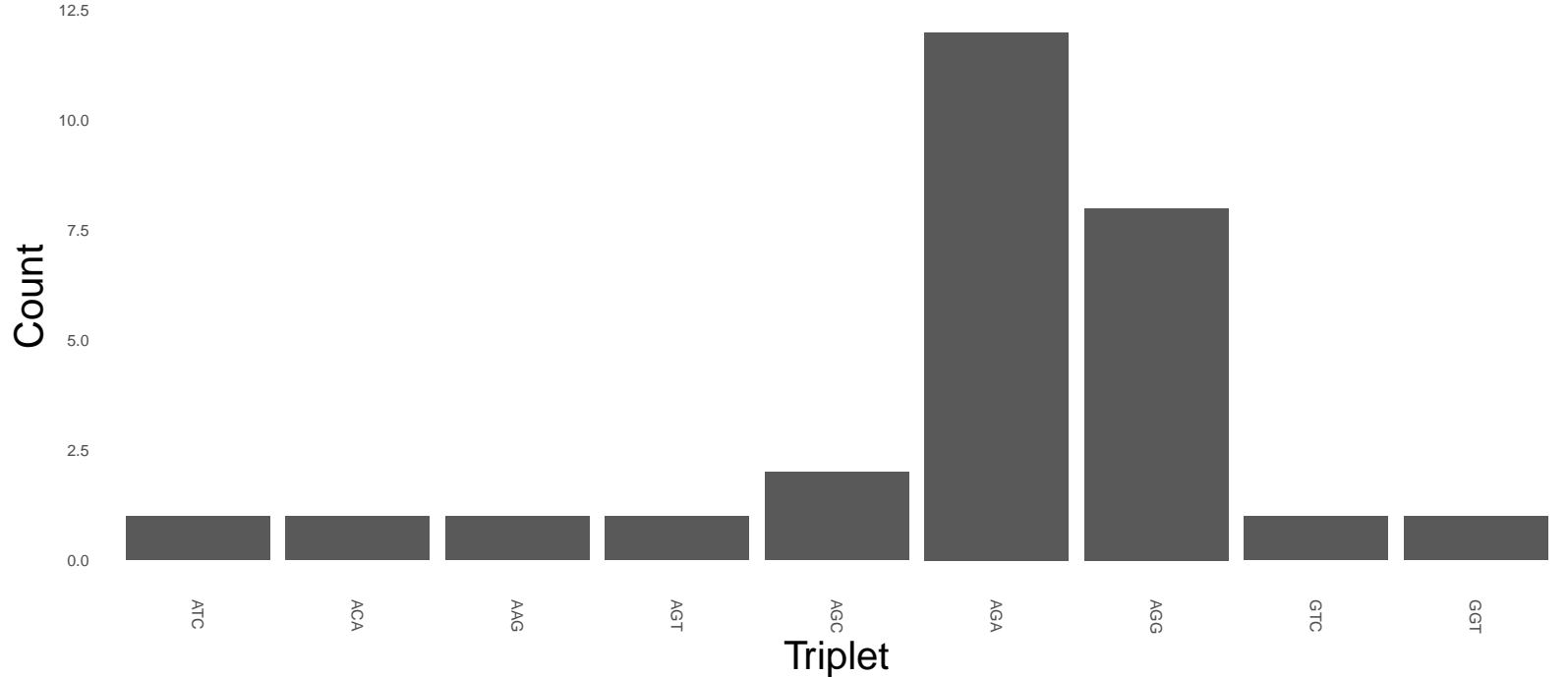




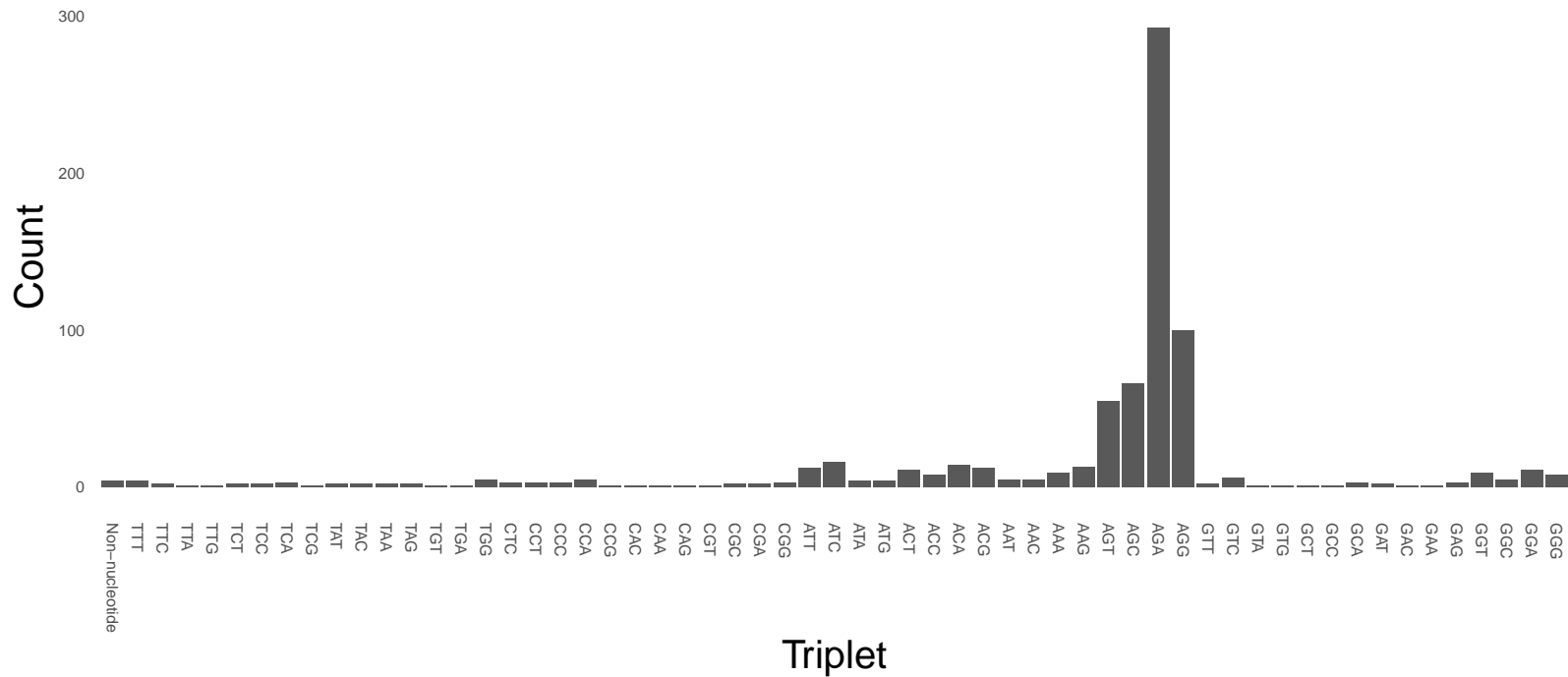
IGHV1-24\*01\_A315G\_C317G- Final 3 nucleotides as a triplet



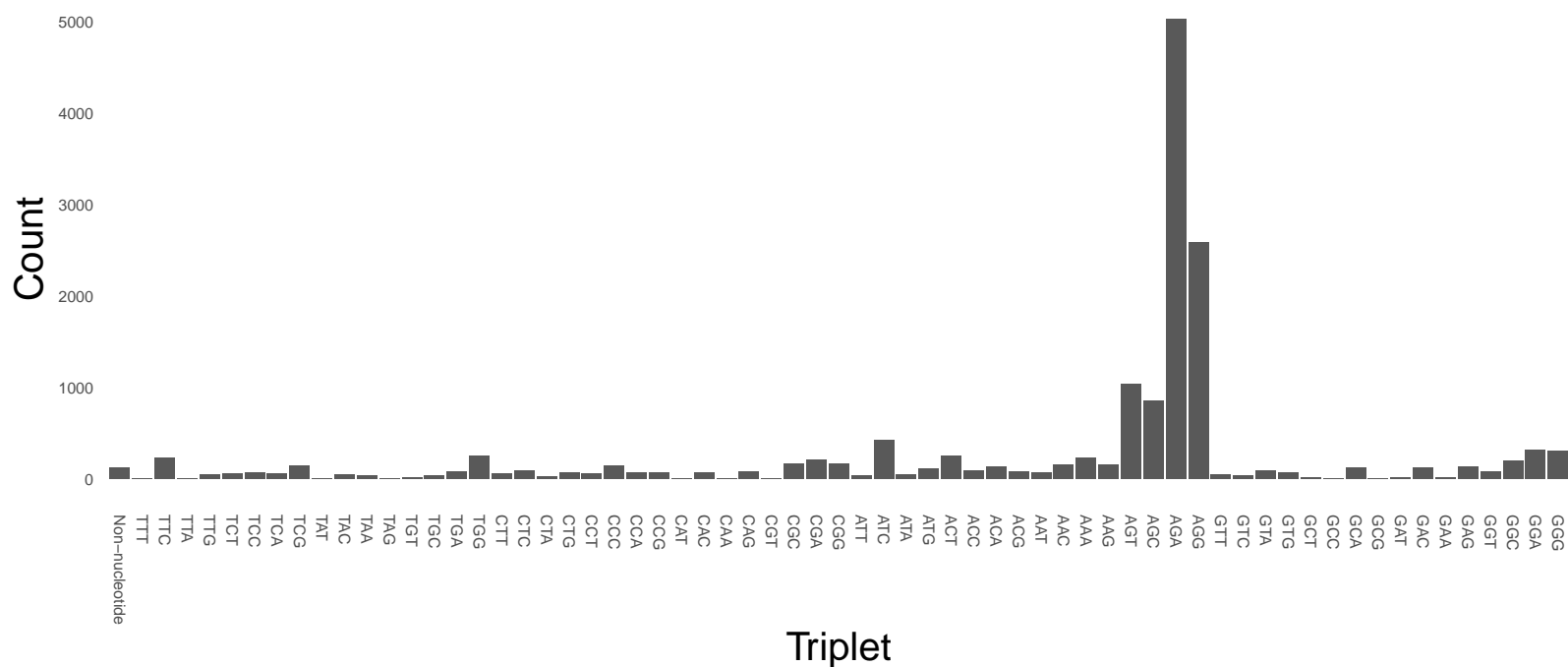
IGHV1-45\*02\_A315G- Final 3 nucleotides as a triplet



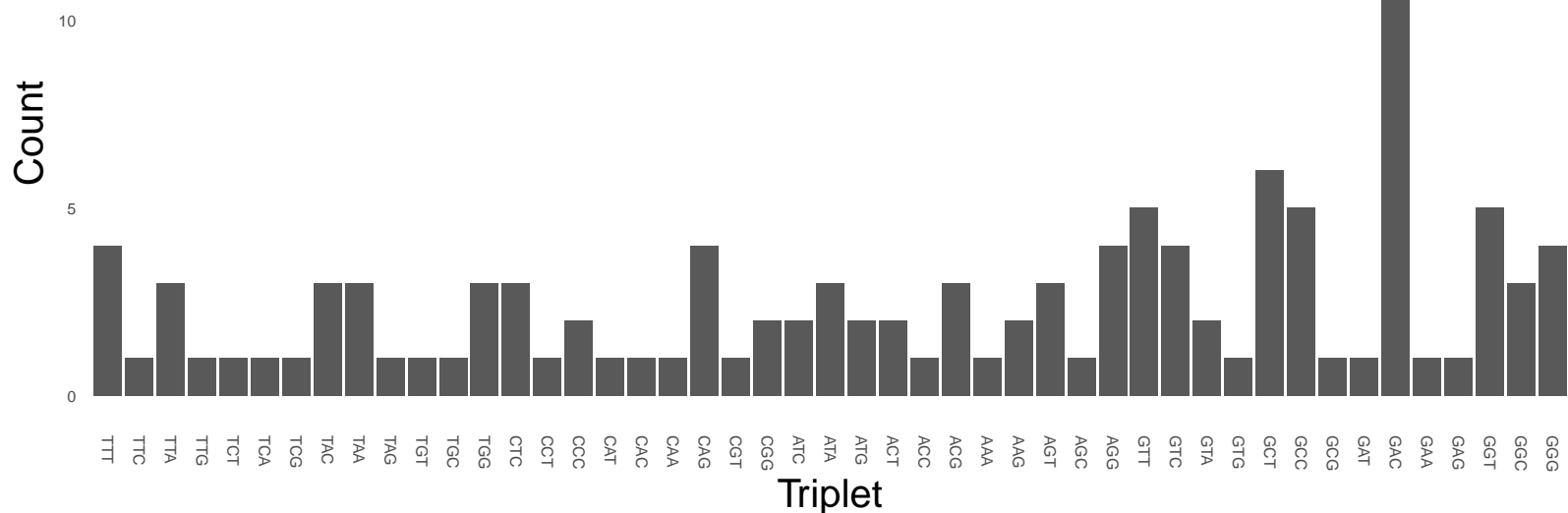
IGHV1-58\*02\_G316A\_C317G- Final 3 nucleotides as a triplet



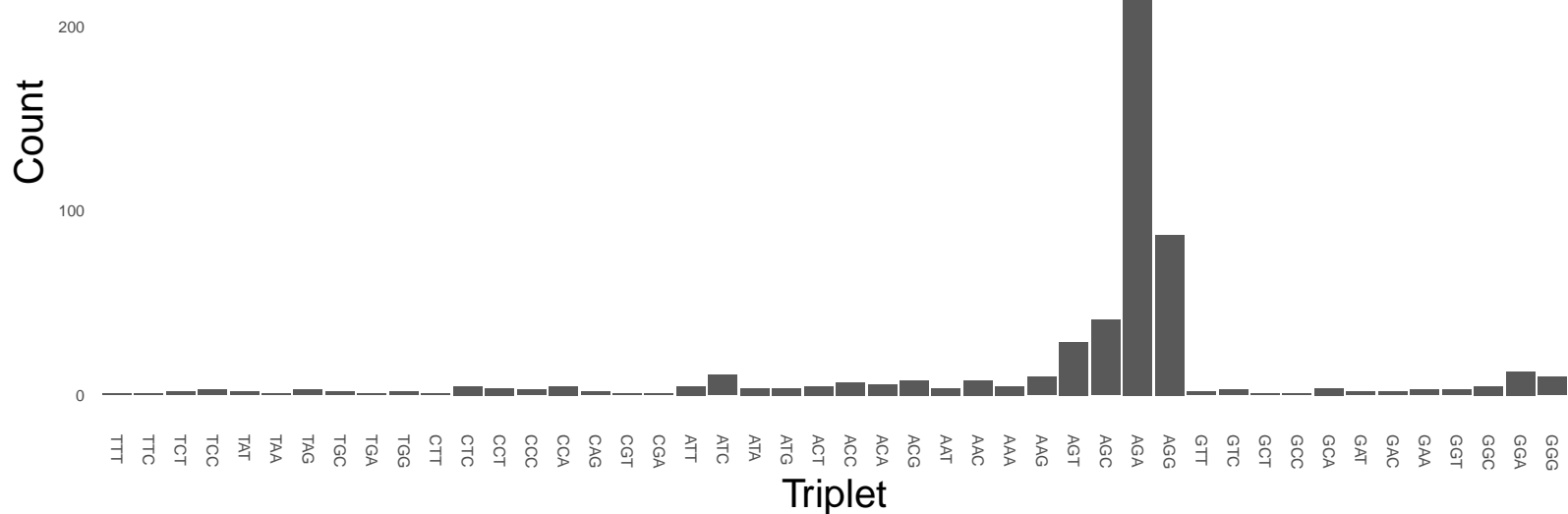
IGHV1-69\*08\_C191T- Final 3 nucleotides as a triplet



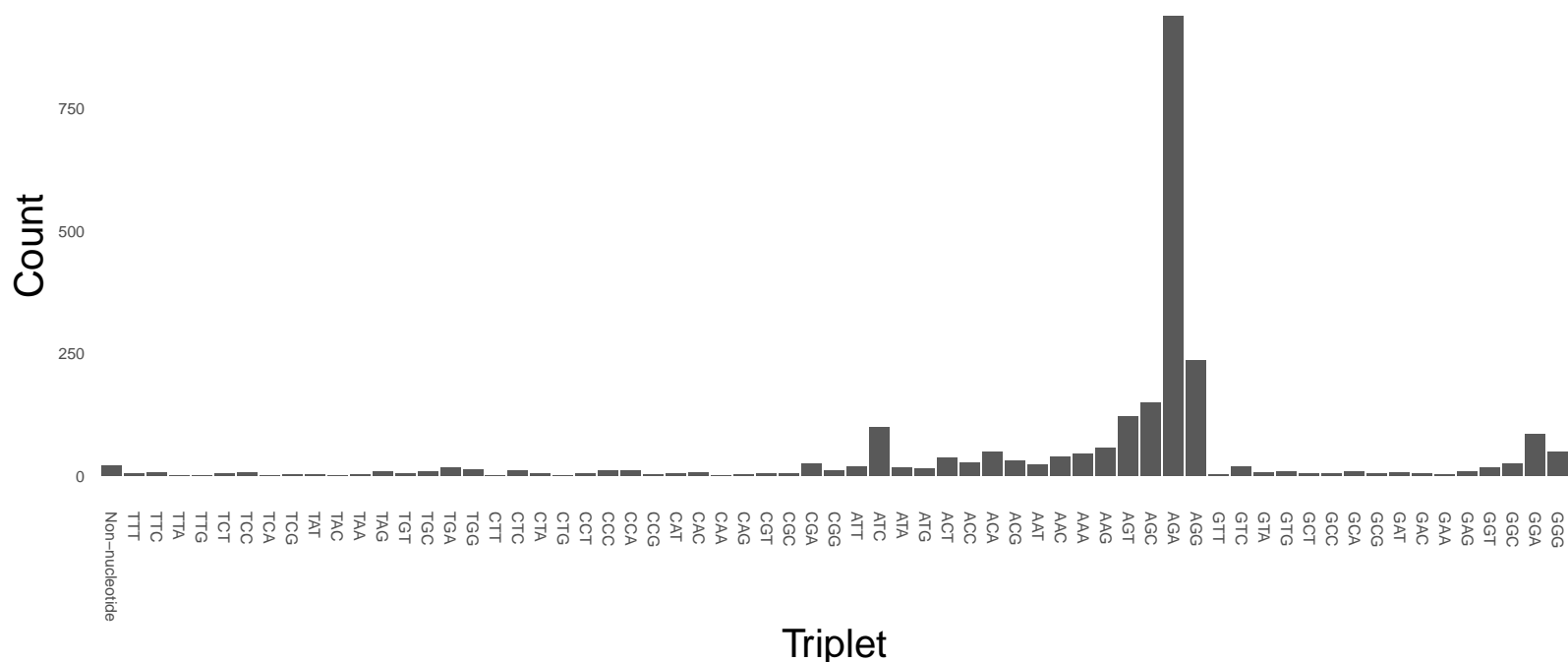
IGHV2-70\*15\_G303A- Final 3 nucleotides as a triplet



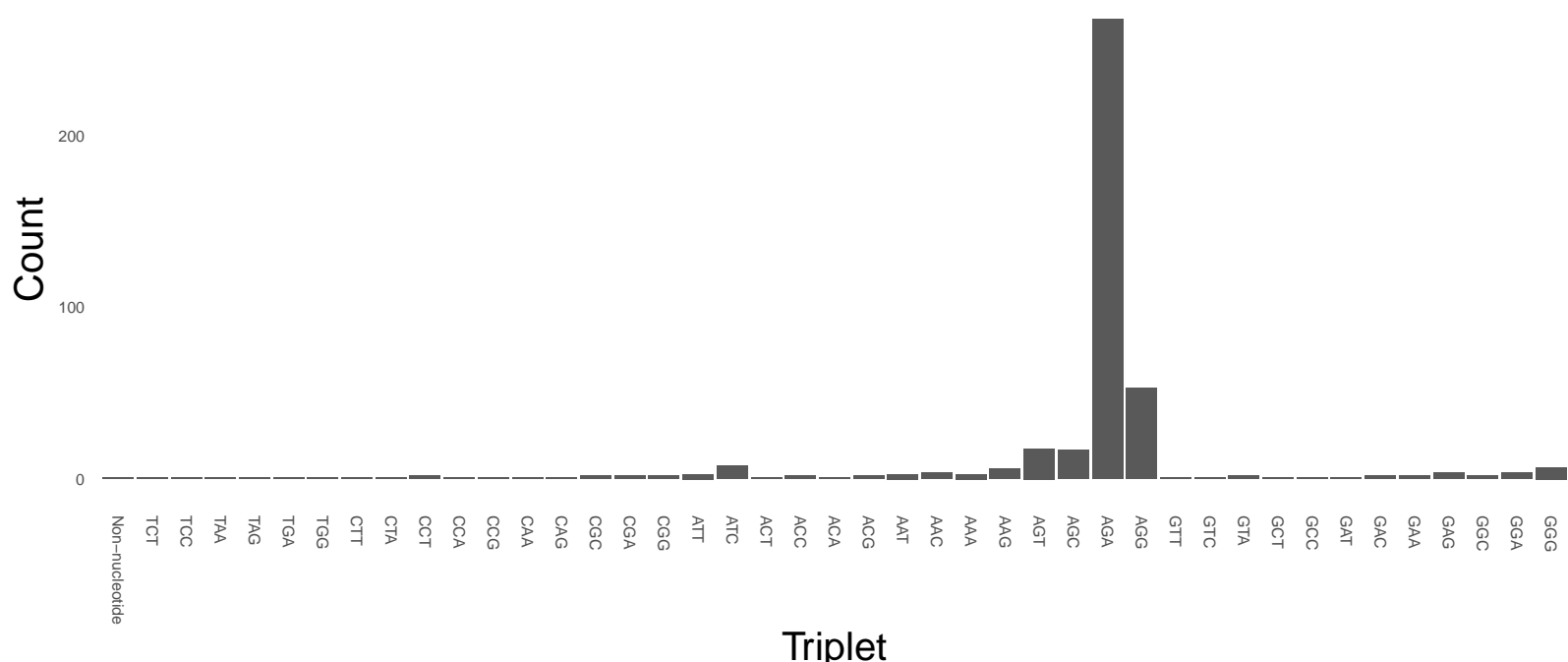
IGHV3-13\*04\_A315G- Final 3 nucleotides as a triplet



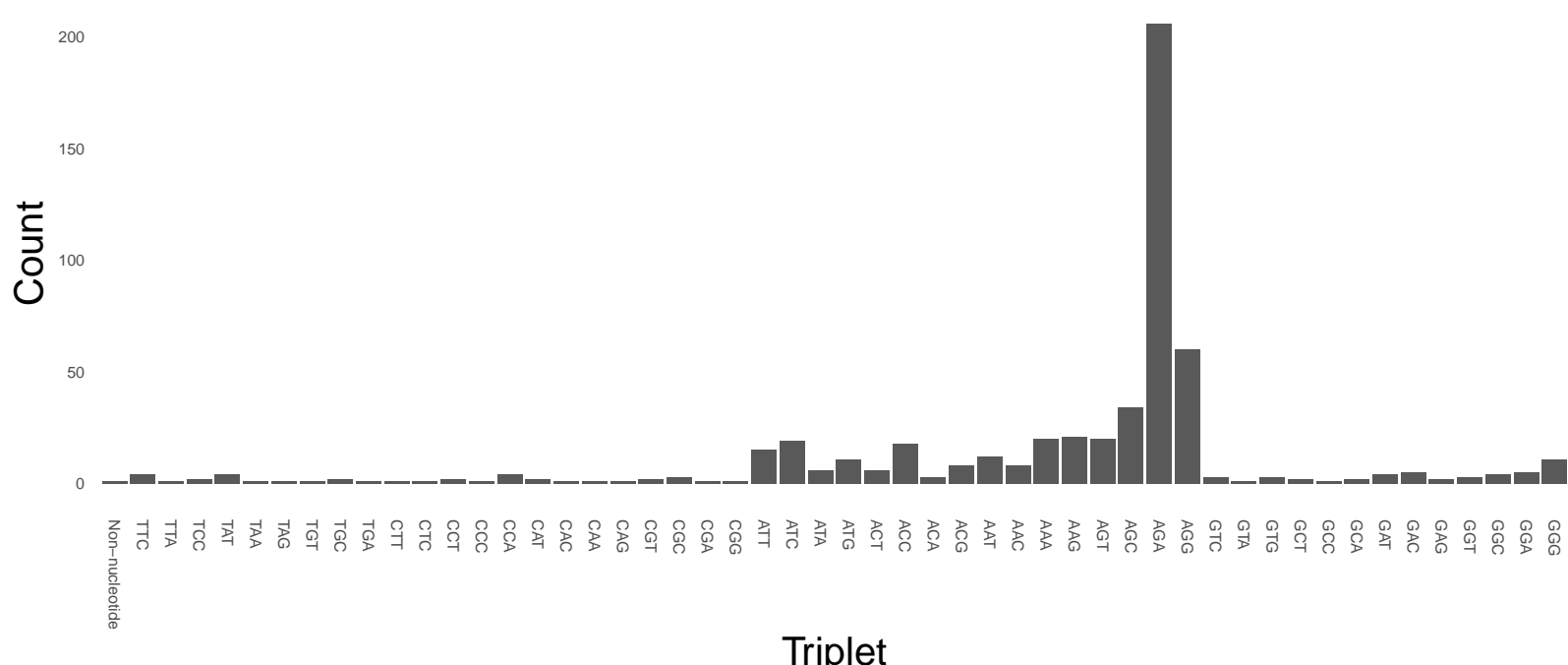
IGHV3–30\*03\_T288C– Final 3 nucleotides as a triplet



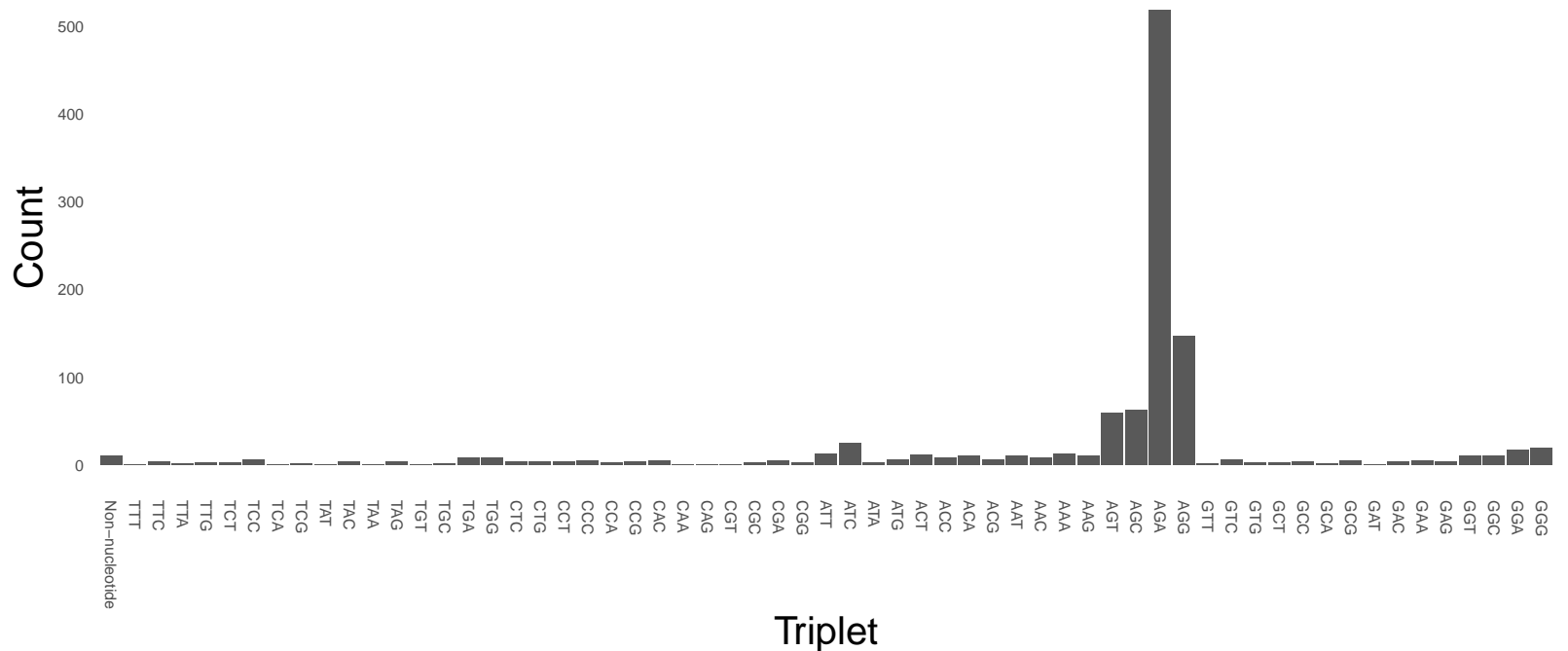
IGHV3–53\*04\_T267G\_C300T\_G317A– Final 3 nucleotides as a triplet



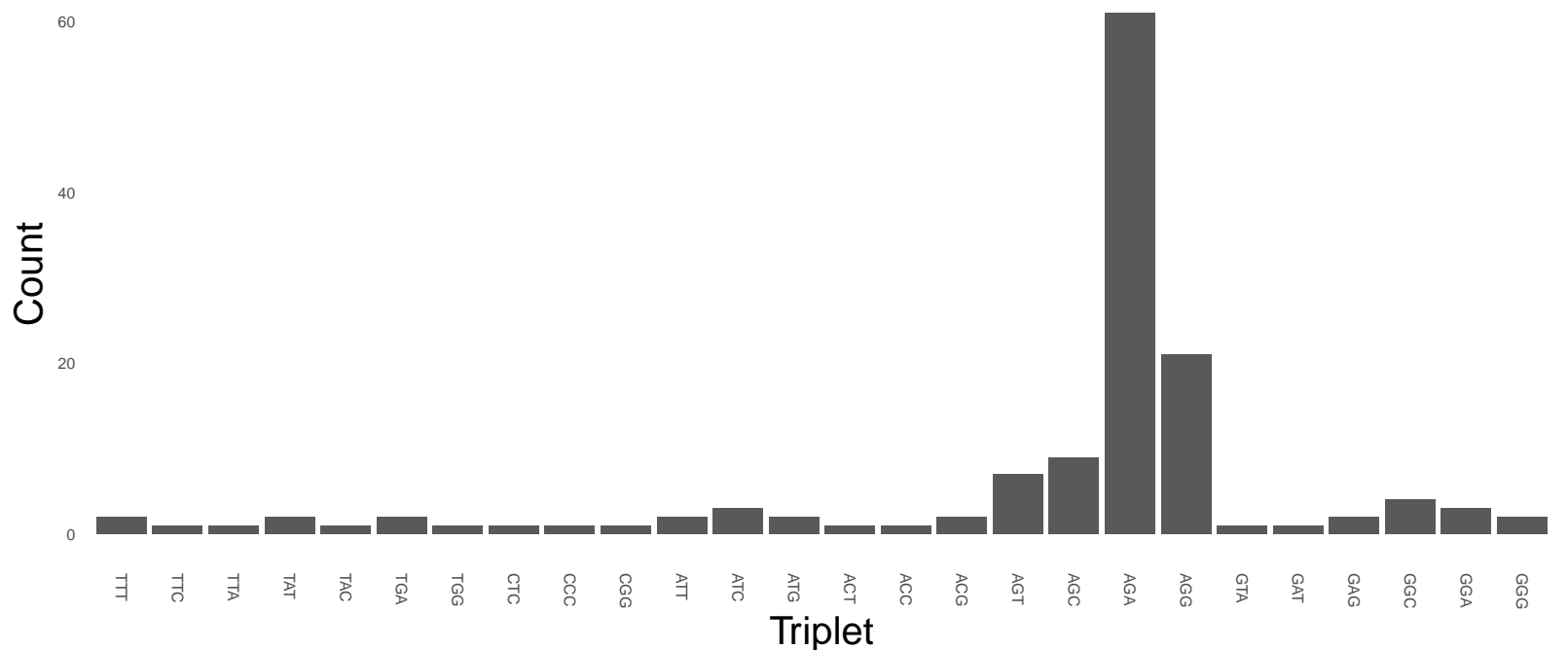
IGHV3–53\*04\_T267G\_T288C\_G303A\_G317A– Final 3 nucleotides as a triplet



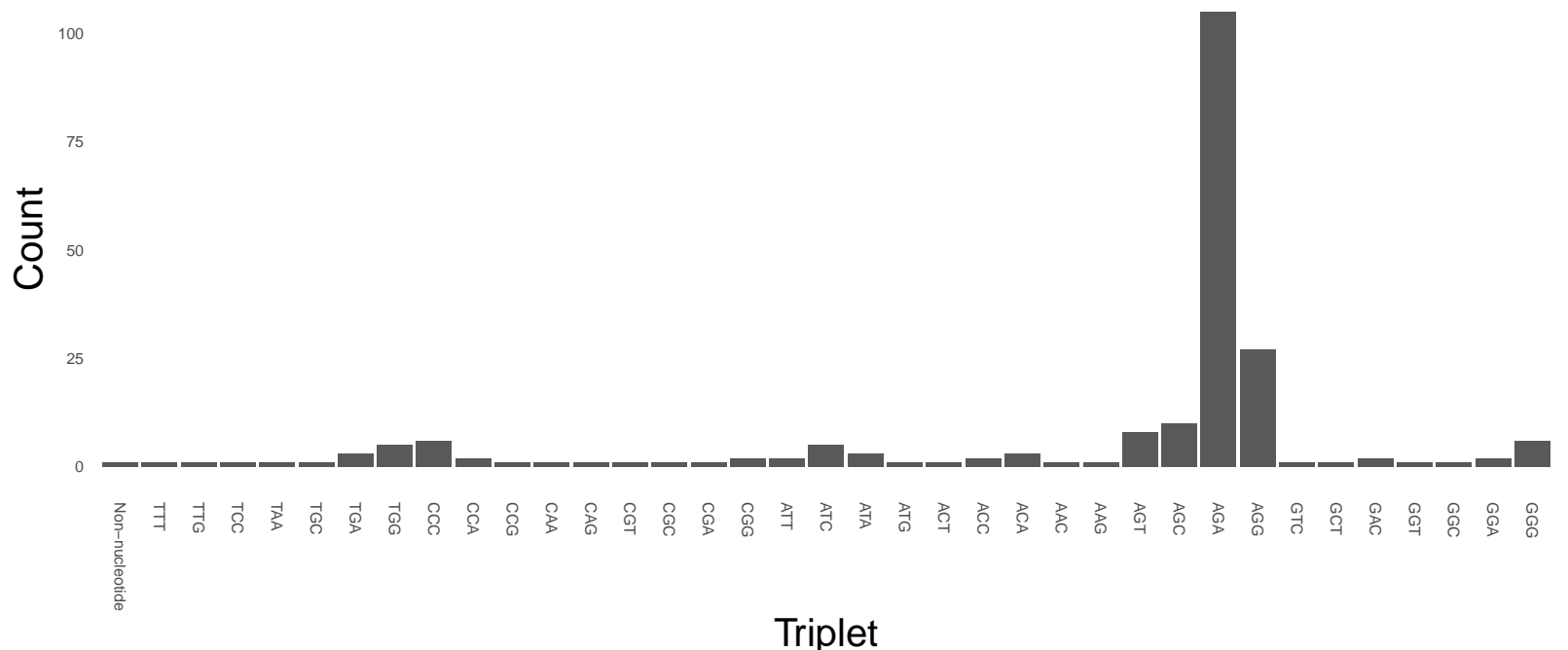
IGHV3-74\*01\_A315G- Final 3 nucleotides as a triplet



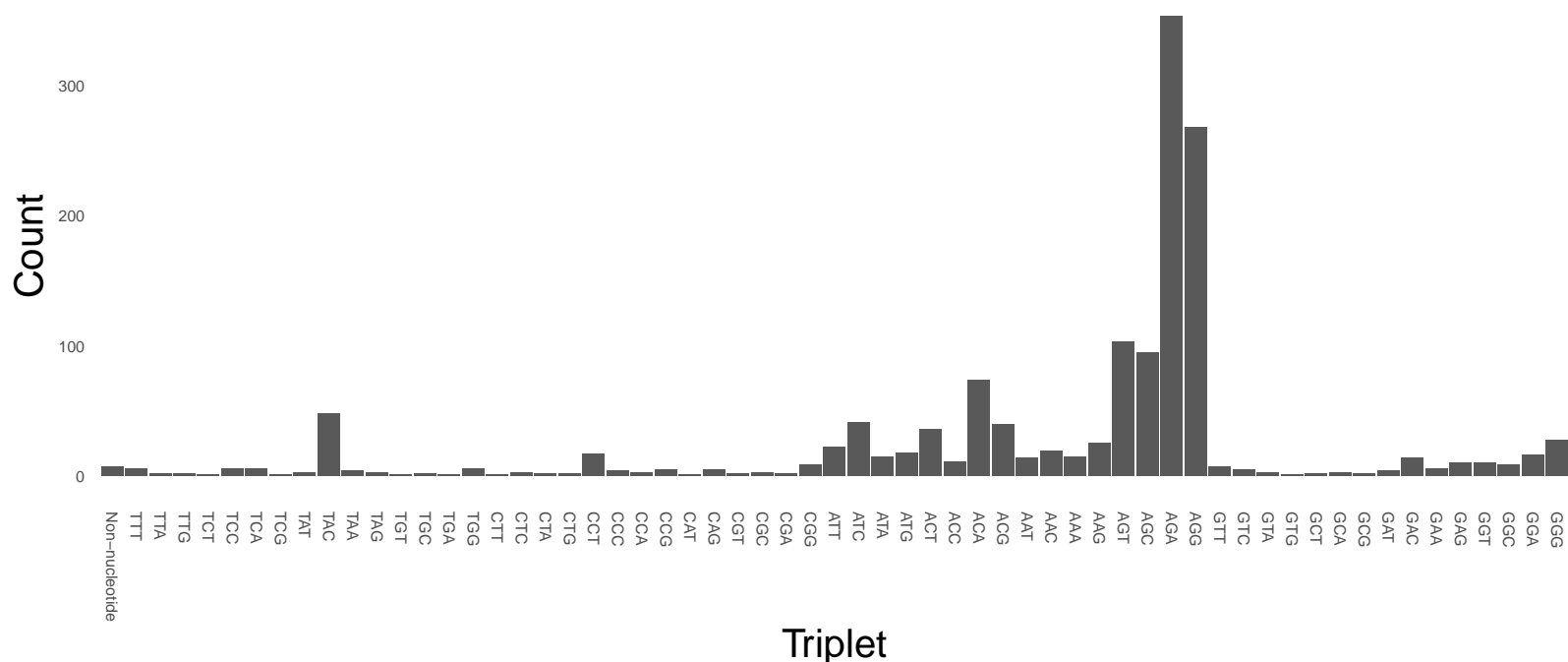
IGHV3-NL1\*01\_G49A\_C159G\_T160G\_T201C\_C223A\_G267T\_T288C\_A317G- Final 3 nucleotides as a triplet



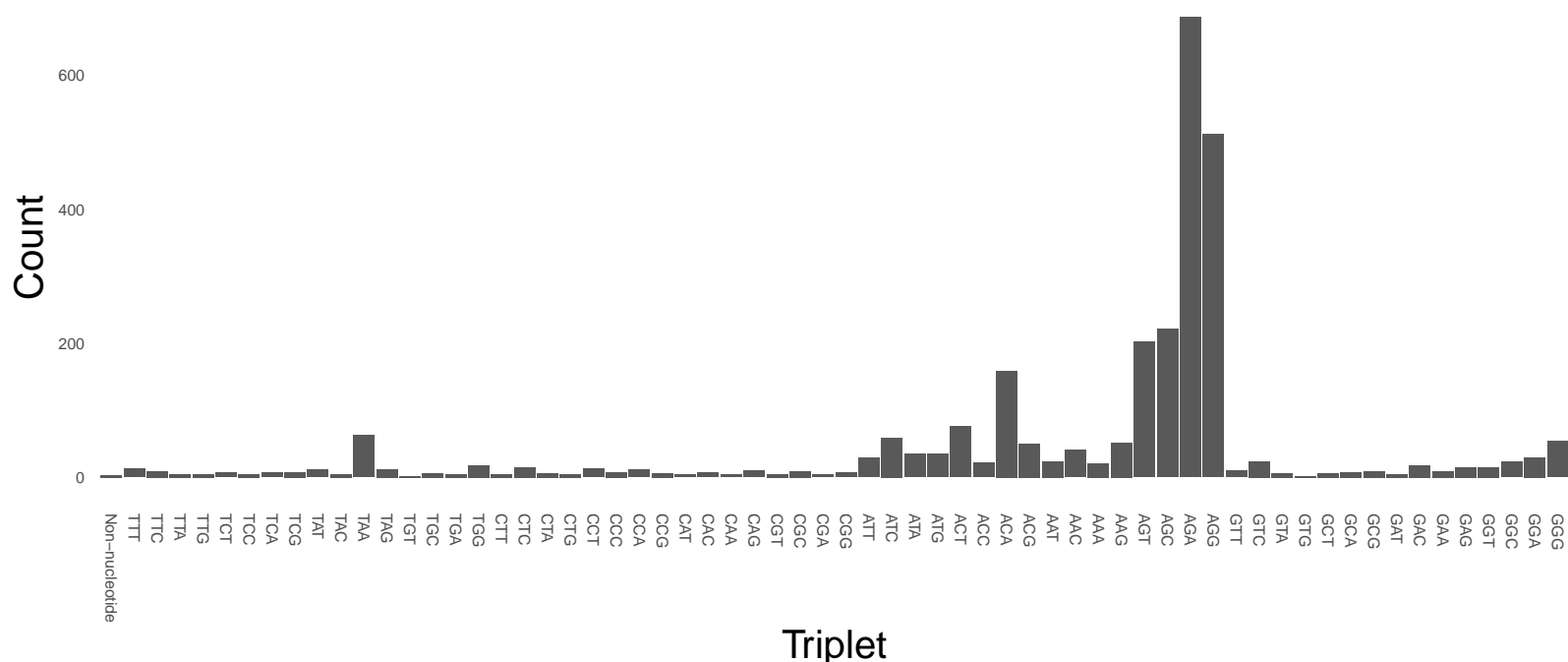
IGHV3-NL1\*01\_G49A\_G75C\_T201C\_C223A\_G267T\_T288C\_A317G- Final 3 nucleotides as a triplet



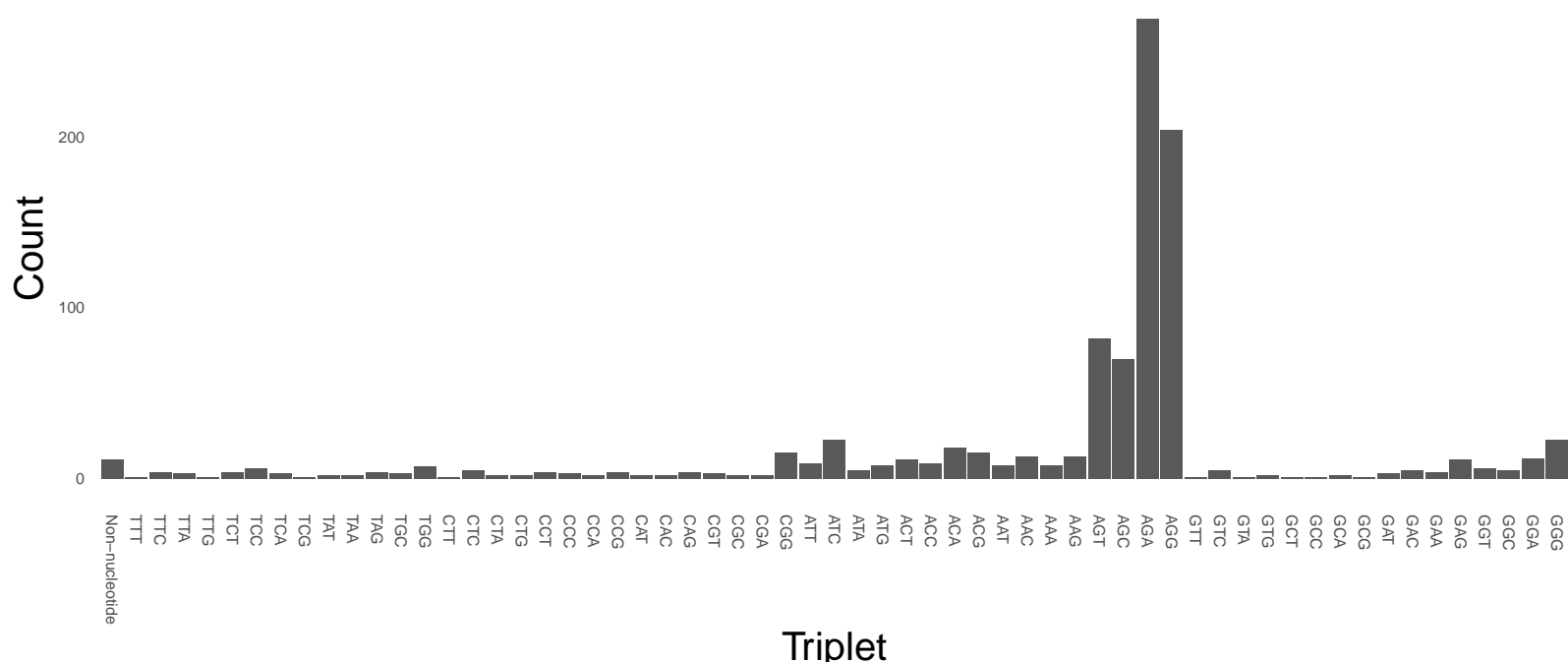
IGHV4-30-2\*01\_C315G- Final 3 nucleotides as a triplet



IGHV4-30-4\*01\_C315G- Final 3 nucleotides as a triplet

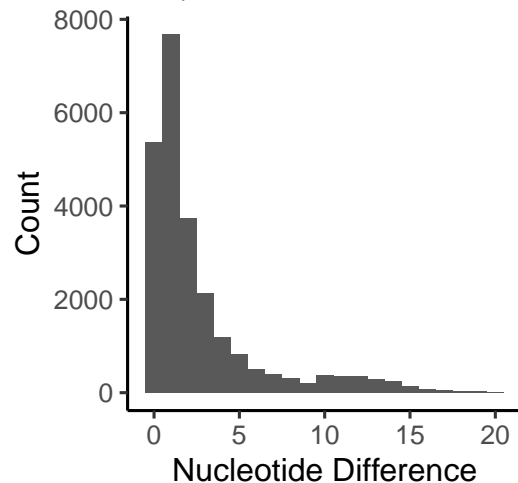


IGHV4-38-2\*02\_A291G- Final 3 nucleotides as a triplet



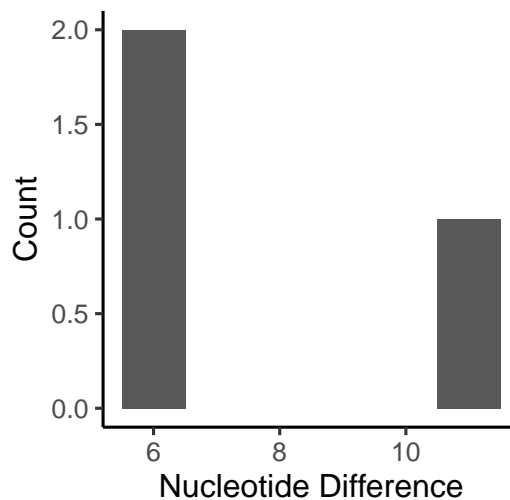
### IGHV1-2\*02

24474 sequences assigned  
5363 (21.9%) exact matches, in which:  
3909 unique CDR3  
6 unique J



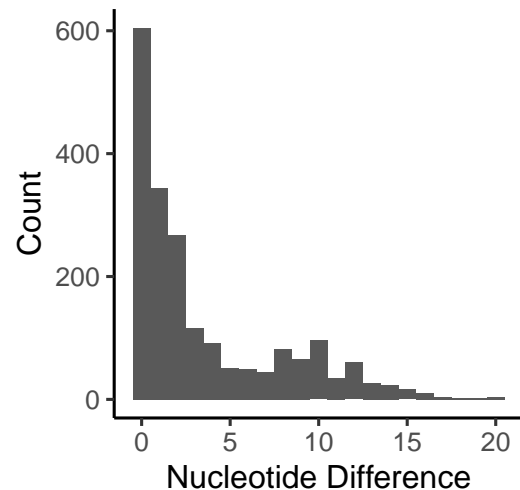
### IGHV1-8\*01

3 sequences assigned  
No exact matches.



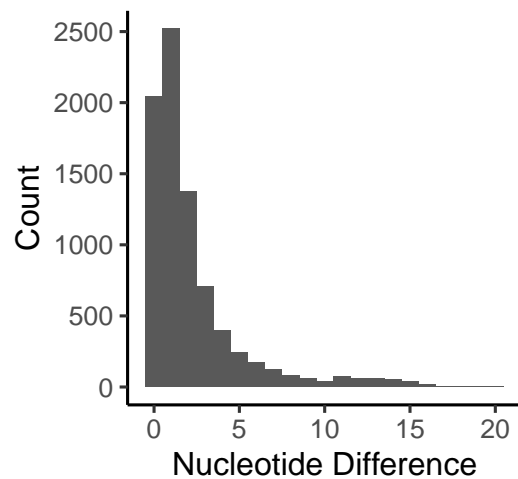
### IGHV1-24\*01\_A315G\_CS

2028 sequences assigned  
605 (29.8%) exact matches, in which:  
594 unique CDR3  
6 unique J



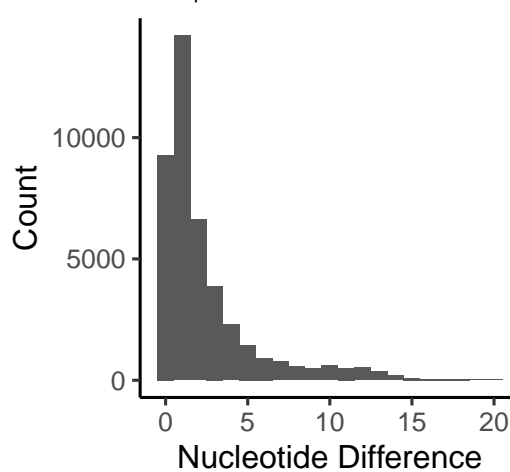
### IGHV1-2\*04

8144 sequences assigned  
2046 (25.1%) exact matches, in which:  
1557 unique CDR3  
6 unique J



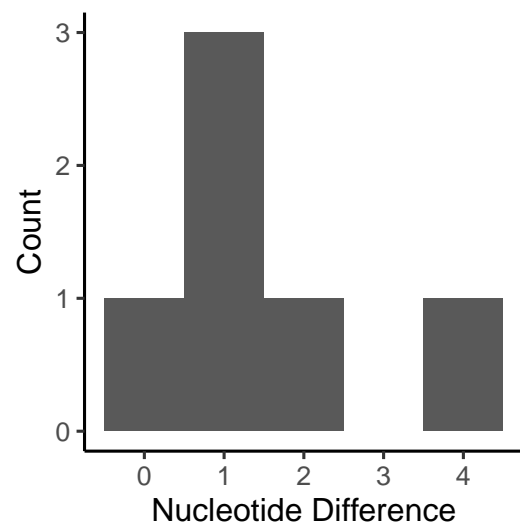
### IGHV1-18\*01

43344 sequences assigned  
9287 (21.4%) exact matches, in which:  
6782 unique CDR3  
6 unique J



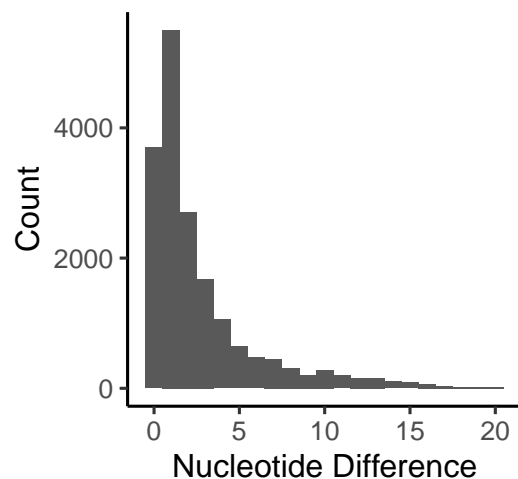
### IGHV1-38-4\*01

7 sequences assigned  
1 (14.3%) exact matches, in which:  
1 unique CDR3  
1 unique J



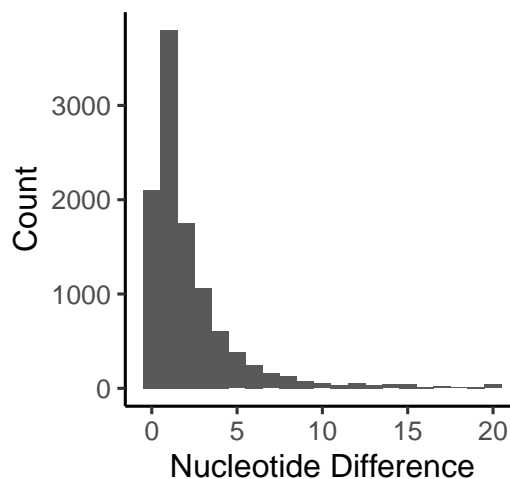
### IGHV1-3\*01

18064 sequences assigned  
3701 (20.5%) exact matches, in which:  
2687 unique CDR3  
6 unique J



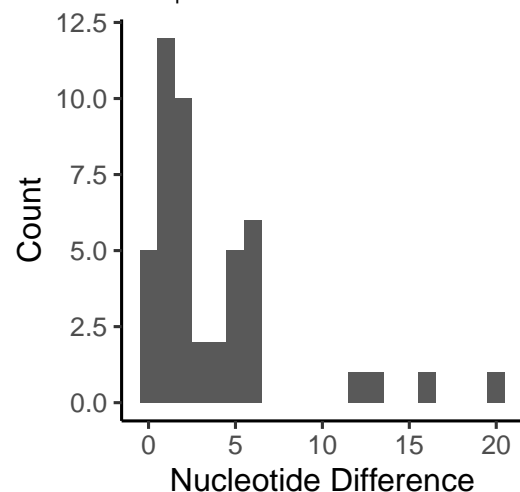
### IGHV1-24\*01

10906 sequences assigned  
2104 (19.3%) exact matches, in which:  
1403 unique CDR3  
6 unique J



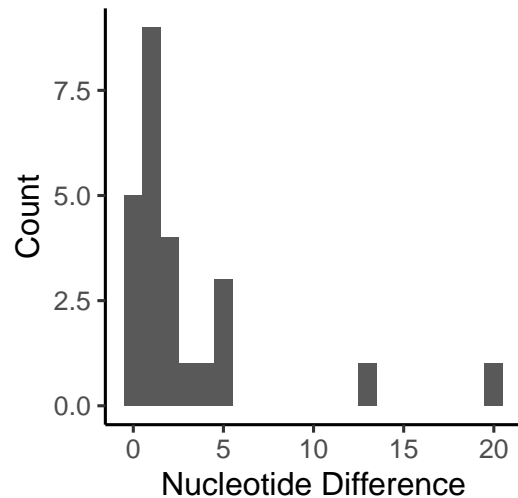
### IGHV1-45\*02

46 sequences assigned  
5 (10.9%) exact matches, in which:  
4 unique CDR3  
2 unique J



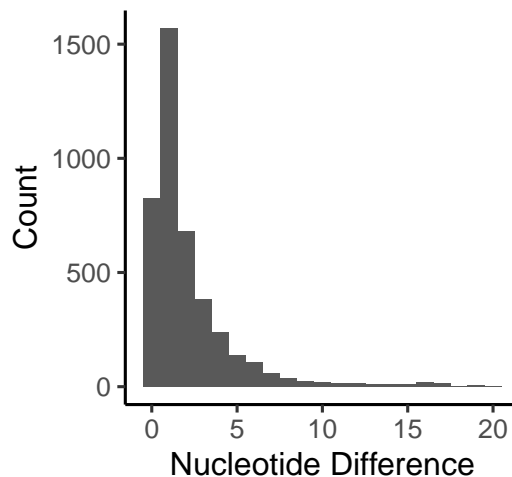
### IGHV1-45\*03

26 sequences assigned  
5 (19.2%) exact matches, in which:  
5 unique CDR3  
2 unique J



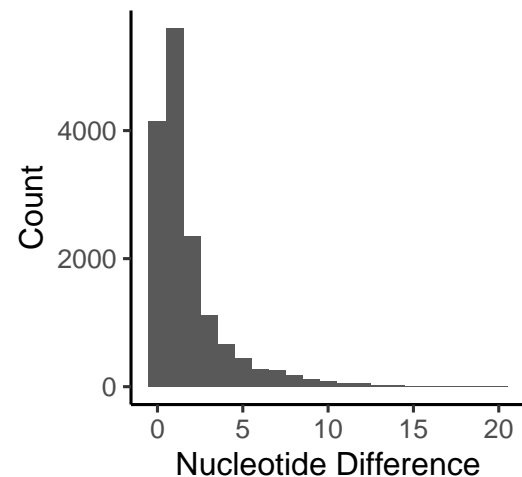
### IGHV1-58\*02

4221 sequences assigned  
825 (19.5%) exact matches, in which:  
509 unique CDR3  
5 unique J



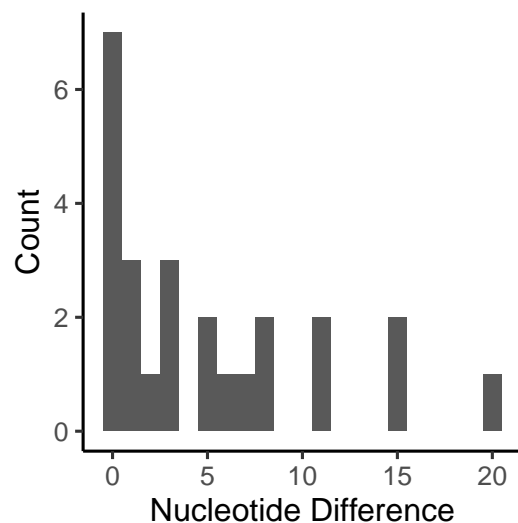
### IGHV1-69\*08\_C191T

15473 sequences assigned  
4153 (26.8%) exact matches, in which:  
3166 unique CDR3  
6 unique J



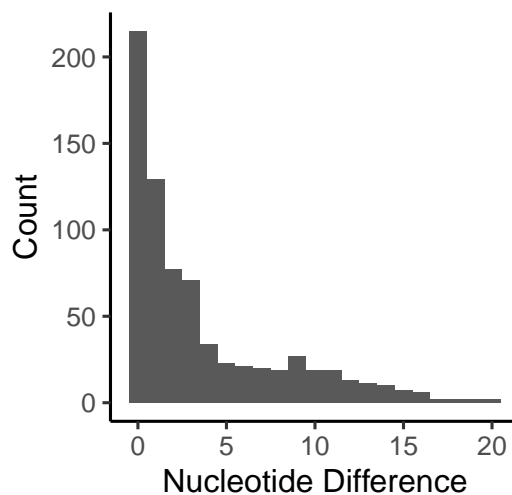
### IGHV1-45\*02\_A315G

28 sequences assigned  
7 (25%) exact matches, in which:  
7 unique CDR3  
3 unique J



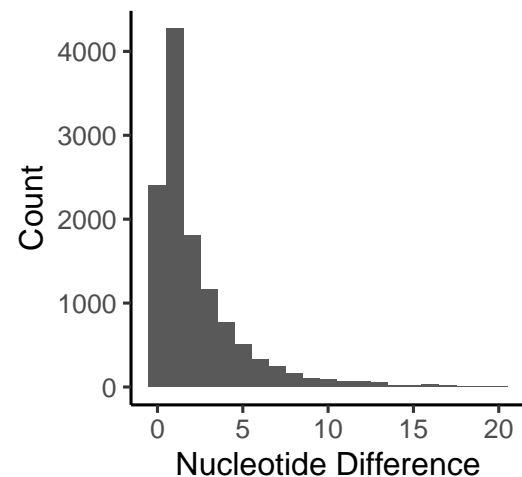
### IGHV1-58\*02\_G316A\_C191T

743 sequences assigned  
215 (28.9%) exact matches, in which:  
215 unique CDR3  
6 unique J



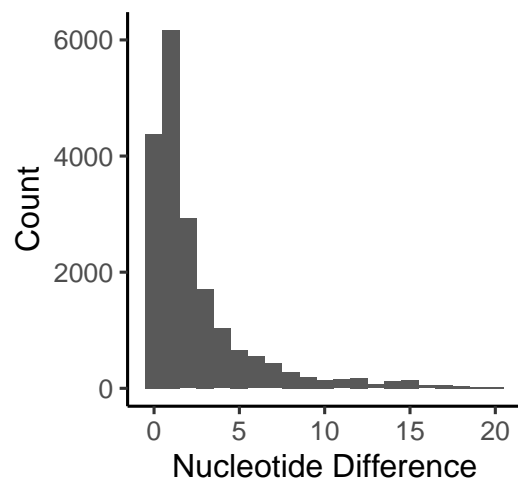
### IGHV2-5\*02

12254 sequences assigned  
2397 (19.6%) exact matches, in which:  
1643 unique CDR3  
6 unique J



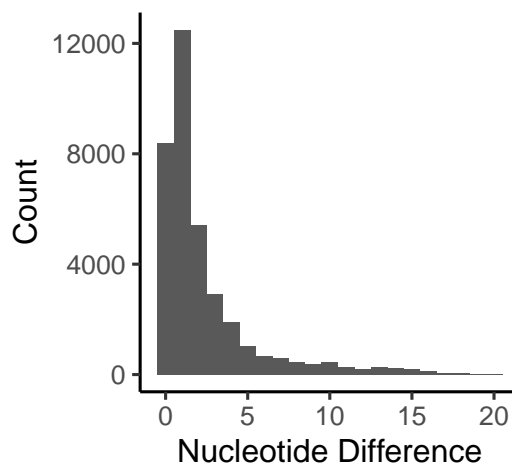
### IGHV1-46\*01

19489 sequences assigned  
4379 (22.5%) exact matches, in which:  
3211 unique CDR3  
6 unique J



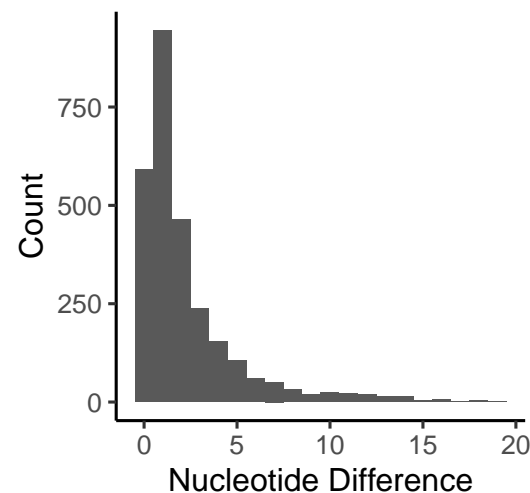
### IGHV1-69\*04

36514 sequences assigned  
8407 (23%) exact matches, in which:  
6133 unique CDR3  
6 unique J



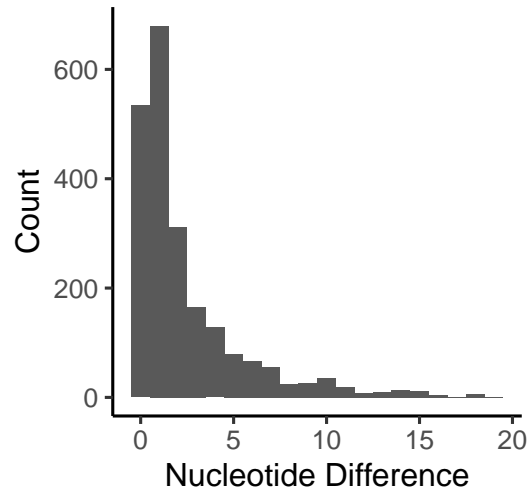
### IGHV2-26\*01

2828 sequences assigned  
590 (20.9%) exact matches, in which:  
438 unique CDR3  
6 unique J



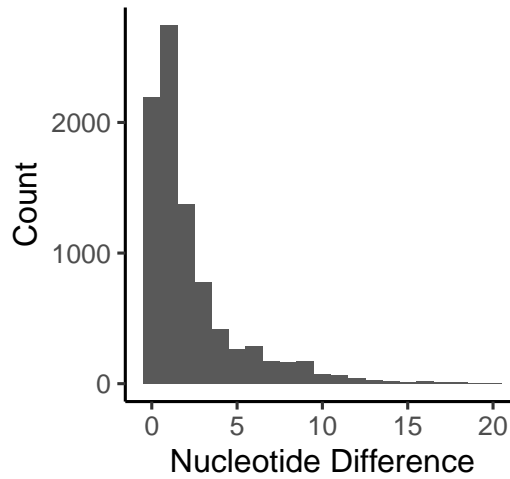
### IGHV2-70\*15

2229 sequences assigned  
534 (24%) exact matches, in which:  
378 unique CDR3  
6 unique J



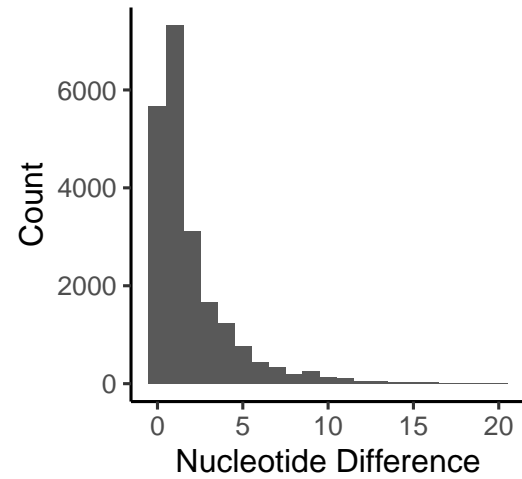
### IGHV3-7\*03

8919 sequences assigned  
2191 (24.6%) exact matches, in which:  
1660 unique CDR3  
6 unique J



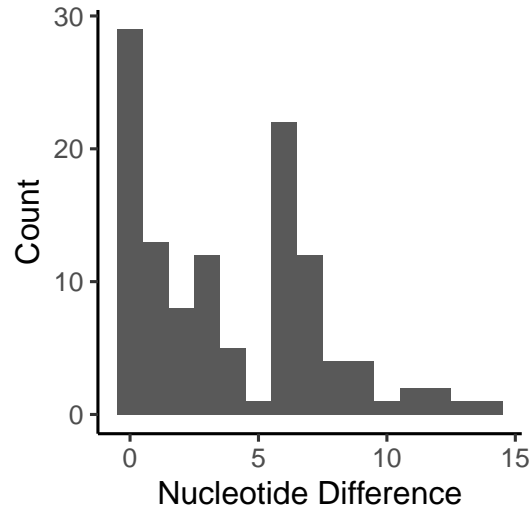
### IGHV3-11\*05

21738 sequences assigned  
5678 (26.1%) exact matches, in which:  
4013 unique CDR3  
6 unique J



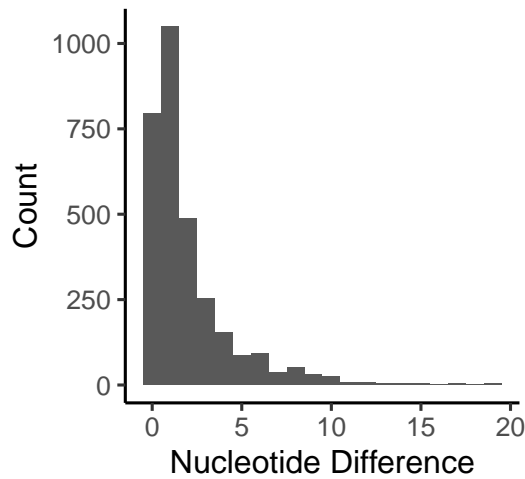
### IGHV2-70\*15\_G303A

117 sequences assigned  
29 (24.8%) exact matches, in which:  
29 unique CDR3  
6 unique J



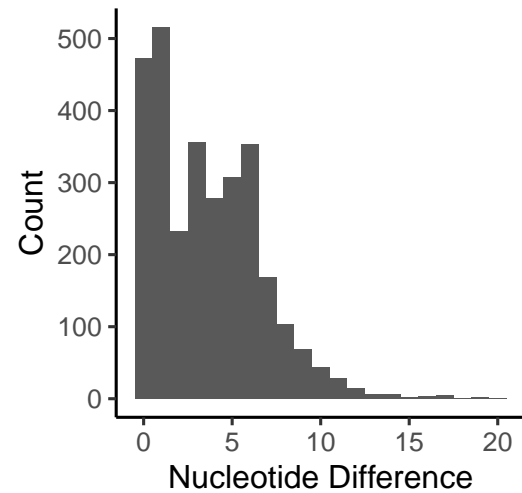
### IGHV3-7\*04

3125 sequences assigned  
796 (25.5%) exact matches, in which:  
577 unique CDR3  
6 unique J



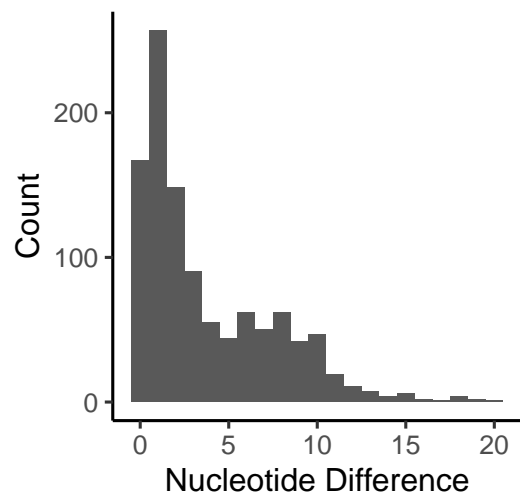
### IGHV3-11\*06

3018 sequences assigned  
472 (15.6%) exact matches, in which:  
461 unique CDR3  
6 unique J



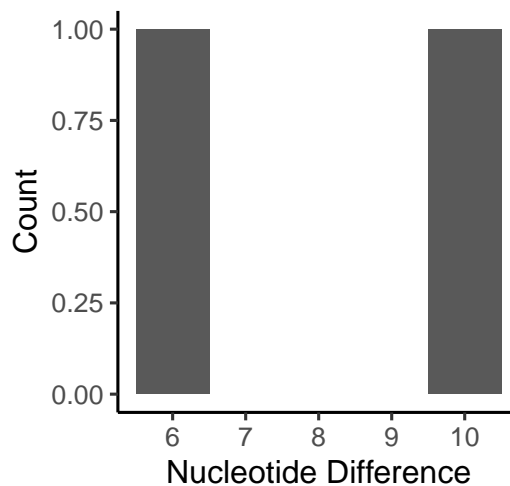
### IGHV3-7\*01

1091 sequences assigned  
167 (15.3%) exact matches, in which:  
165 unique CDR3  
6 unique J



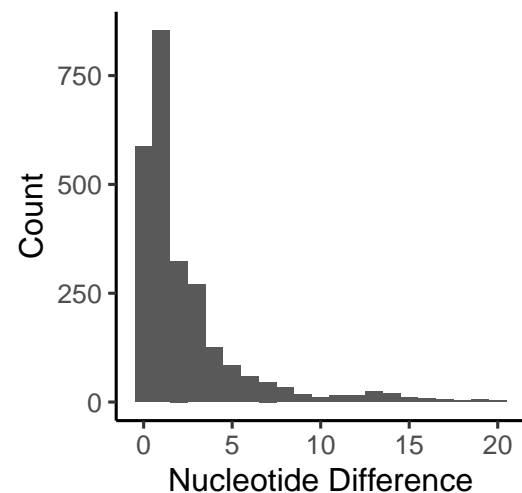
### IGHV3-9\*01

2 sequences assigned  
No exact matches.



### IGHV3-13\*04

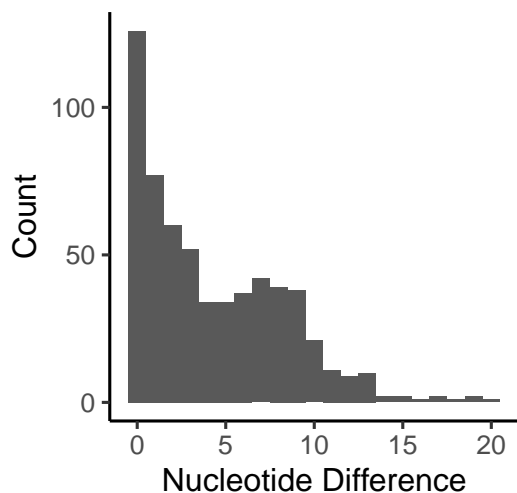
2547 sequences assigned  
588 (23.1%) exact matches, in which:  
397 unique CDR3  
5 unique J





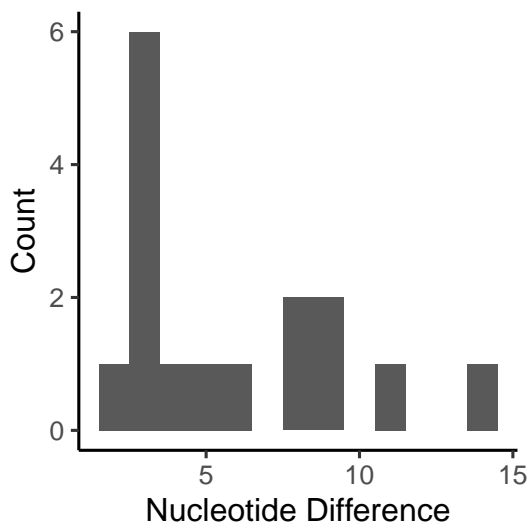
### IGHV3-13\*04\_A315G

608 sequences assigned  
126 (20.7%) exact matches, in which:  
126 unique CDR3  
6 unique J



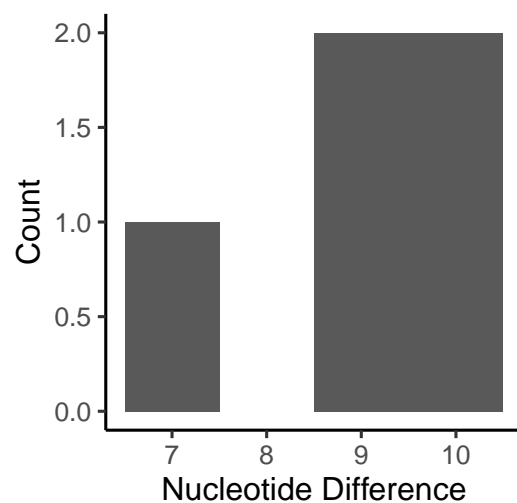
### IGHV3-20\*03

16 sequences assigned  
No exact matches.



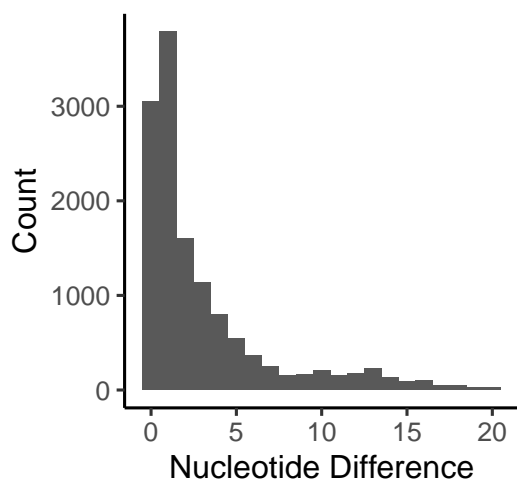
### IGHV3-22\*02

6 sequences assigned  
No exact matches.



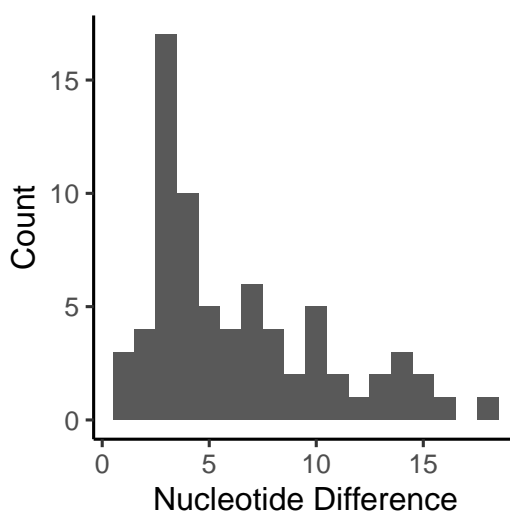
### IGHV3-15\*01

13274 sequences assigned  
3047 (23%) exact matches, in which:  
2118 unique CDR3  
6 unique J



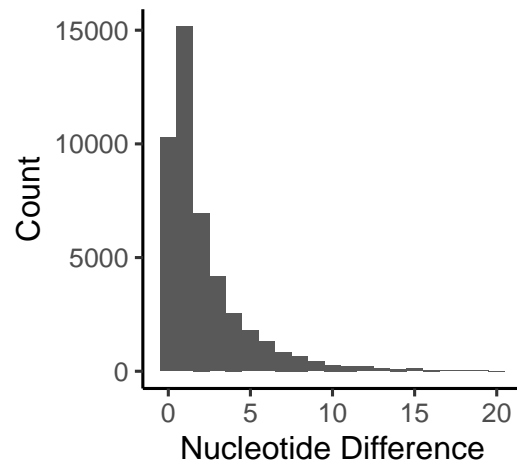
### IGHV3-20\*04

73 sequences assigned  
No exact matches.



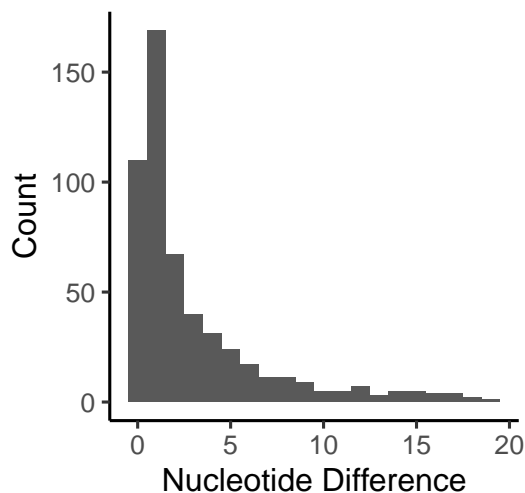
### IGHV3-23\*01

45593 sequences assigned  
10286 (22.6%) exact matches, in which:  
7527 unique CDR3  
6 unique J



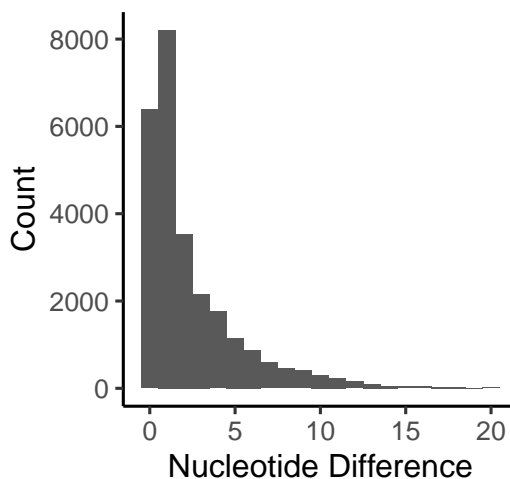
### IGHV3-20\*01

535 sequences assigned  
110 (20.6%) exact matches, in which:  
86 unique CDR3  
5 unique J



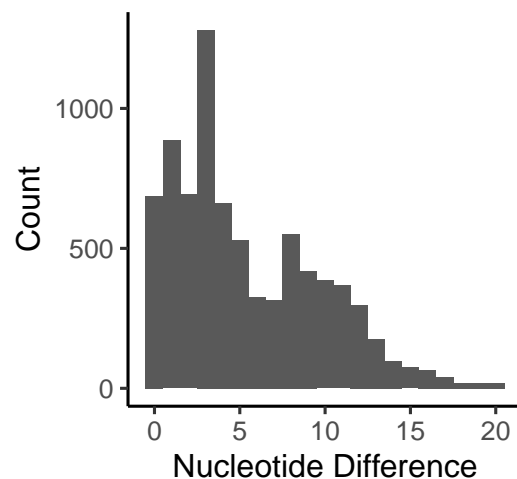
### IGHV3-21\*01

26746 sequences assigned  
6390 (23.9%) exact matches, in which:  
4679 unique CDR3  
6 unique J



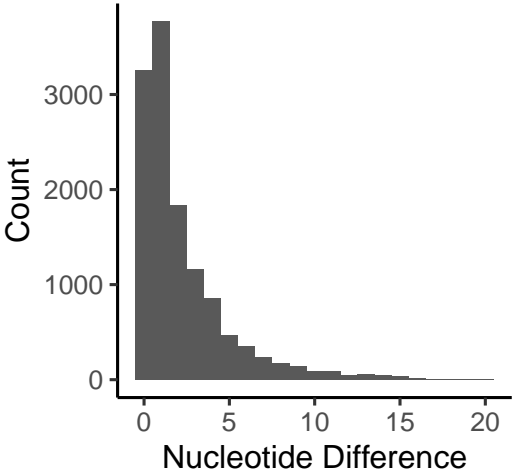
### IGHV3-23\*04

8108 sequences assigned  
687 (8.5%) exact matches, in which:  
617 unique CDR3  
6 unique J



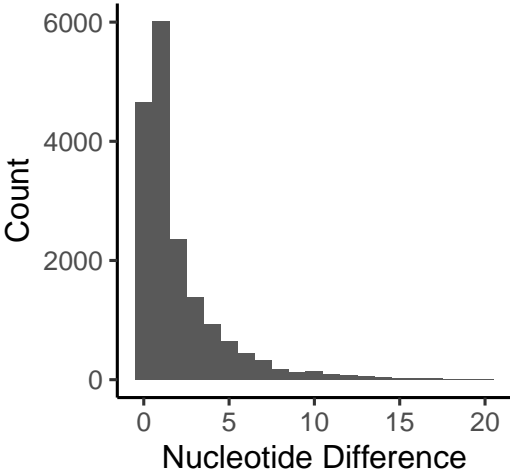
IGHV3-30-3\*01

12749 sequences assigned  
3259 (25.6%) exact matches, in which:  
2458 unique CDR3  
6 unique J



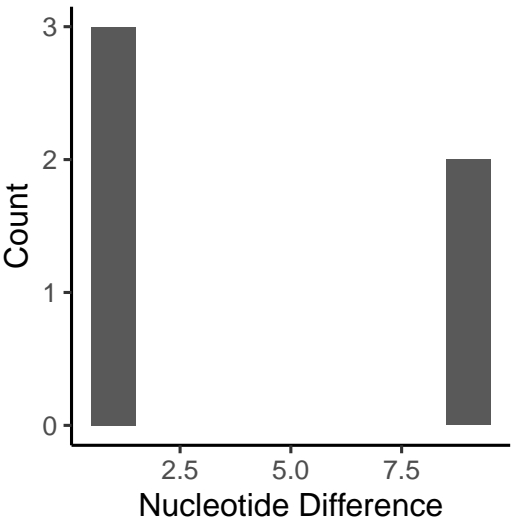
IGHV3-33\*01

17680 sequences assigned  
4652 (26.3%) exact matches, in which:  
3359 unique CDR3  
6 unique J



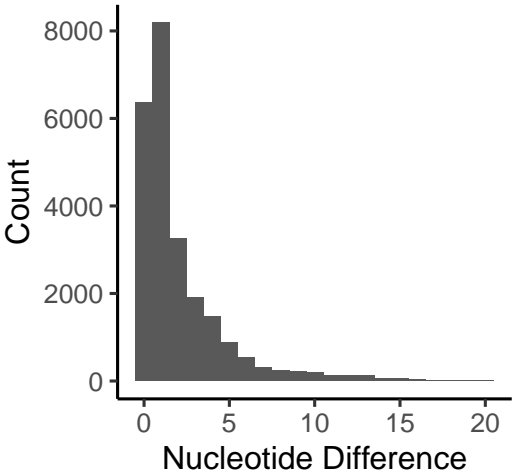
IGHV3-35\*02

5 sequences assigned  
No exact matches.



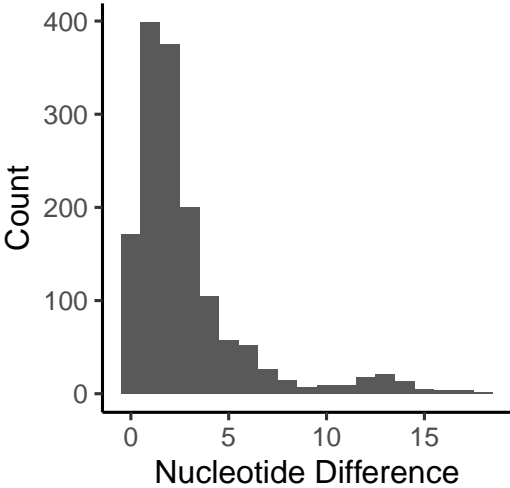
IGHV3-30\*18

24262 sequences assigned  
6367 (26.2%) exact matches, in which:  
4441 unique CDR3  
6 unique J



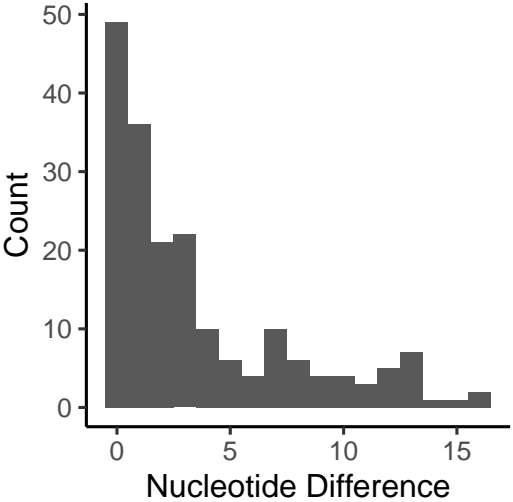
IGHV3-33\*06

1498 sequences assigned  
171 (11.4%) exact matches, in which:  
165 unique CDR3  
5 unique J



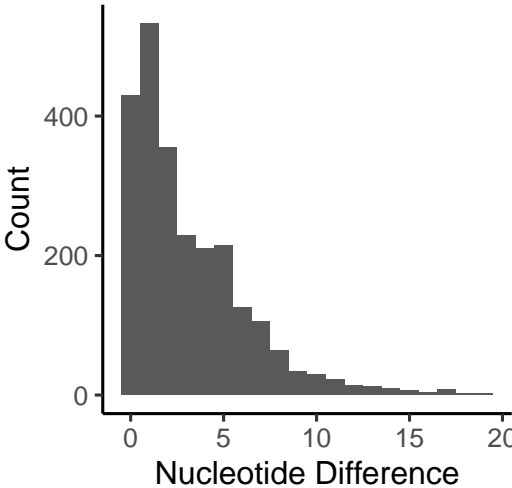
IGHV3-38-3\*01

195 sequences assigned  
49 (25.1%) exact matches, in which:  
44 unique CDR3  
4 unique J



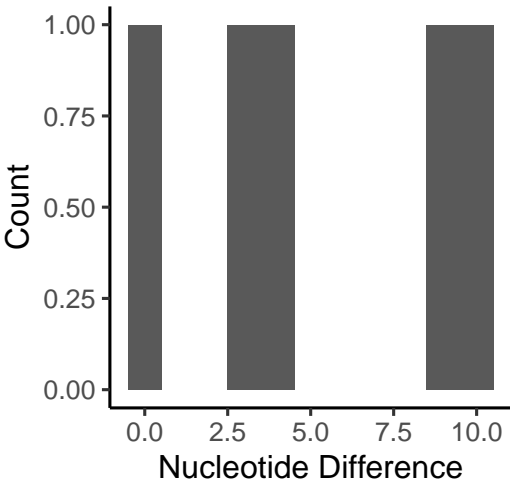
IGHV3-30\*03\_T288C

2422 sequences assigned  
430 (17.8%) exact matches, in which:  
417 unique CDR3  
6 unique J



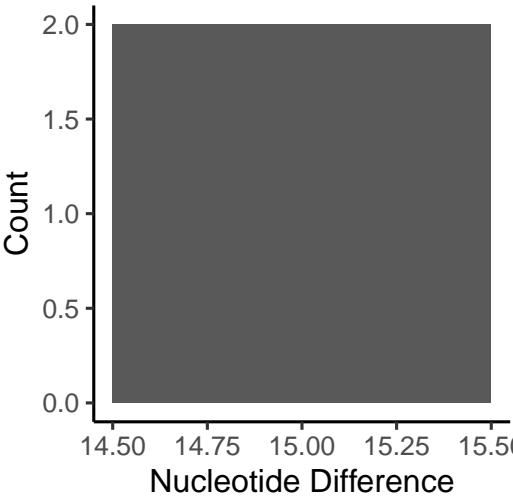
IGHV3-35\*01

5 sequences assigned  
1 (20%) exact matches, in which:  
1 unique CDR3  
1 unique J



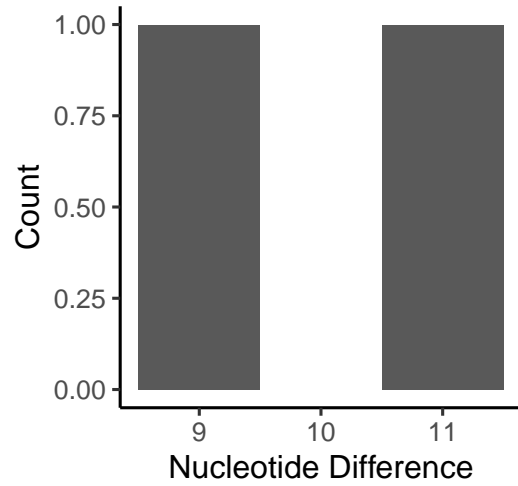
IGHV3-38\*02

2 sequences assigned  
No exact matches.



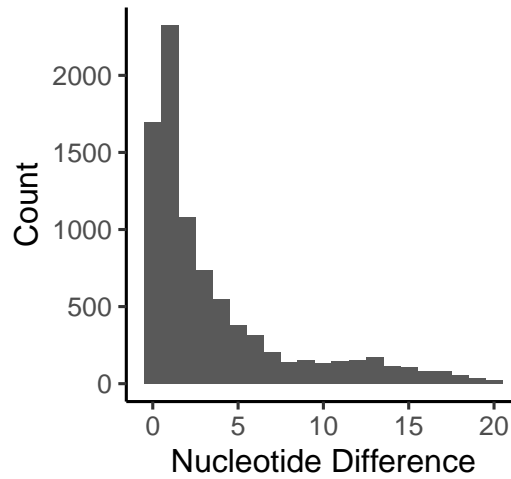
### IGHV3-38\*03

3 sequences assigned  
No exact matches.



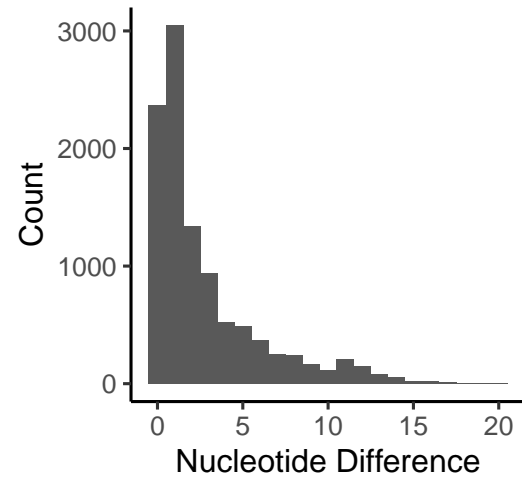
### IGHV3-43\*02

8798 sequences assigned  
1699 (19.3%) exact matches, in which:  
1257 unique CDR3  
6 unique J



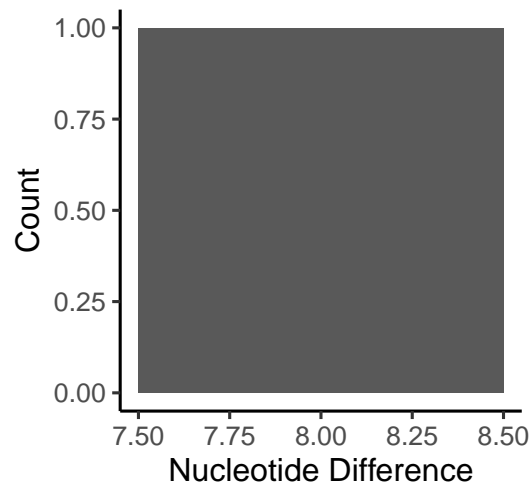
### IGHV3-48\*04

10498 sequences assigned  
2371 (22.6%) exact matches, in which:  
1802 unique CDR3  
6 unique J



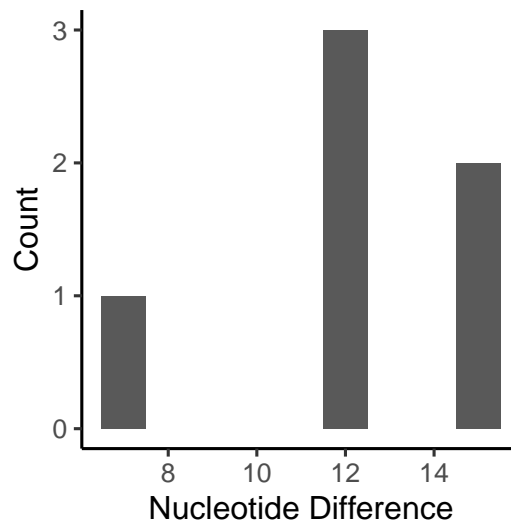
### IGHV3-41\*02

1 sequences assigned  
No exact matches.



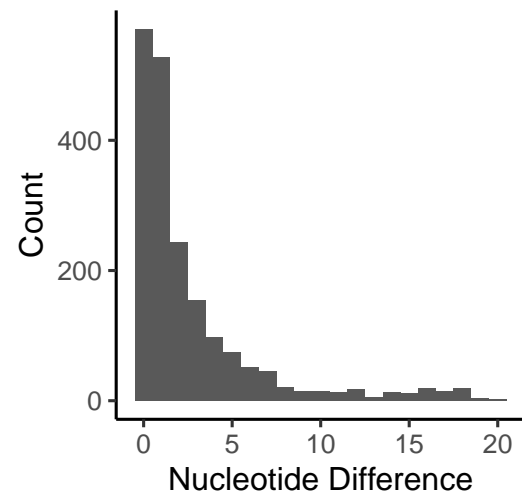
### IGHV3-47\*01

6 sequences assigned  
No exact matches.



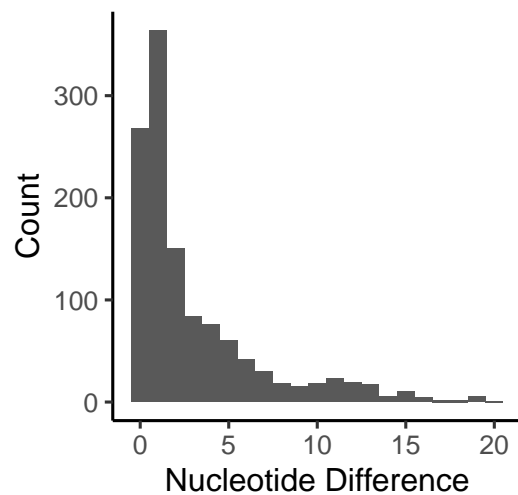
### IGHV3-49\*03

1955 sequences assigned  
571 (29.2%) exact matches, in which:  
431 unique CDR3  
6 unique J



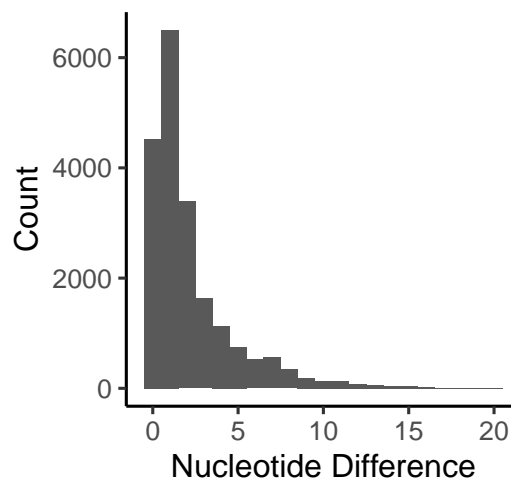
### IGHV3-43\*01

1222 sequences assigned  
268 (21.9%) exact matches, in which:  
193 unique CDR3  
6 unique J



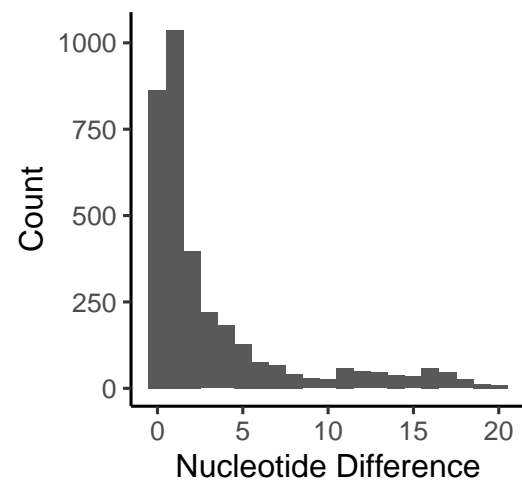
### IGHV3-48\*03

20206 sequences assigned  
4521 (22.4%) exact matches, in which:  
3303 unique CDR3  
6 unique J



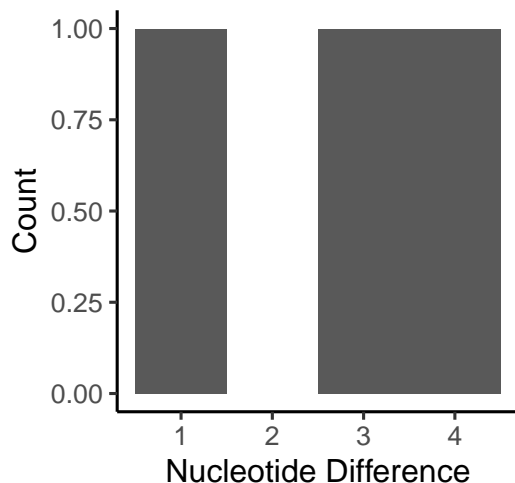
### IGHV3-49\*04

3487 sequences assigned  
863 (24.7%) exact matches, in which:  
642 unique CDR3  
6 unique J



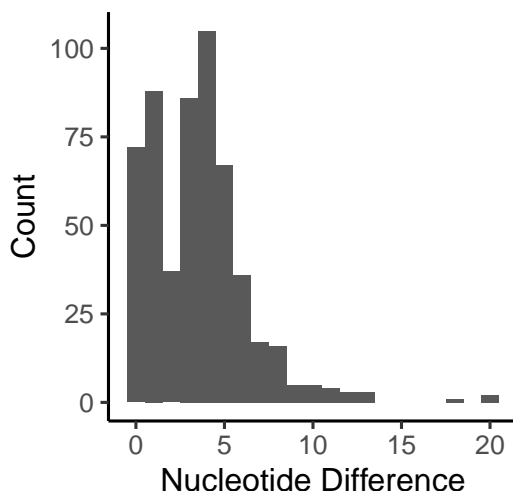
### IGHV3-52\*01

3 sequences assigned  
No exact matches.



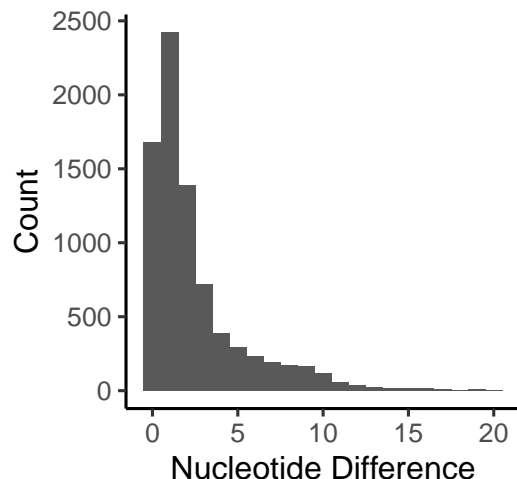
### IGHV3-53\*04\_T267G\_T2

552 sequences assigned  
72 (13%) exact matches, in which:  
72 unique CDR3  
6 unique J



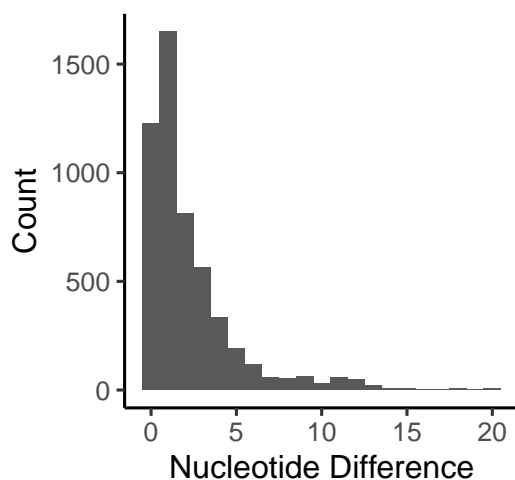
### IGHV3-66\*01

8049 sequences assigned  
1679 (20.9%) exact matches, in which:  
1196 unique CDR3  
6 unique J



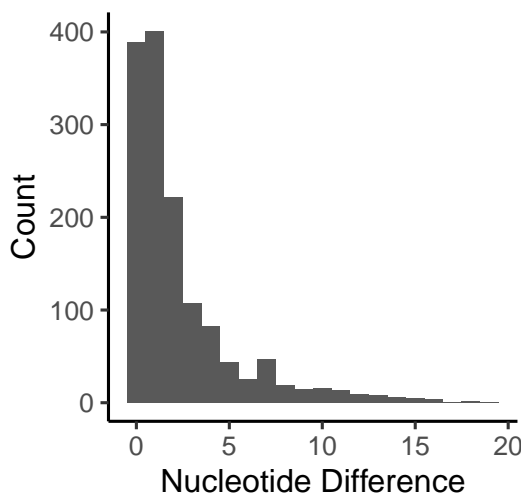
### IGHV3-53\*04

5324 sequences assigned  
1225 (23%) exact matches, in which:  
903 unique CDR3  
6 unique J



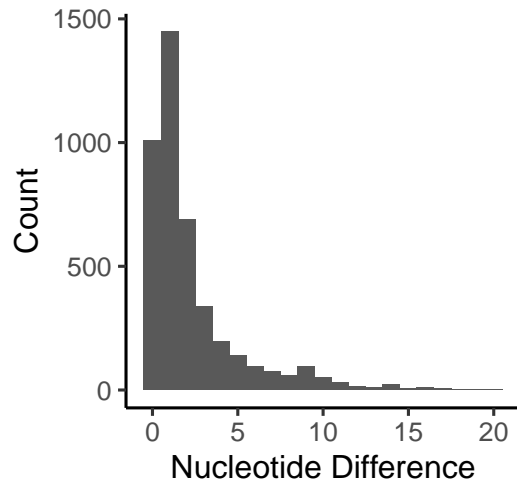
### IGHV3-64\*01

1430 sequences assigned  
389 (27.2%) exact matches, in which:  
298 unique CDR3  
6 unique J



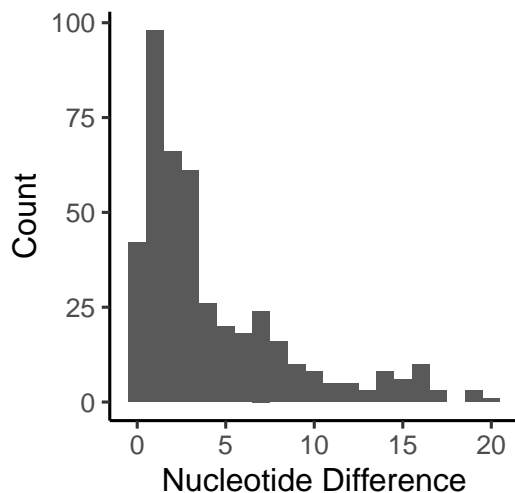
### IGHV3-66\*02

4326 sequences assigned  
1007 (23.3%) exact matches, in which:  
711 unique CDR3  
6 unique J



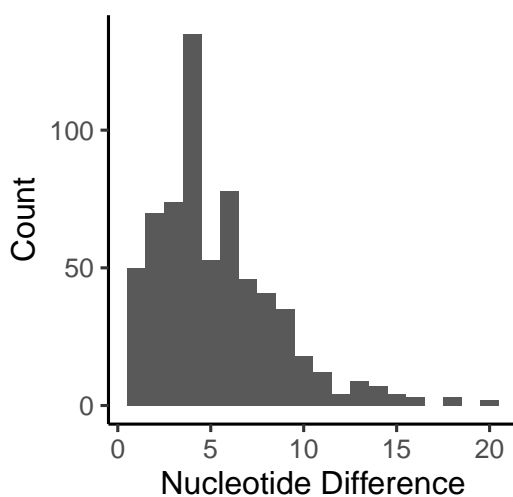
### IGHV3-53\*04\_T267G\_C3

438 sequences assigned  
42 (9.6%) exact matches, in which:  
42 unique CDR3  
4 unique J



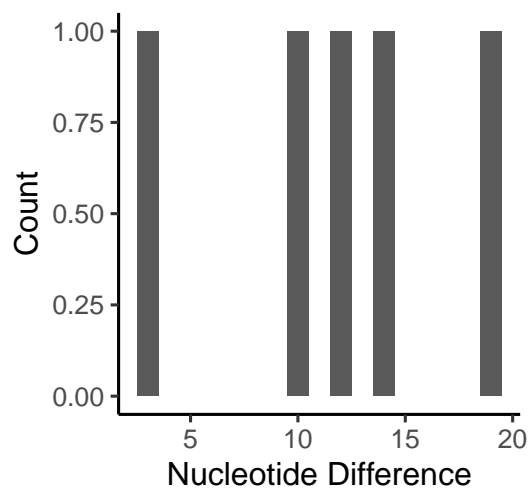
### IGHV3-64\*04

645 sequences assigned  
No exact matches.



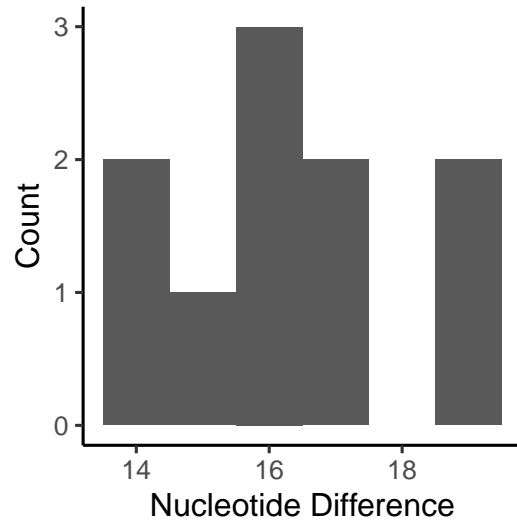
### IGHV3-69-1\*01

5 sequences assigned  
No exact matches.



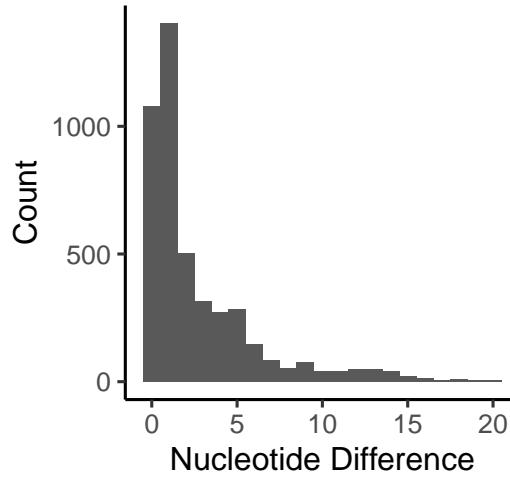
### IGHV3-71\*04

14 sequences assigned  
No exact matches.



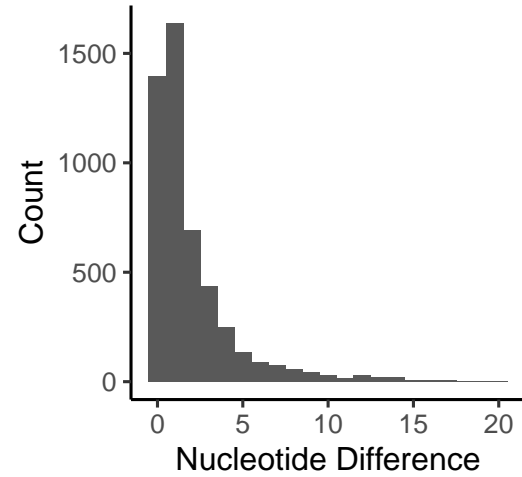
### IGHV3-74\*01

4551 sequences assigned  
1080 (23.7%) exact matches, in which:  
776 unique CDR3  
6 unique J



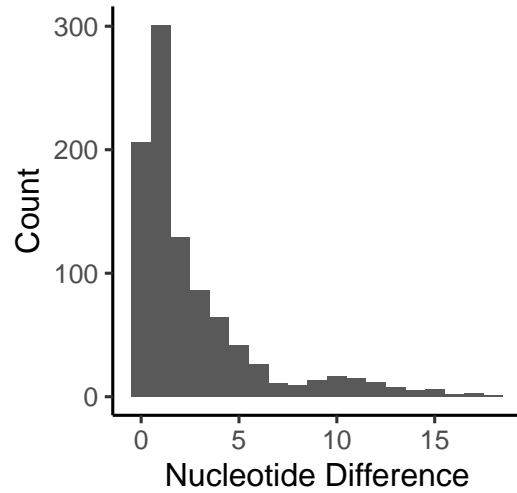
### IGHV3-64D\*06

4989 sequences assigned  
1396 (28%) exact matches, in which:  
1056 unique CDR3  
6 unique J



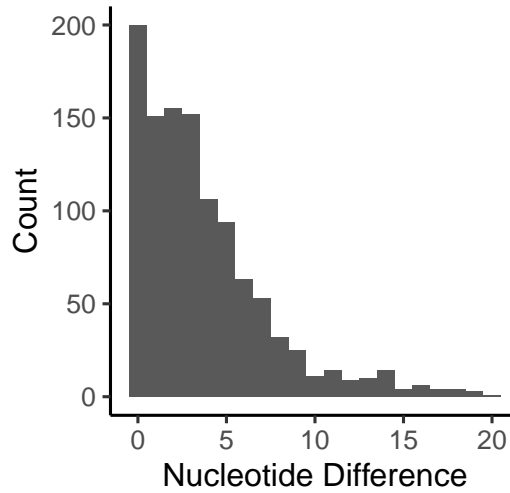
### IGHV3-72\*01

971 sequences assigned  
206 (21.2%) exact matches, in which:  
136 unique CDR3  
5 unique J



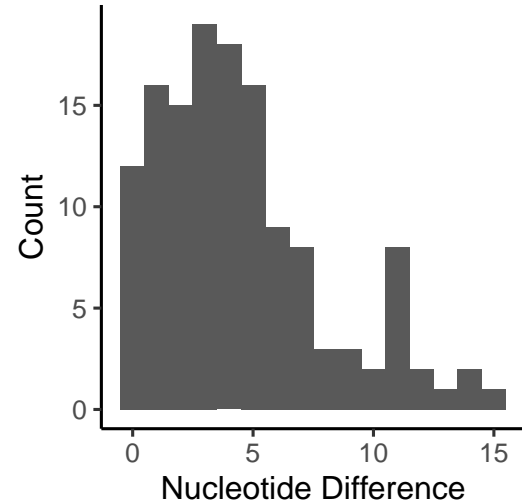
### IGHV3-74\*01\_A315G

1115 sequences assigned  
200 (17.9%) exact matches, in which:  
200 unique CDR3  
6 unique J



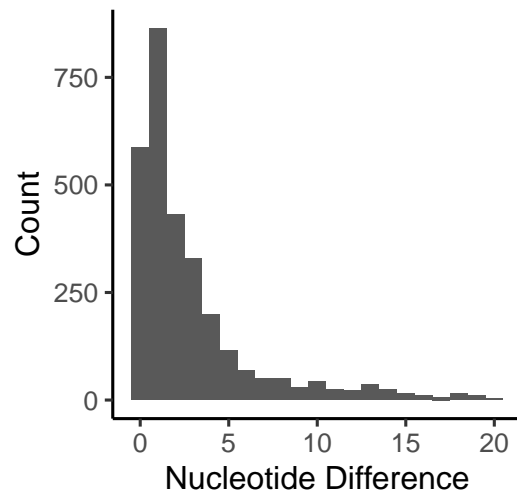
### IGHV3-NL1\*01\_G49A\_C1

135 sequences assigned  
12 (8.9%) exact matches, in which:  
11 unique CDR3  
4 unique J



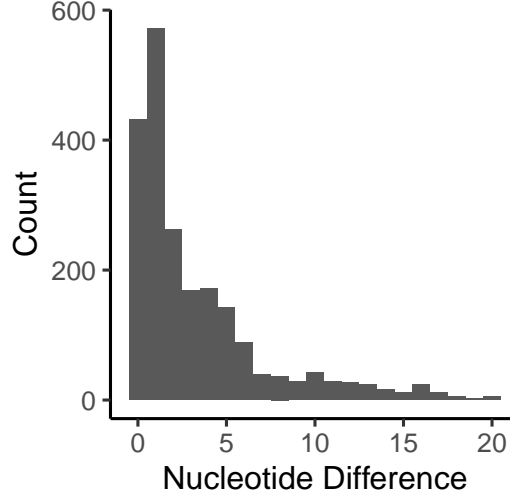
### IGHV3-73\*01

2964 sequences assigned  
588 (19.8%) exact matches, in which:  
415 unique CDR3  
6 unique J



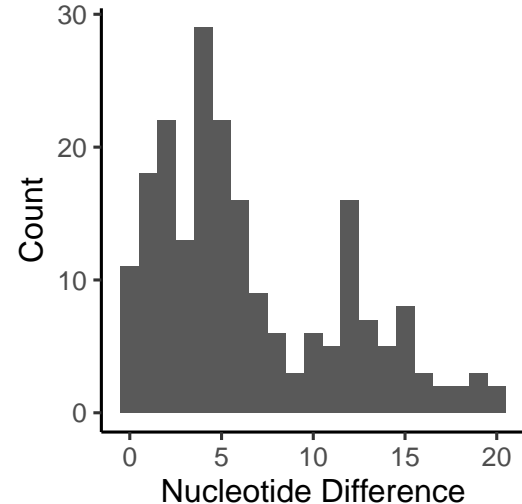
### IGHV3-43D\*03

2166 sequences assigned  
432 (19.9%) exact matches, in which:  
320 unique CDR3  
6 unique J



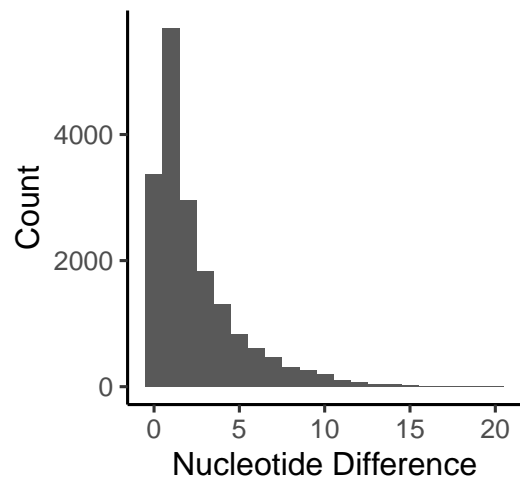
### IGHV3-NL1\*01\_G49A\_G7

213 sequences assigned  
11 (5.2%) exact matches, in which:  
10 unique CDR3  
4 unique J



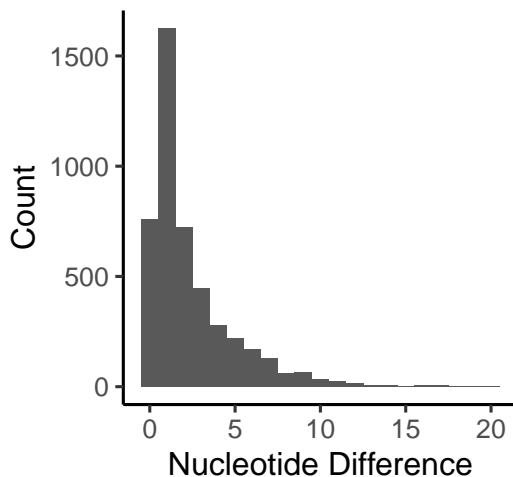
### IGHV4-4\*02

18293 sequences assigned  
3373 (18.4%) exact matches, in which:  
2495 unique CDR3  
6 unique J



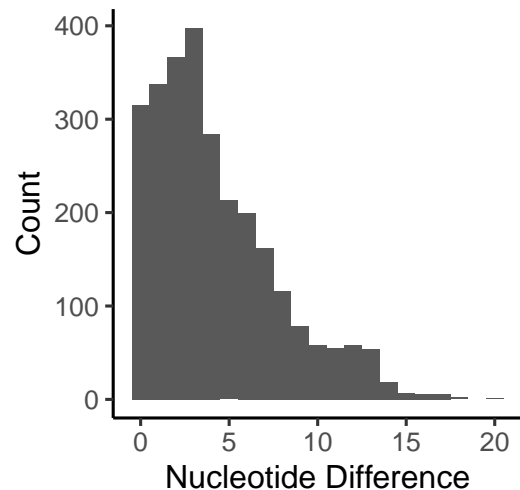
### IGHV4-30-2\*01

4618 sequences assigned  
762 (16.5%) exact matches, in which:  
512 unique CDR3  
5 unique J



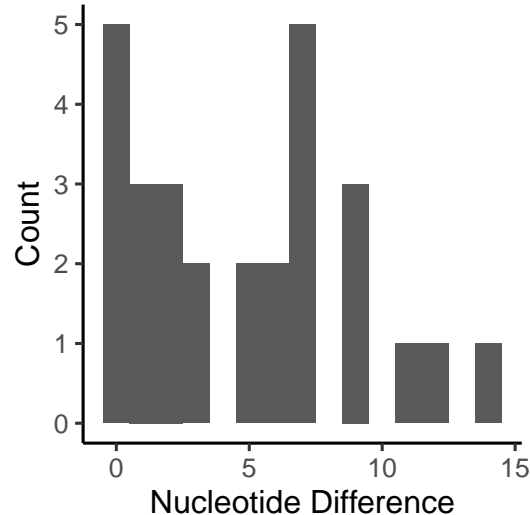
### IGHV4-30-4\*01\_C315G

2762 sequences assigned  
315 (11.4%) exact matches, in which:  
308 unique CDR3  
6 unique J



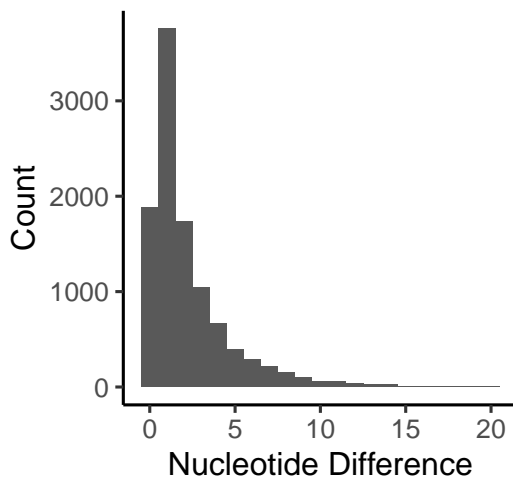
### IGHV4-28\*03

28 sequences assigned  
5 (17.9%) exact matches, in which:  
5 unique CDR3  
3 unique J



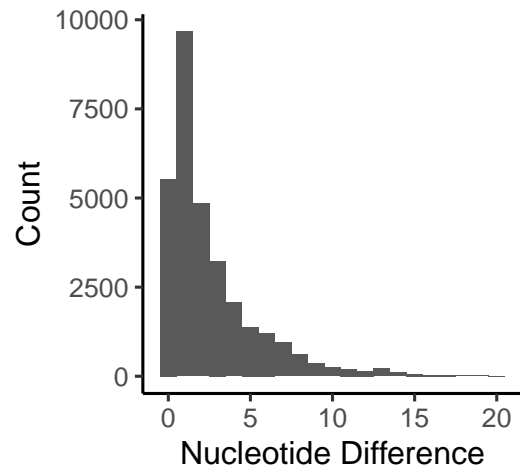
### IGHV4-30-4\*01

10536 sequences assigned  
1878 (17.8%) exact matches, in which:  
1296 unique CDR3  
6 unique J



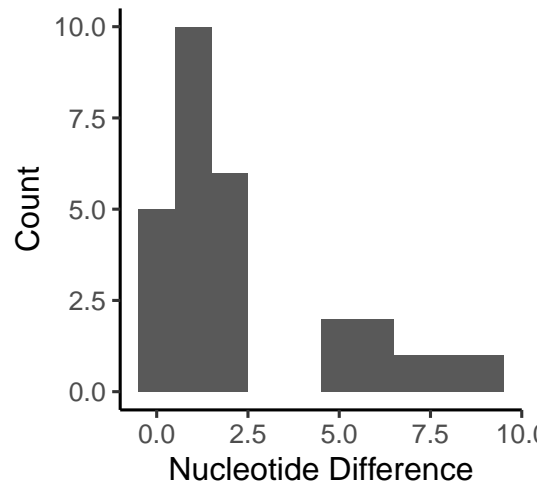
### IGHV4-31\*03

31202 sequences assigned  
5530 (17.7%) exact matches, in which:  
3976 unique CDR3  
6 unique J



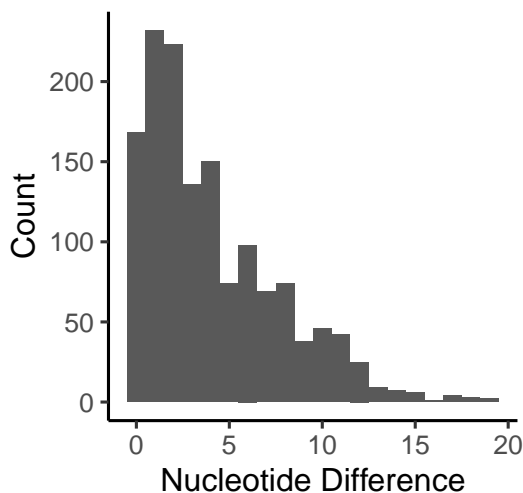
### IGHV4-28\*07

28 sequences assigned  
5 (17.9%) exact matches, in which:  
3 unique CDR3  
2 unique J



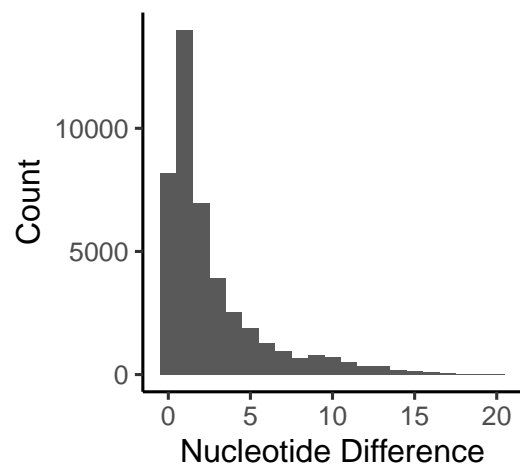
### IGHV4-30-2\*01\_C315G

1428 sequences assigned  
168 (11.8%) exact matches, in which:  
162 unique CDR3  
6 unique J



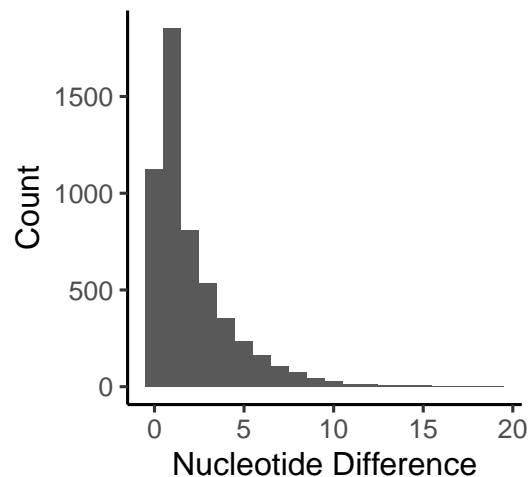
### IGHV4-34\*01

43965 sequences assigned  
8198 (18.6%) exact matches, in which:  
5866 unique CDR3  
6 unique J



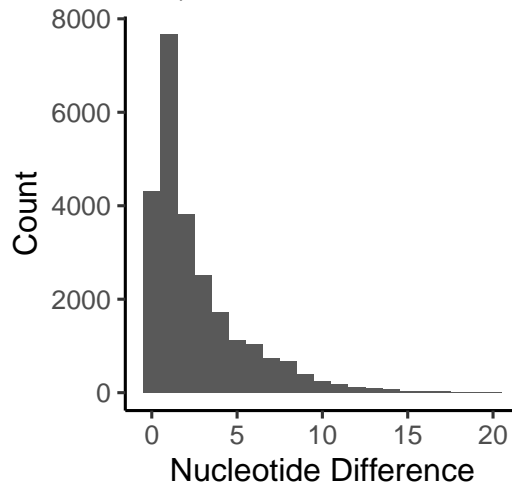
### IGHV4-38-2\*02

5391 sequences assigned  
1122 (20.8%) exact matches, in which:  
833 unique CDR3  
6 unique J



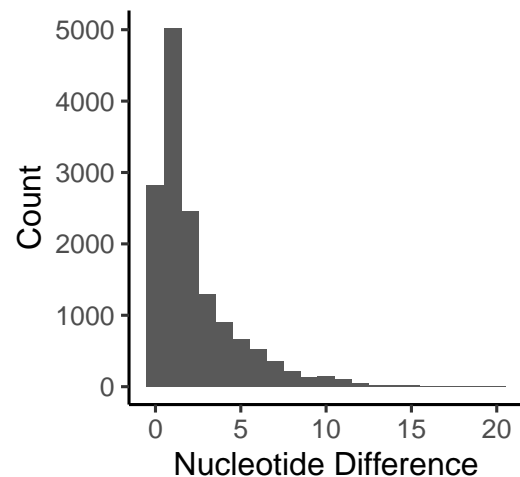
### IGHV4-39\*07

25037 sequences assigned  
4321 (17.3%) exact matches, in which:  
3277 unique CDR3  
6 unique J



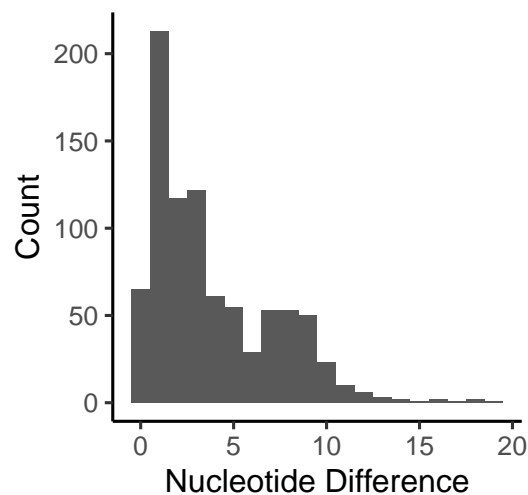
### IGHV4-59\*08

14848 sequences assigned  
2816 (19%) exact matches, in which:  
2030 unique CDR3  
6 unique J



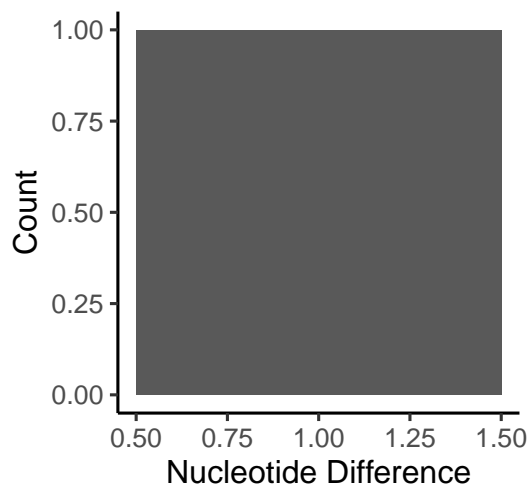
### IGHV4-38-2\*02\_A291G

953 sequences assigned  
65 (6.8%) exact matches, in which:  
65 unique CDR3  
6 unique J



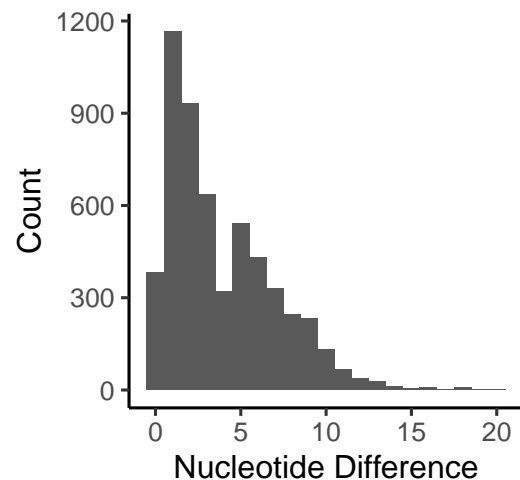
### IGHV4-55\*08

1 sequences assigned  
No exact matches.



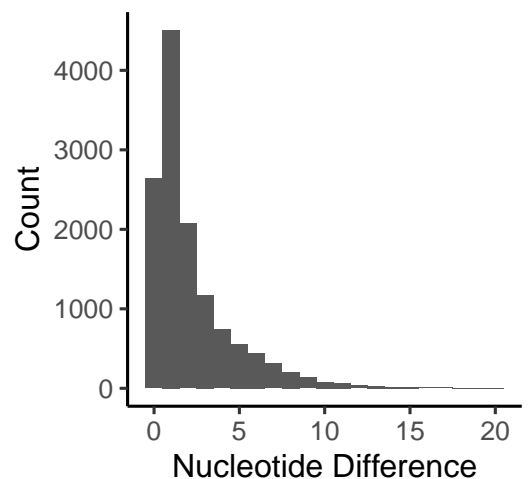
### IGHV4-59\*12

5602 sequences assigned  
382 (6.8%) exact matches, in which:  
375 unique CDR3  
6 unique J



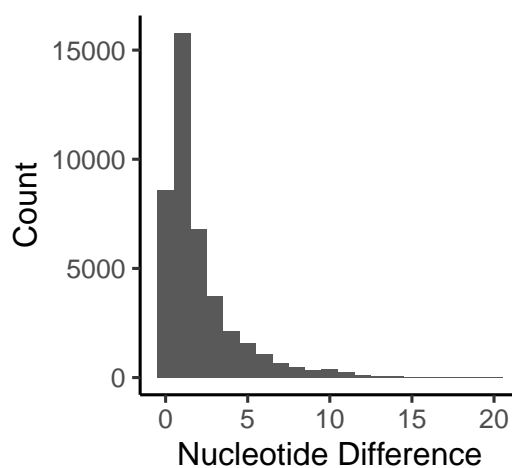
### IGHV4-39\*01

13141 sequences assigned  
2639 (20.1%) exact matches, in which:  
2046 unique CDR3  
6 unique J



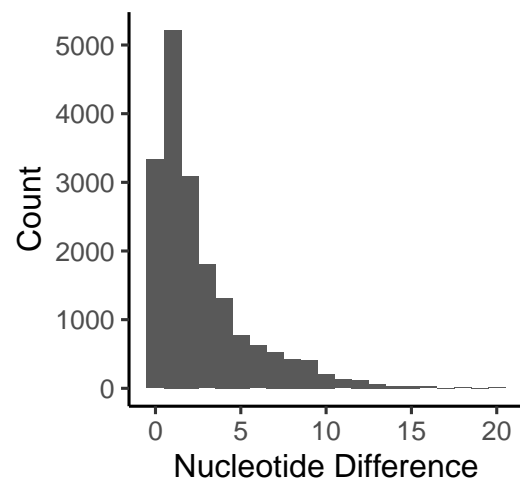
### IGHV4-59\*01

42414 sequences assigned  
8587 (20.2%) exact matches, in which:  
6112 unique CDR3  
6 unique J



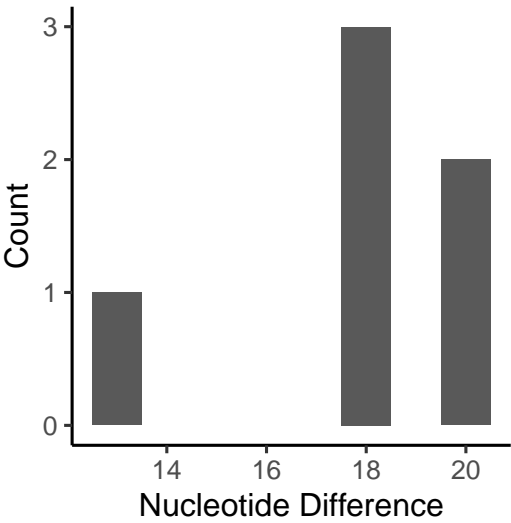
### IGHV4-61\*02

18247 sequences assigned  
3331 (18.3%) exact matches, in which:  
2592 unique CDR3  
6 unique J



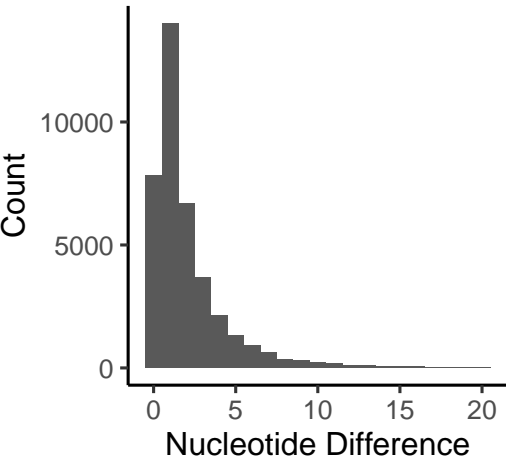
IGHV1/OR15-3\*02

7 sequences assigned  
No exact matches.



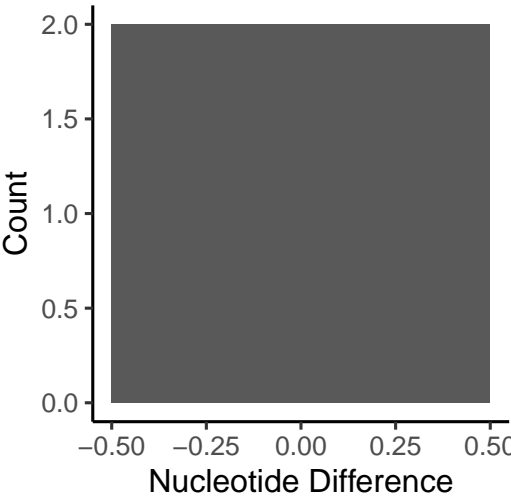
IGHV5-51\*01

39099 sequences assigned  
7843 (20.1%) exact matches, in which:  
5507 unique CDR3  
6 unique J



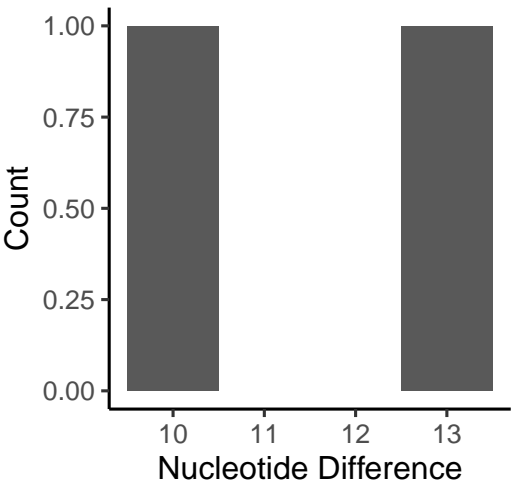
IGHV7-81\*01

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



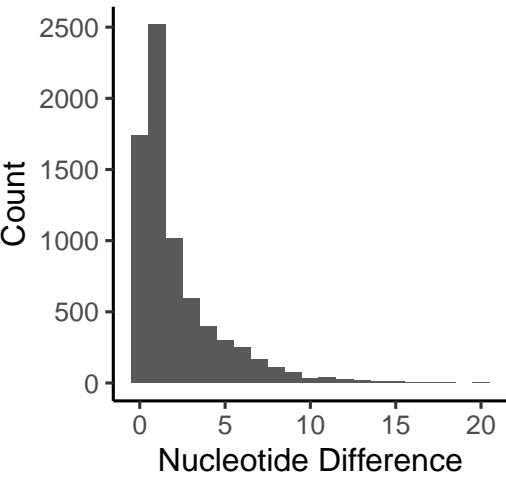
IGHV4/OR15-8\*01

2 sequences assigned  
No exact matches.



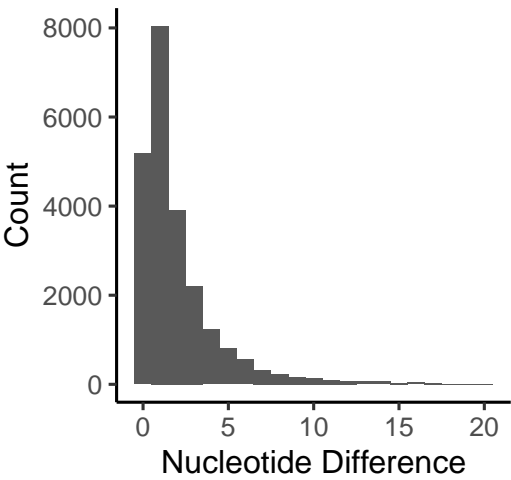
IGHV6-1\*01

7318 sequences assigned  
1736 (23.7%) exact matches, in which:  
1198 unique CDR3  
6 unique J



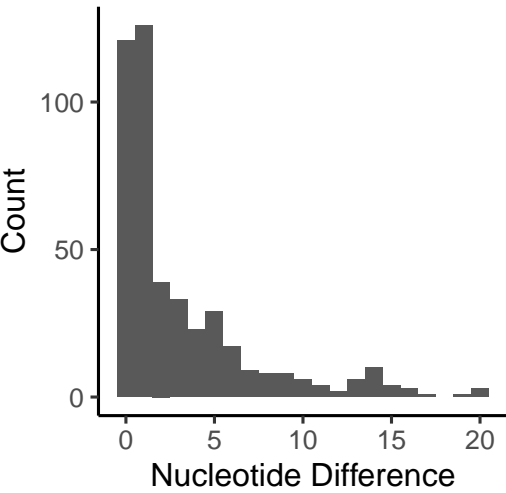
IGHV5-10-1\*01

23408 sequences assigned  
5179 (22.1%) exact matches, in which:  
3833 unique CDR3  
6 unique J



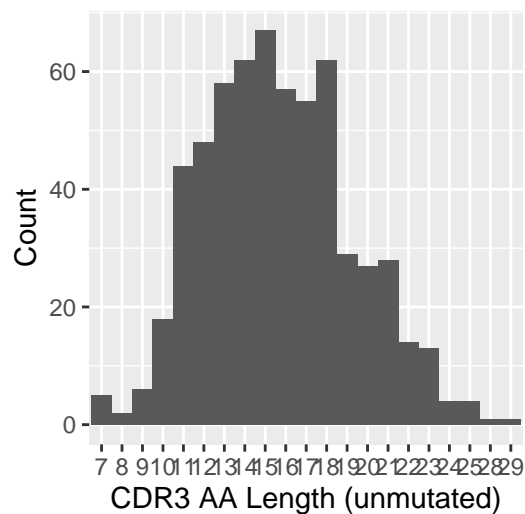
IGHV7-4-1\*01

457 sequences assigned  
121 (26.5%) exact matches, in which:  
100 unique CDR3  
6 unique J

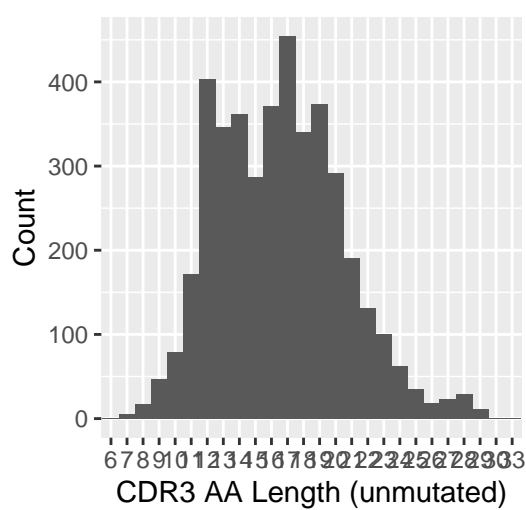




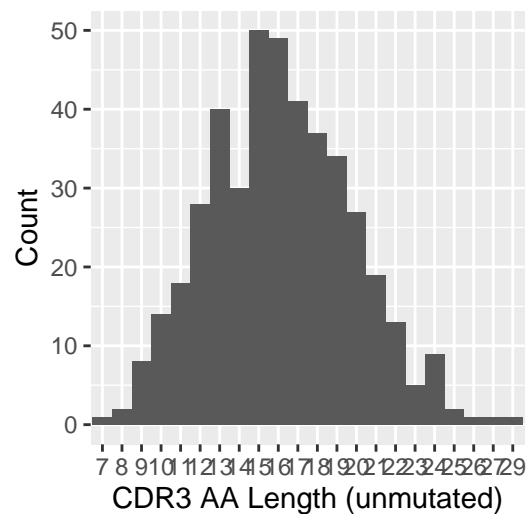
IGHV1-24\*01\_A315G\_C317V



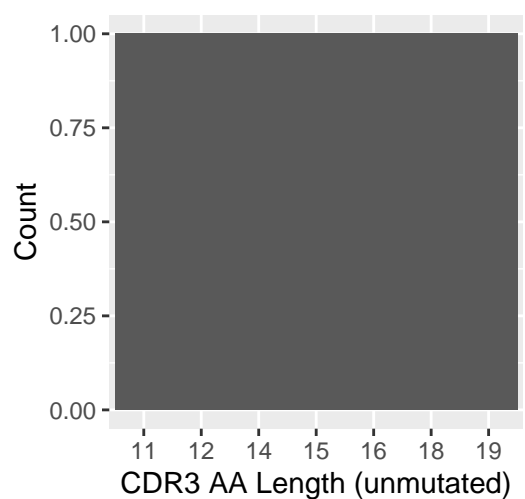
IGHV1-69\*08\_C191T



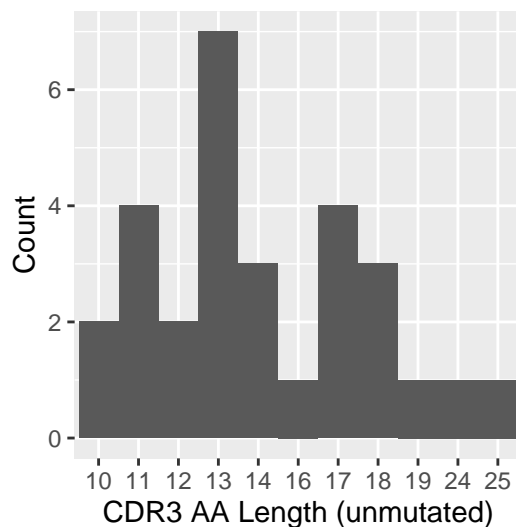
IGHV3-30\*03\_T288C



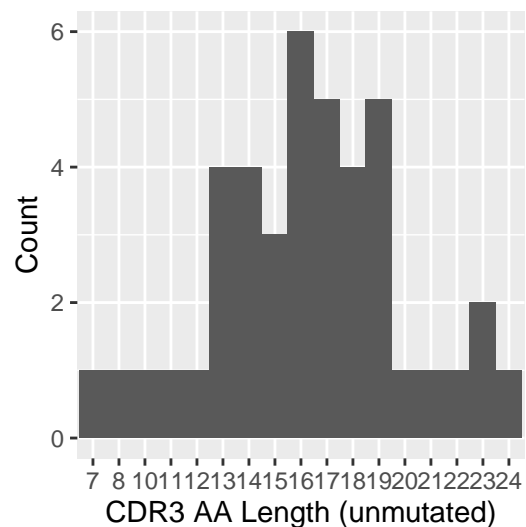
IGHV1-45\*02\_A315G



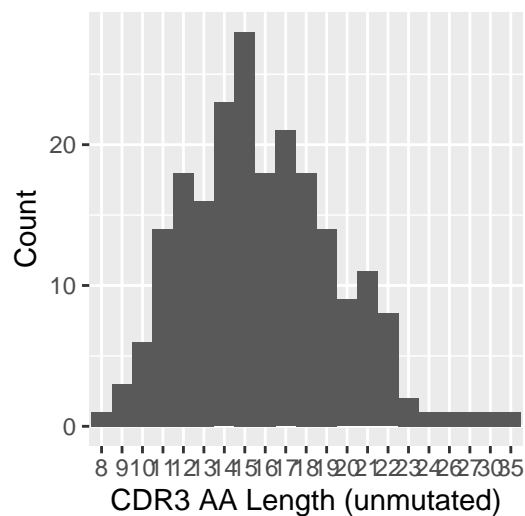
IGHV2-70\*15\_G303A



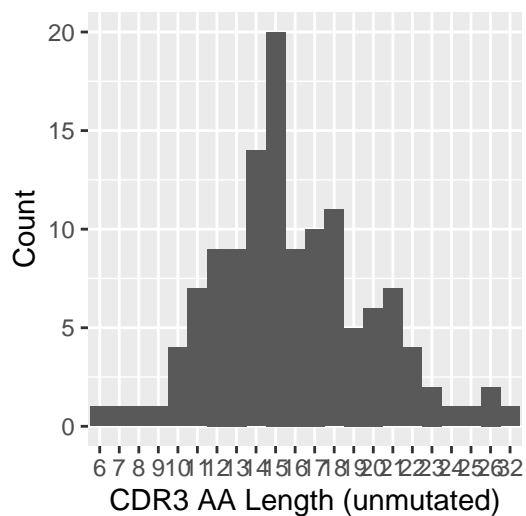
IGHV3-53\*04\_T267G\_C300T



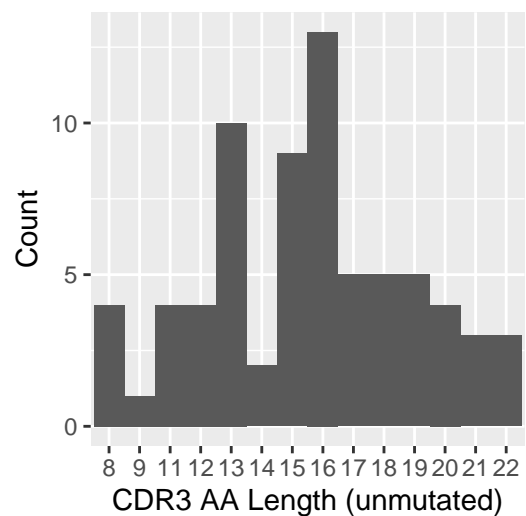
IGHV1-58\*02\_G316A\_C317V



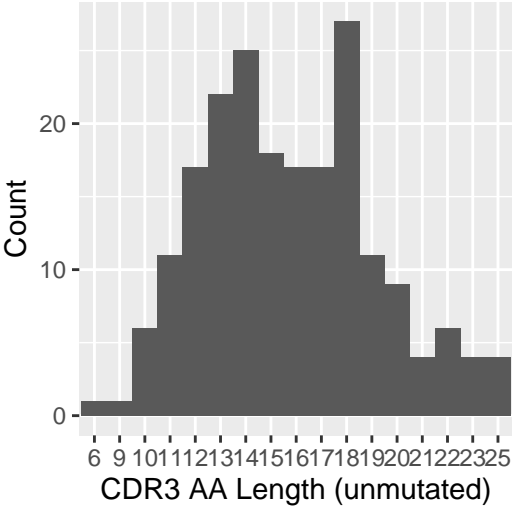
IGHV3-13\*04\_A315G



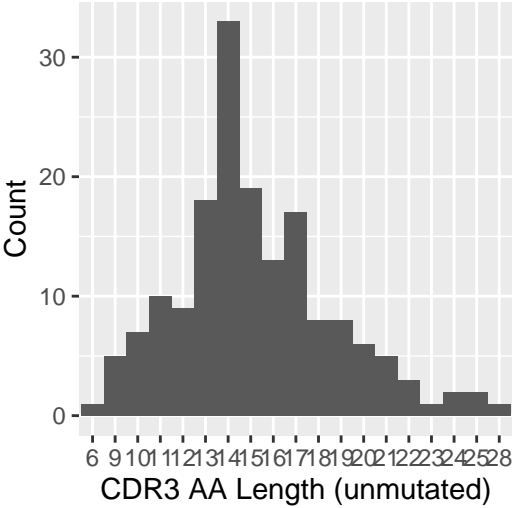
IGHV3-53\*04\_T267G\_T288C



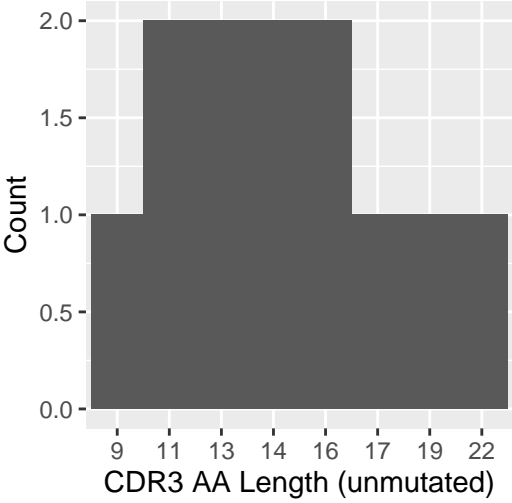
IGHV3-74\*01\_A315G



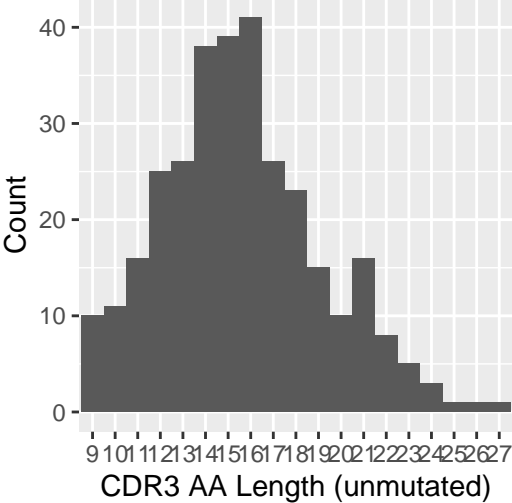
IGHV4-30-2\*01\_C315G



IGHV3-NL1\*01\_G49A\_C15G

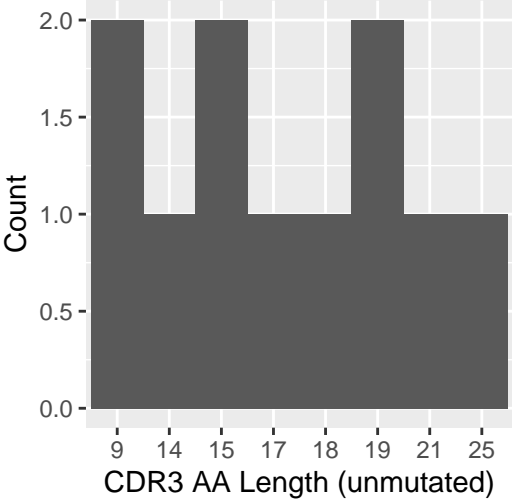


IGHV4-30-4\*01\_C315G

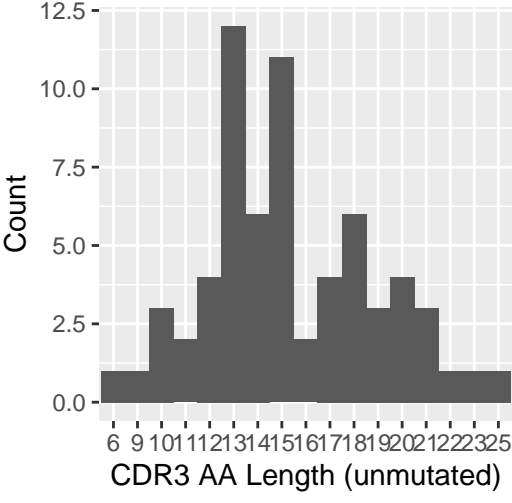


\_T288C\_A317G

IGHV3-NL1\*01\_G49A\_G75C



IGHV4-38-2\*02\_A291G



A317G

