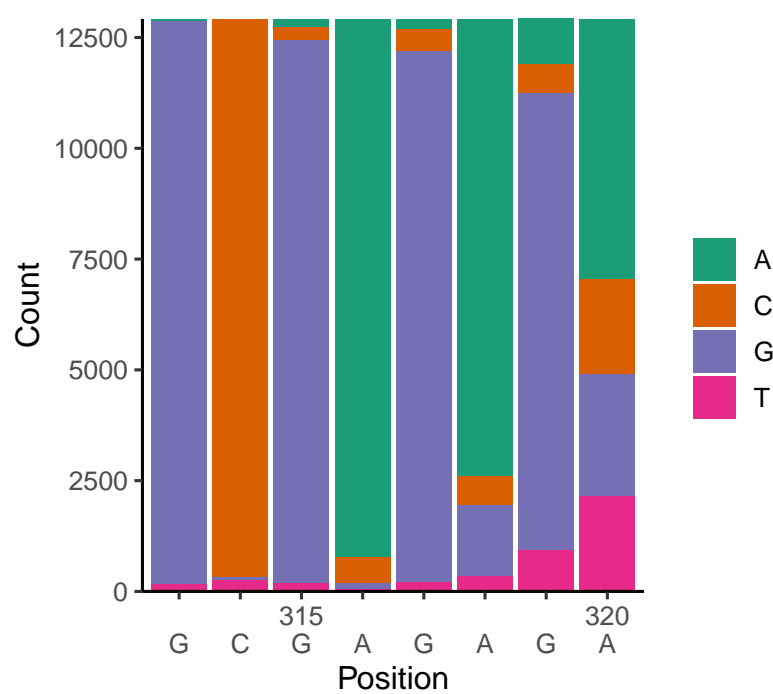
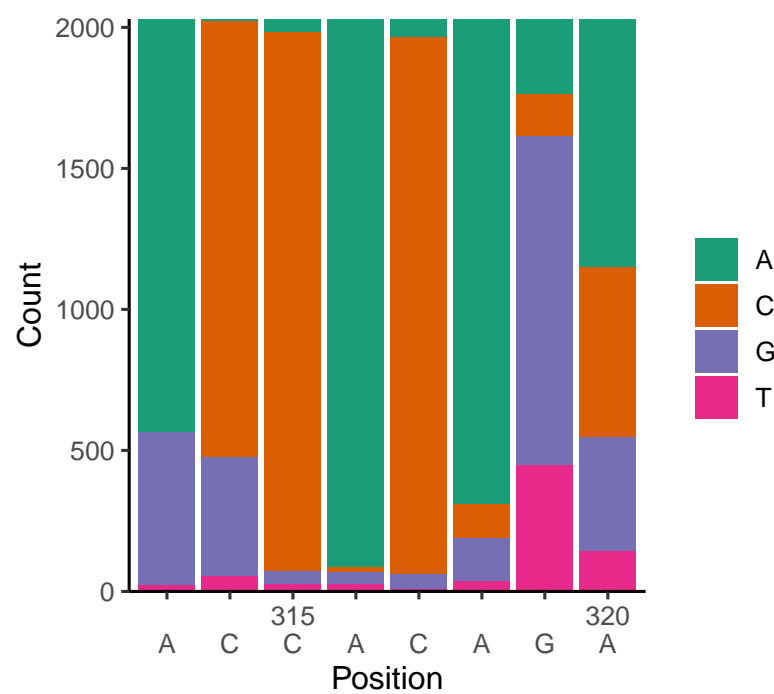


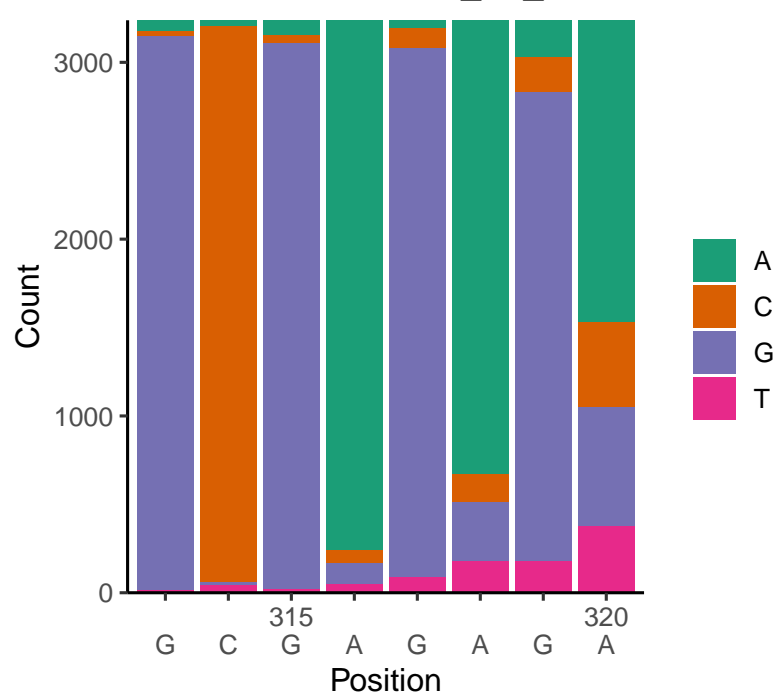
Gene IGHV1-18\*01\_A190G



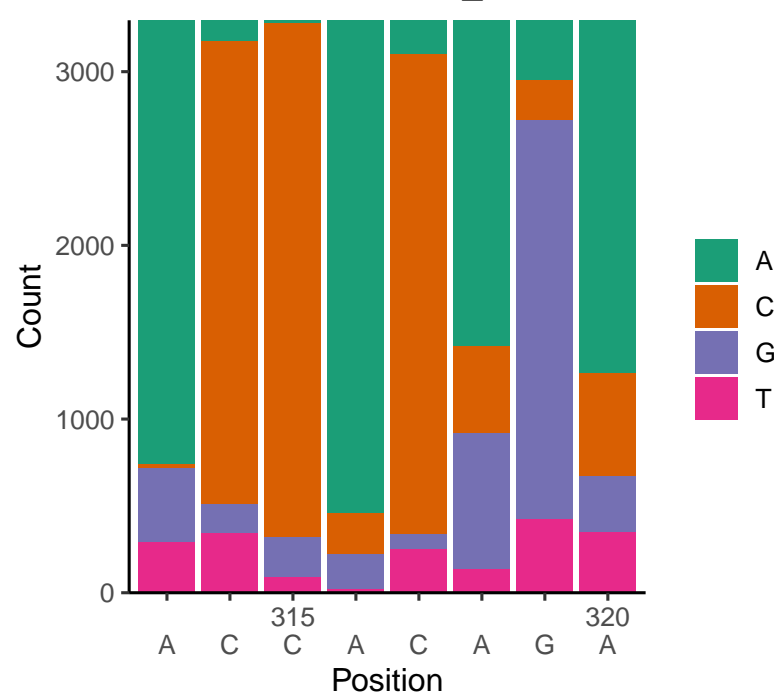
Gene IGHV3-15\*01\_02\_G147A



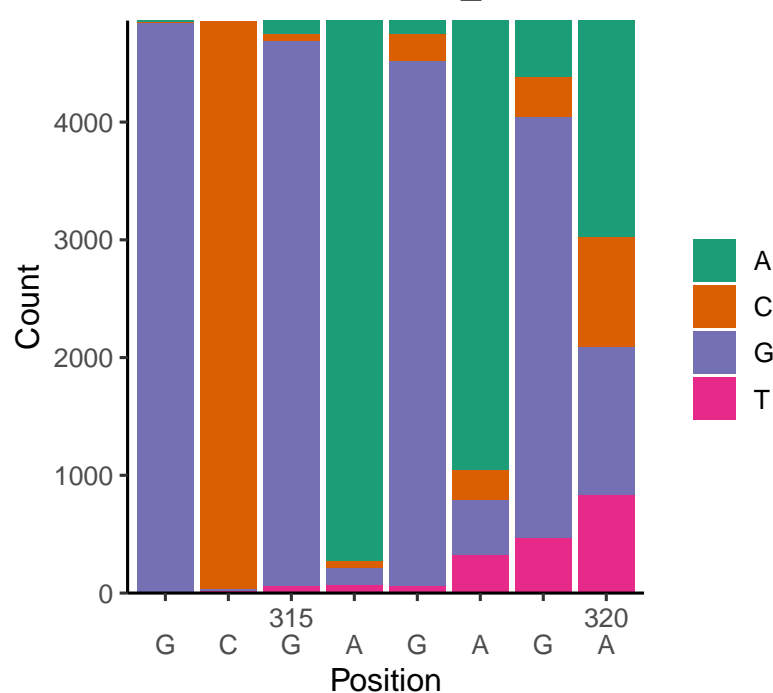
Gene IGHV1-69\*04\_09\_G112A



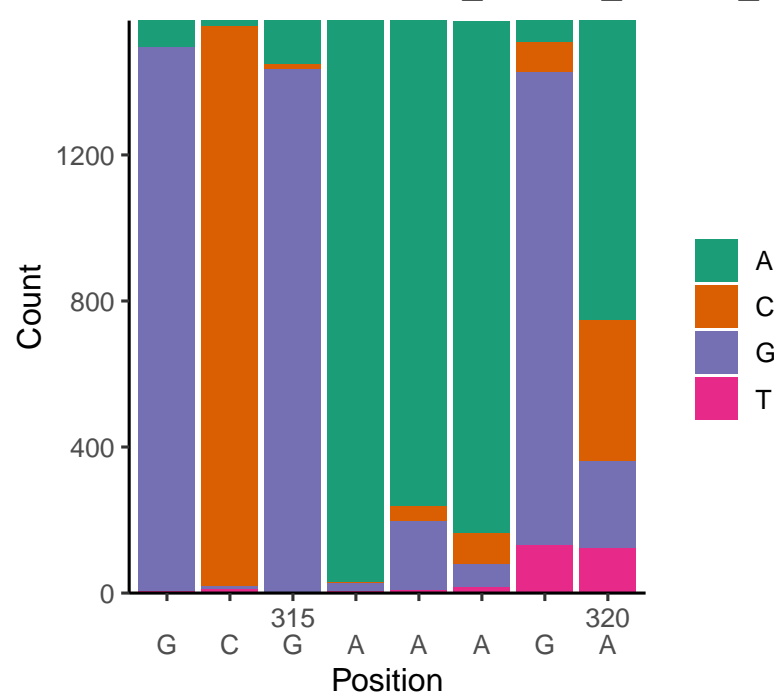
Gene IGHV3-15\*07\_C159T



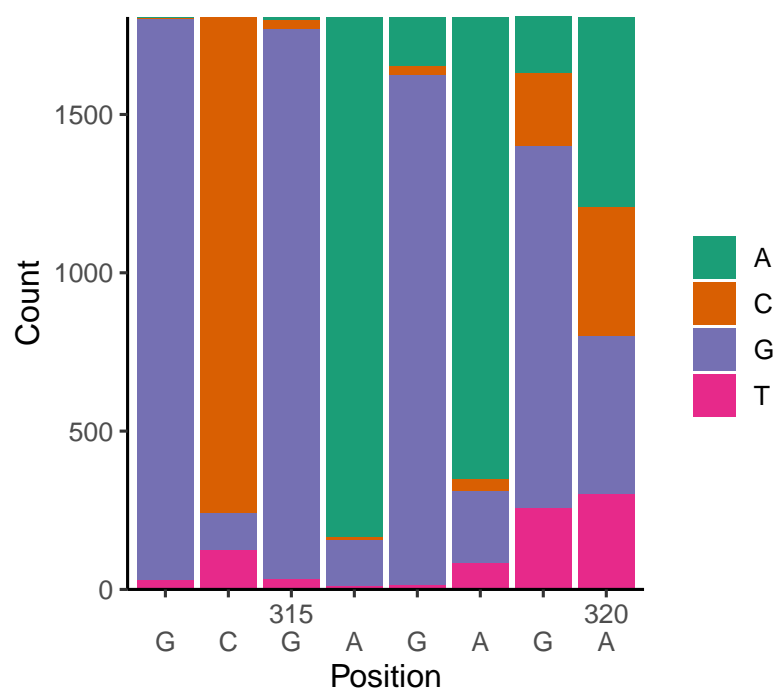
Gene IGHV1-69\*10\_A244G



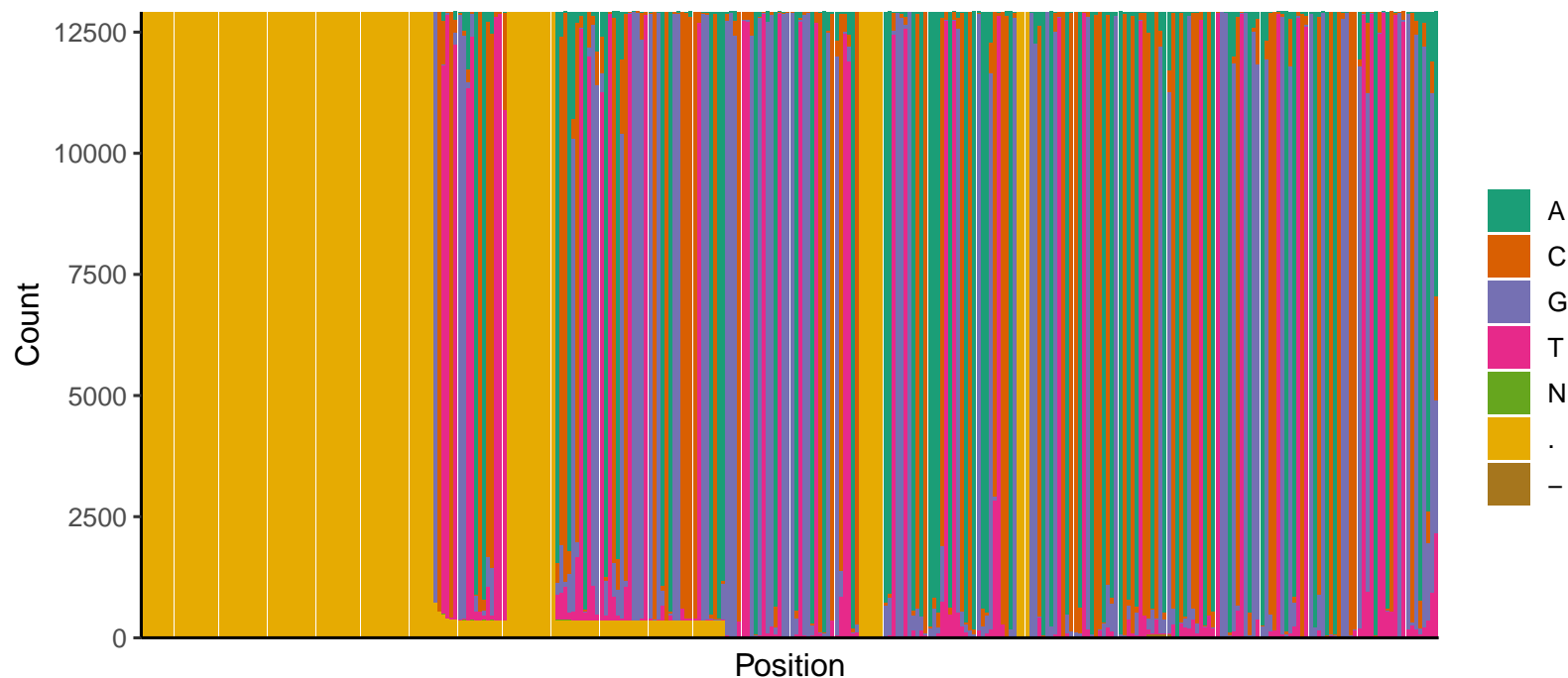
Gene IGHV3-30\*18\_C170G\_A171G\_G3



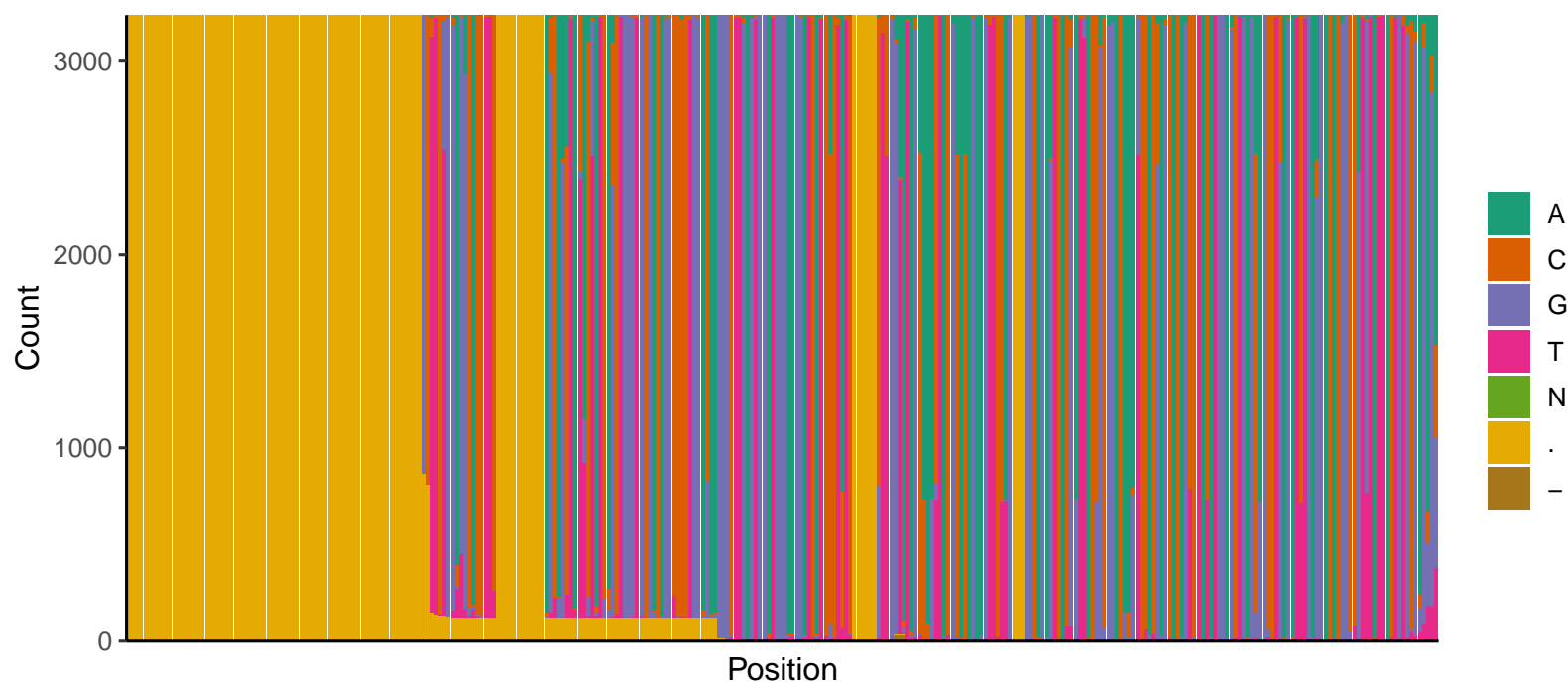
# Gene IGHV4-31\*03\_04\_C198T



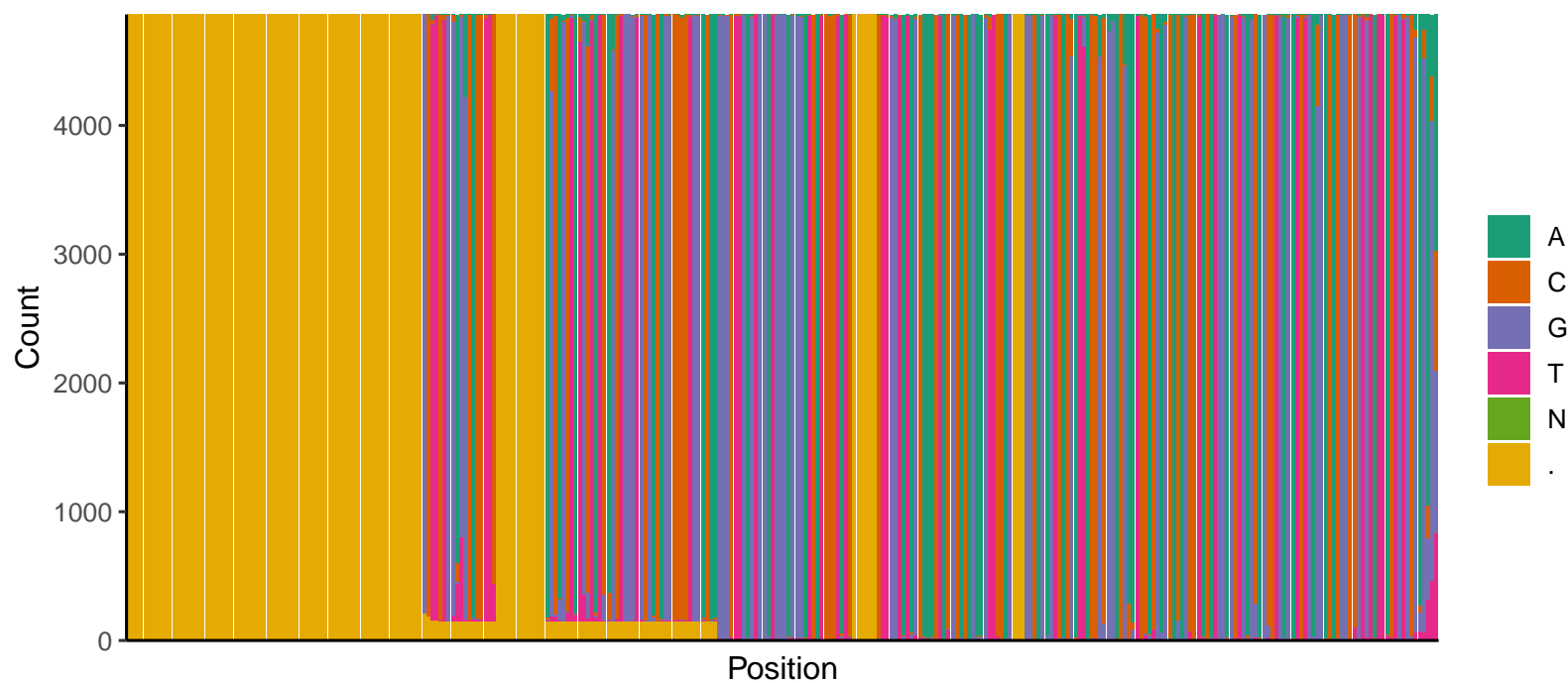
Gene IGHV1-18\*01\_A190G



Gene IGHV1-69\*04\_09\_G112A



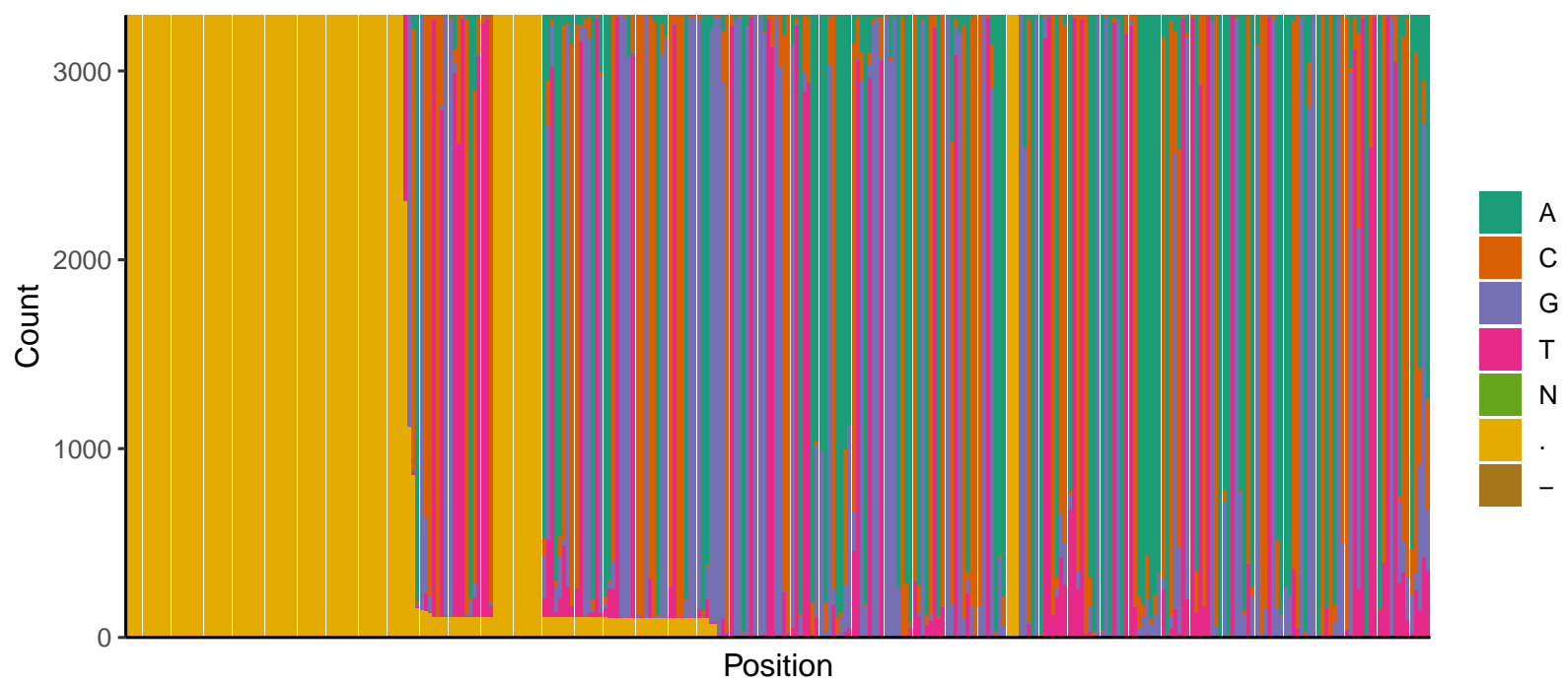
Gene IGHV1-69\*10\_A244G



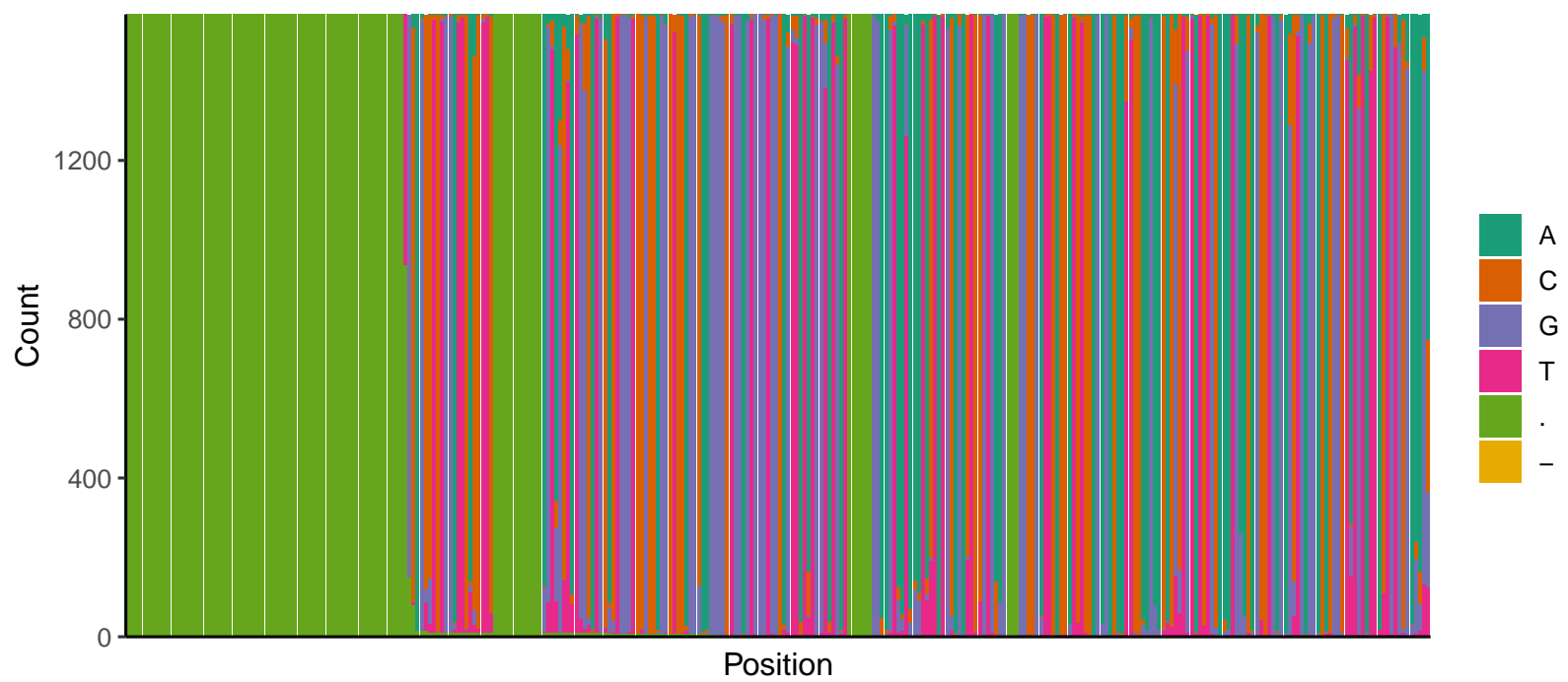
Gene IGHV3-15\*01\_02\_G147A



Gene IGHV3-15\*07\_C159T



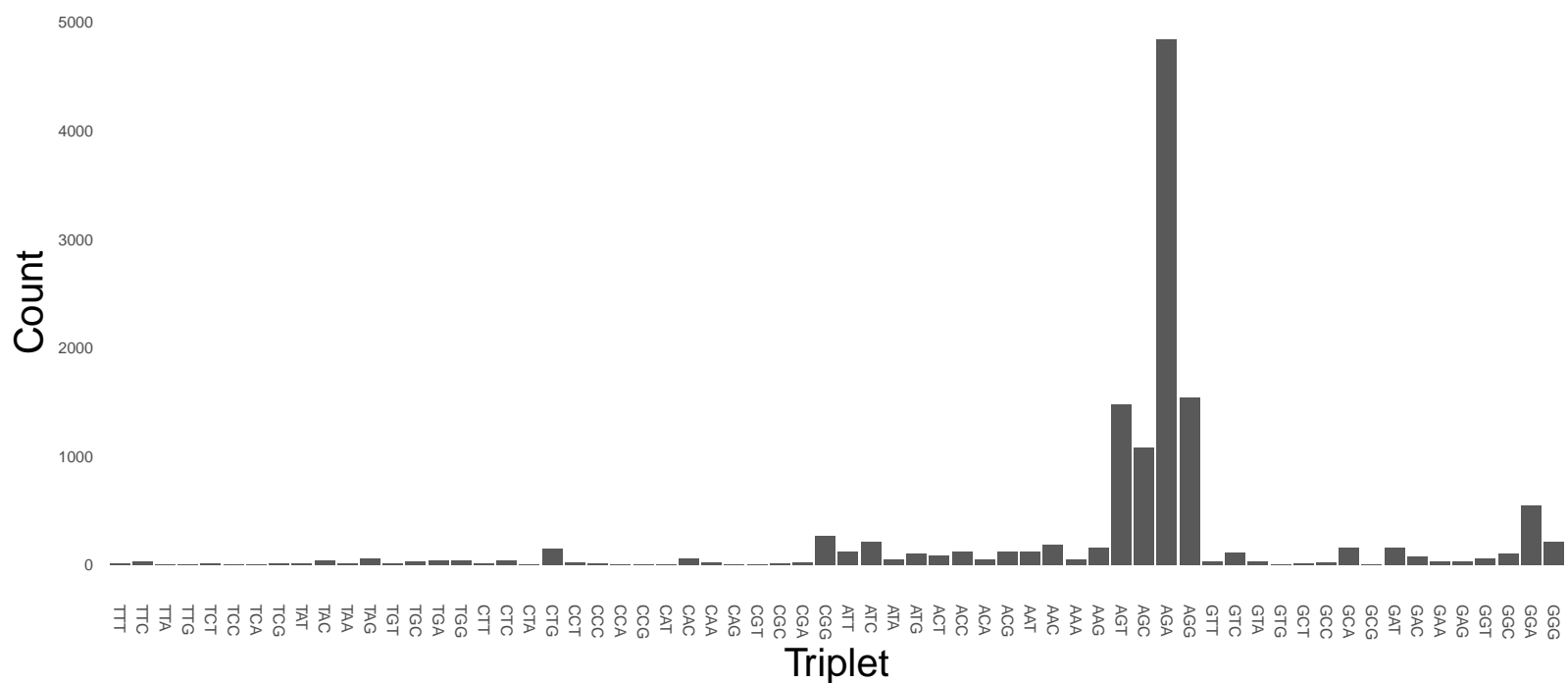
Gene IGHV3-30\*18\_C170G\_A171G\_G301A



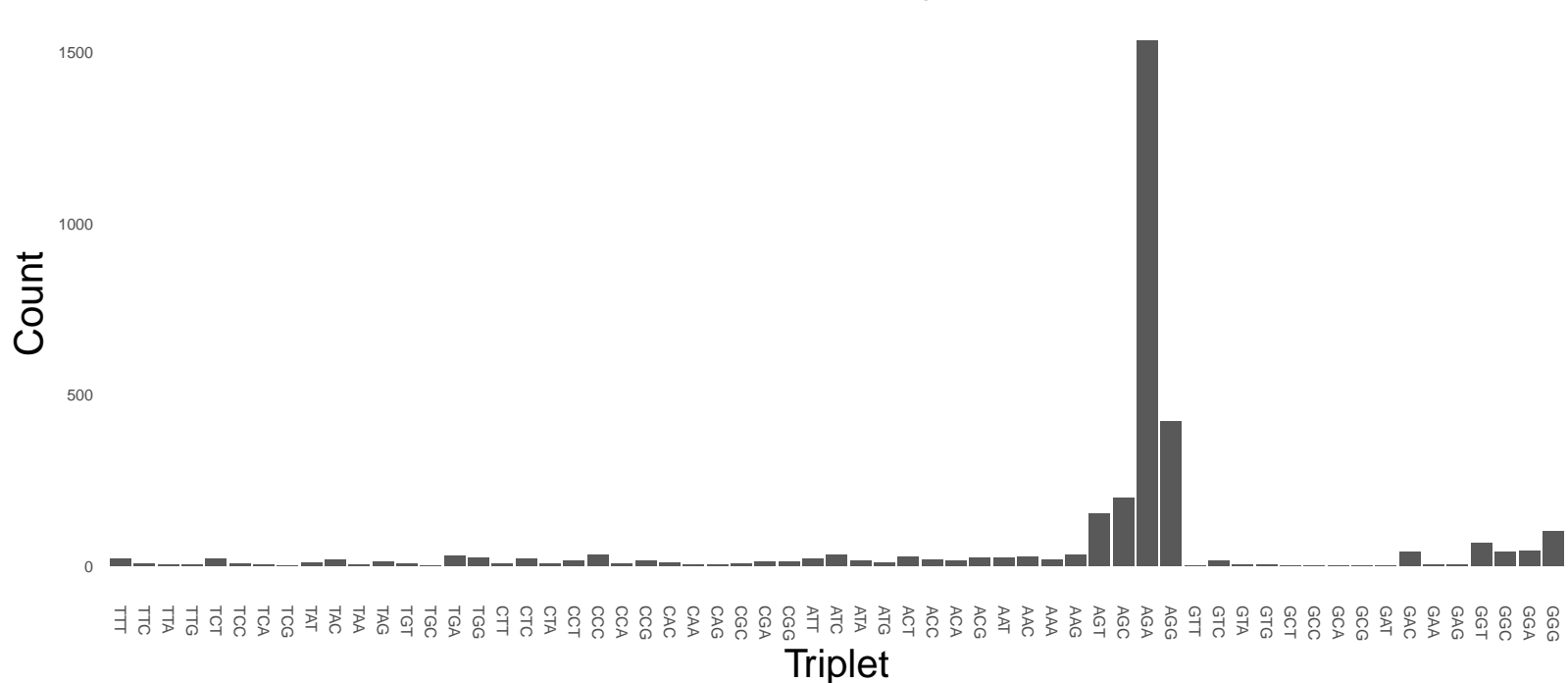
# Gene IGHV4-31\*03\_04\_C198T



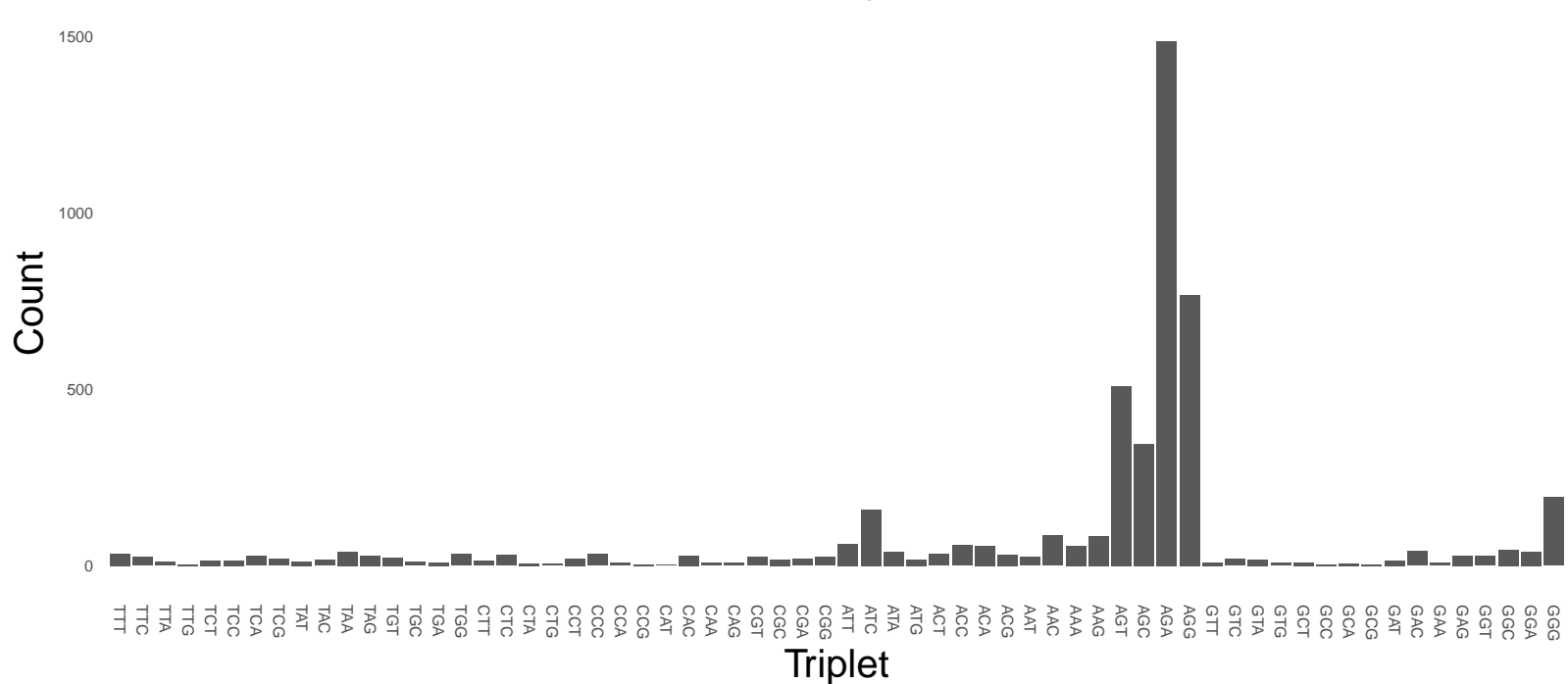
### IGHV1-18\*01\_A190G- Final 3 nucleotides as a triplet



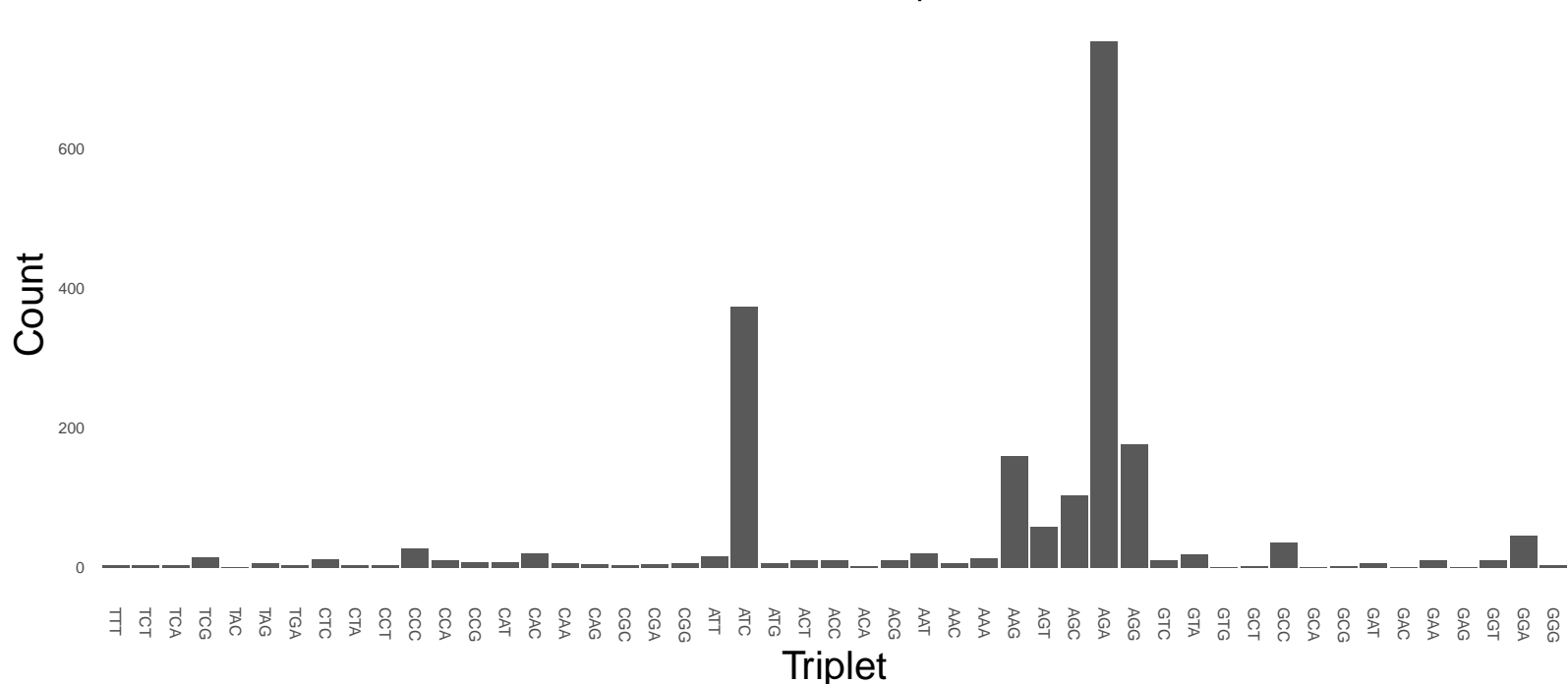
IGHV1-69\*04\_09\_G112A- Final 3 nucleotides as a triplet



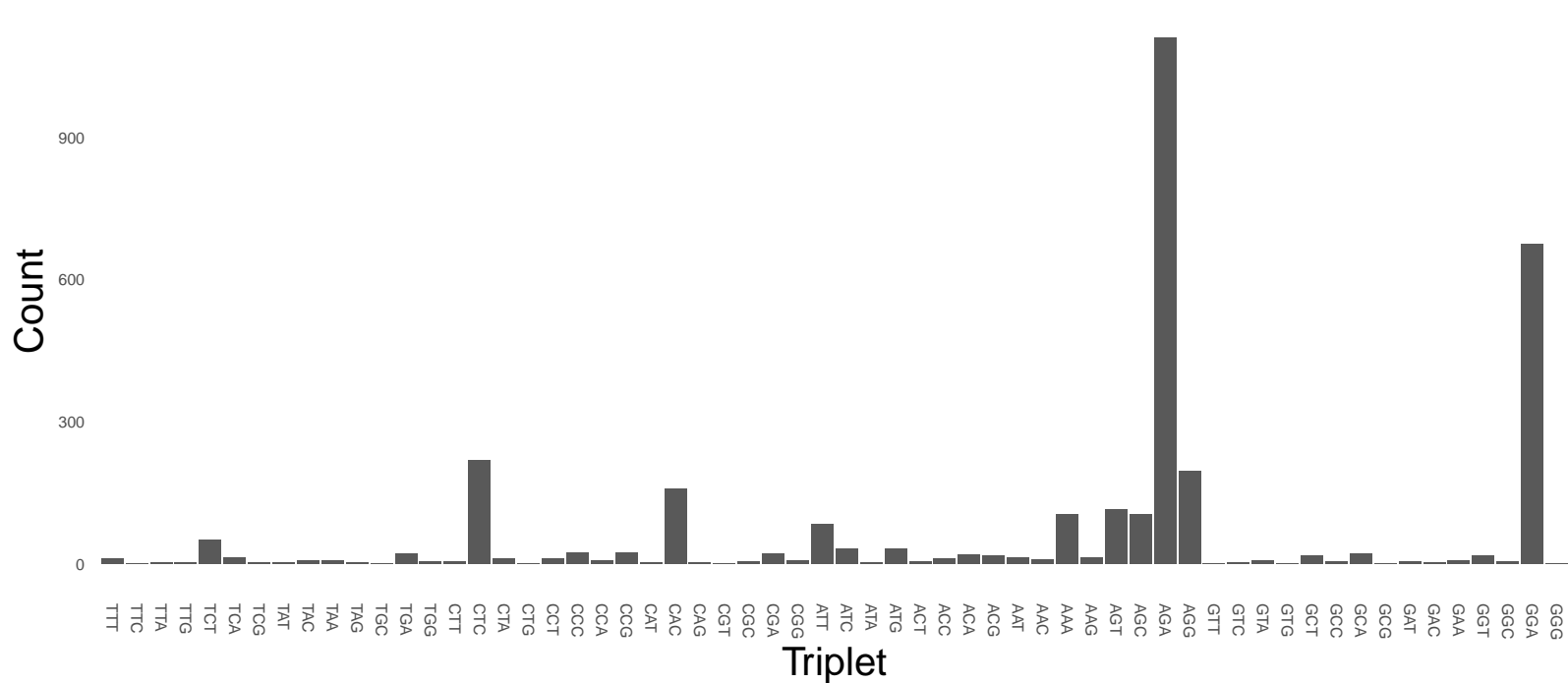
### IGHV1-69\*10\_A244G- Final 3 nucleotides as a triplet



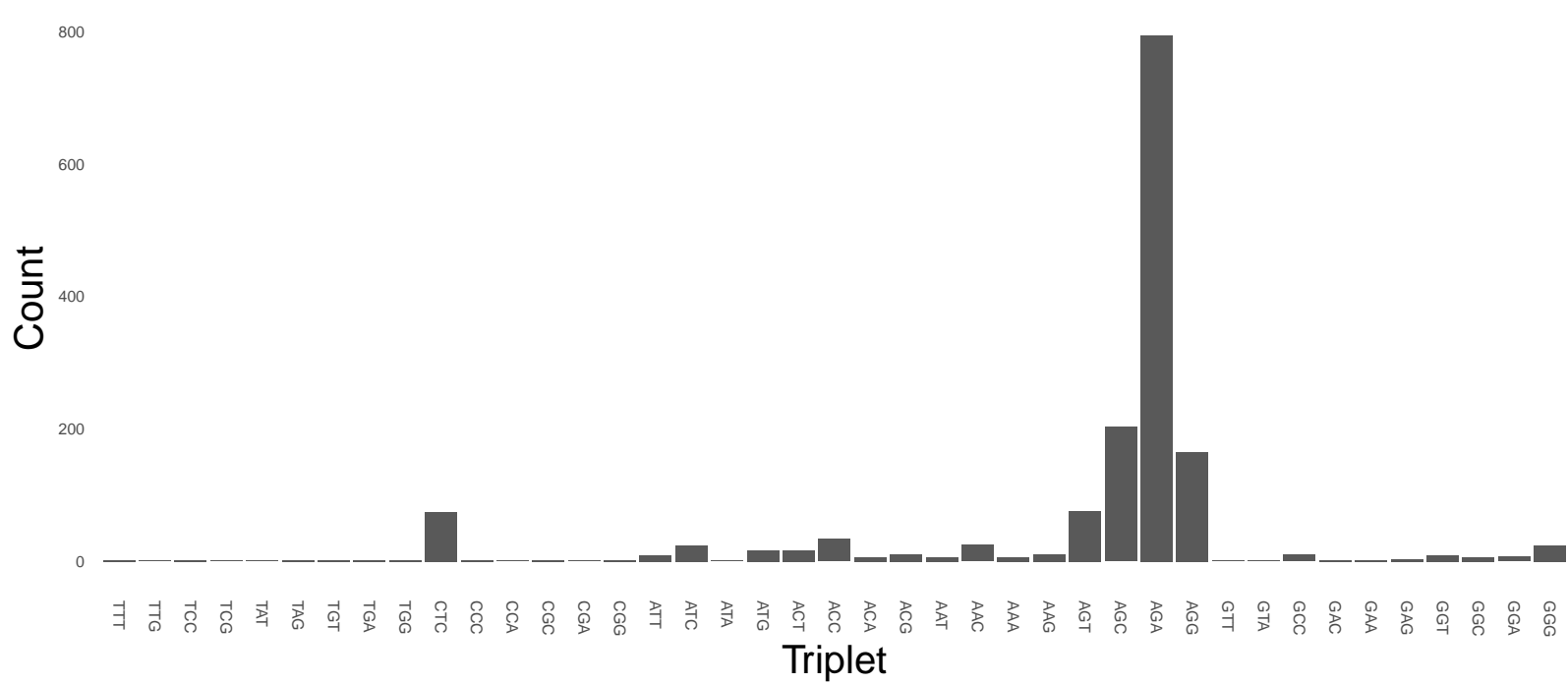
IGHV3-15\*01\_02\_G147A- Final 3 nucleotides as a triplet



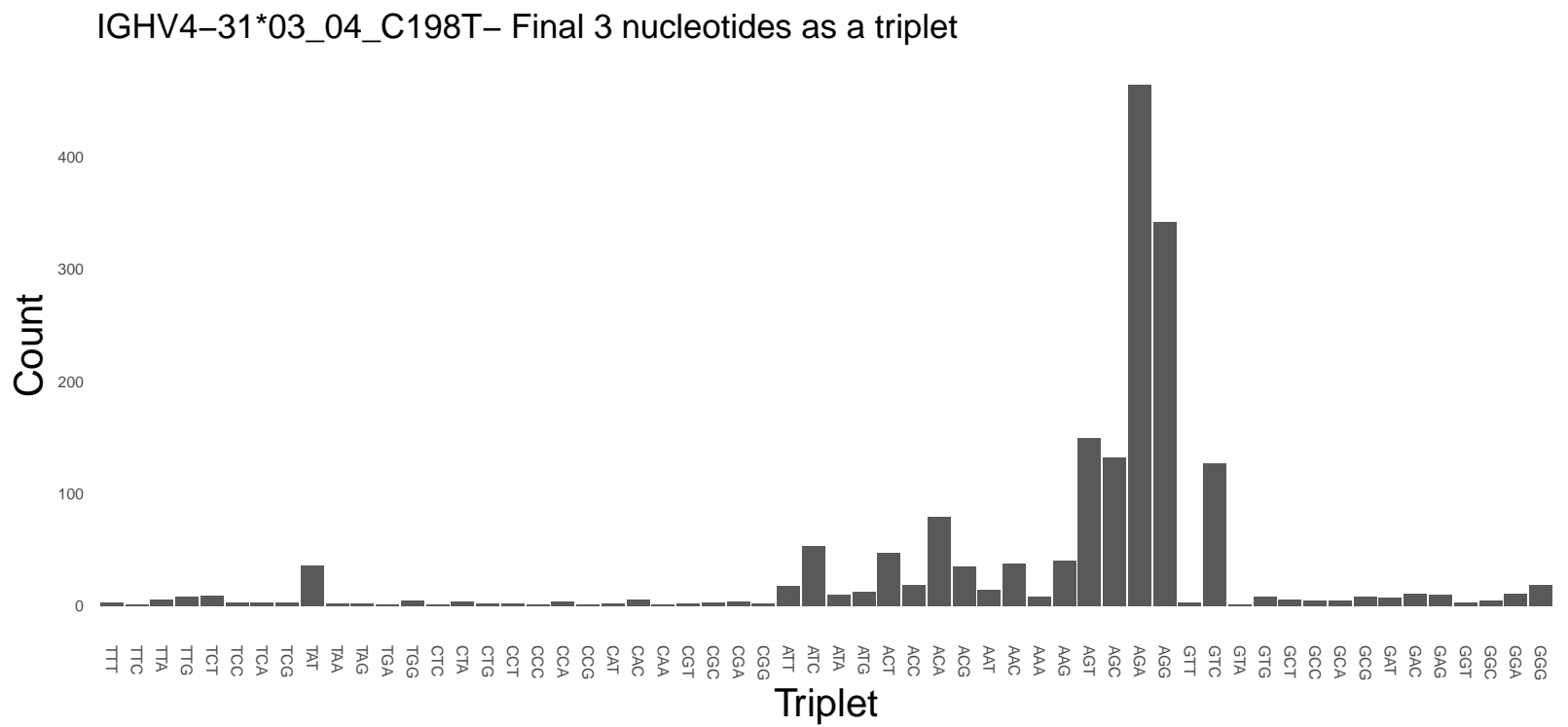
IGHV3-15\*07\_C159T- Final 3 nucleotides as a triplet



IGHV3-30\*18\_C170G\_A171G\_G301A- Final 3 nucleotides as a triplet



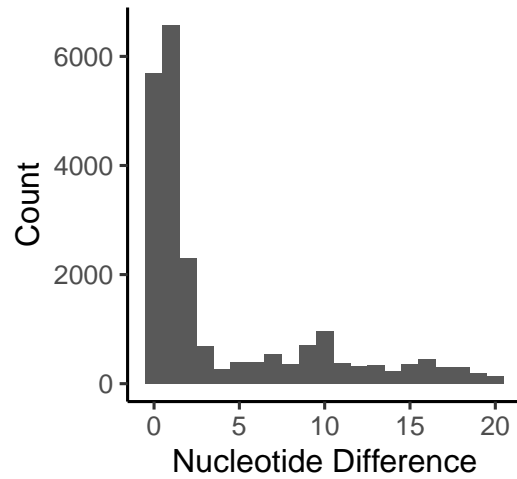
IGHV4-31\*03\_04\_C198T- Final 3 nucleotides as a triplet





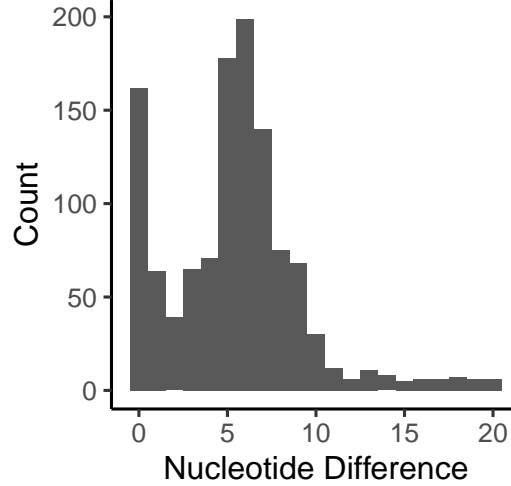
### IGHV1-2\*02

24234 sequences assigned  
5699 (23.5%) exact matches, in which:  
4652 unique CDR3  
6 unique J



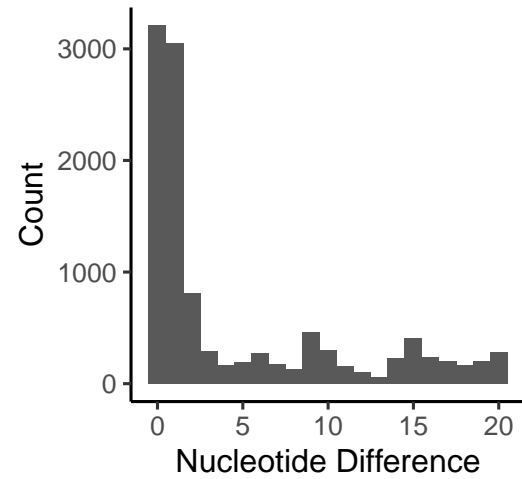
### IGHV1-8\*02

1176 sequences assigned  
162 (13.8%) exact matches, in which:  
160 unique CDR3  
5 unique J



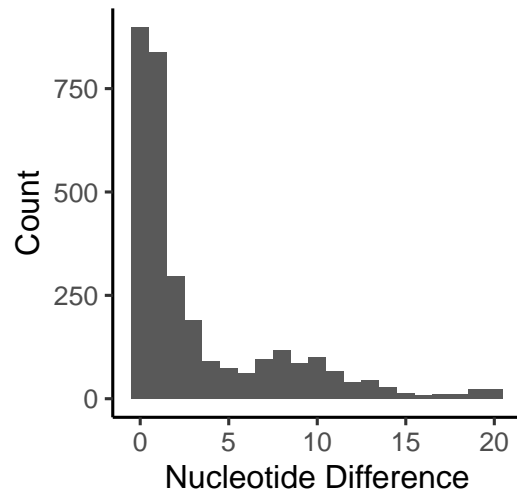
### IGHV1-18\*01\_A190G

12919 sequences assigned  
3210 (24.8%) exact matches, in which:  
2709 unique CDR3  
6 unique J



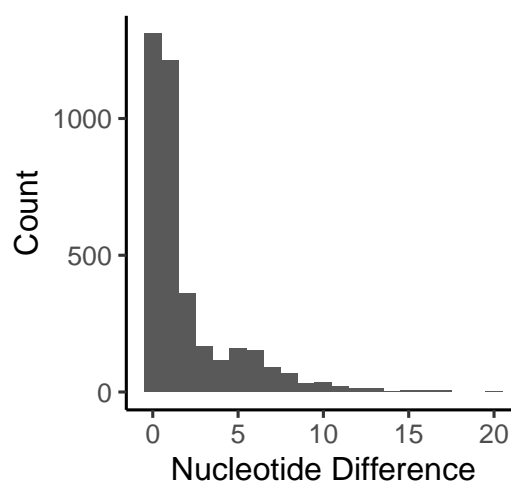
### IGHV1-3\*01\_05

3476 sequences assigned  
899 (25.9%) exact matches, in which:  
759 unique CDR3  
6 unique J



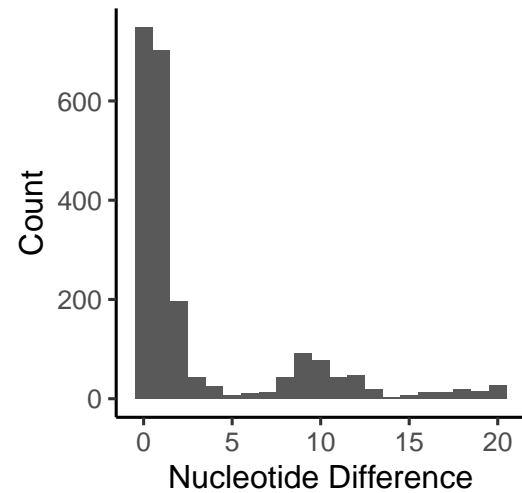
### IGHV1-8\*03

3818 sequences assigned  
1310 (34.3%) exact matches, in which:  
1127 unique CDR3  
6 unique J



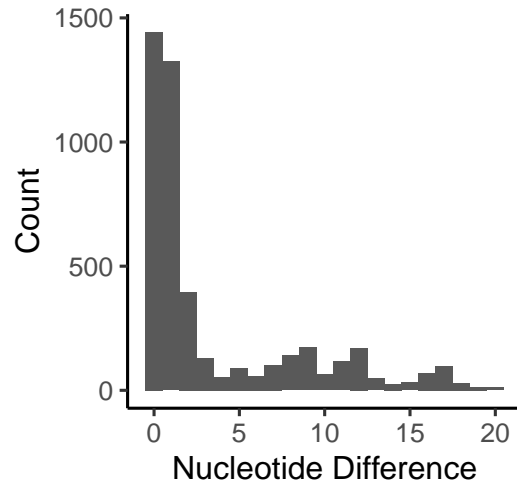
### IGHV1-24\*01

2852 sequences assigned  
749 (26.3%) exact matches, in which:  
636 unique CDR3  
6 unique J



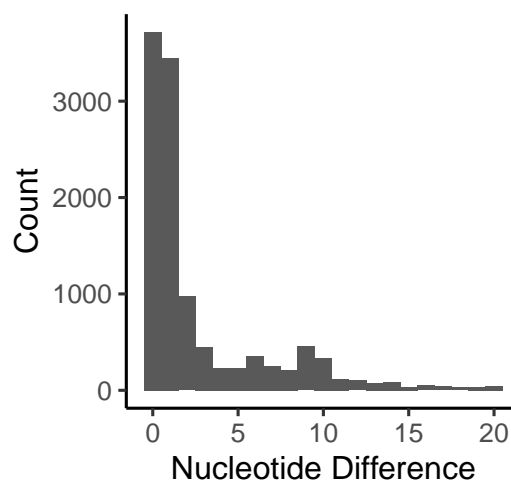
### IGHV1-8\*01

4640 sequences assigned  
1443 (31.1%) exact matches, in which:  
1267 unique CDR3  
6 unique J



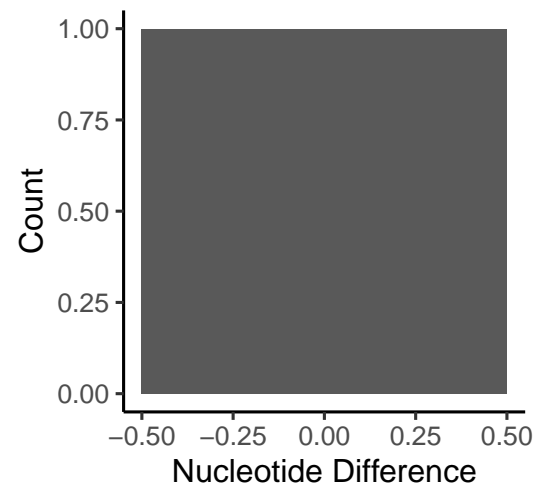
### IGHV1-18\*01

11921 sequences assigned  
3717 (31.2%) exact matches, in which:  
3159 unique CDR3  
6 unique J



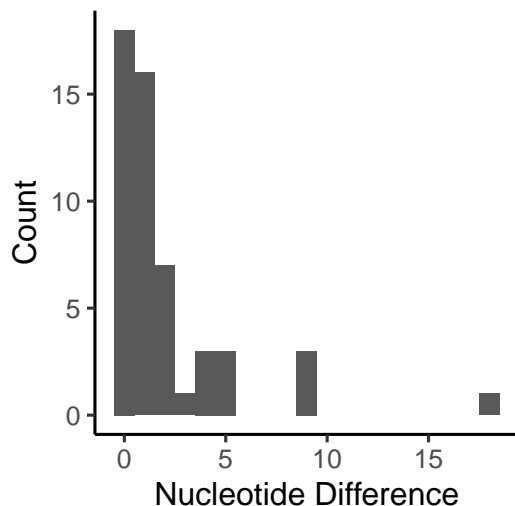
### IGHV1-38-4\*01

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



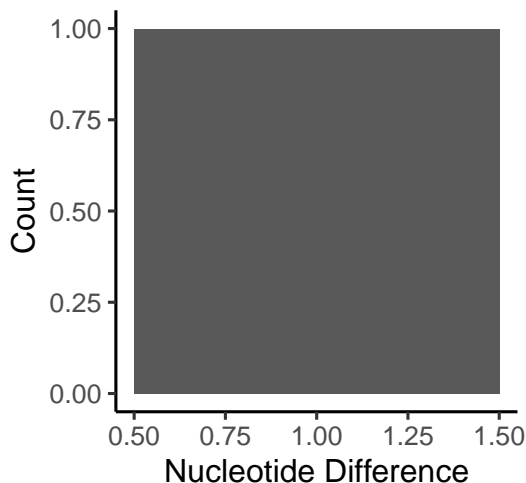
## IGHV1-45\*02

52 sequences assigned  
18 (34.6%) exact matches, in which:  
15 unique CDR3  
2 unique J



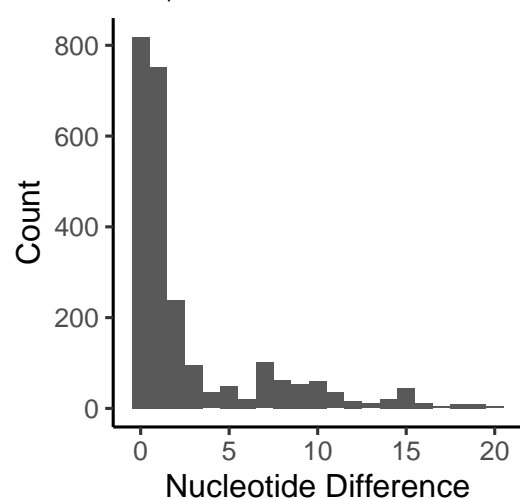
## IGHV1-68\*02

1 sequences assigned  
No exact matches.



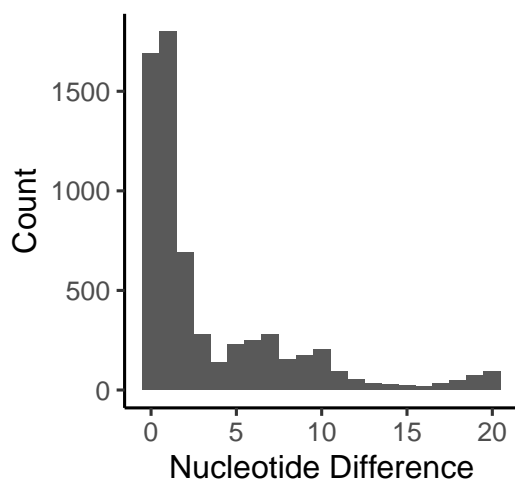
## IGHV1-69\*04\_09\_G112A

3238 sequences assigned  
819 (25.3%) exact matches, in which:  
727 unique CDR3  
6 unique J



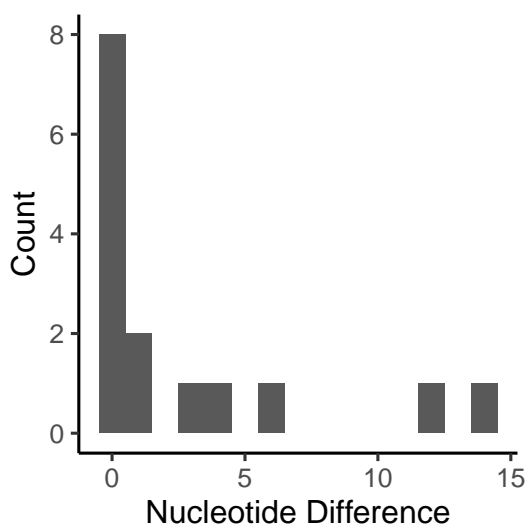
## IGHV1-46\*01

6841 sequences assigned  
1692 (24.7%) exact matches, in which:  
1430 unique CDR3  
6 unique J



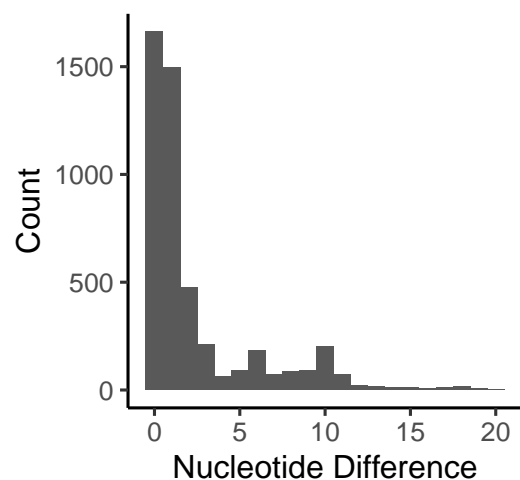
## IGHV1-69-2\*01

20 sequences assigned  
8 (40%) exact matches, in which:  
6 unique CDR3  
4 unique J



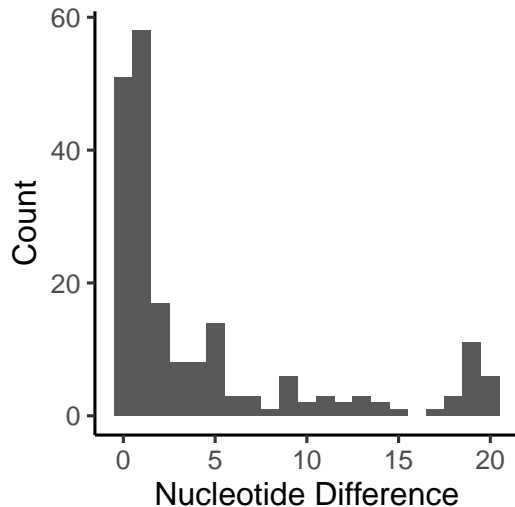
## IGHV1-69\*10\_A244G

4862 sequences assigned  
1662 (34.2%) exact matches, in which:  
1483 unique CDR3  
6 unique J



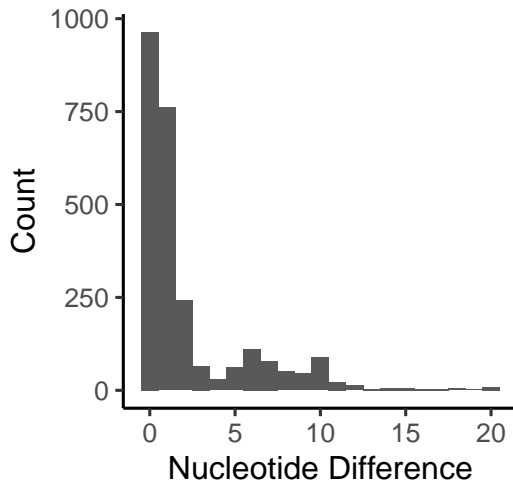
## IGHV1-58\*02

265 sequences assigned  
51 (19.2%) exact matches, in which:  
40 unique CDR3  
5 unique J



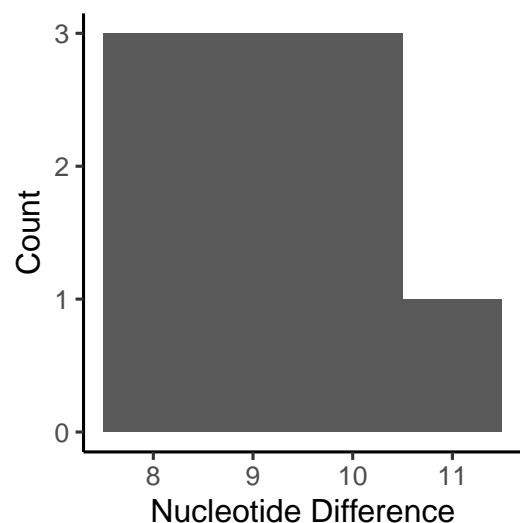
## IGHV1-69\*05

2691 sequences assigned  
964 (35.8%) exact matches, in which:  
861 unique CDR3  
6 unique J



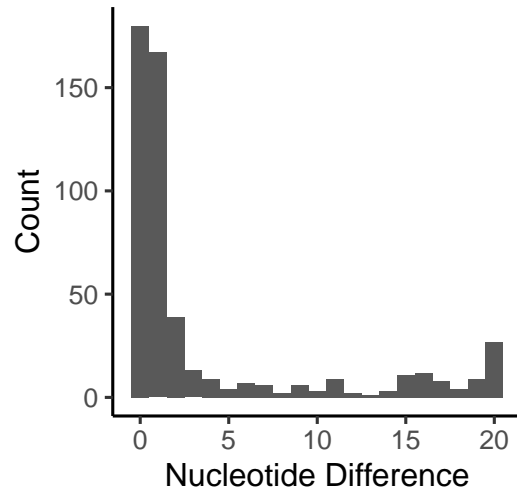
## IGHV1-NL1\*01

10 sequences assigned  
No exact matches.



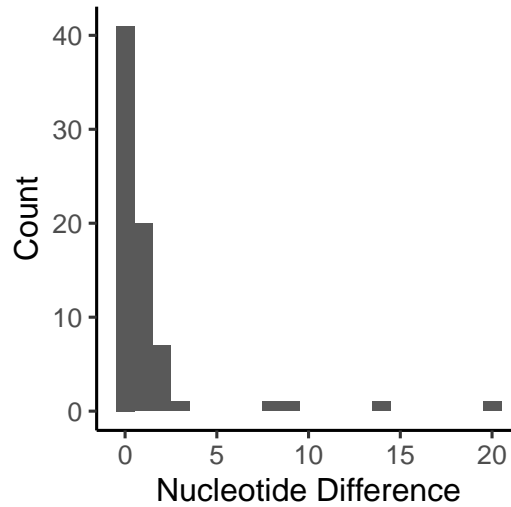
### IGHV2-5\*01

870 sequences assigned  
180 (20.7%) exact matches, in which:  
157 unique CDR3  
6 unique J



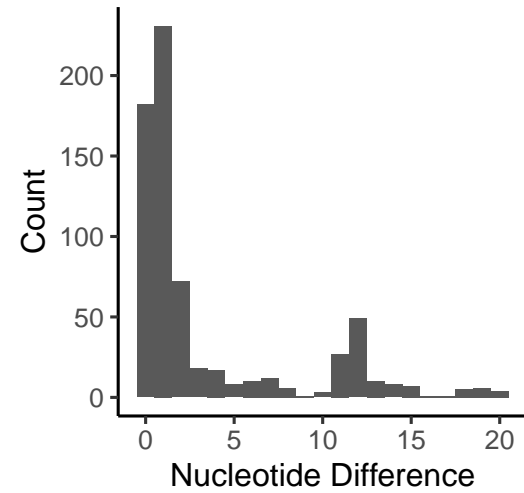
### IGHV2-26\*02

189 sequences assigned  
41 (21.7%) exact matches, in which:  
35 unique CDR3  
5 unique J



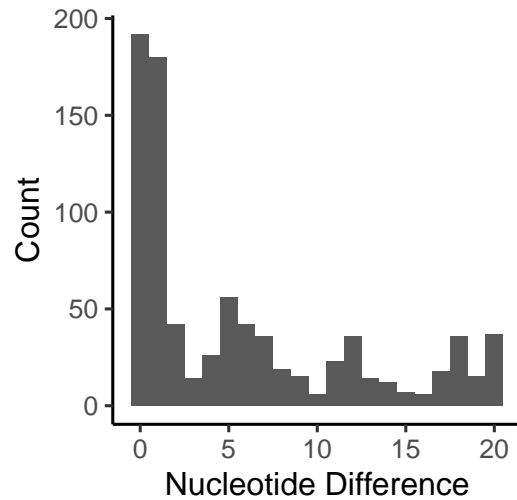
### IGHV2-70\*11\_15

714 sequences assigned  
182 (25.5%) exact matches, in which:  
149 unique CDR3  
6 unique J



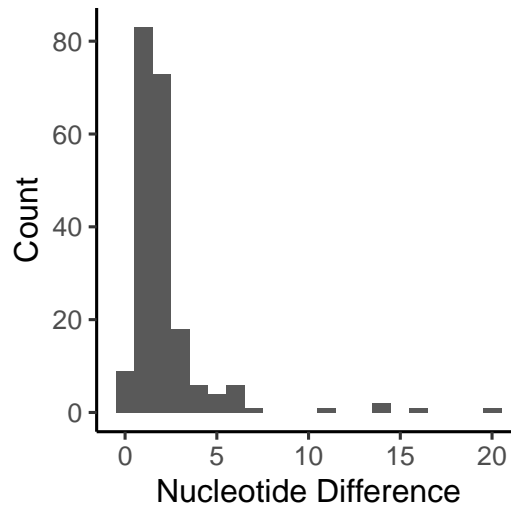
### IGHV2-5\*02

1103 sequences assigned  
192 (17.4%) exact matches, in which:  
169 unique CDR3  
5 unique J



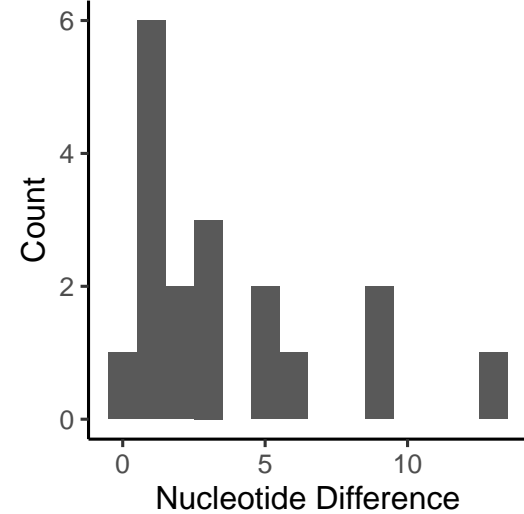
### IGHV2-70\*01

265 sequences assigned  
9 (3.4%) exact matches, in which:  
7 unique CDR3  
4 unique J



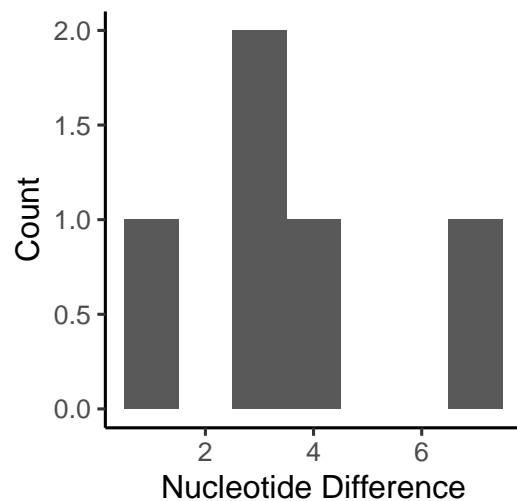
### IGHV2-70D\*04

19 sequences assigned  
1 (5.3%) exact matches, in which:  
1 unique CDR3  
1 unique J



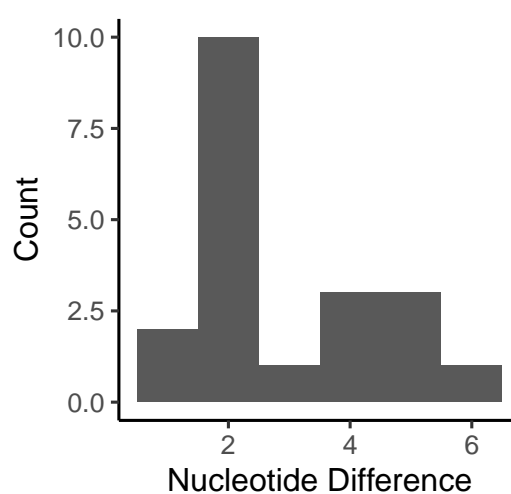
### IGHV2-26\*01

6 sequences assigned  
No exact matches.



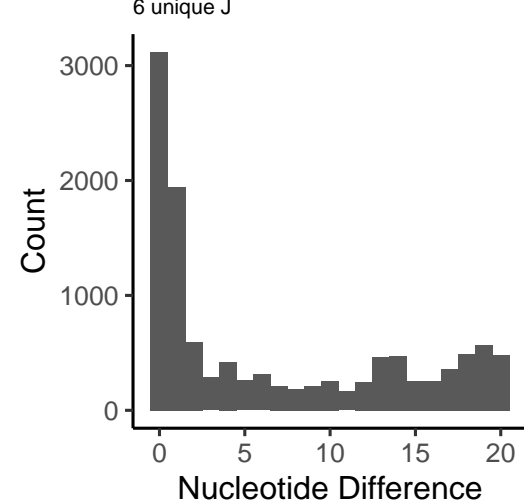
### IGHV2-70\*12

21 sequences assigned  
No exact matches.



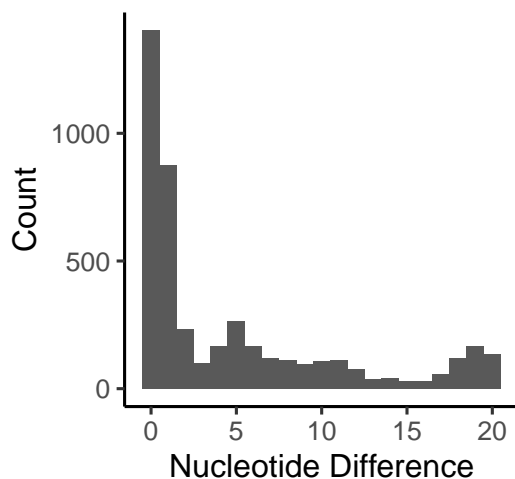
### IGHV3-7\*01

16461 sequences assigned  
3118 (18.9%) exact matches, in which:  
2048 unique CDR3  
6 unique J



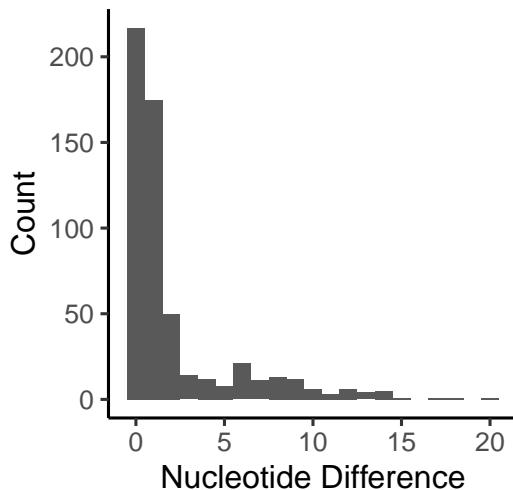
### IGHV3-9\*01

5163 sequences assigned  
1403 (27.2%) exact matches, in which:  
847 unique CDR3  
6 unique J



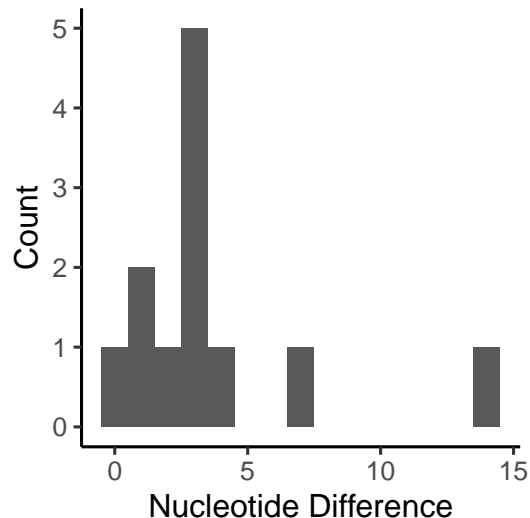
### IGHV3-13\*01

686 sequences assigned  
217 (31.6%) exact matches, in which:  
133 unique CDR3  
6 unique J



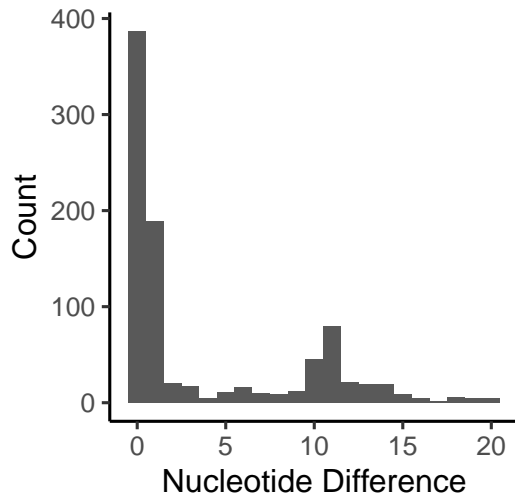
### IGHV3-19\*01

12 sequences assigned  
1 (8.3%) exact matches, in which:  
1 unique CDR3  
0 unique J



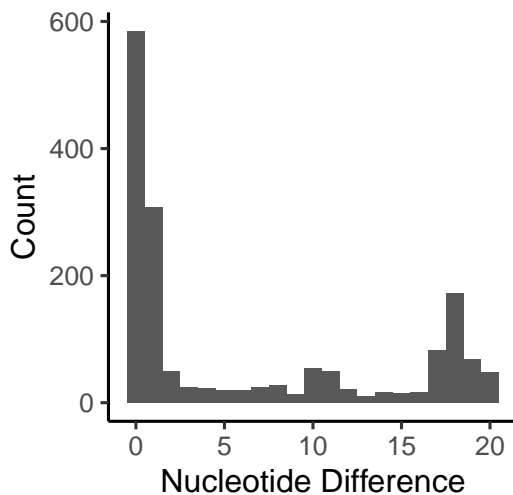
### IGHV3-9\*03

899 sequences assigned  
387 (43%) exact matches, in which:  
224 unique CDR3  
6 unique J



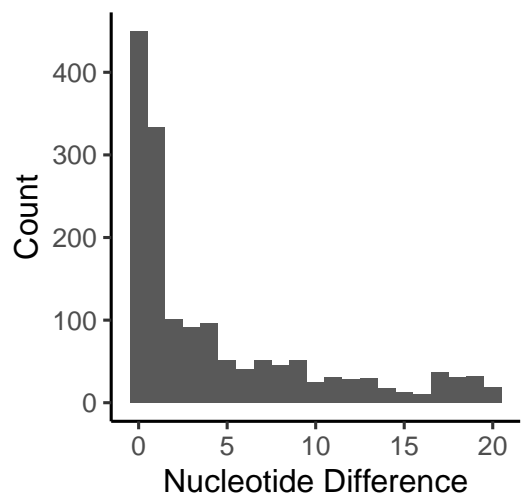
### IGHV3-15\*01\_02\_G147A

2030 sequences assigned  
585 (28.8%) exact matches, in which:  
391 unique CDR3  
6 unique J



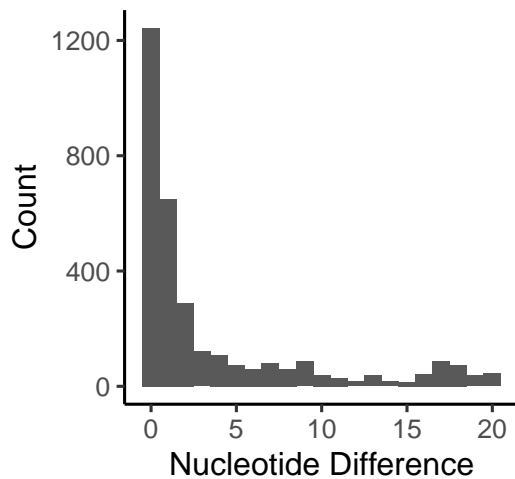
### IGHV3-20\*03\_04

1775 sequences assigned  
450 (25.4%) exact matches, in which:  
291 unique CDR3  
6 unique J



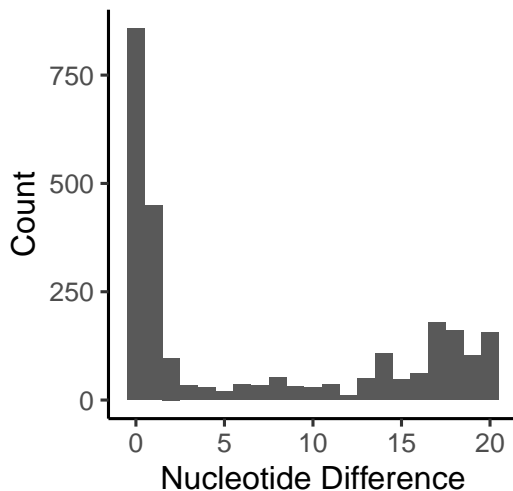
### IGHV3-11\*04

4661 sequences assigned  
1243 (26.7%) exact matches, in which:  
861 unique CDR3  
6 unique J



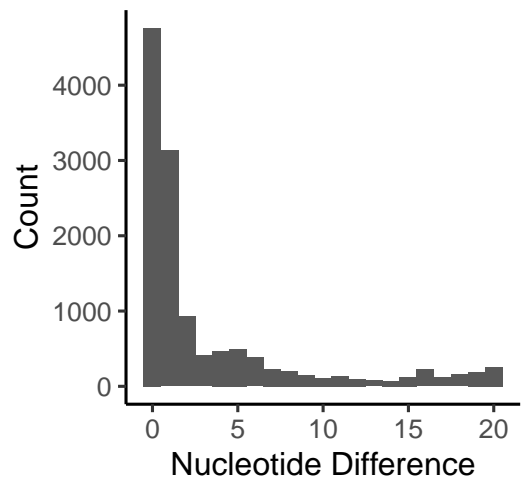
### IGHV3-15\*07\_C159T

3296 sequences assigned  
858 (26%) exact matches, in which:  
577 unique CDR3  
6 unique J



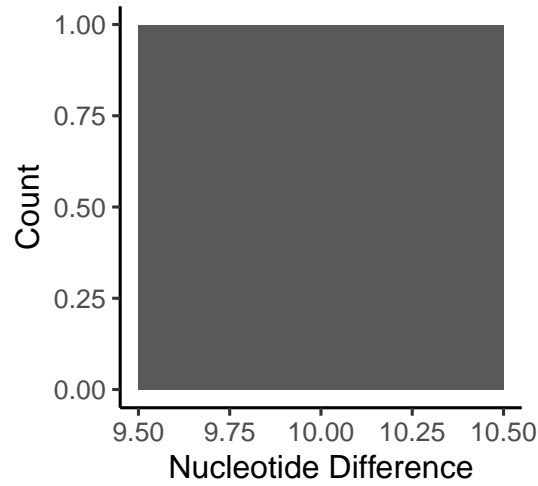
### IGHV3-21\*01\_02

16071 sequences assigned  
4759 (29.6%) exact matches, in which:  
2976 unique CDR3  
6 unique J



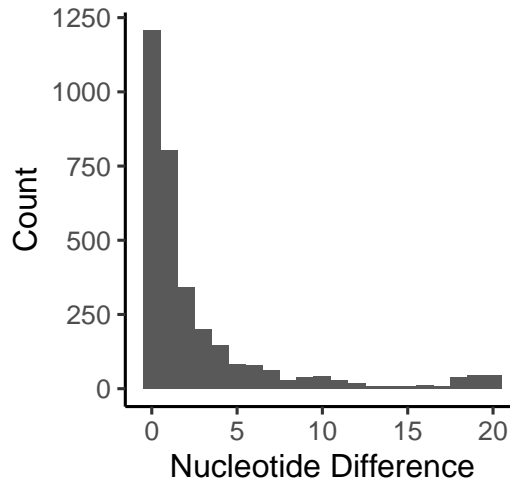
### IGHV3-22\*01\_02

1 sequences assigned  
No exact matches.



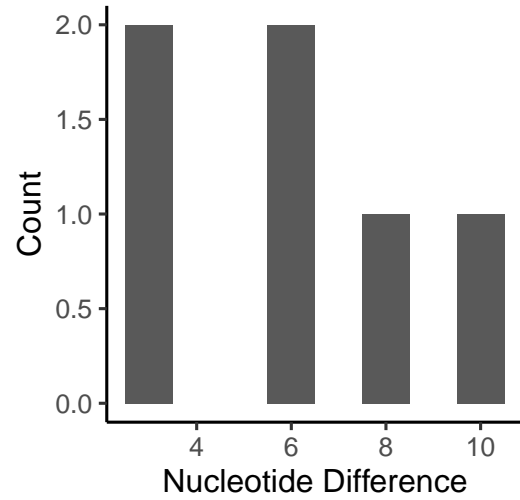
### IGHV3-33\*01

4060 sequences assigned  
1207 (29.7%) exact matches, in which:  
823 unique CDR3  
6 unique J



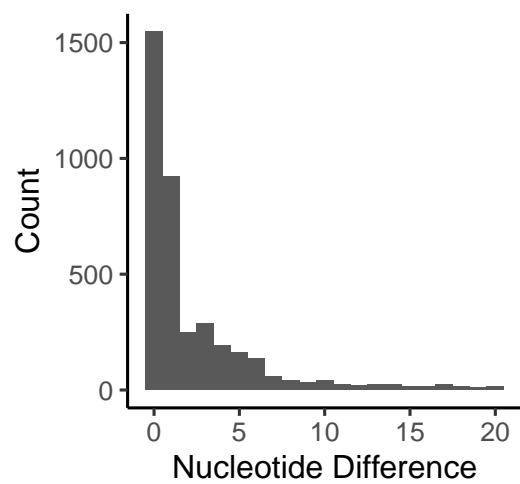
### IGHV3-38\*03

6 sequences assigned  
No exact matches.



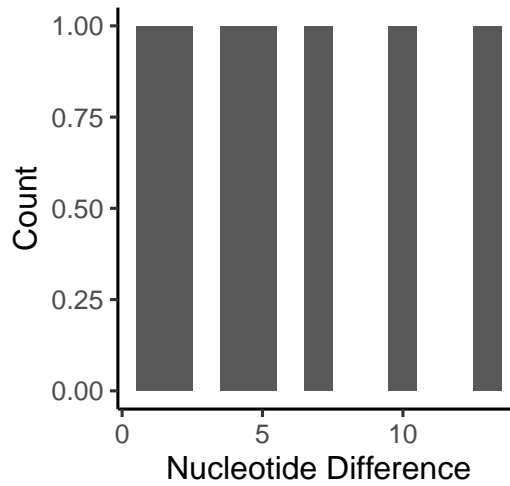
### IGHV3-30-3\*01

4579 sequences assigned  
1547 (33.8%) exact matches, in which:  
1023 unique CDR3  
6 unique J



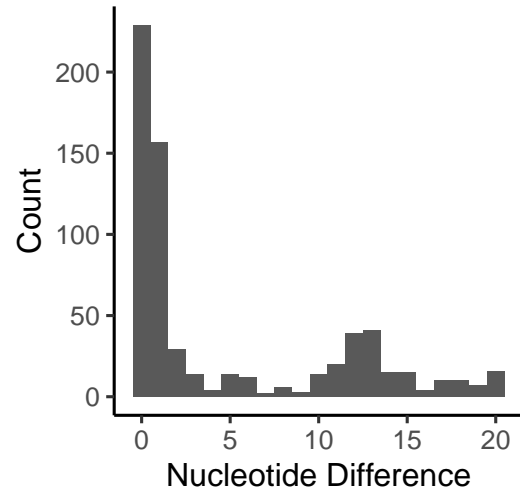
### IGHV3-35\*01

7 sequences assigned  
No exact matches.



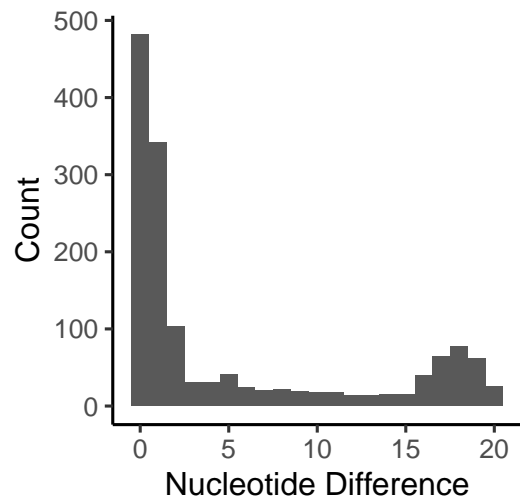
### IGHV3-43\*01

890 sequences assigned  
229 (25.7%) exact matches, in which:  
137 unique CDR3  
5 unique J



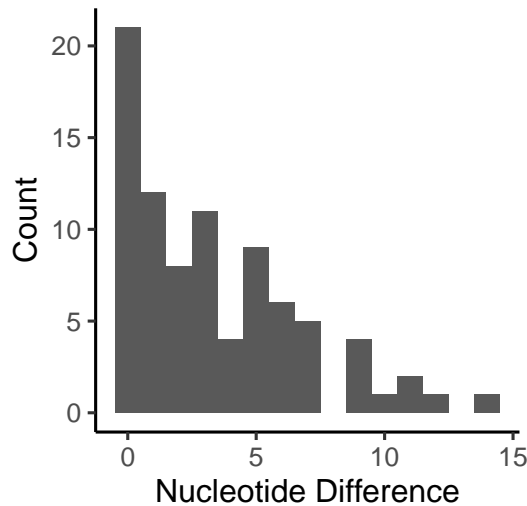
### IGHV3-30\*18\_C170G\_A'

1568 sequences assigned  
482 (30.7%) exact matches, in which:  
316 unique CDR3  
6 unique J



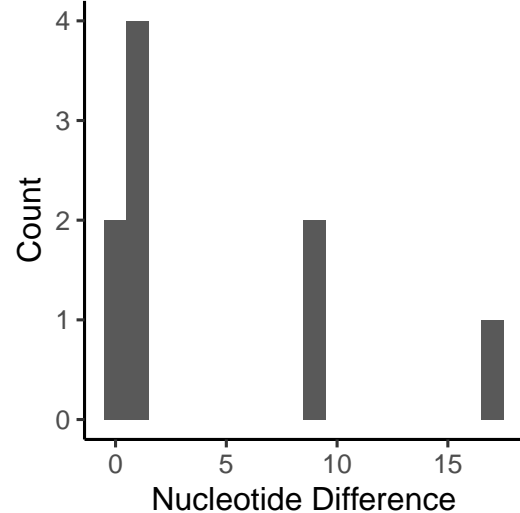
### IGHV3-38-3\*01

85 sequences assigned  
21 (24.7%) exact matches, in which:  
21 unique CDR3  
5 unique J



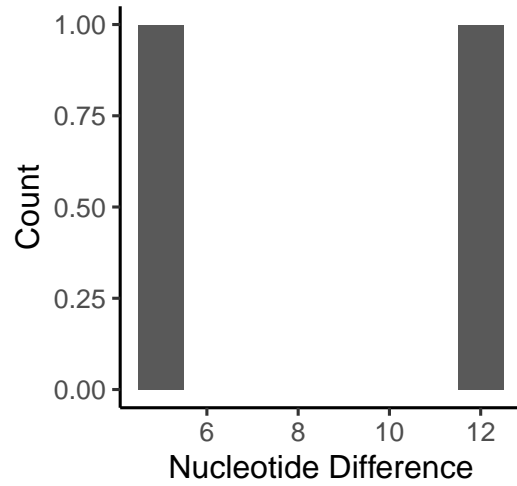
### IGHV3-47\*01

9 sequences assigned  
2 (22.2%) exact matches, in which:  
1 unique CDR3  
1 unique J



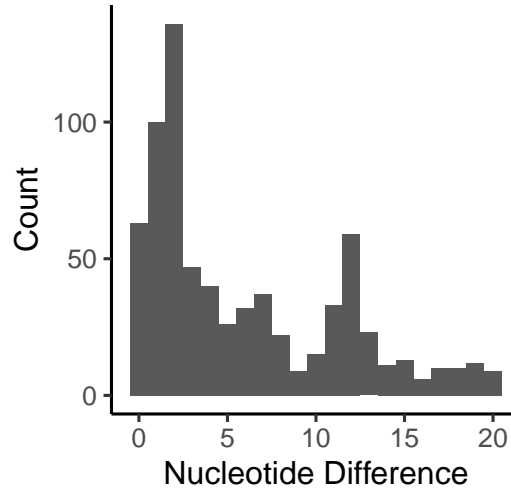
### IGHV3-47\*02

2 sequences assigned  
No exact matches.



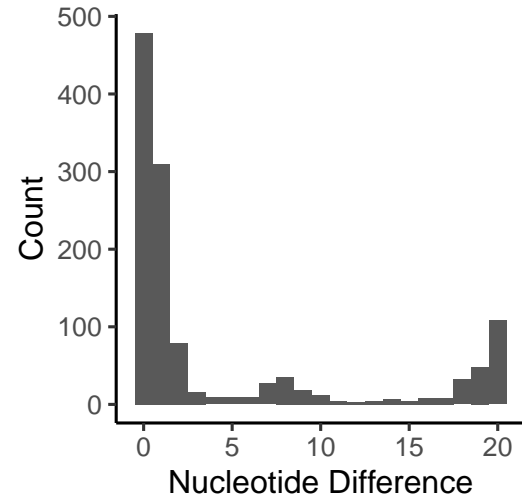
### IGHV3-48\*04

789 sequences assigned  
63 (8%) exact matches, in which:  
63 unique CDR3  
5 unique J



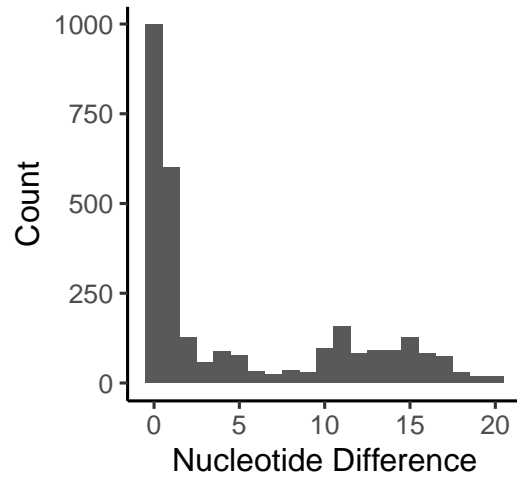
### IGHV3-53\*04

1693 sequences assigned  
479 (28.3%) exact matches, in which:  
301 unique CDR3  
6 unique J



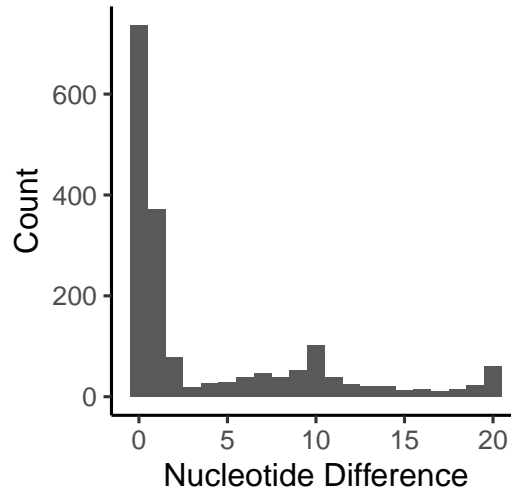
### IGHV3-48\*02

4683 sequences assigned  
998 (21.3%) exact matches, in which:  
633 unique CDR3  
6 unique J



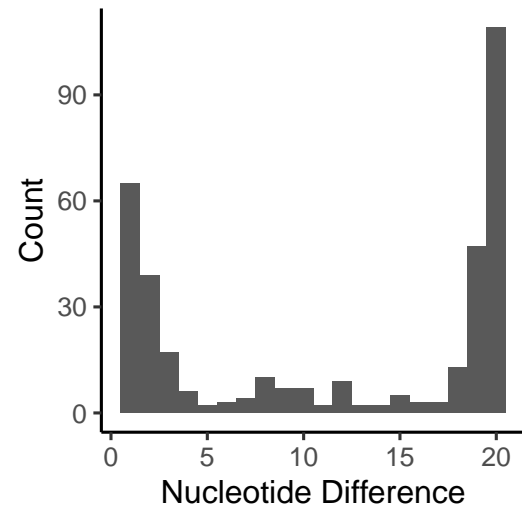
### IGHV3-49\*03\_05

2205 sequences assigned  
737 (33.4%) exact matches, in which:  
472 unique CDR3  
6 unique J



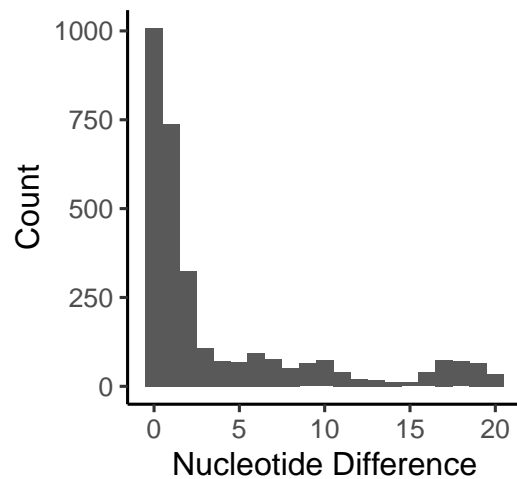
### IGHV3-53\*05

414 sequences assigned  
No exact matches.



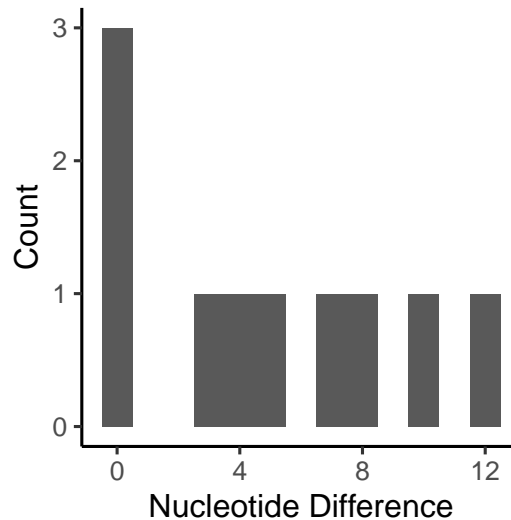
### IGHV3-48\*03

3256 sequences assigned  
1008 (31%) exact matches, in which:  
643 unique CDR3  
6 unique J



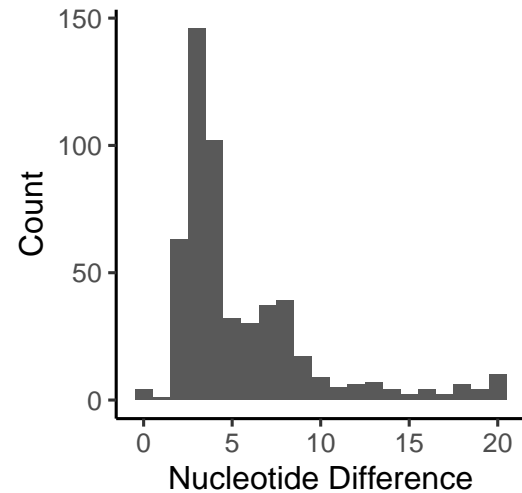
### IGHV3-52\*01\_03

10 sequences assigned  
3 (30%) exact matches, in which:  
3 unique CDR3  
2 unique J



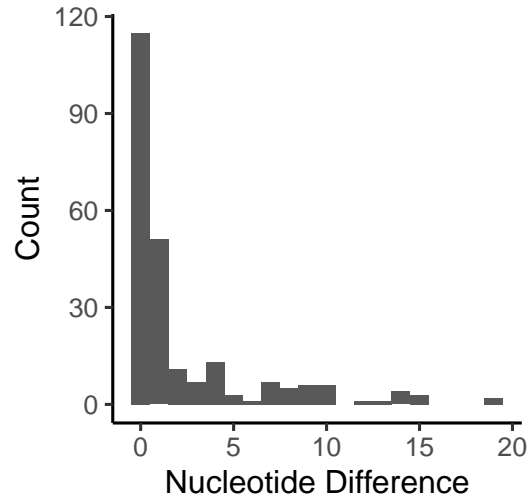
### IGHV3-53\*01\_02

795 sequences assigned  
4 (0.5%) exact matches, in which:  
4 unique CDR3  
2 unique J



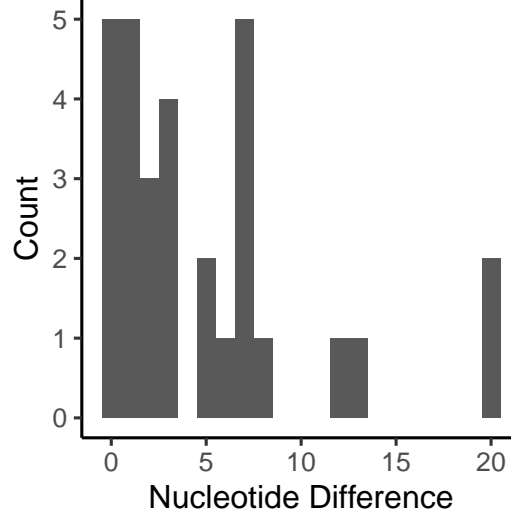
### IGHV3-64\*01

238 sequences assigned  
115 (48.3%) exact matches, in which:  
71 unique CDR3  
5 unique J



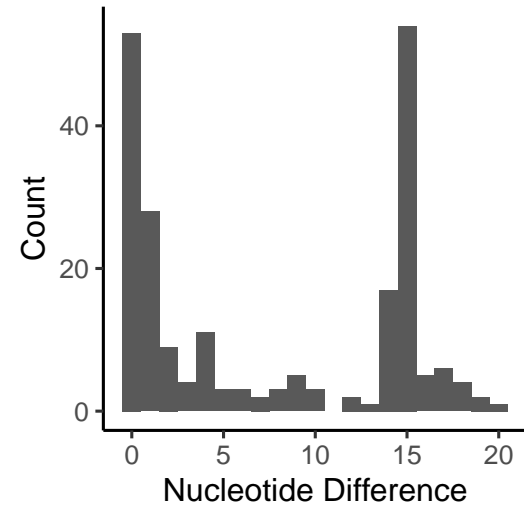
### IGHV3-69-1\*01

44 sequences assigned  
5 (11.4%) exact matches, in which:  
5 unique CDR3  
2 unique J



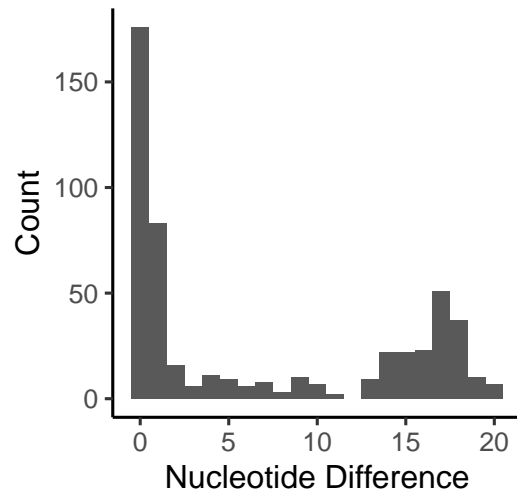
### IGHV3-72\*01

629 sequences assigned  
53 (8.4%) exact matches, in which:  
35 unique CDR3  
5 unique J



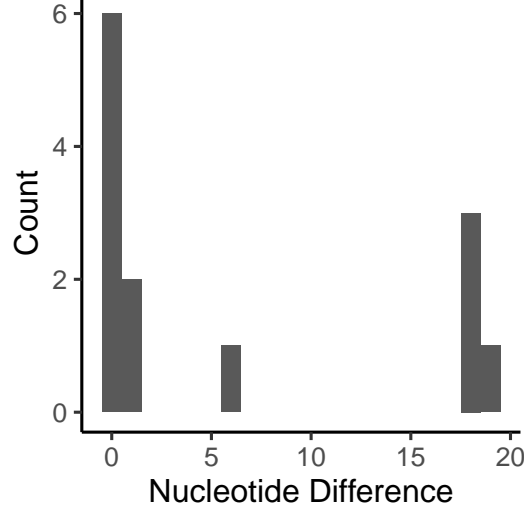
### IGHV3-64\*02\_07

652 sequences assigned  
176 (27%) exact matches, in which:  
114 unique CDR3  
6 unique J



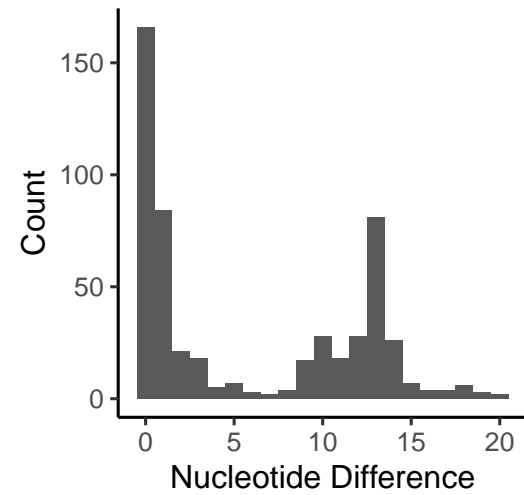
### IGHV3-69-1\*02

90 sequences assigned  
6 (6.7%) exact matches, in which:  
6 unique CDR3  
3 unique J



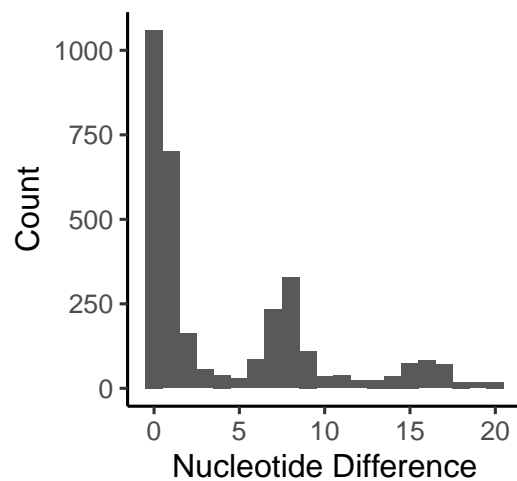
### IGHV3-73\*01\_02

586 sequences assigned  
166 (28.3%) exact matches, in which:  
104 unique CDR3  
6 unique J



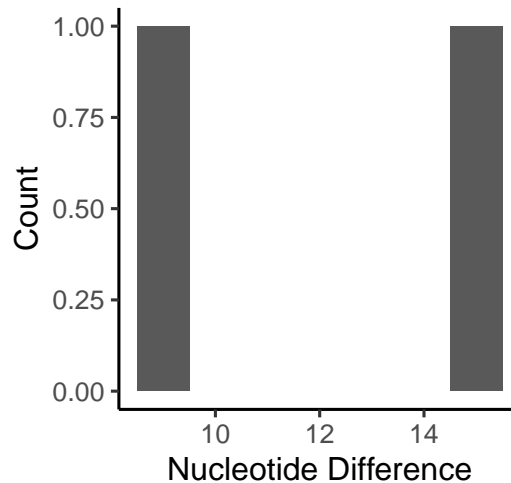
### IGHV3-66\*02

4048 sequences assigned  
1060 (26.2%) exact matches, in which:  
663 unique CDR3  
6 unique J



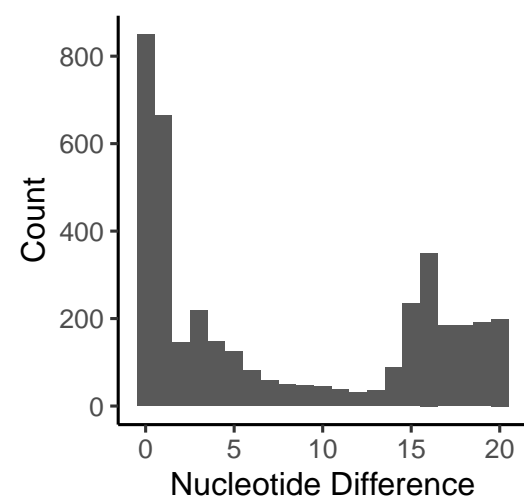
### IGHV3-71\*01\_04

4 sequences assigned  
No exact matches.



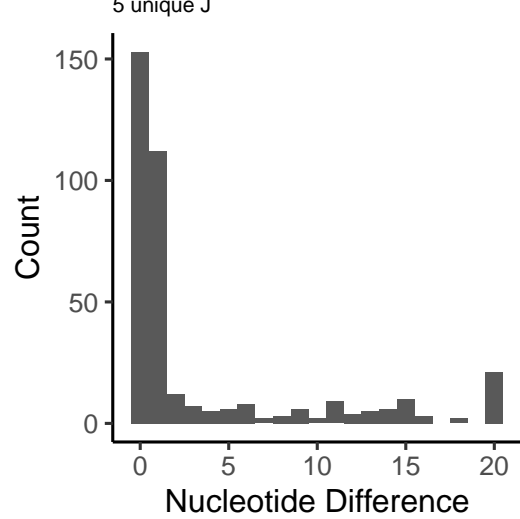
### IGHV3-74\*01\_02

6420 sequences assigned  
850 (13.2%) exact matches, in which:  
529 unique CDR3  
6 unique J



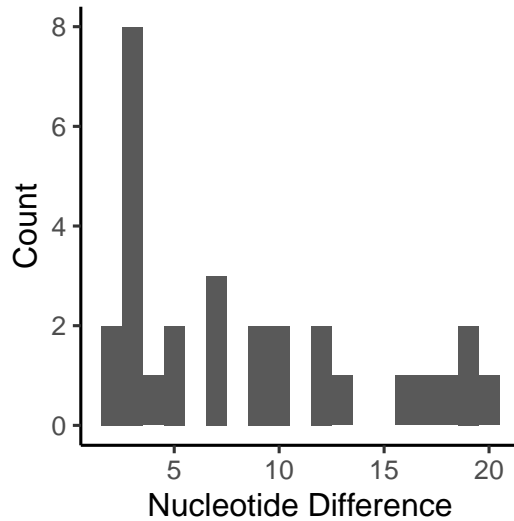
### IGHV3-43D\*03

429 sequences assigned  
153 (35.7%) exact matches, in which:  
95 unique CDR3  
5 unique J



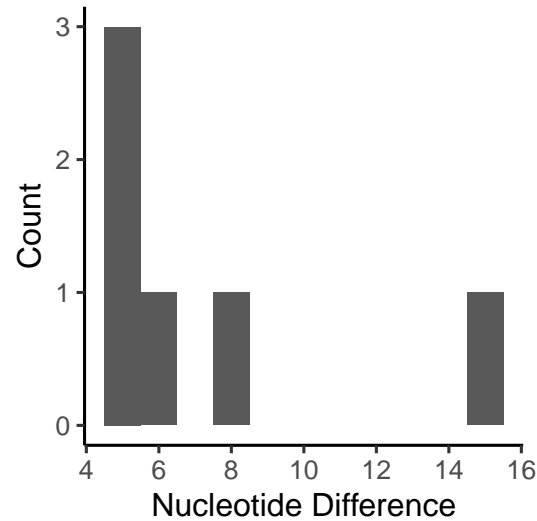
### IGHV3-NL1\*01

38 sequences assigned  
No exact matches.



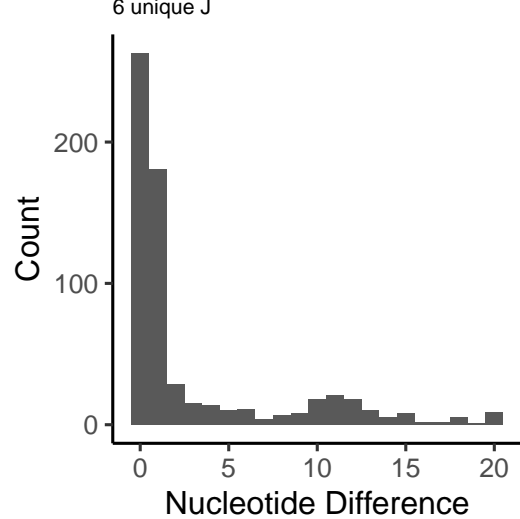
### IGHV4-30-2\*03

8 sequences assigned  
No exact matches.



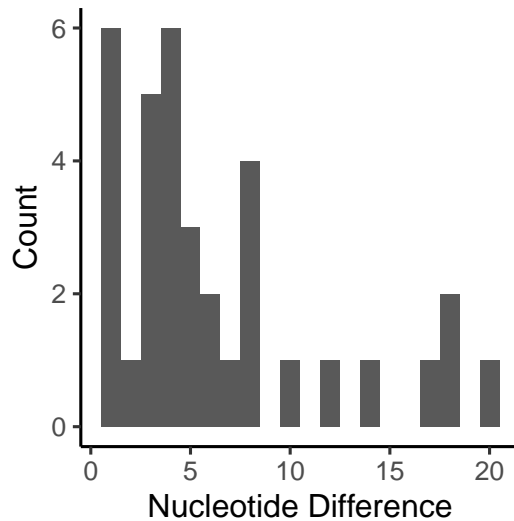
### IGHV3-43D\*04

704 sequences assigned  
263 (37.4%) exact matches, in which:  
155 unique CDR3  
6 unique J



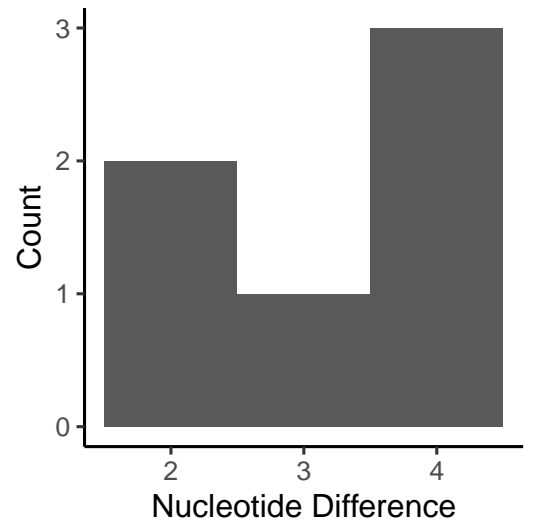
### IGHV4-28\*03

37 sequences assigned  
No exact matches.



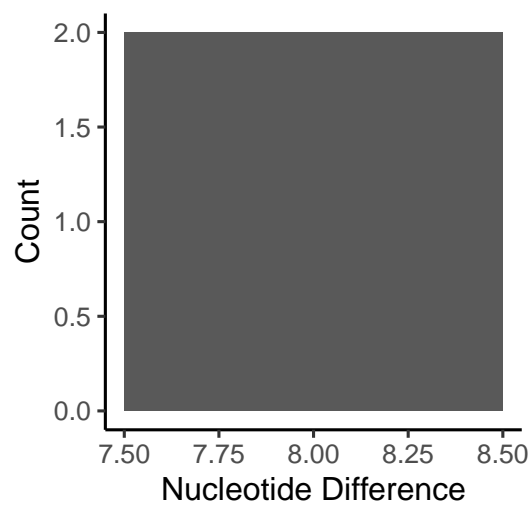
### IGHV4-30-2\*04

6 sequences assigned  
No exact matches.



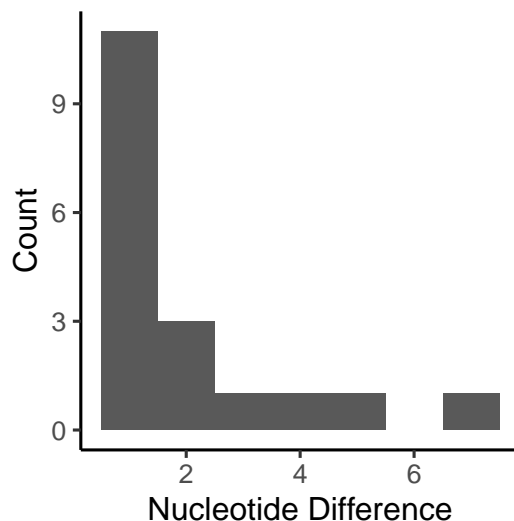
### IGHV3-64D\*06

4 sequences assigned  
No exact matches.



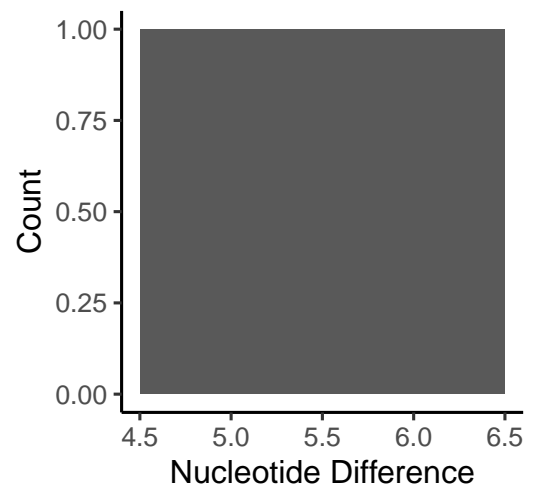
### IGHV4-28\*01\_07

50 sequences assigned  
No exact matches.



### IGHV4-30-2\*05

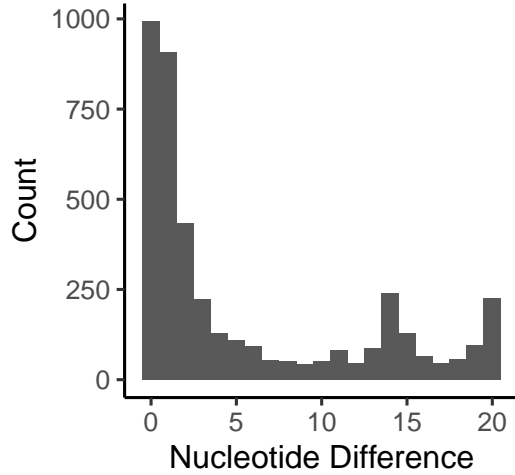
2 sequences assigned  
No exact matches.





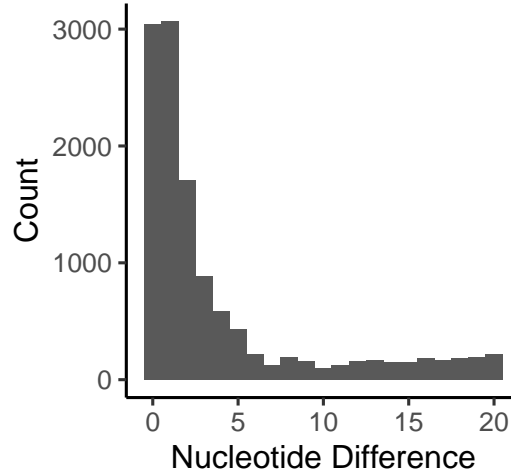
### IGHV4-30-4\*08

5312 sequences assigned  
993 (18.7%) exact matches, in which:  
885 unique CDR3  
6 unique J



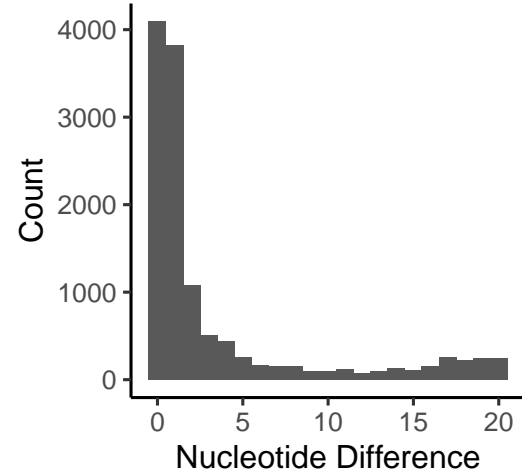
### IGHV4-38-2\*01

13669 sequences assigned  
3046 (22.3%) exact matches, in which:  
2693 unique CDR3  
6 unique J



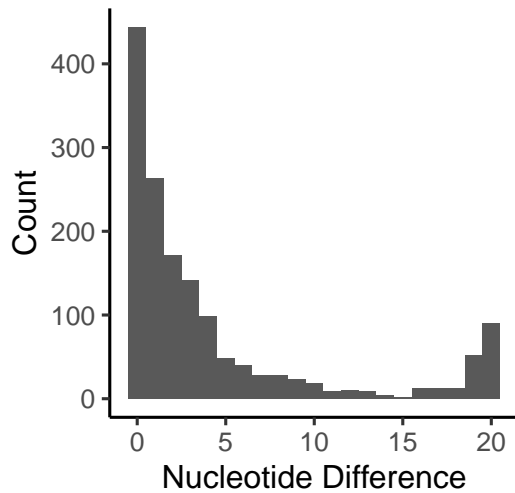
### IGHV4-39\*01\_05

16873 sequences assigned  
4094 (24.3%) exact matches, in which:  
3466 unique CDR3  
6 unique J



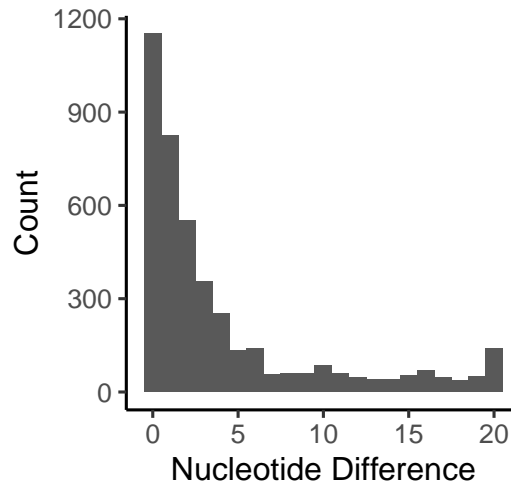
### IGHV4-31\*03\_04\_C198T

1808 sequences assigned  
444 (24.6%) exact matches, in which:  
398 unique CDR3  
6 unique J



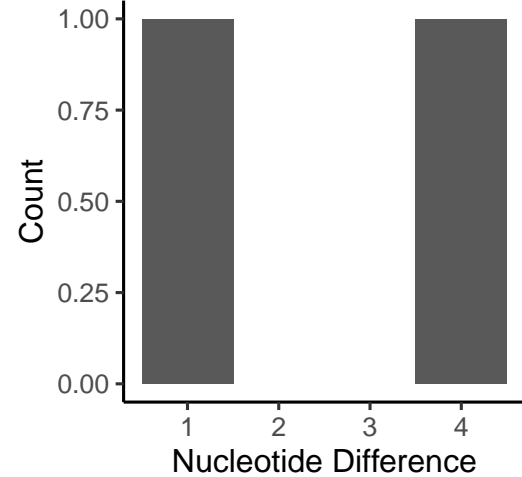
### IGHV4-38-2\*02

7046 sequences assigned  
1152 (16.3%) exact matches, in which:  
1036 unique CDR3  
6 unique J



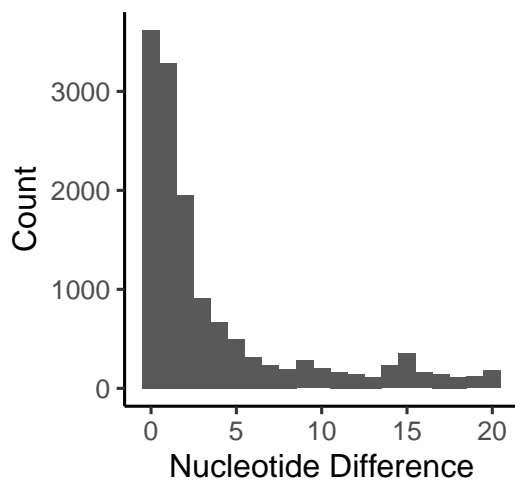
### IGHV4-55\*02\_04\_08

2 sequences assigned  
No exact matches.



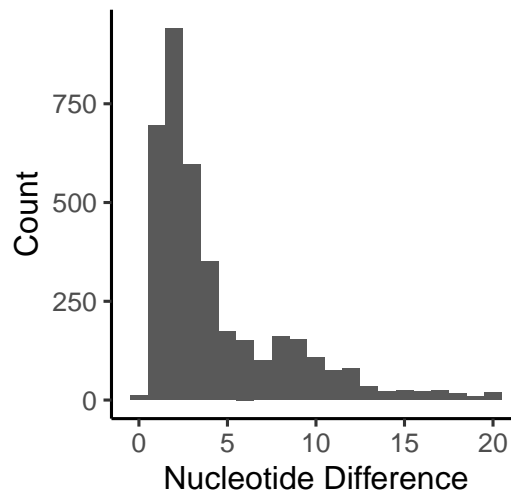
### IGHV4-34\*01\_02

16478 sequences assigned  
3620 (22%) exact matches, in which:  
2706 unique CDR3  
6 unique J



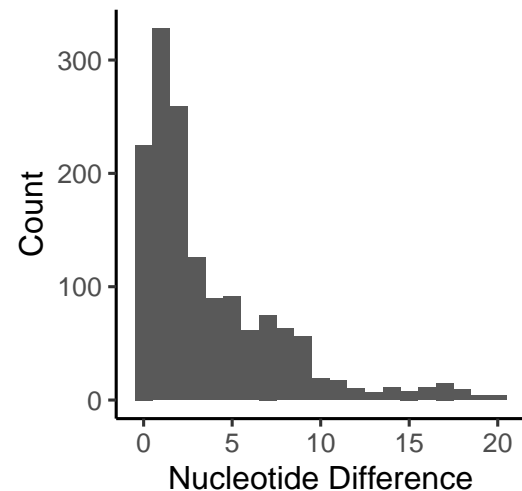
### IGHV4-39\*07

3973 sequences assigned  
11 (0.3%) exact matches, in which:  
11 unique CDR3  
4 unique J



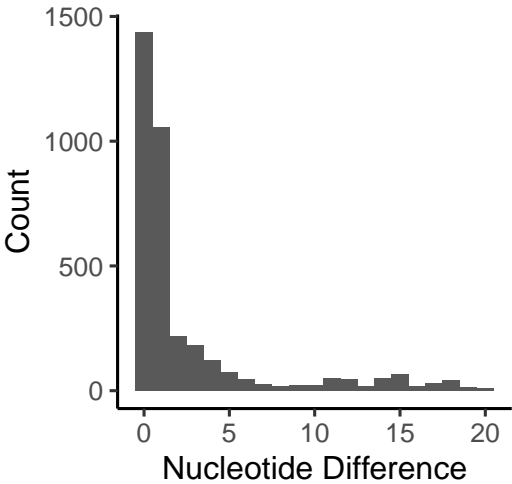
### IGHV4-59\*08

1590 sequences assigned  
225 (14.2%) exact matches, in which:  
222 unique CDR3  
6 unique J



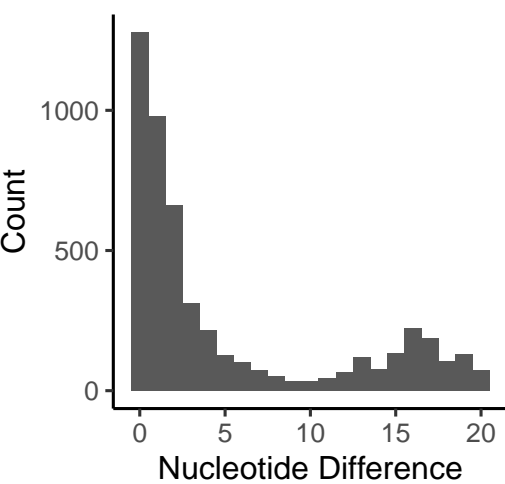
IGHV4-59\*01\_07

4174 sequences assigned  
1436 (34.4%) exact matches, in which:  
1242 unique CDR3  
6 unique J



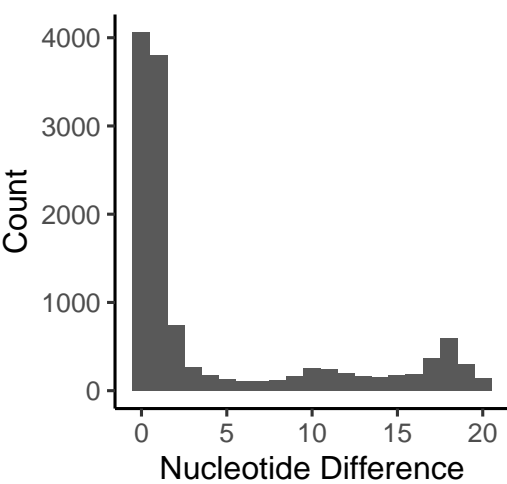
IGHV4-61\*02

6650 sequences assigned  
1278 (19.2%) exact matches, in which:  
1163 unique CDR3  
6 unique J



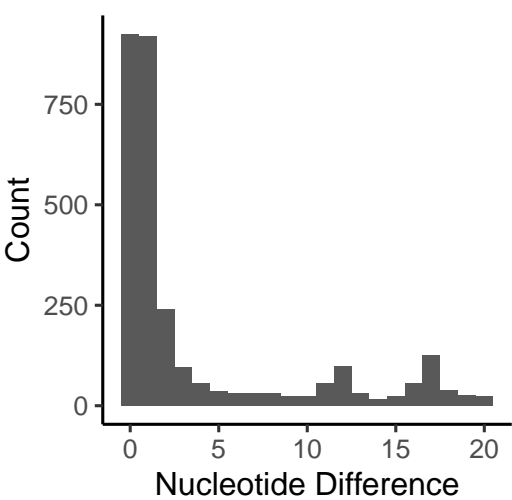
IGHV5-51\*01\_03

13939 sequences assigned  
4060 (29.1%) exact matches, in which:  
2315 unique CDR3  
6 unique J



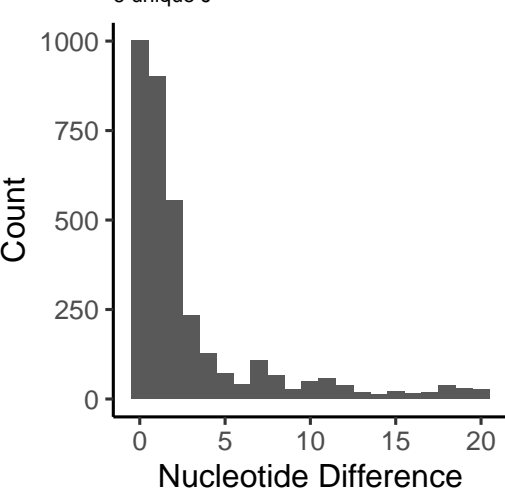
IGHV4-59\*11

4027 sequences assigned  
925 (23%) exact matches, in which:  
762 unique CDR3  
6 unique J



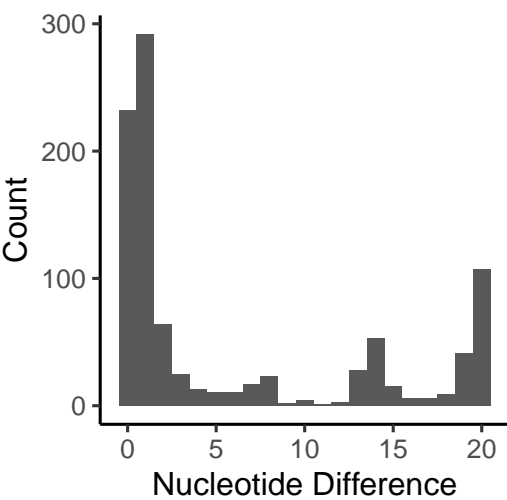
IGHV4-61\*09

4349 sequences assigned  
1001 (23%) exact matches, in which:  
905 unique CDR3  
6 unique J



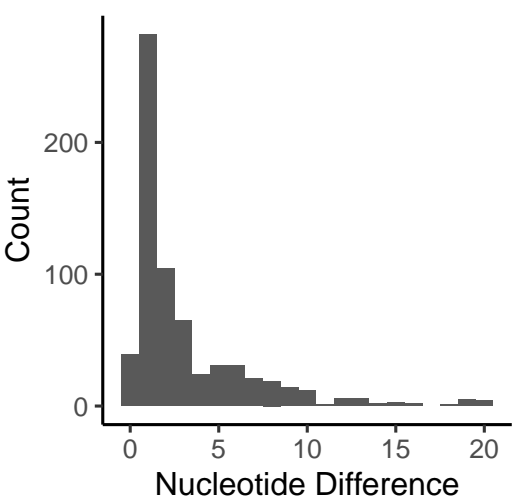
IGHV6-1\*01\_02

1815 sequences assigned  
232 (12.8%) exact matches, in which:  
206 unique CDR3  
5 unique J



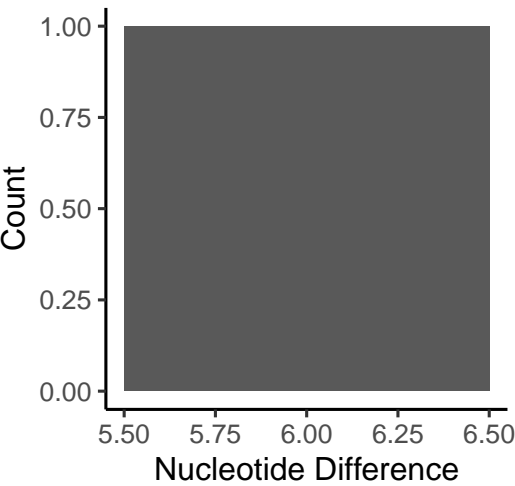
IGHV4-59\*12

791 sequences assigned  
39 (4.9%) exact matches, in which:  
39 unique CDR3  
5 unique J



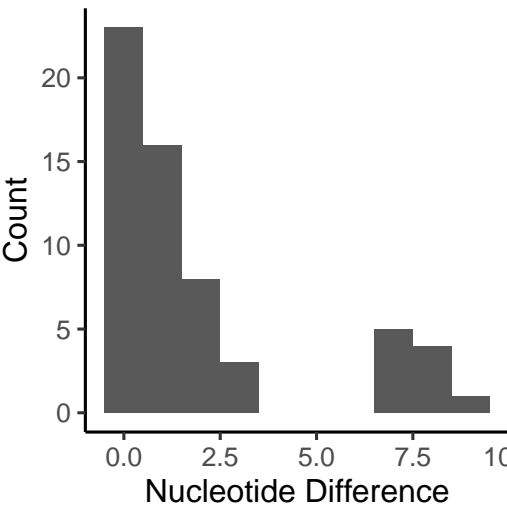
IGHV5-10-1\*01\_03

2 sequences assigned  
No exact matches.



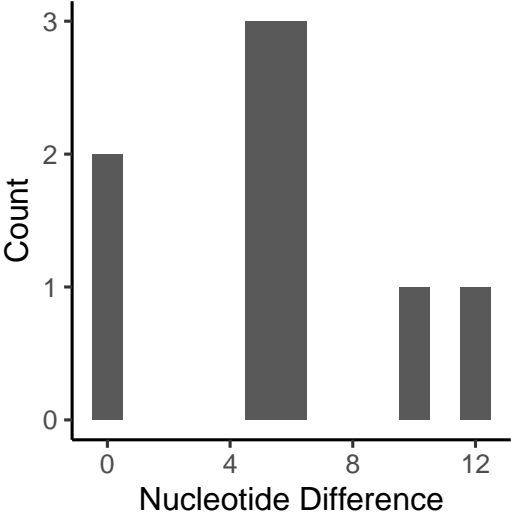
IGHV7-4-1\*01

60 sequences assigned  
23 (38.3%) exact matches, in which:  
16 unique CDR3  
4 unique J

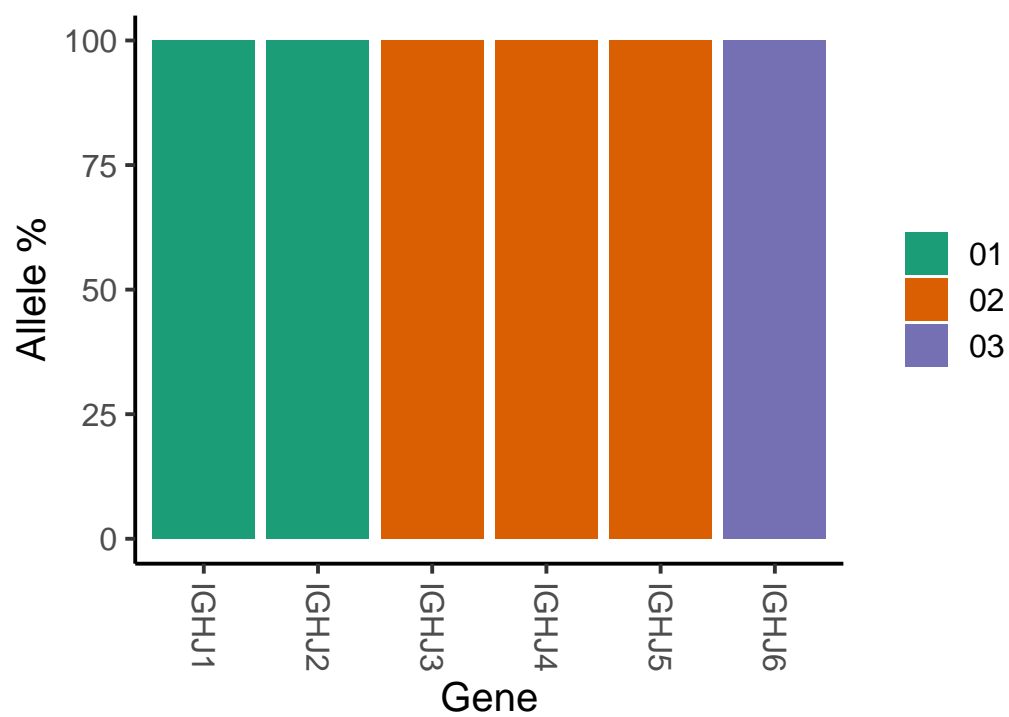


# IGHV7-4-1\*02

10 sequences assigned  
2 (20%) exact matches, in which:  
2 unique CDR3  
1 unique J



Allele Usage



Warning – no inferred sequences found.

Novel sequence(s)IGHV3–33\*01\_G75CIGHV4–59\*02\_G88AIGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.

Novel sequence(s)IGHV3–33\*01\_G75CIGHV4–59\*02\_G88AIGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.

Novel sequence(s)IGHV3–30\*03\_T288CIGHV4–59\*02\_G88AIGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.

Warning – no inferred sequences found.

Warning – no inferred sequences found.

Warning – no inferred sequences found.

Novel sequence(s)IGHV1–69\*04\_09\_G112AIGHV4–59\*02\_G88AIGHV5–10–1\*01\_03\_T258CIGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.

Warning – no inferred sequences found.

Novel sequence(s)IGHV1–69\*08\_C191TIGHV3–48\*03\_T303GIGHV4–59\*02\_G88AIGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.

Warning – no inferred sequences found.

Warning – no inferred sequences found.

Novel sequence(s)IGHV3–30\*03\_T288CIGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.

Warning:IGHV4–31\*02,IGHV4–31\*03\_04 have identical germline sequences.

Novel sequence(s)IGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.

Novel sequence(s)IGHV1–69\*04\_09\_G112A are not listed in the genotype and will be ignored.

Novel sequence(s)IGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.

Warning – no inferred sequences found.

Novel sequence(s)IGHV1–69\*08\_C191TIGHV3–30\*03\_T288CIGHV3–30–3\*02\_G75CIGHV4–59\*02\_G88AIGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.

Novel sequence(s)IGHV4–59\*02\_G88AIGHV5–51\*07\_A128G are not listed in the genotype and will be ignored.