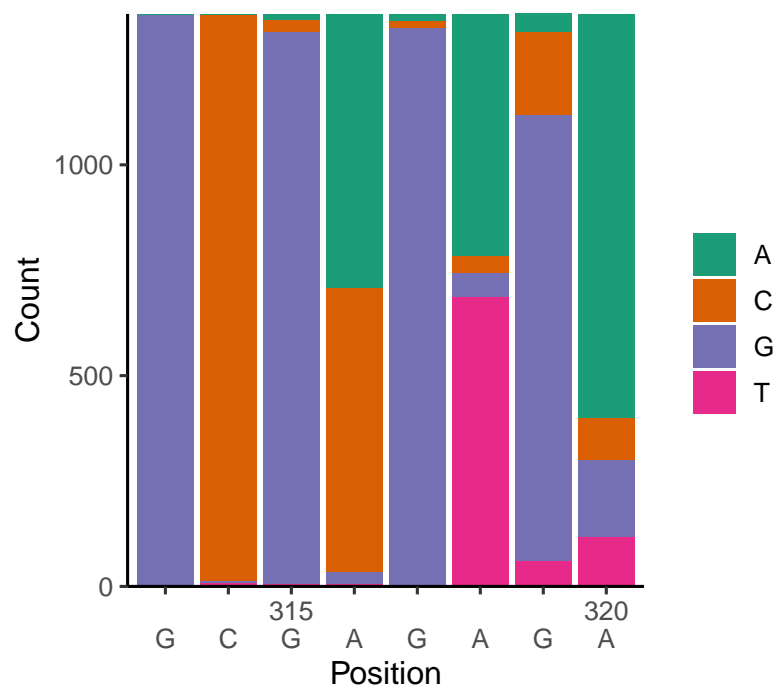
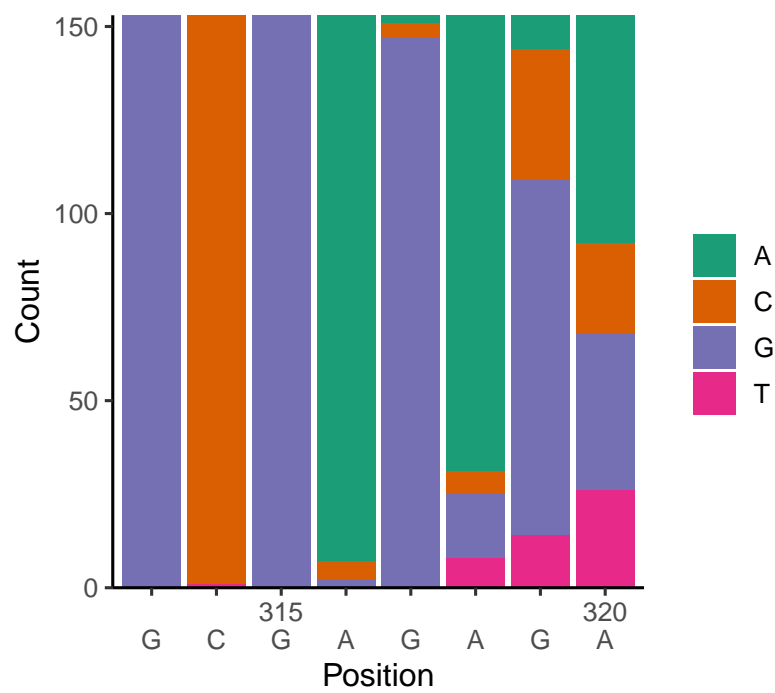


Gene IGHV4-31\*02\_G92A\_C111T\_A113T\_A138T\_A164G\_A225C\_A234C\_G238C\_A240



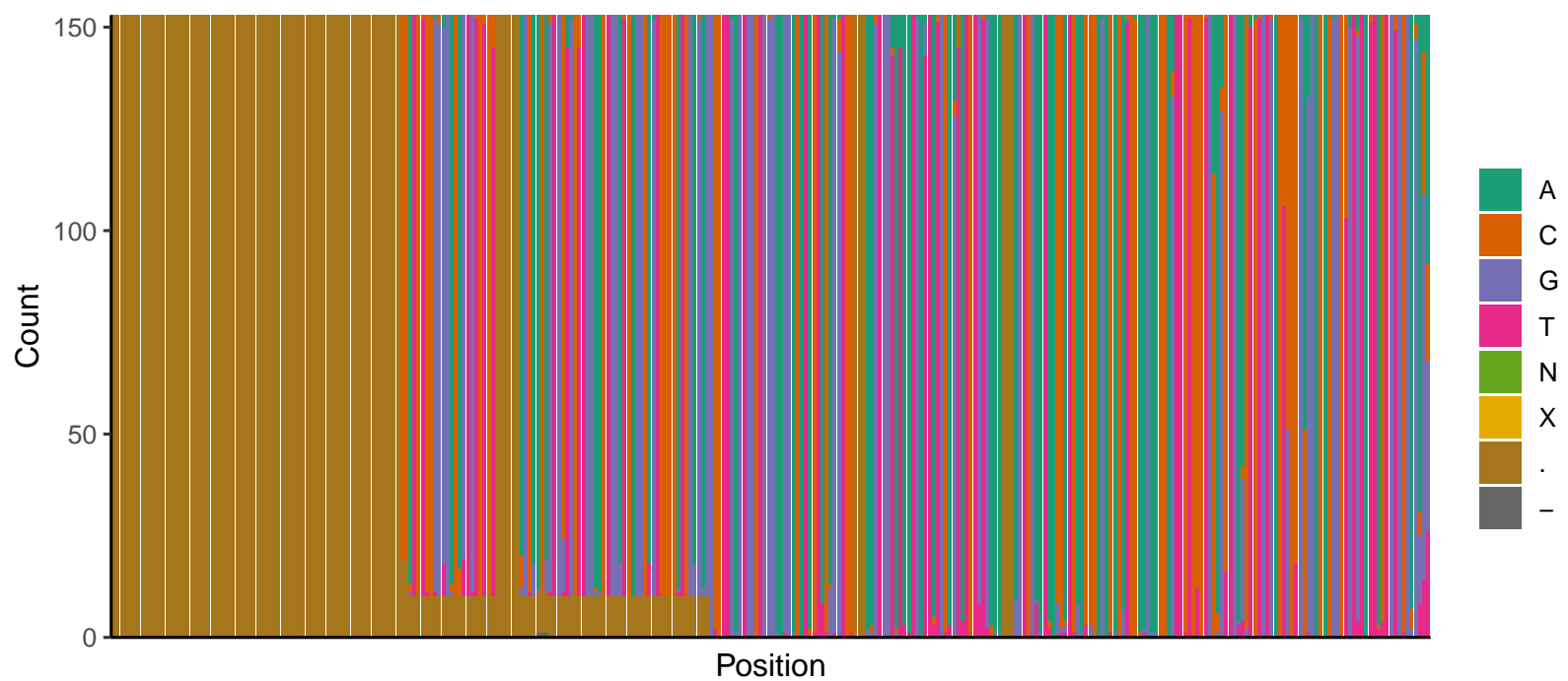
Gene IGHV6-1\*01\_02\_A315G



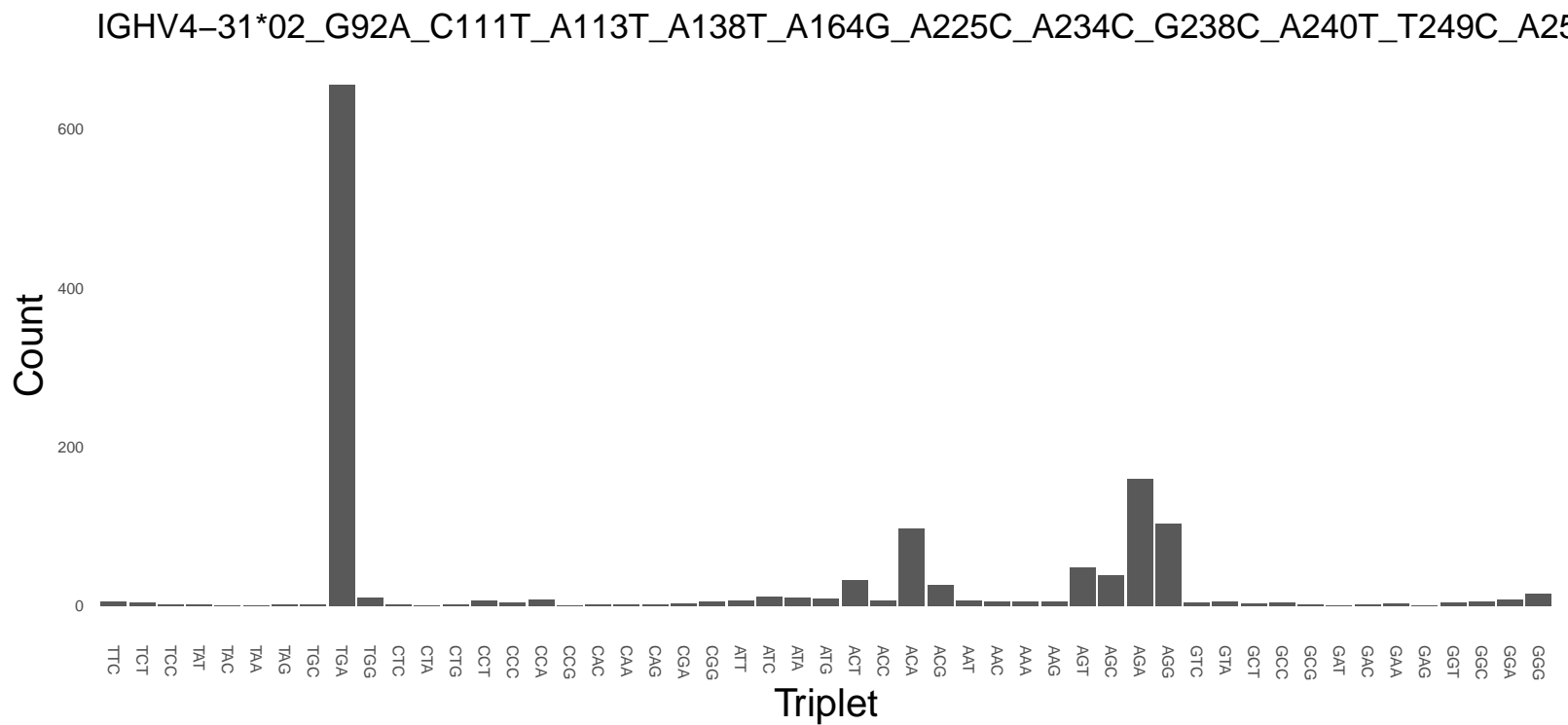
Gene IGHV4-31\*02\_G92A\_C111T\_A113T\_A138T\_A164G\_A225C\_A234C\_G238C\_A240



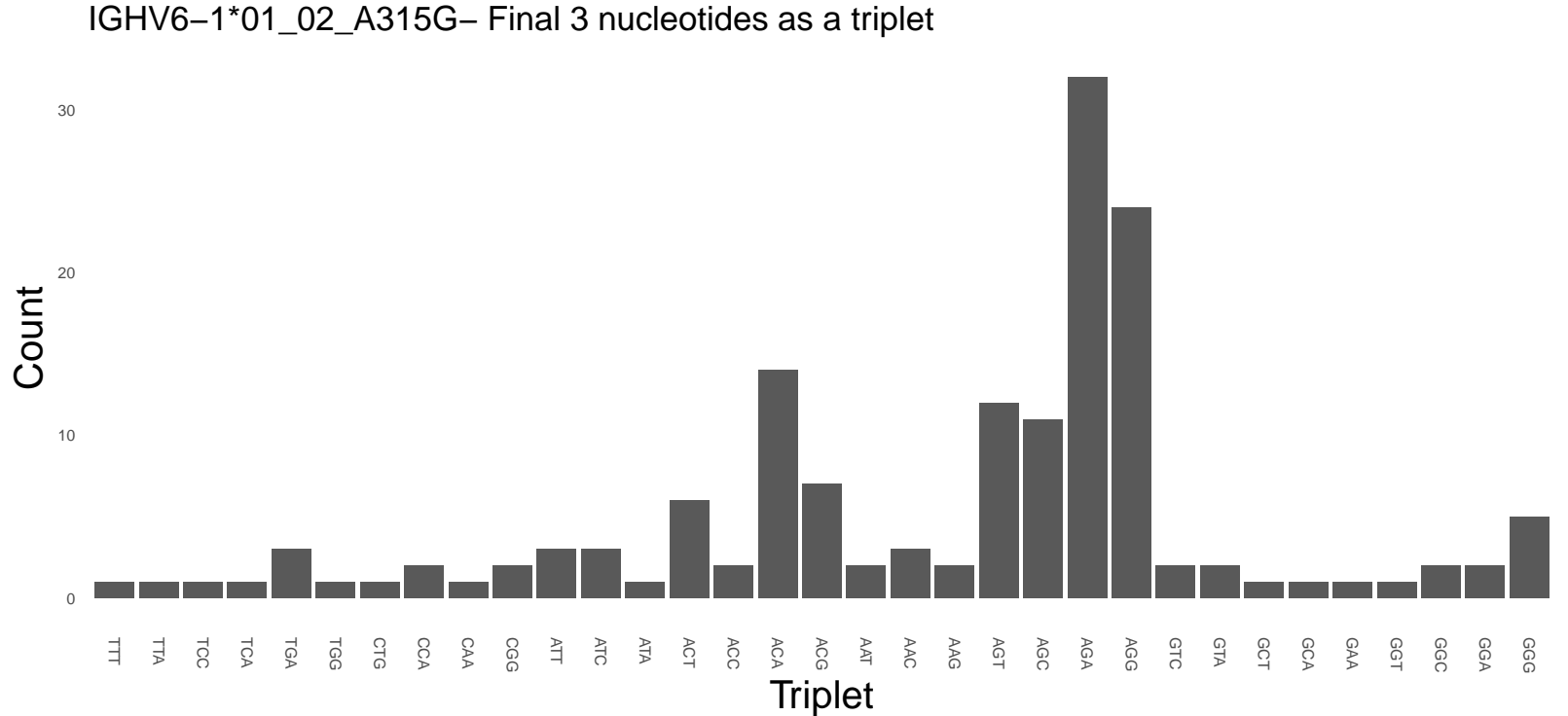
Gene IGHV6-1\*01\_02\_A315G



IGHV4-31\*02\_G92A\_C111T\_A113T\_A138T\_A164G\_A225C\_A234C\_G238C\_A240T\_T249C\_A25

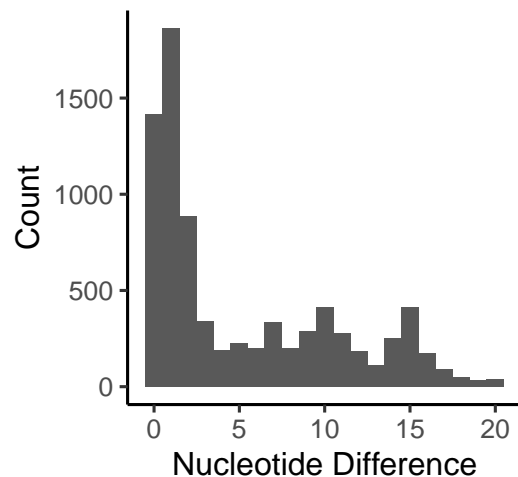


IGHV6-1\*01\_02\_A315G- Final 3 nucleotides as a triplet



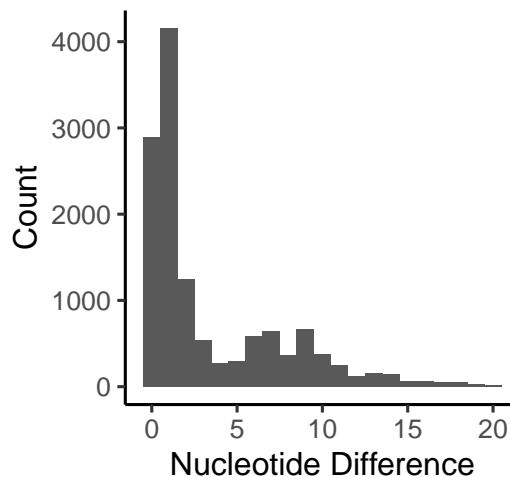
### IGHV1-2\*02

8681 sequences assigned  
1418 (16.3%) exact matches, in which:  
1139 unique CDR3  
6 unique J



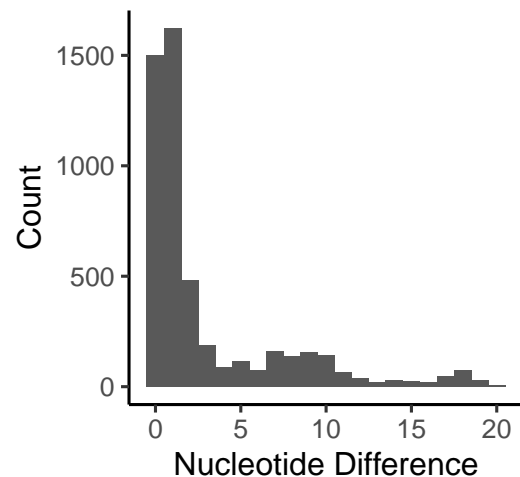
### IGHV1-18\*01

14925 sequences assigned  
2890 (19.4%) exact matches, in which:  
2206 unique CDR3  
6 unique J



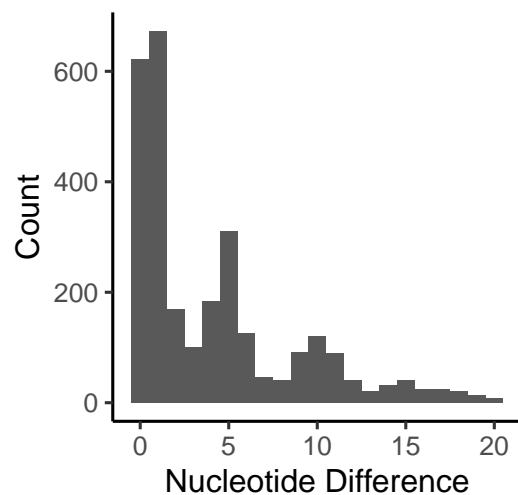
### IGHV1-46\*01

5075 sequences assigned  
1500 (29.6%) exact matches, in which:  
1249 unique CDR3  
6 unique J



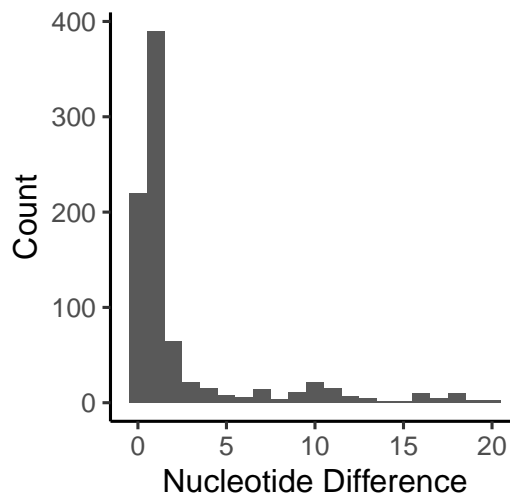
### IGHV1-3\*01\_05

2845 sequences assigned  
622 (21.9%) exact matches, in which:  
502 unique CDR3  
6 unique J



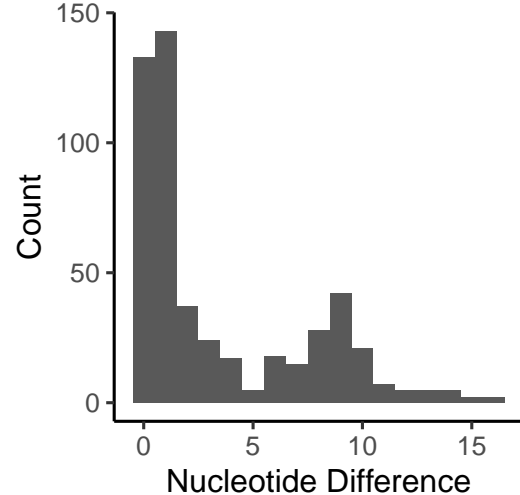
### IGHV1-24\*01

874 sequences assigned  
220 (25.2%) exact matches, in which:  
149 unique CDR3  
6 unique J



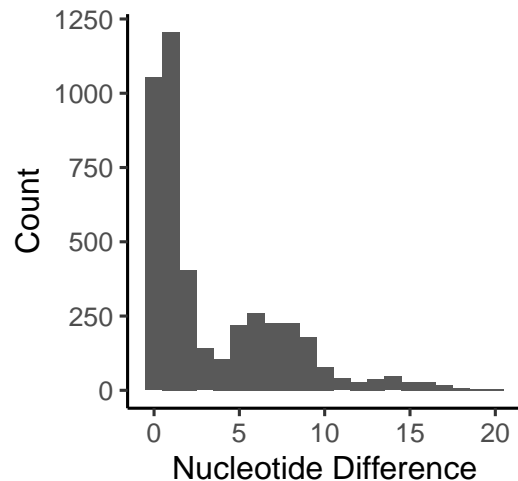
### IGHV1-58\*02

514 sequences assigned  
133 (25.9%) exact matches, in which:  
106 unique CDR3  
5 unique J



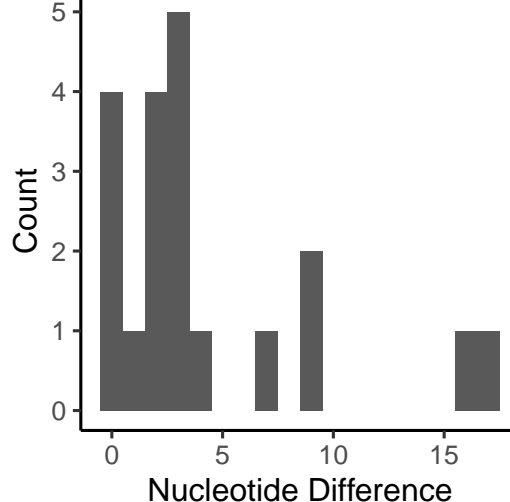
### IGHV1-8\*01

4458 sequences assigned  
1053 (23.6%) exact matches, in which:  
875 unique CDR3  
6 unique J



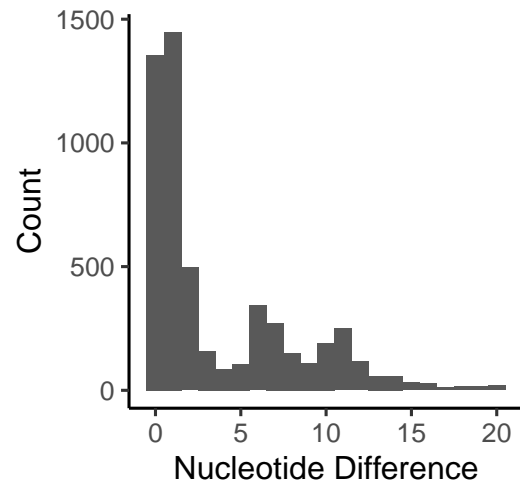
### IGHV1-45\*03

21 sequences assigned  
4 (19%) exact matches, in which:  
4 unique CDR3  
2 unique J



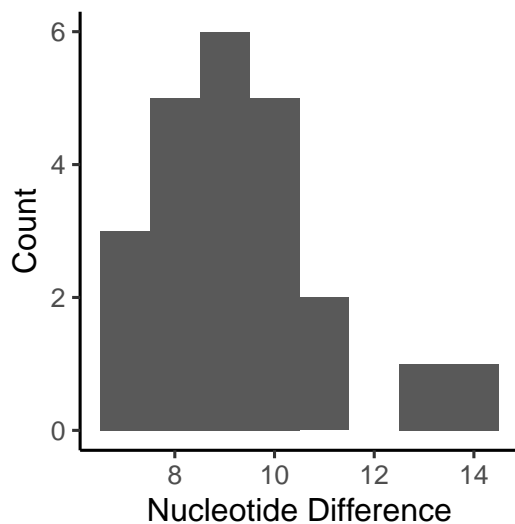
### IGHV1-69\*04\_09

5528 sequences assigned  
1356 (24.5%) exact matches, in which:  
1135 unique CDR3  
6 unique J



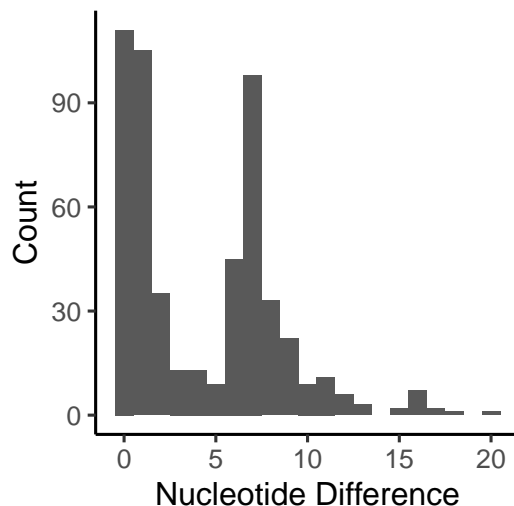
### IGHV1–NL1\*01

23 sequences assigned  
No exact matches.



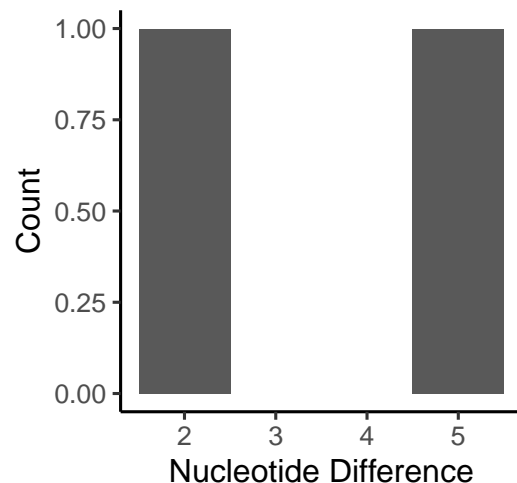
### IGHV2–26\*01

528 sequences assigned  
111 (21%) exact matches, in which:  
95 unique CDR3  
5 unique J



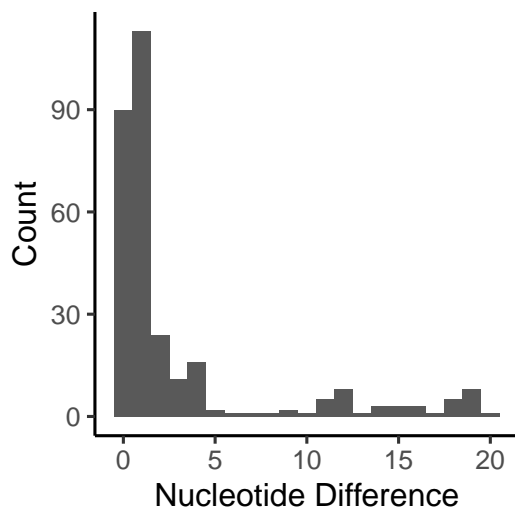
### IGHV2–70D\*14

2 sequences assigned  
No exact matches.



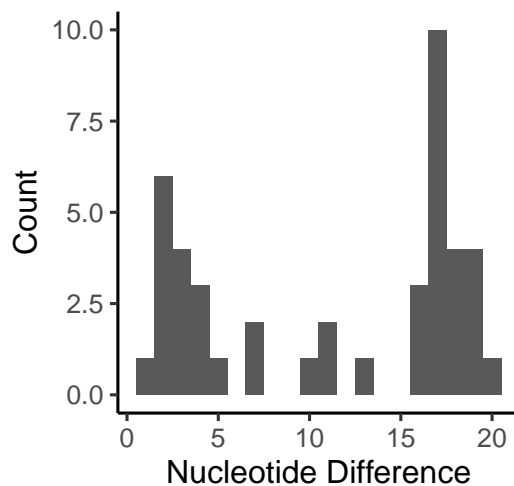
### IGHV2–5\*01

311 sequences assigned  
90 (28.9%) exact matches, in which:  
71 unique CDR3  
6 unique J



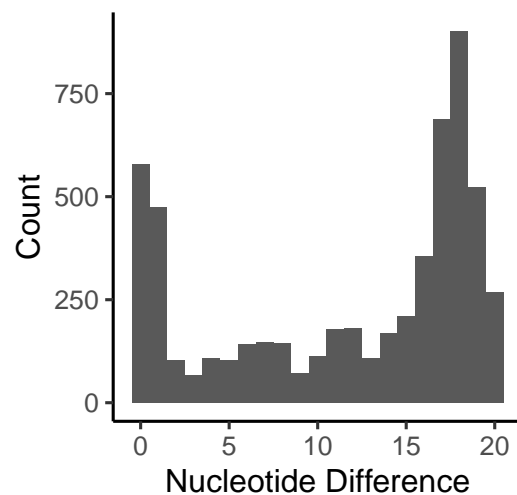
### IGHV2–70\*12

782 sequences assigned  
No exact matches.



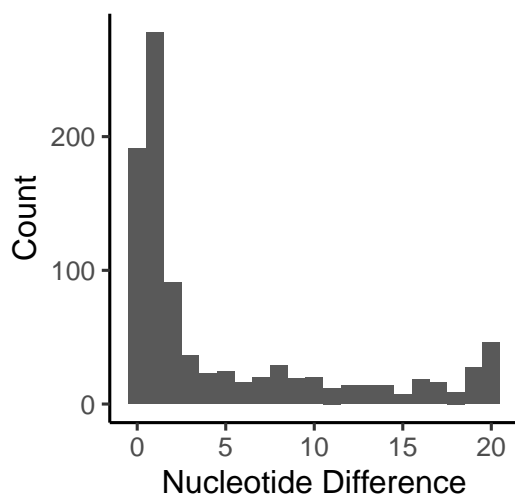
### IGHV3–7\*01

8488 sequences assigned  
578 (6.8%) exact matches, in which:  
411 unique CDR3  
6 unique J



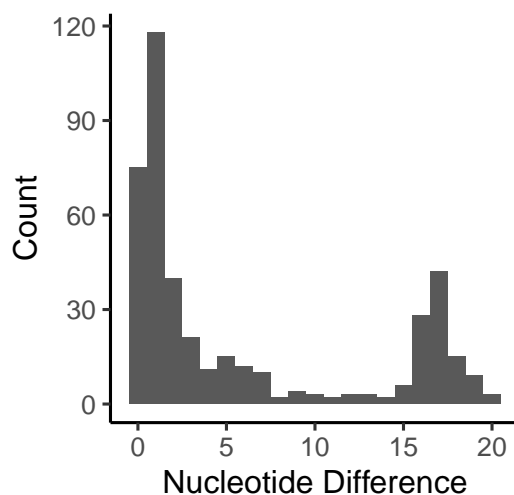
### IGHV2–5\*02

1186 sequences assigned  
191 (16.1%) exact matches, in which:  
145 unique CDR3  
6 unique J



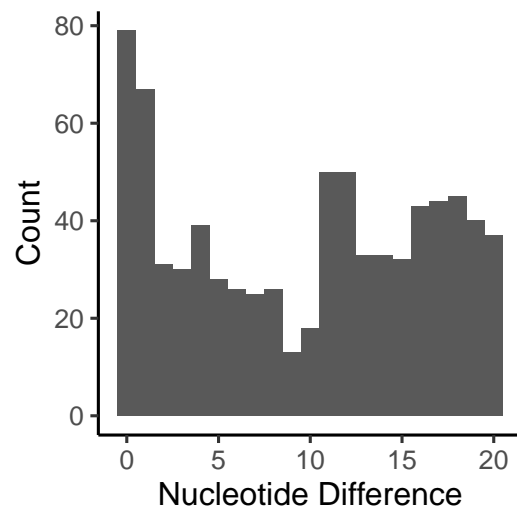
### IGHV2–70\*11\_15

469 sequences assigned  
75 (16%) exact matches, in which:  
53 unique CDR3  
4 unique J



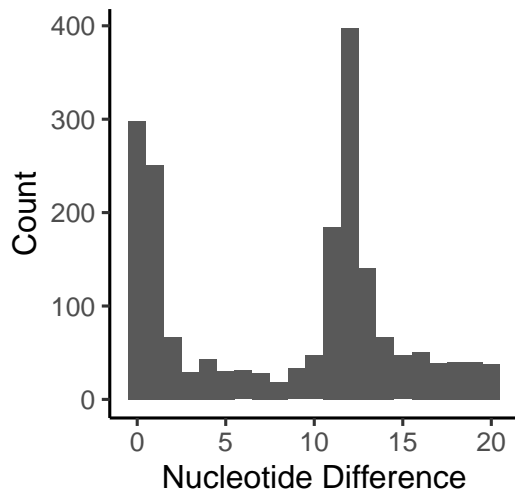
### IGHV3–7\*03

1147 sequences assigned  
79 (6.9%) exact matches, in which:  
67 unique CDR3  
6 unique J



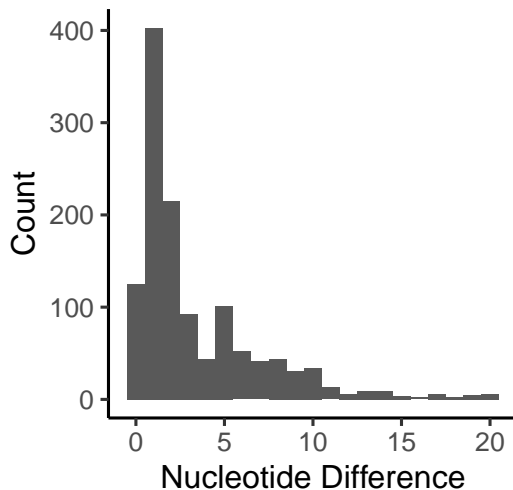
### IGHV3-7\*05

2115 sequences assigned  
298 (14.1%) exact matches, in which:  
205 unique CDR3  
6 unique J



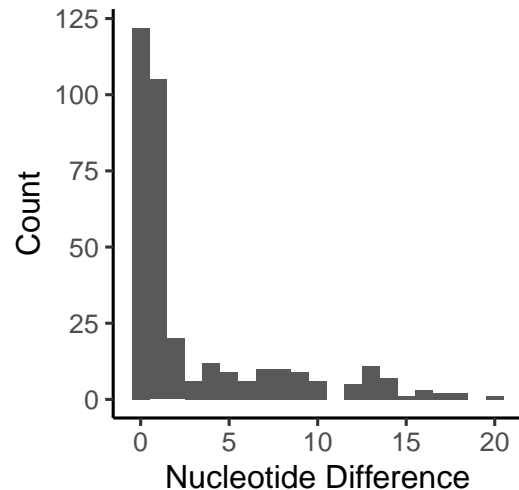
### IGHV3-11\*06

1321 sequences assigned  
125 (9.5%) exact matches, in which:  
118 unique CDR3  
4 unique J



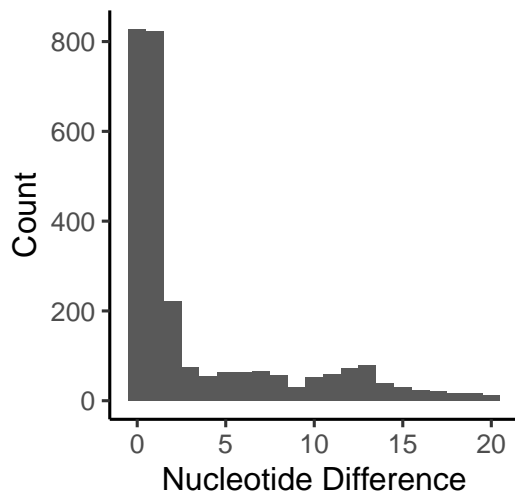
### IGHV3-13\*04

361 sequences assigned  
122 (33.8%) exact matches, in which:  
74 unique CDR3  
6 unique J



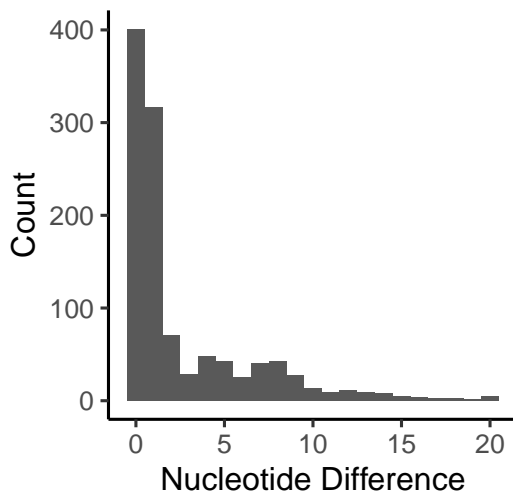
### IGHV3-9\*01

2943 sequences assigned  
828 (28.1%) exact matches, in which:  
447 unique CDR3  
6 unique J



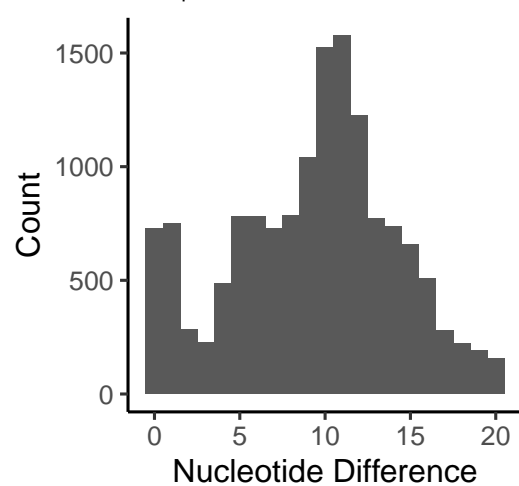
### IGHV3-11\*03\_05

1190 sequences assigned  
401 (33.7%) exact matches, in which:  
262 unique CDR3  
6 unique J



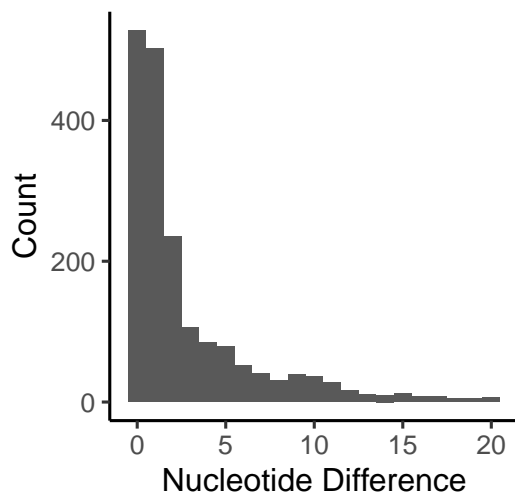
### IGHV3-15\*01\_02

15419 sequences assigned  
726 (4.7%) exact matches, in which:  
418 unique CDR3  
6 unique J



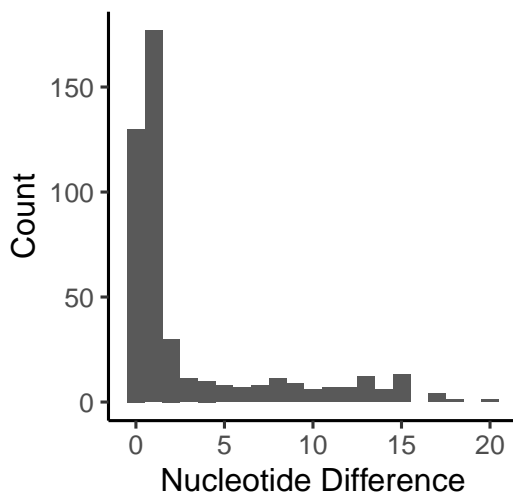
### IGHV3-11\*01

2718 sequences assigned  
528 (19.4%) exact matches, in which:  
370 unique CDR3  
6 unique J



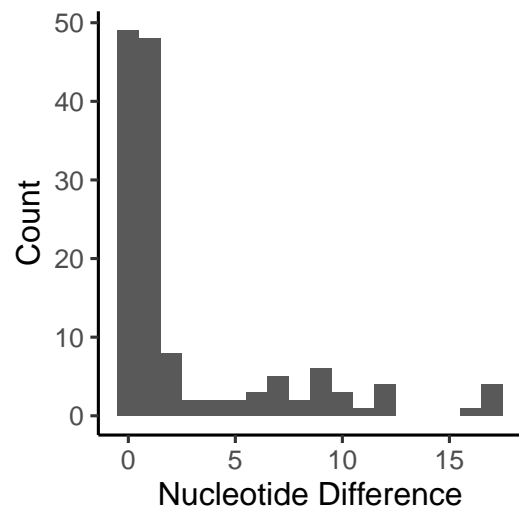
### IGHV3-13\*01

826 sequences assigned  
130 (15.7%) exact matches, in which:  
72 unique CDR3  
5 unique J



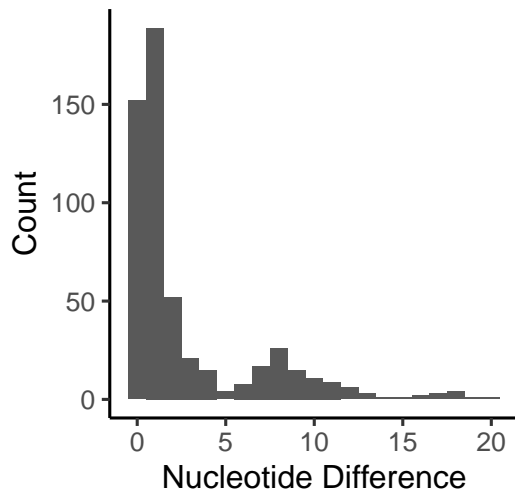
### IGHV3-20\*01\_02

144 sequences assigned  
49 (34%) exact matches, in which:  
30 unique CDR3  
5 unique J



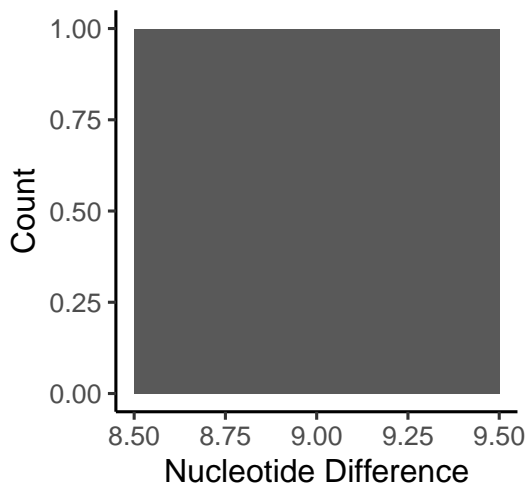
### IGHV3-20\*03\_04

794 sequences assigned  
152 (19.1%) exact matches, in which:  
87 unique CDR3  
5 unique J



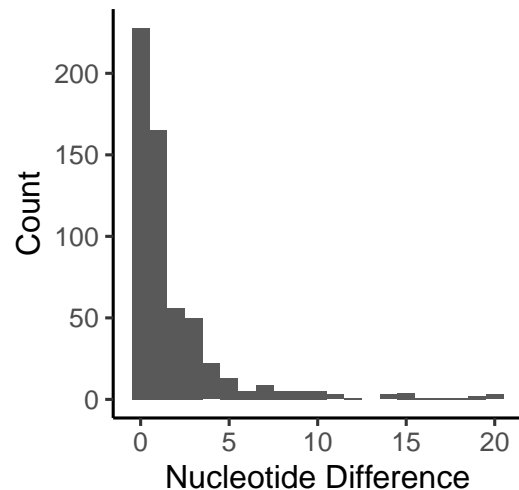
### IGHV3-22\*01\_02

1 sequences assigned  
No exact matches.



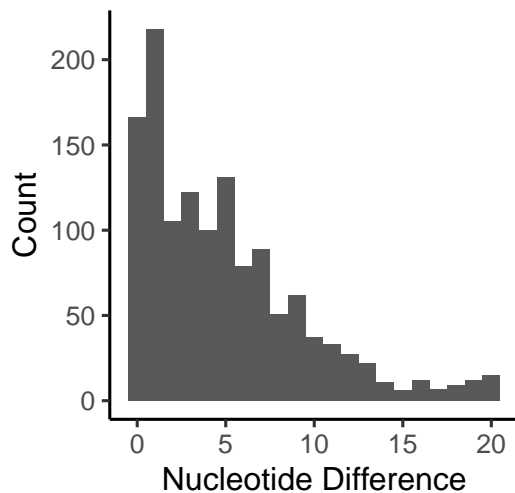
### IGHV3-30\*03

691 sequences assigned  
228 (33%) exact matches, in which:  
212 unique CDR3  
6 unique J



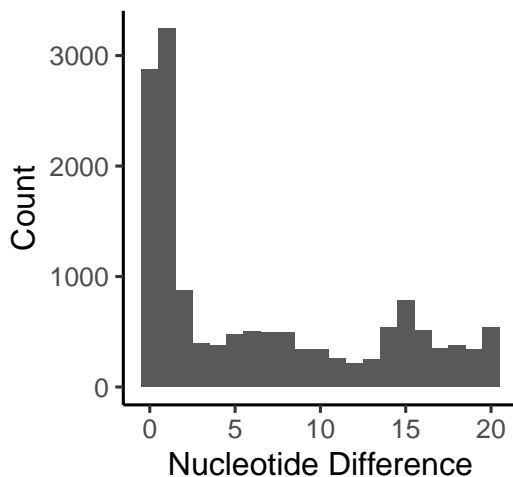
### IGHV3-21\*04

1418 sequences assigned  
166 (11.7%) exact matches, in which:  
144 unique CDR3  
6 unique J



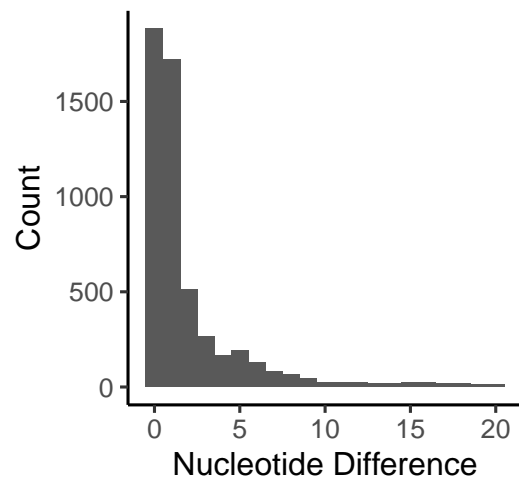
### IGHV3-23\*01\_04

19161 sequences assigned  
2875 (15%) exact matches, in which:  
1653 unique CDR3  
6 unique J



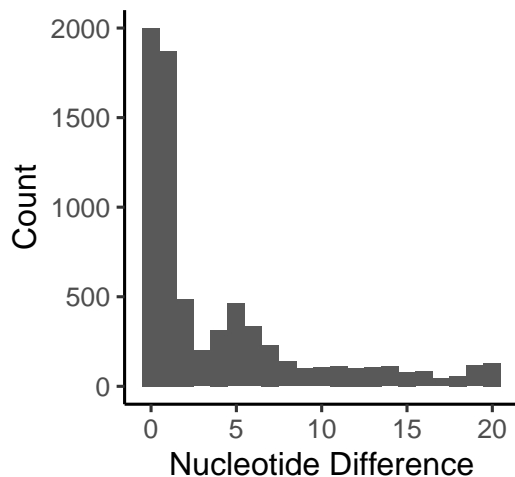
### IGHV3-30\*04

5589 sequences assigned  
1882 (33.7%) exact matches, in which:  
1218 unique CDR3  
6 unique J



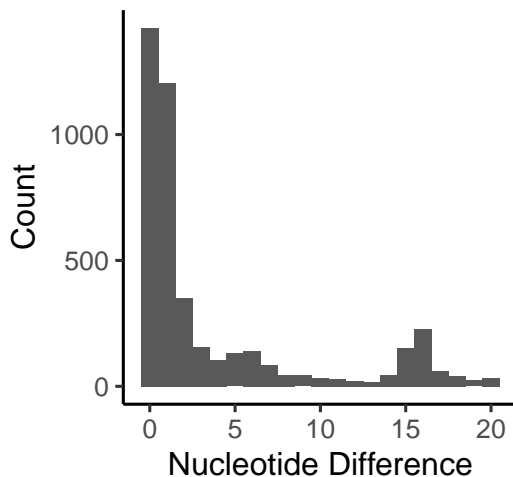
### IGHV3-21\*01\_02

8824 sequences assigned  
2000 (22.7%) exact matches, in which:  
1253 unique CDR3  
6 unique J



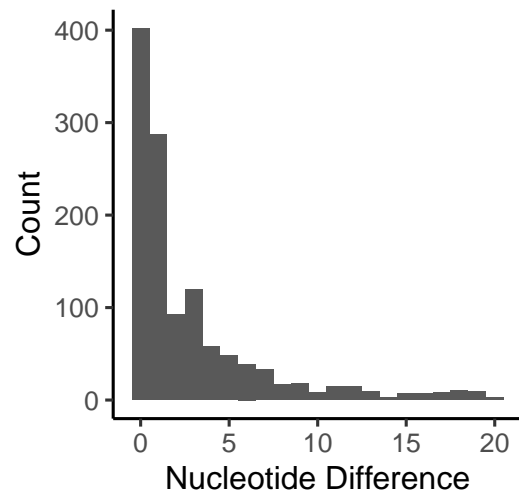
### IGHV3-30-3\*01

4578 sequences assigned  
1423 (31.1%) exact matches, in which:  
957 unique CDR3  
6 unique J



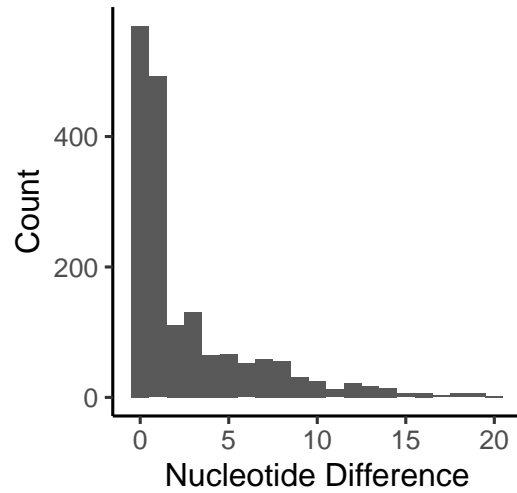
### IGHV3-30\*18

1327 sequences assigned  
402 (30.3%) exact matches, in which:  
229 unique CDR3  
5 unique J



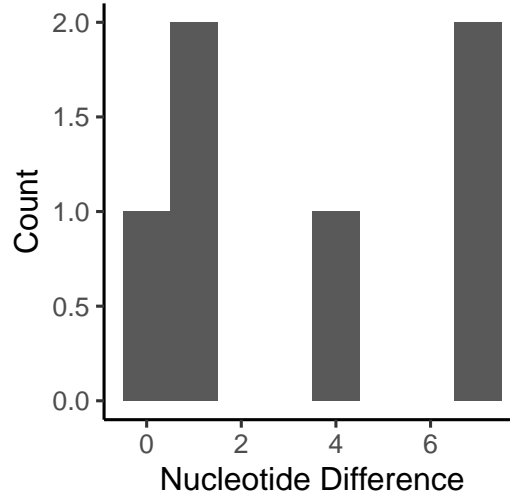
### IGHV3–33\*01

2289 sequences assigned  
570 (24.9%) exact matches, in which:  
388 unique CDR3  
6 unique J



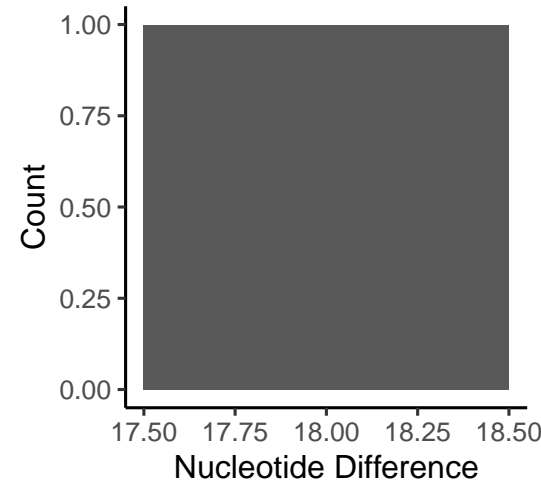
### IGHV3–35\*01

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



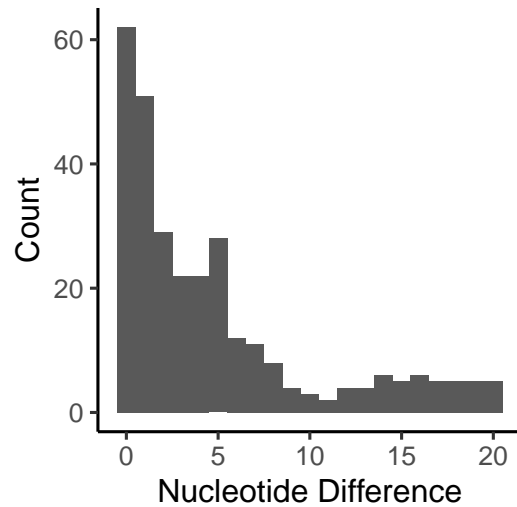
### IGHV3–47\*02

1 sequences assigned  
No exact matches.



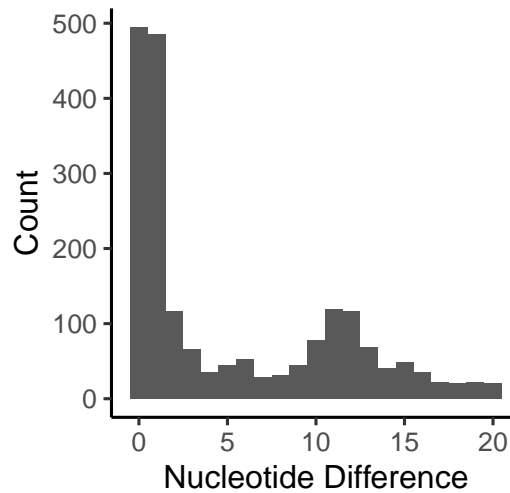
### IGHV3–33\*05

329 sequences assigned  
62 (18.8%) exact matches, in which:  
59 unique CDR3  
5 unique J



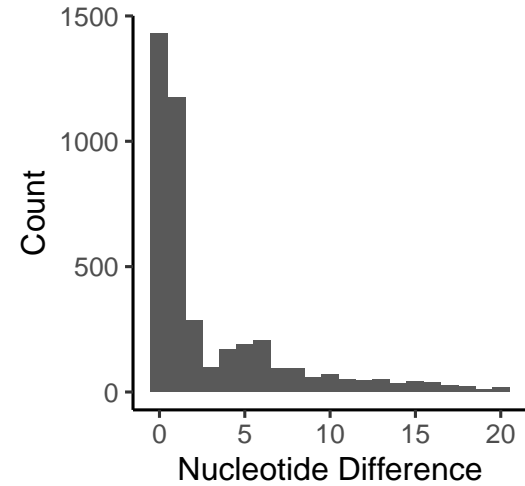
### IGHV3–43\*02

2235 sequences assigned  
495 (22.1%) exact matches, in which:  
284 unique CDR3  
6 unique J



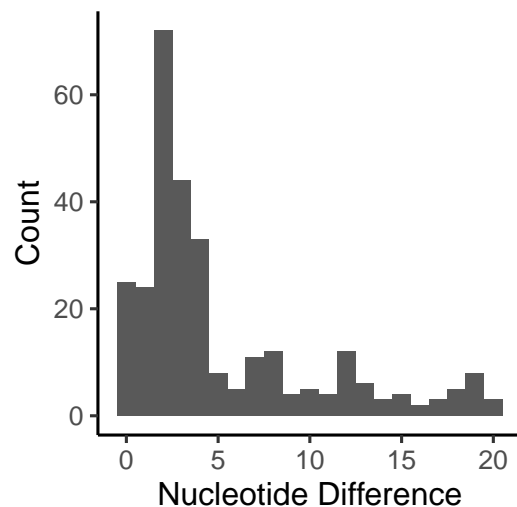
### IGHV3–48\*03

4784 sequences assigned  
1429 (29.9%) exact matches, in which:  
842 unique CDR3  
6 unique J



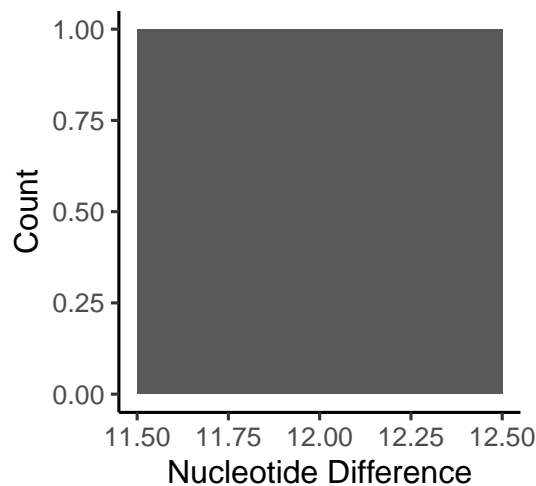
### IGHV3–33\*06

346 sequences assigned  
25 (7.2%) exact matches, in which:  
24 unique CDR3  
4 unique J



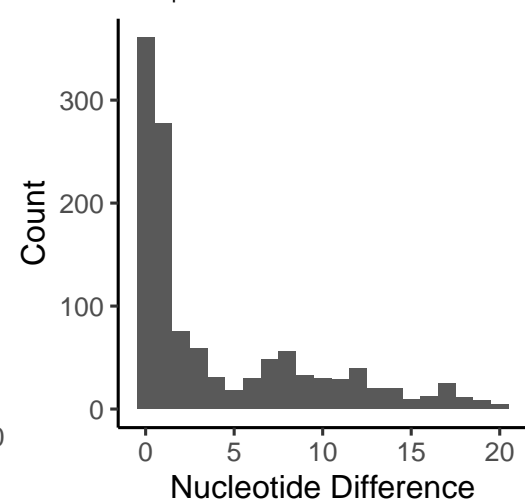
### IGHV3–47\*01

1 sequences assigned  
No exact matches.



### IGHV3–49\*04

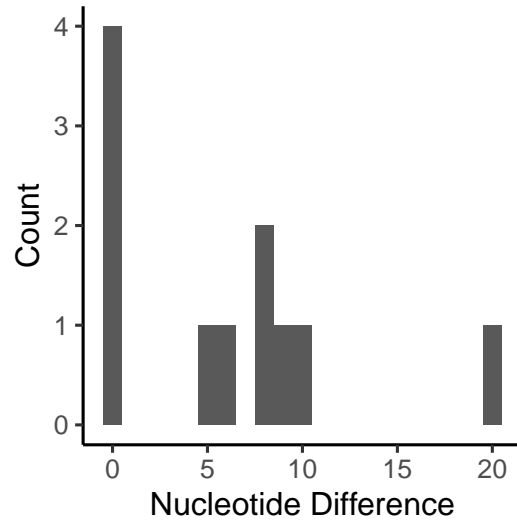
2048 sequences assigned  
361 (17.6%) exact matches, in which:  
223 unique CDR3  
6 unique J





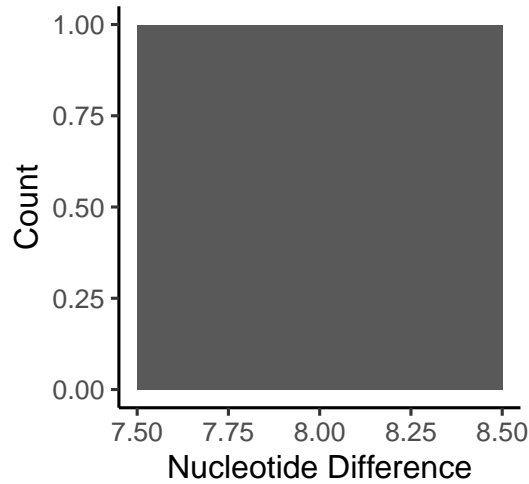
### IGHV3-52\*01\_03

11 sequences assigned  
4 (36.4%) exact matches, in which:  
4 unique CDR3  
4 unique J



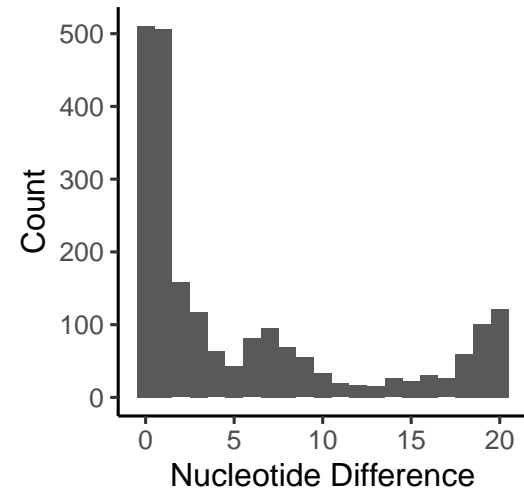
### IGHV3-62\*04

1 sequences assigned  
No exact matches.



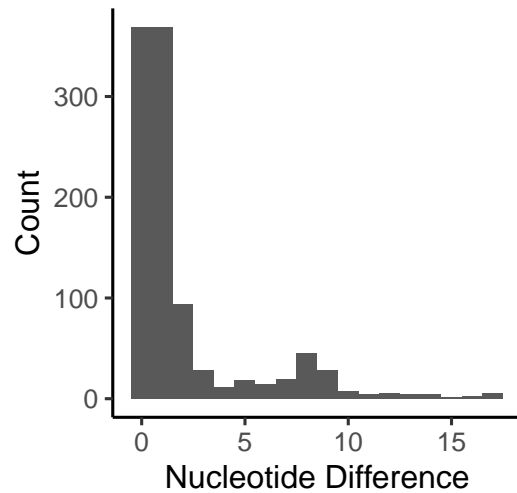
### IGHV3-66\*01

5638 sequences assigned  
511 (9.1%) exact matches, in which:  
373 unique CDR3  
5 unique J



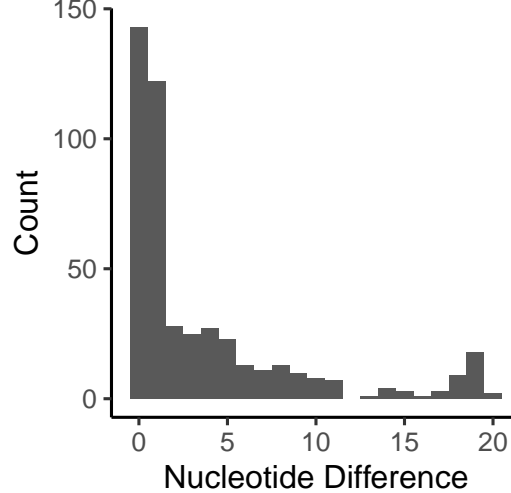
### IGHV3-53\*04

1078 sequences assigned  
369 (34.2%) exact matches, in which:  
247 unique CDR3  
5 unique J



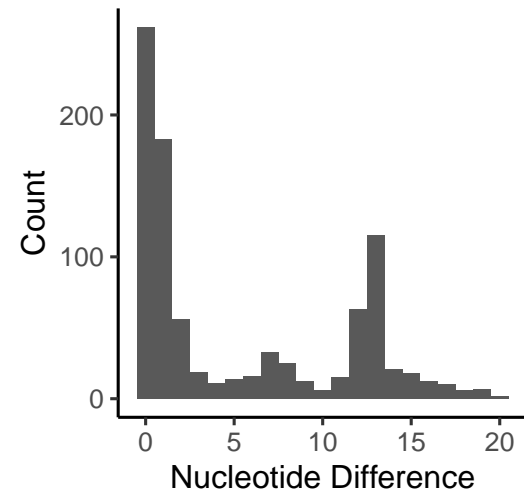
### IGHV3-64\*01

490 sequences assigned  
143 (29.2%) exact matches, in which:  
88 unique CDR3  
5 unique J



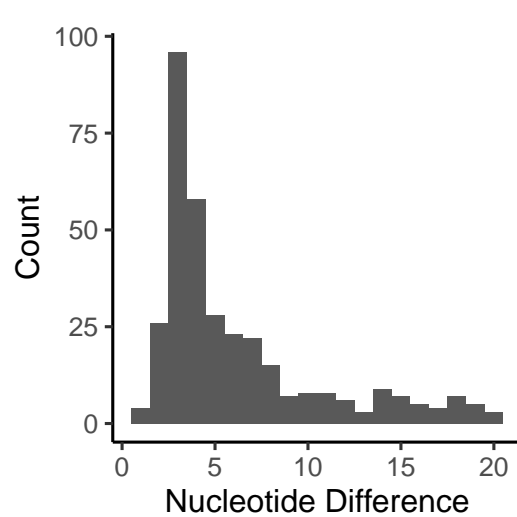
### IGHV3-66\*02

1095 sequences assigned  
262 (23.9%) exact matches, in which:  
184 unique CDR3  
5 unique J



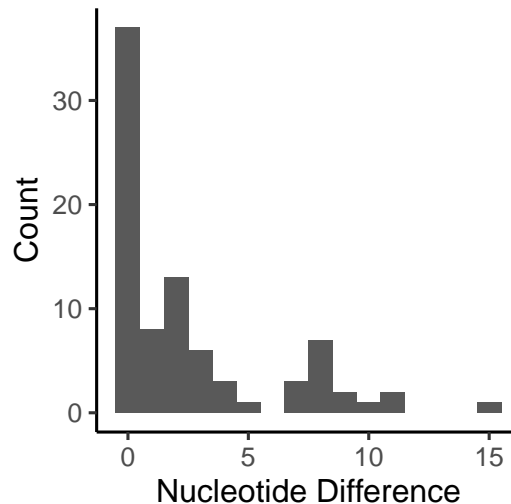
### IGHV3-53\*01\_02

439 sequences assigned  
No exact matches.



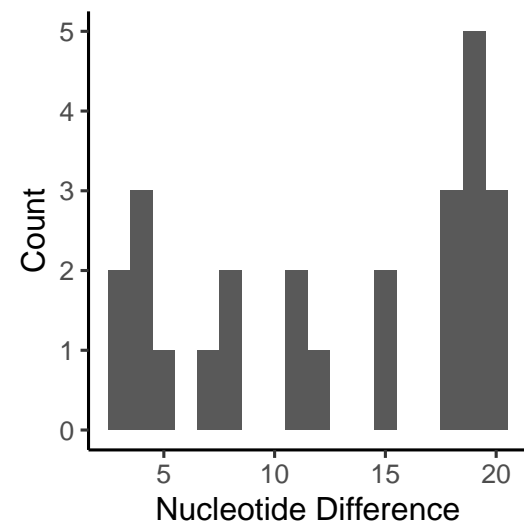
### IGHV3-64\*04

84 sequences assigned  
37 (44%) exact matches, in which:  
36 unique CDR3  
4 unique J



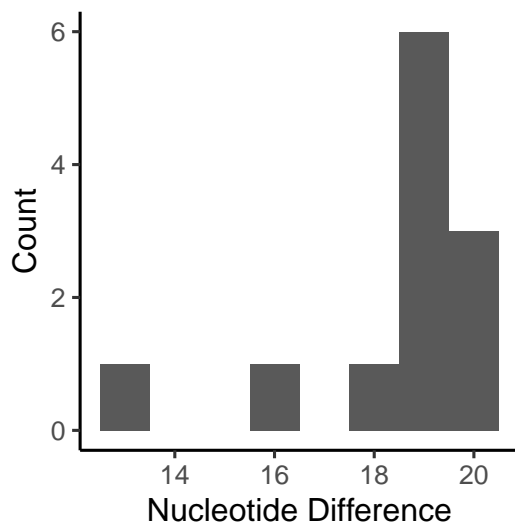
### IGHV3-69-1\*01

45 sequences assigned  
No exact matches.



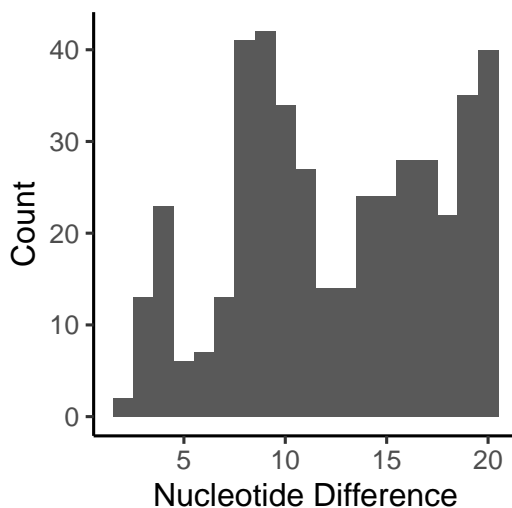
### IGHV3-69-1\*02

25 sequences assigned  
No exact matches.



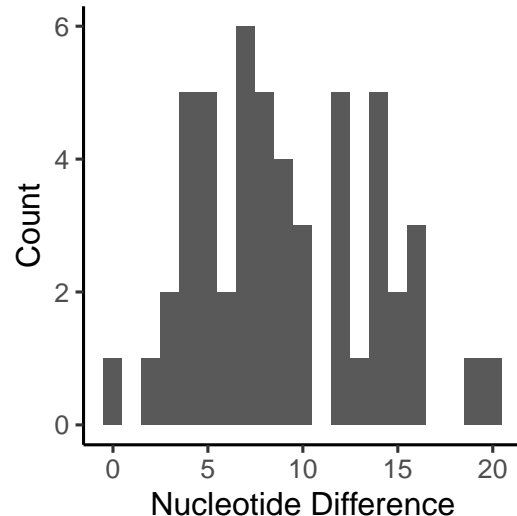
### IGHV3-74\*03

1709 sequences assigned  
No exact matches.



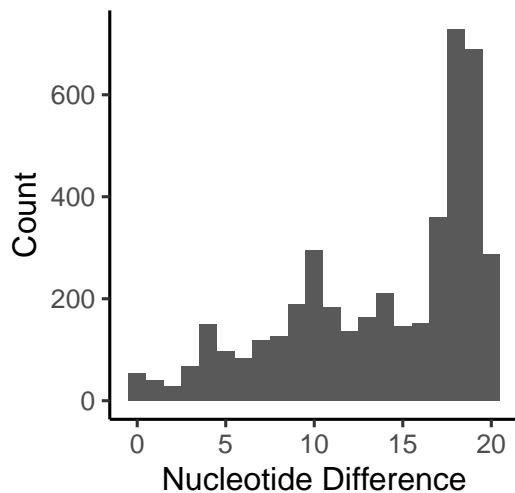
### IGHV3-NL1\*01

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



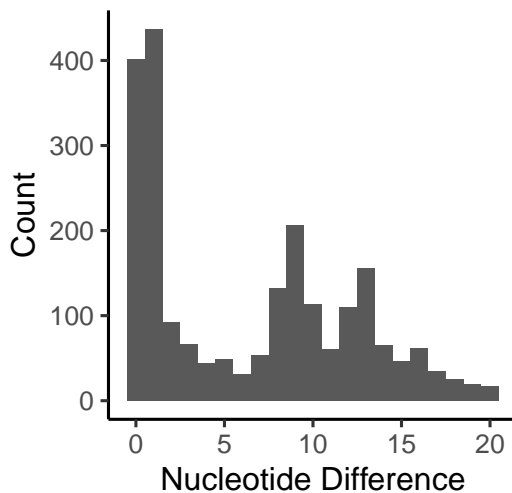
### IGHV3-72\*01

5828 sequences assigned  
54 (0.9%) exact matches, in which:  
34 unique CDR3  
5 unique J



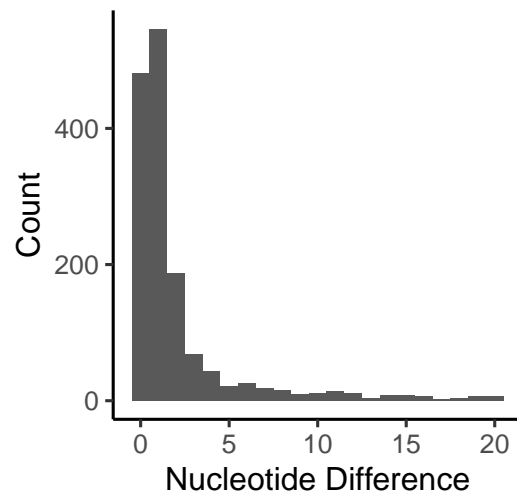
### IGHV3-74\*01\_02

2488 sequences assigned  
402 (16.2%) exact matches, in which:  
222 unique CDR3  
5 unique J



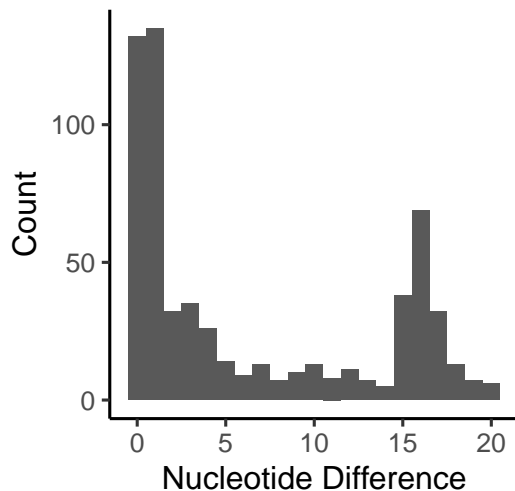
### IGHV4-4\*07

1622 sequences assigned  
481 (29.7%) exact matches, in which:  
404 unique CDR3  
6 unique J



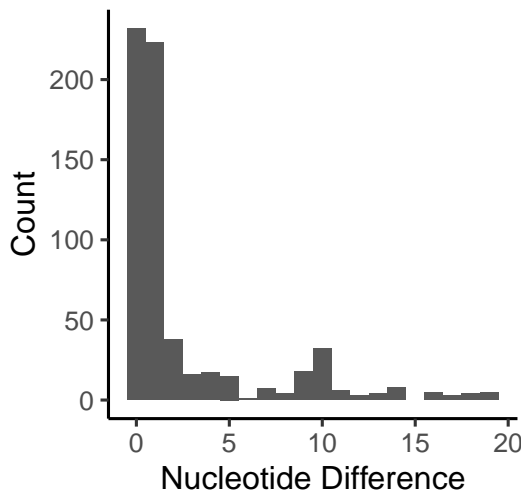
### IGHV3-73\*01\_02

987 sequences assigned  
132 (13.4%) exact matches, in which:  
81 unique CDR3  
5 unique J



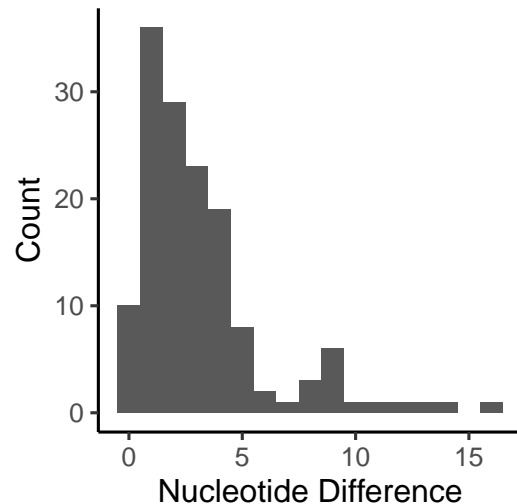
### IGHV3-64D\*09

703 sequences assigned  
232 (33%) exact matches, in which:  
106 unique CDR3  
5 unique J



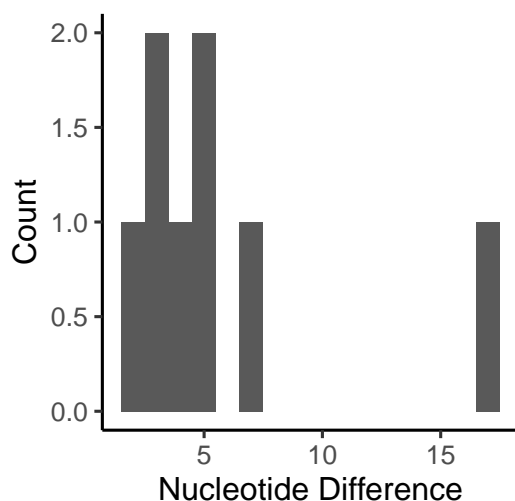
### IGHV4-4\*02\_03

150 sequences assigned  
10 (6.7%) exact matches, in which:  
10 unique CDR3  
5 unique J



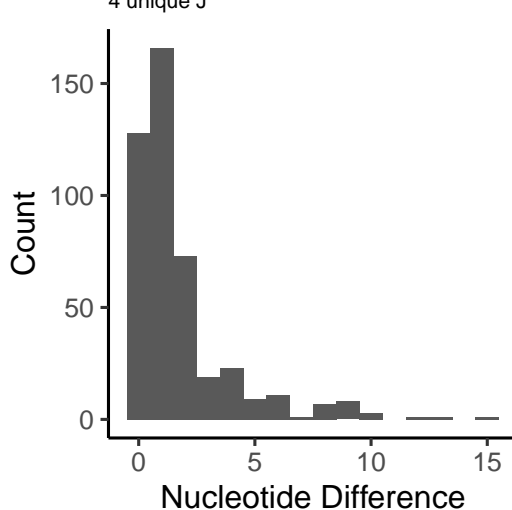
### IGHV4-28\*03

9 sequences assigned  
No exact matches.



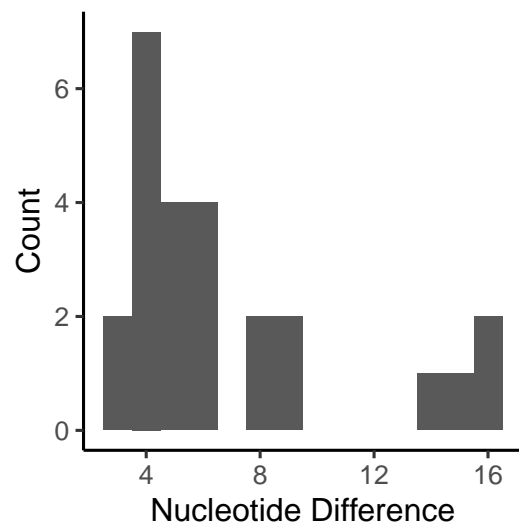
### IGHV4-30-2\*01

1447 sequences assigned  
128 (8.8%) exact matches, in which:  
68 unique CDR3  
4 unique J



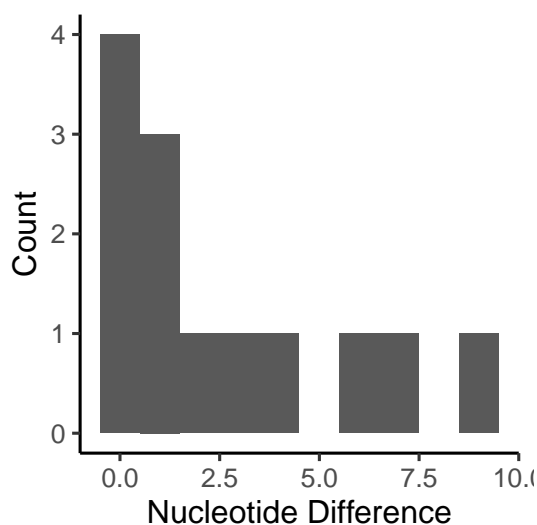
### IGHV4-30-4\*07

29 sequences assigned  
No exact matches.



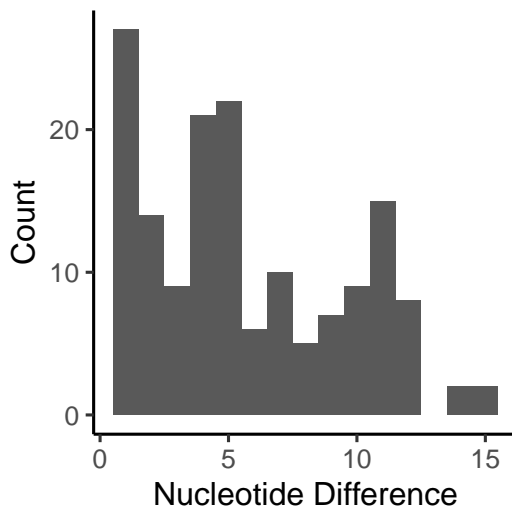
### IGHV4-28\*02\_05

13 sequences assigned  
4 (30.8%) exact matches, in which:  
3 unique CDR3  
3 unique J



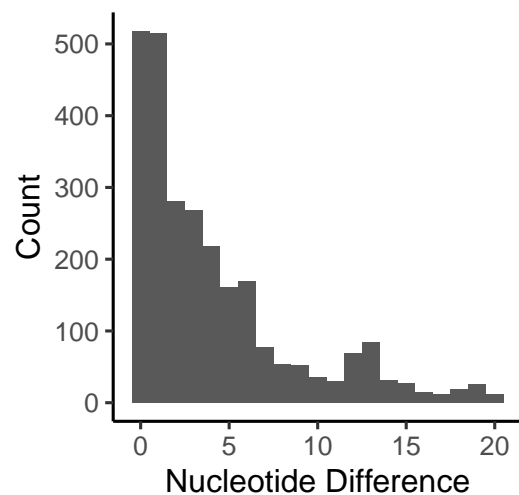
### IGHV4-30-2\*03

176 sequences assigned  
No exact matches.



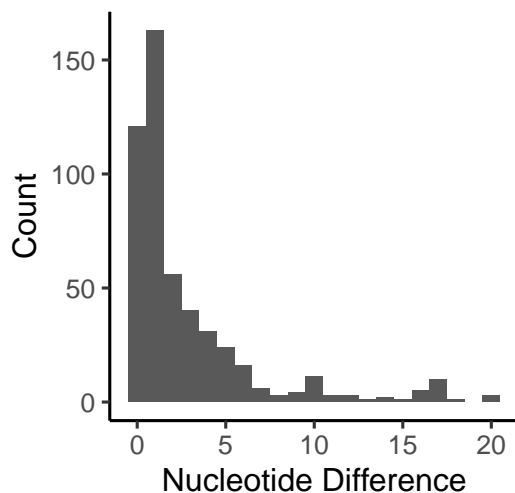
### IGHV4-31\*02

2758 sequences assigned  
518 (18.8%) exact matches, in which:  
414 unique CDR3  
6 unique J



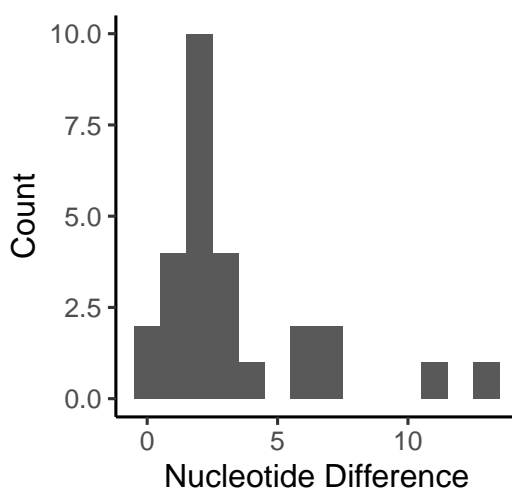
### IGHV4-30-4\*01

746 sequences assigned  
121 (16.2%) exact matches, in which:  
92 unique CDR3  
4 unique J



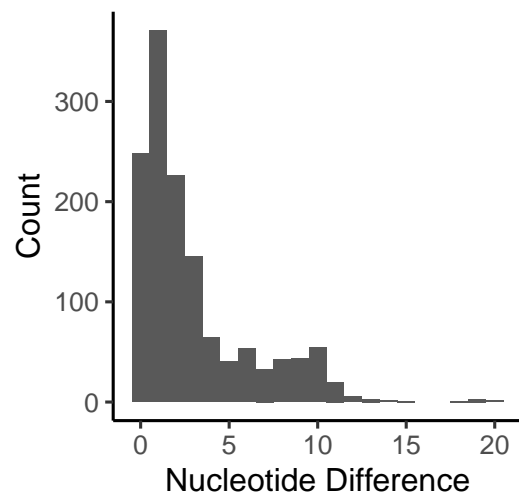
### IGHV4-30-2\*05

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



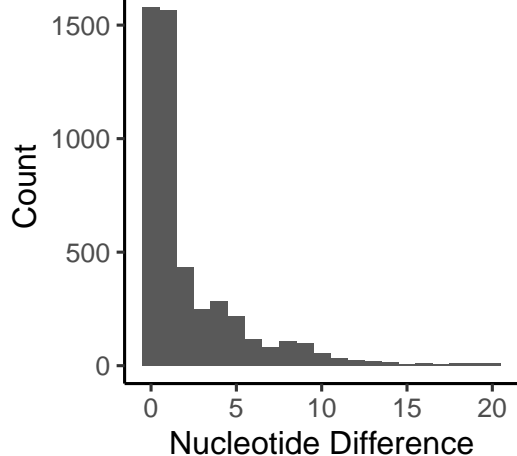
### IGHV4-31\*02\_G92A\_C1

1358 sequences assigned  
248 (18.3%) exact matches, in which:  
211 unique CDR3  
6 unique J



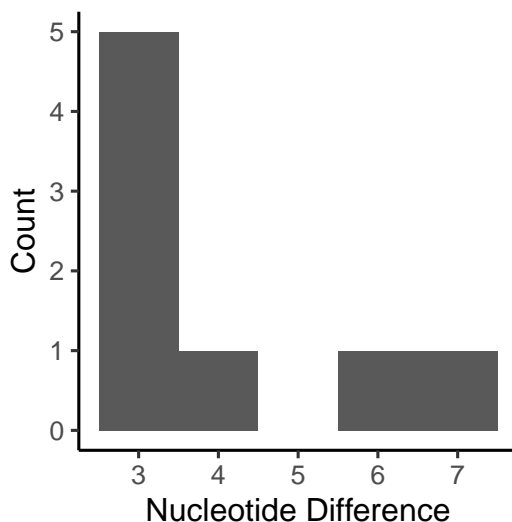
### IGHV4-34\*01\_02

5216 sequences assigned  
1578 (30.3%) exact matches, in which:  
1124 unique CDR3  
6 unique J



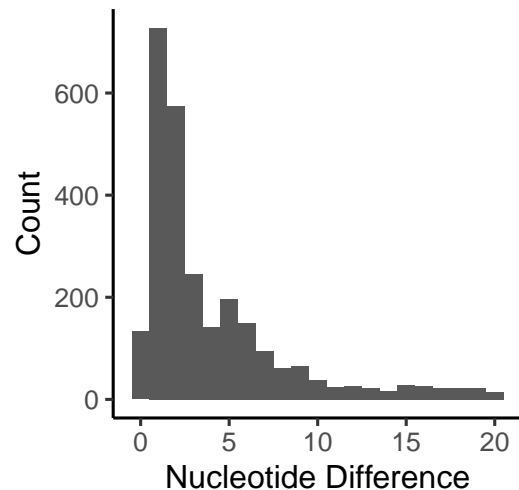
### IGHV4-55\*09

10 sequences assigned  
No exact matches.



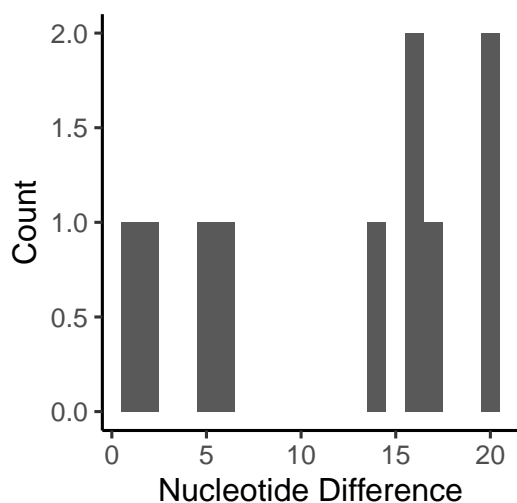
### IGHV4-59\*12

3454 sequences assigned  
133 (3.9%) exact matches, in which:  
126 unique CDR3  
6 unique J



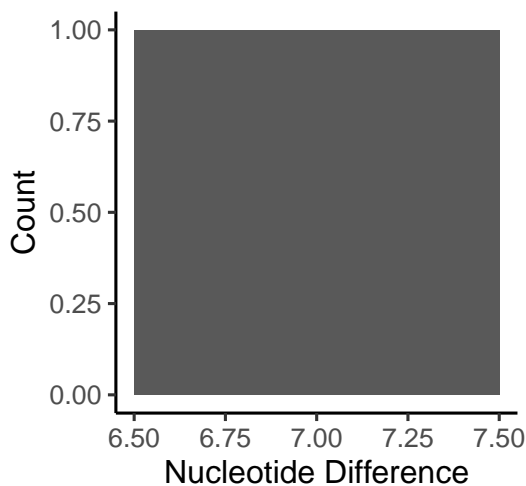
### IGHV4-38-2\*01

16 sequences assigned  
No exact matches.



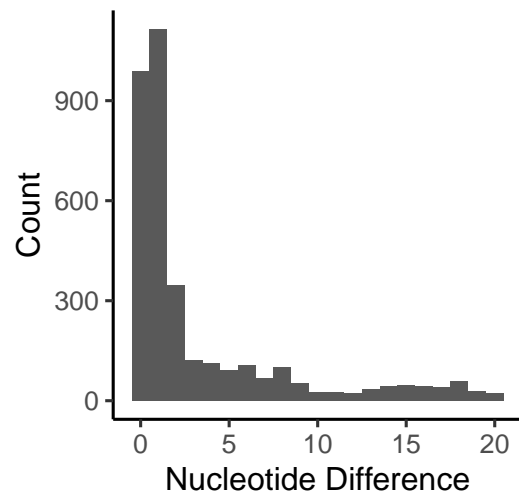
### IGHV4-55\*02\_04\_08

1 sequences assigned  
No exact matches.



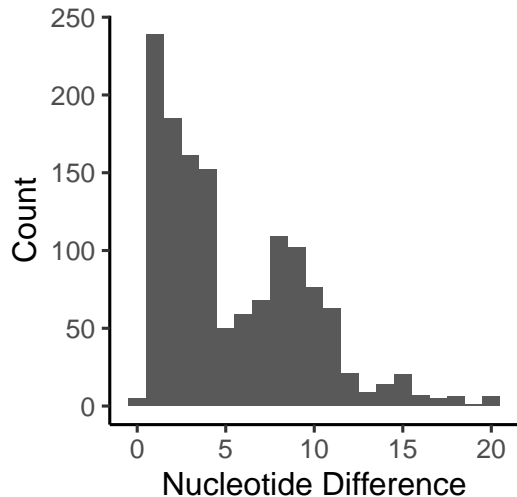
### IGHV4-61\*02

3668 sequences assigned  
988 (26.9%) exact matches, in which:  
827 unique CDR3  
6 unique J



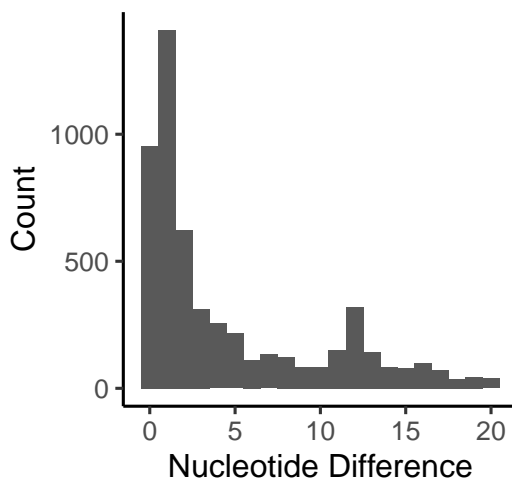
### IGHV4-39\*07

1576 sequences assigned  
5 (0.3%) exact matches, in which:  
5 unique CDR3  
2 unique J



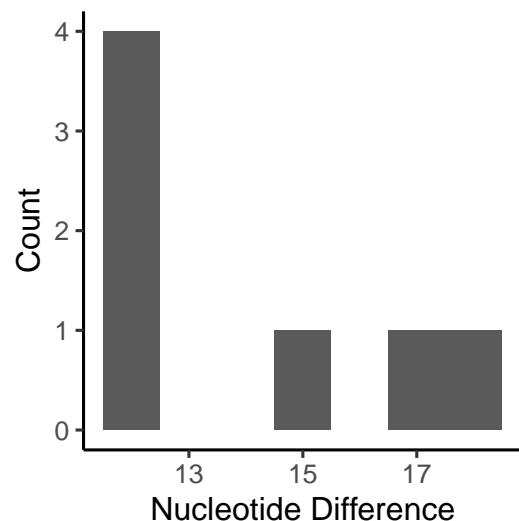
### IGHV4-59\*08

5900 sequences assigned  
954 (16.2%) exact matches, in which:  
730 unique CDR3  
6 unique J



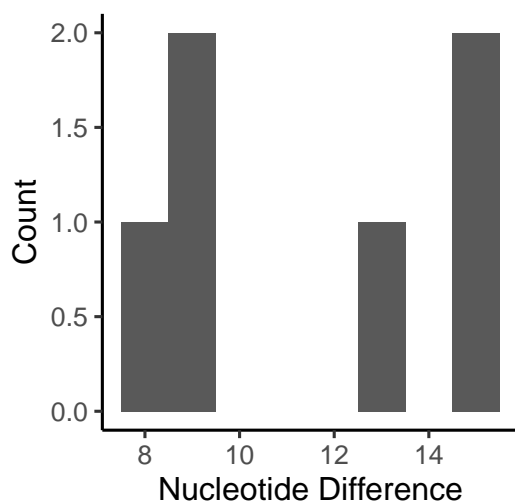
### IGHV1/OR15-2\*02\_03

10 sequences assigned  
No exact matches.



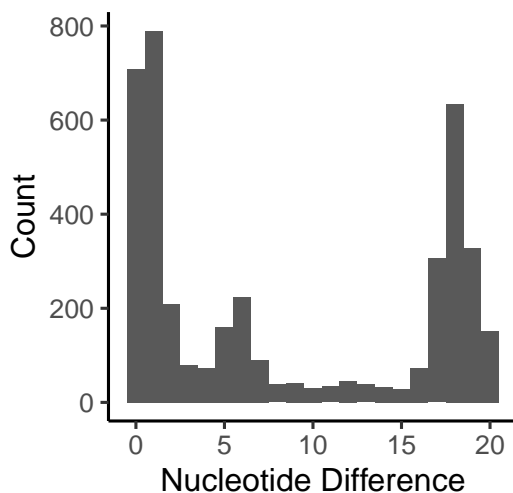
### IGHV1/OR15-3\*02

7 sequences assigned  
No exact matches.



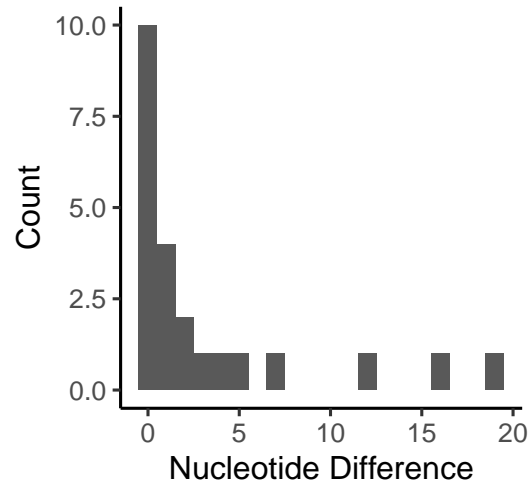
### IGHV5-10-1\*01\_03

4580 sequences assigned  
708 (15.5%) exact matches, in which:  
468 unique CDR3  
5 unique J



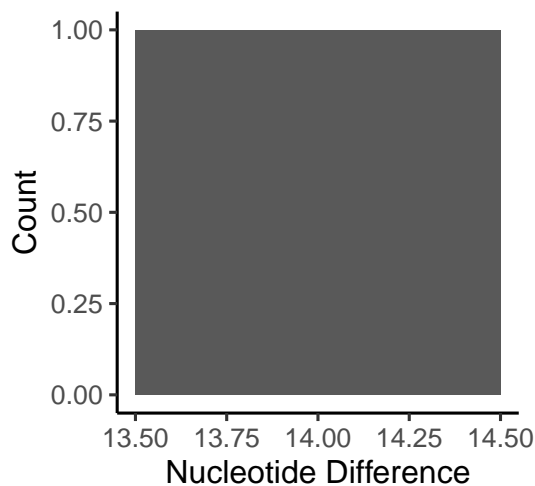
### IGHV5-51\*07

25 sequences assigned  
10 (40%) exact matches, in which:  
10 unique CDR3  
3 unique J



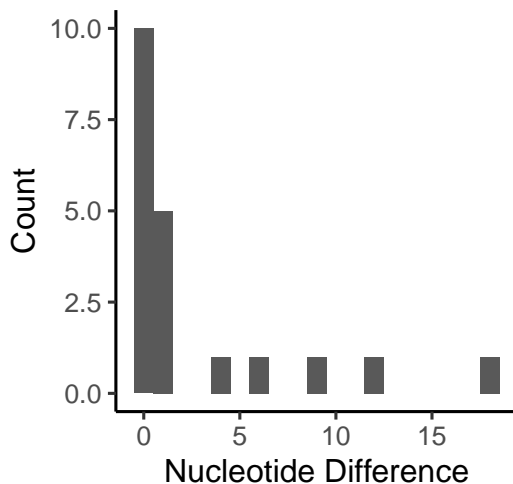
### IGHV1/OR15-4\*01

1 sequences assigned  
No exact matches.



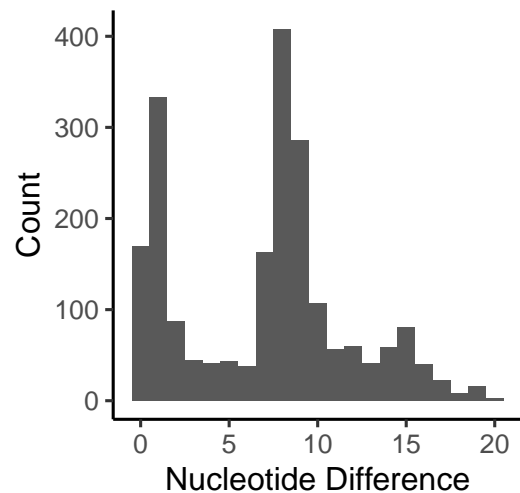
### IGHV5-51\*04

32 sequences assigned  
10 (31.2%) exact matches, in which:  
10 unique CDR3  
5 unique J



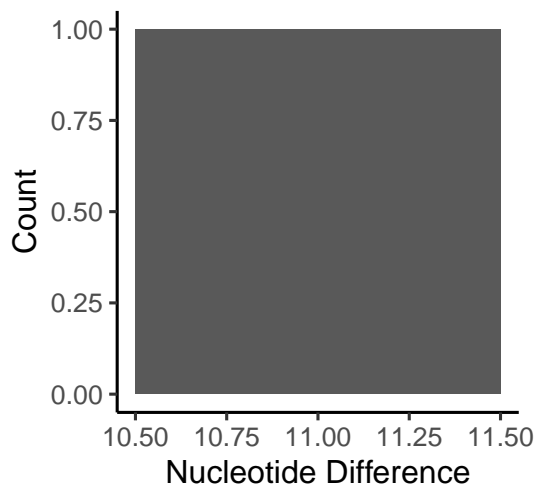
### IGHV6-1\*01\_02

2253 sequences assigned  
170 (7.5%) exact matches, in which:  
115 unique CDR3  
5 unique J



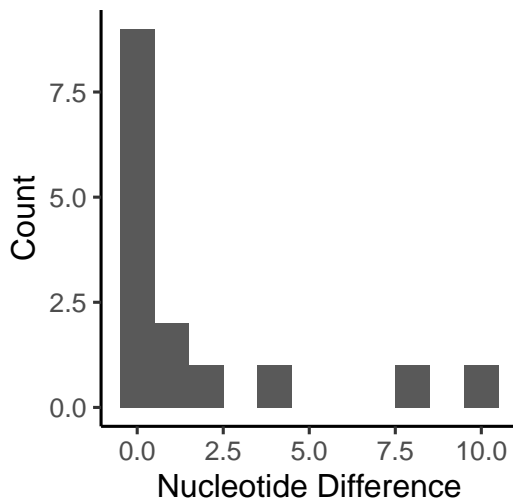
### IGHV1/OR15-9\*01

1 sequences assigned  
No exact matches.



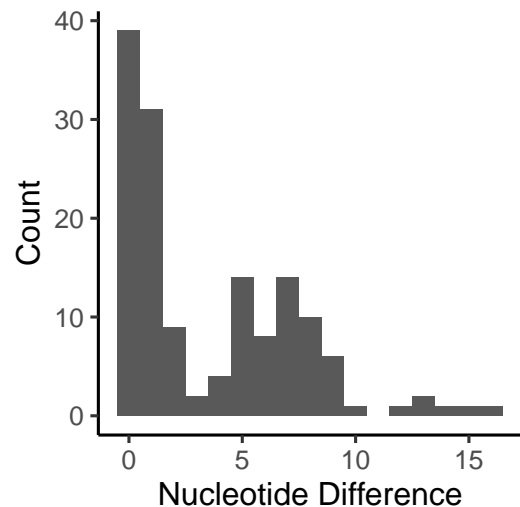
### IGHV5-51\*06

18 sequences assigned  
9 (50%) exact matches, in which:  
9 unique CDR3  
4 unique J



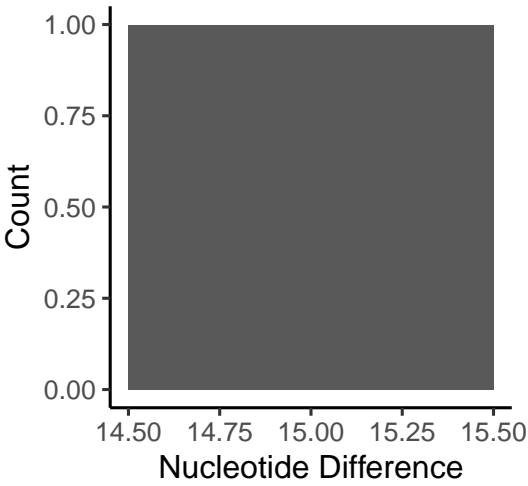
### IGHV6-1\*01\_02\_A315G

153 sequences assigned  
39 (25.5%) exact matches, in which:  
39 unique CDR3  
6 unique J



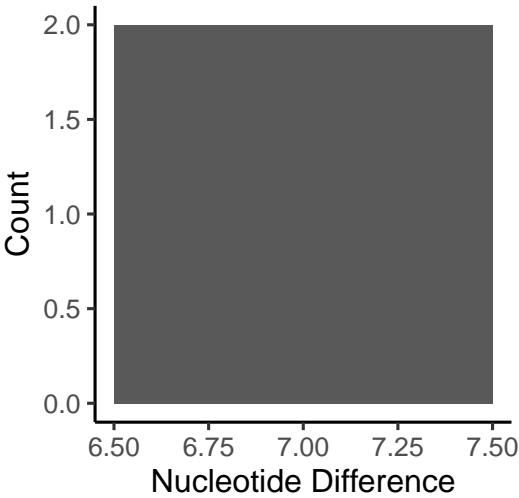
IGHV3/OR16-6\*02

4 sequences assigned  
No exact matches.



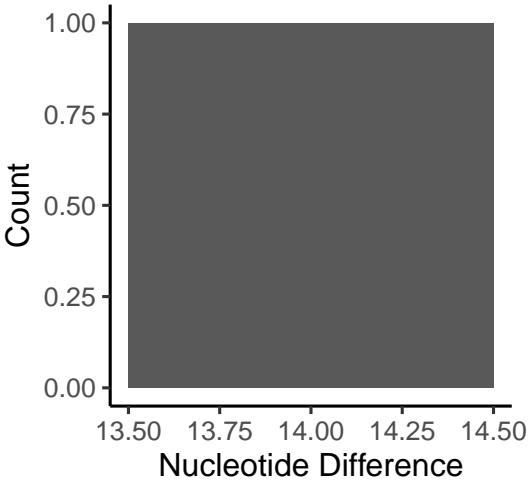
IGHV7-81\*01

2 sequences assigned  
No exact matches.



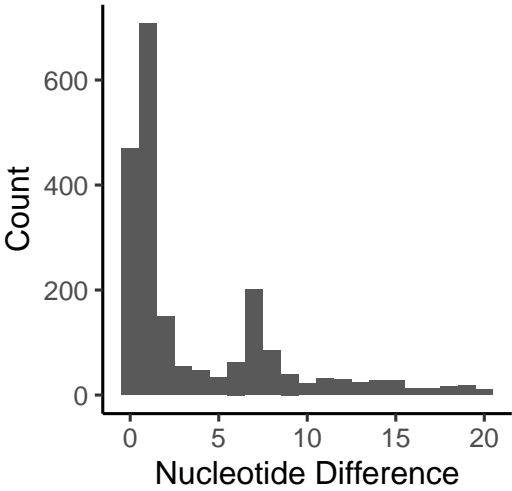
IGHV3/OR16-13\*01

1 sequences assigned  
No exact matches.

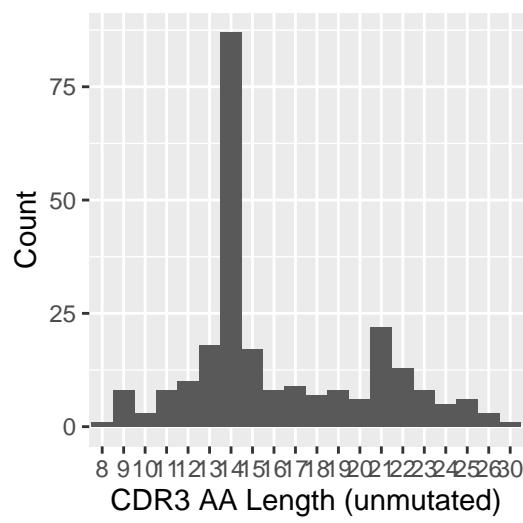


IGHV7-4-1\*02

2653 sequences assigned  
470 (17.7%) exact matches, in which:  
360 unique CDR3  
6 unique J



IGHV4-31\*02\_G92A\_C111T\_A113T\_A138T\_A164G\_A225C\_A234C\_G238C\_A240T\_T249C\_A25



IGHV6-1\*01\_02\_A315G

