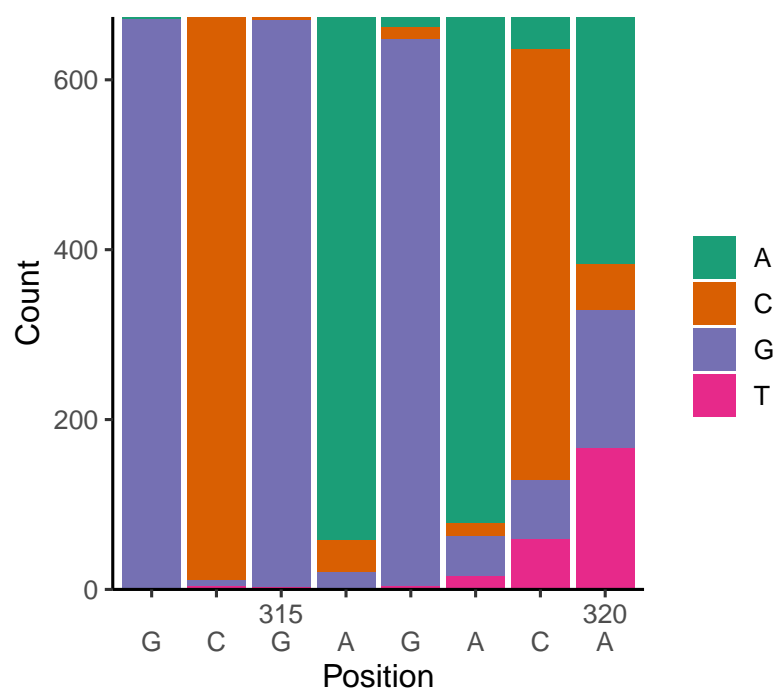
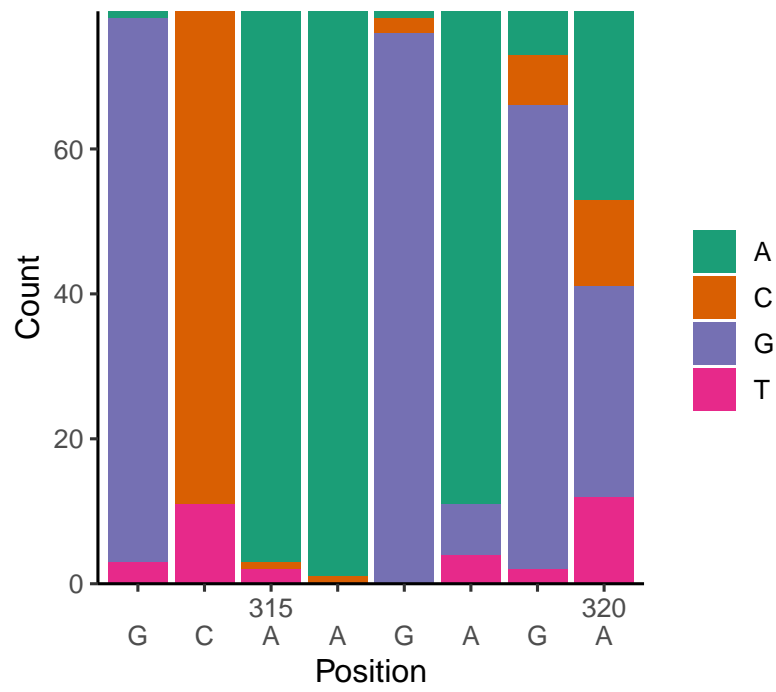


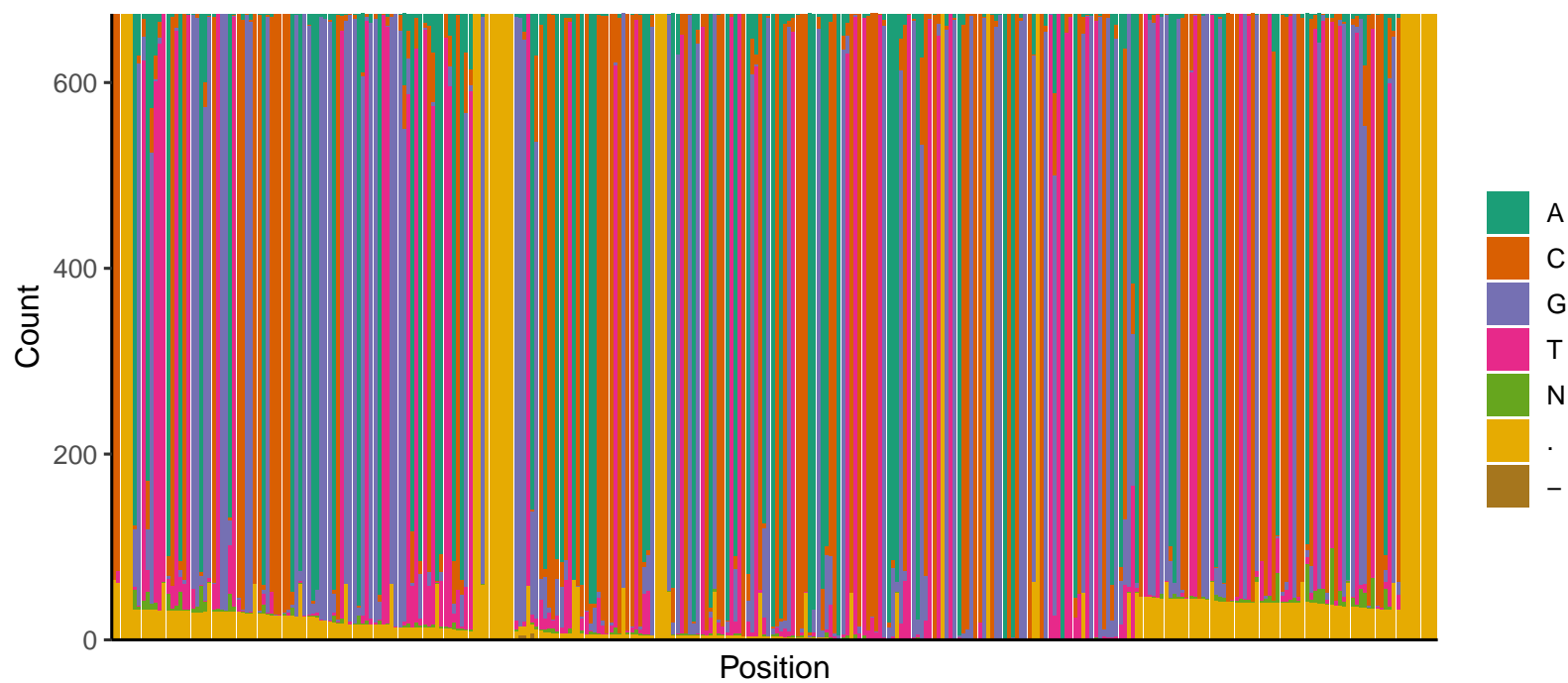
Gene IGHV4-59\*08\_A291G



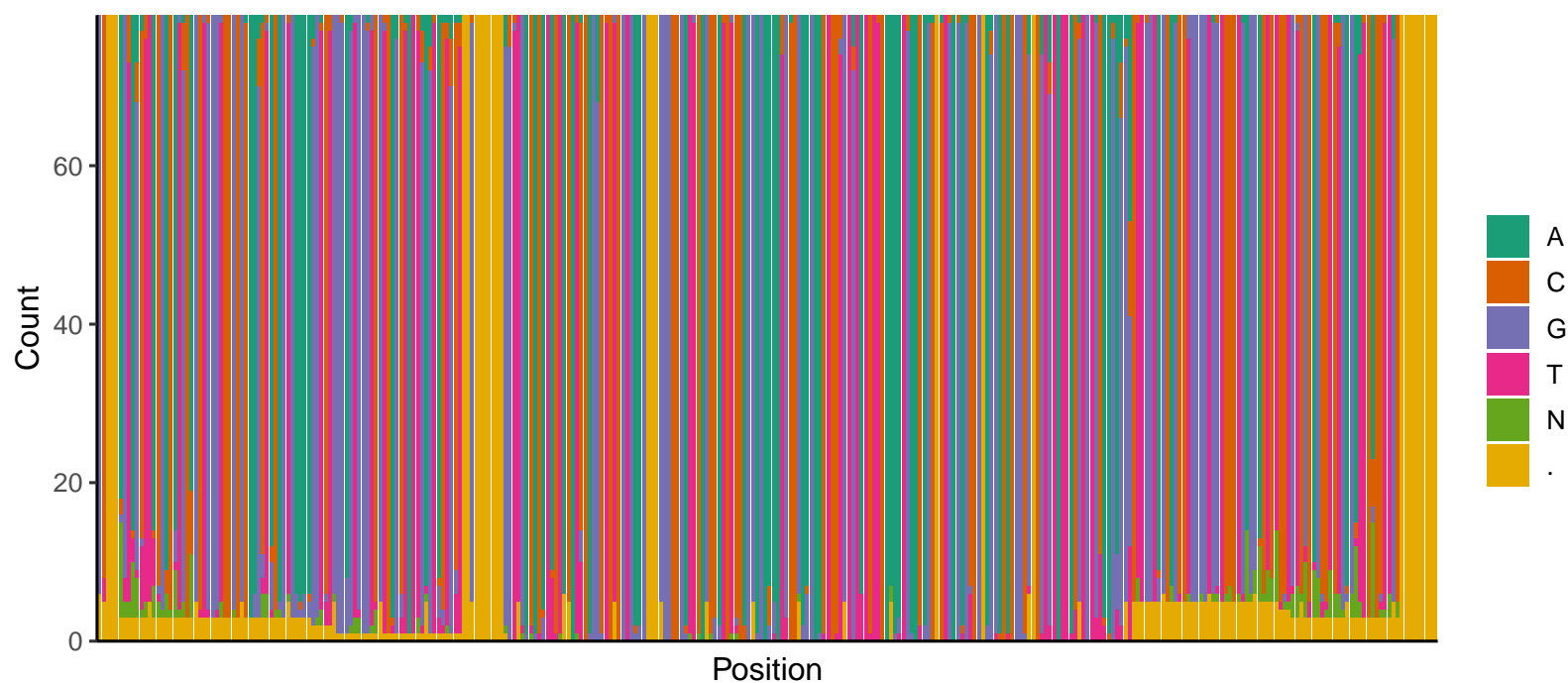
Gene IGHV3-13\*01\_G290A\_T300C



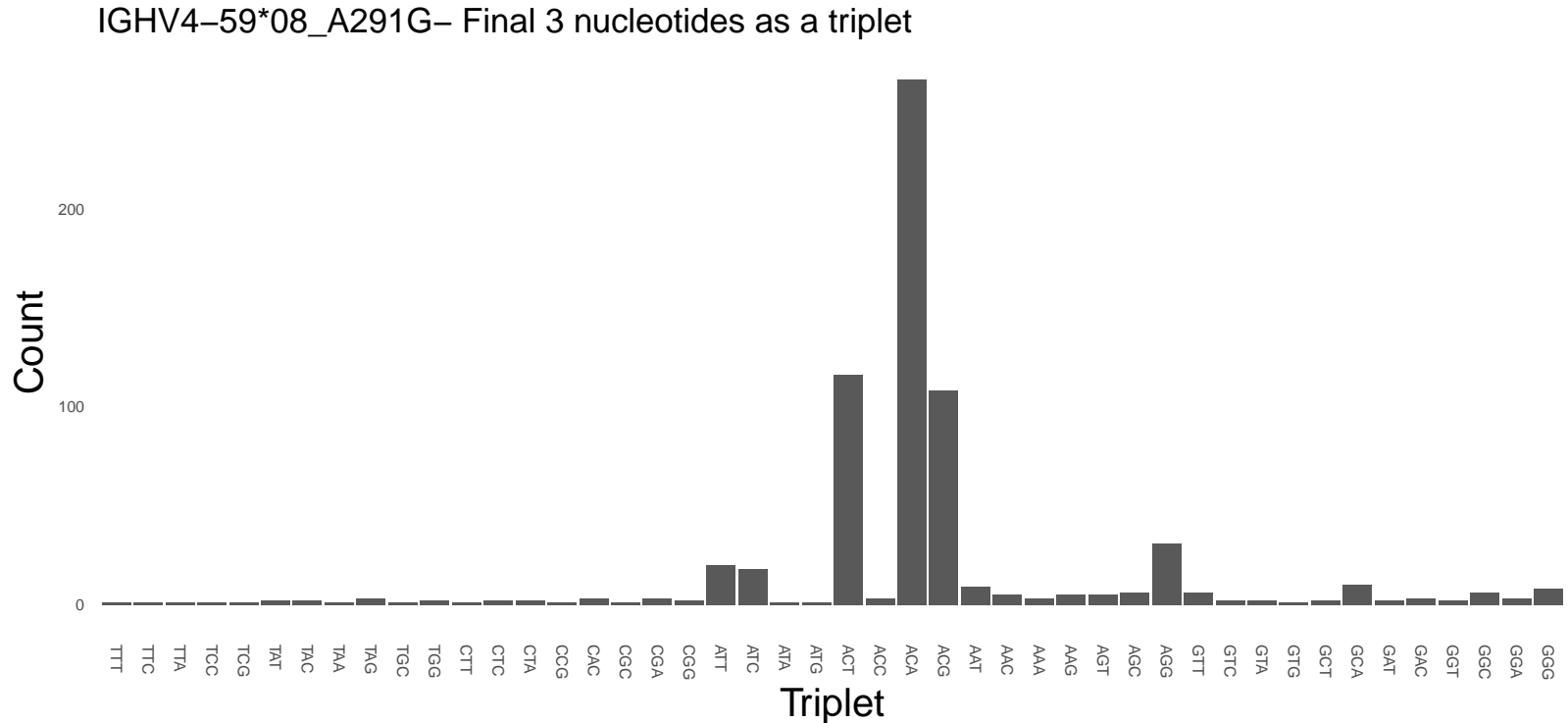
Gene IGHV4-59\*08\_A291G



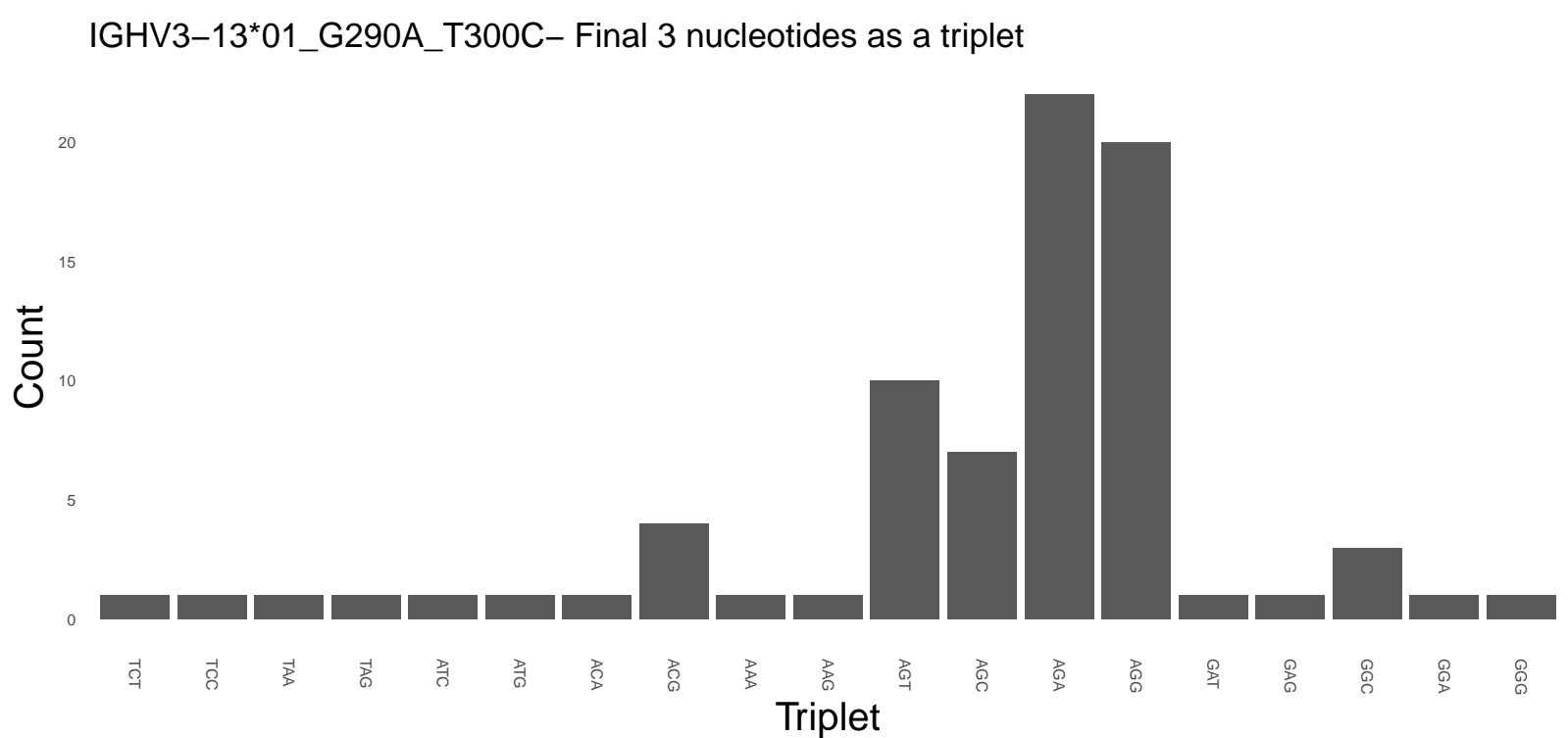
Gene IGHV3-13\*01\_G290A\_T300C



IGHV4–59\*08\_A291G– Final 3 nucleotides as a triplet

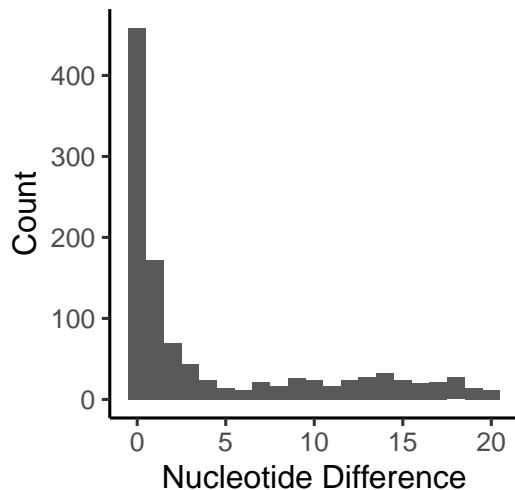


IGHV3–13\*01\_G290A\_T300C– Final 3 nucleotides as a triplet



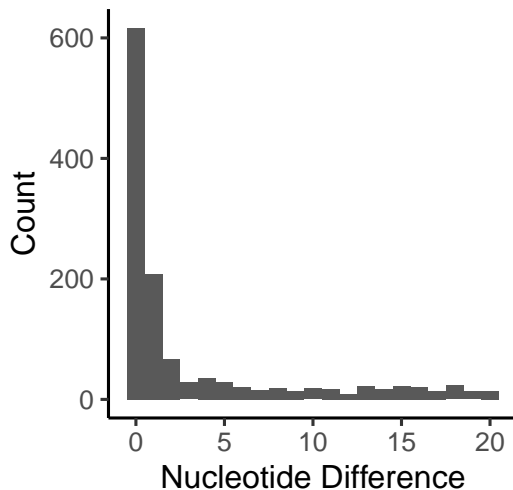
### IGHV1-2\*02

1299 sequences assigned  
459 (35.3%) exact matches, in which:  
455 unique CDR3  
6 unique J



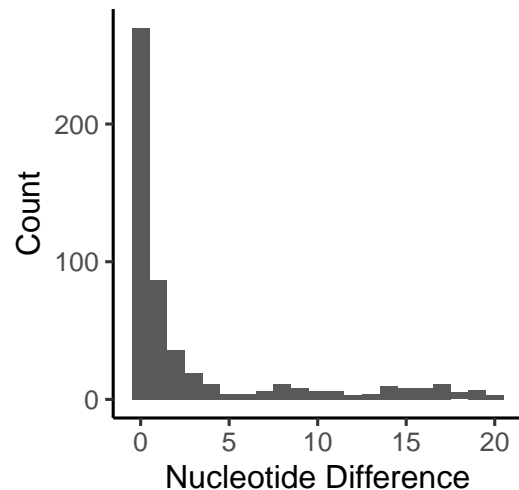
### IGHV1-18\*01

1425 sequences assigned  
617 (43.3%) exact matches, in which:  
610 unique CDR3  
6 unique J



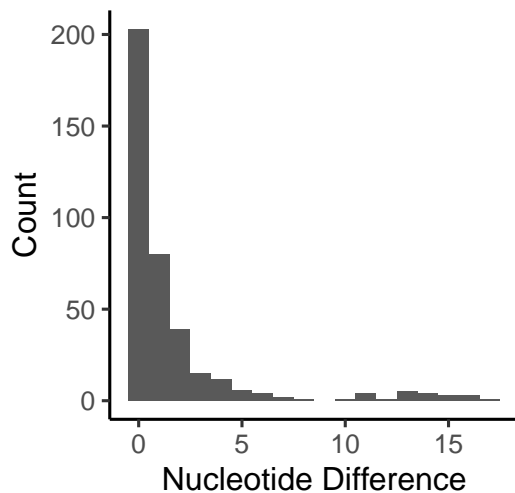
### IGHV1-46\*01

615 sequences assigned  
270 (43.9%) exact matches, in which:  
269 unique CDR3  
5 unique J



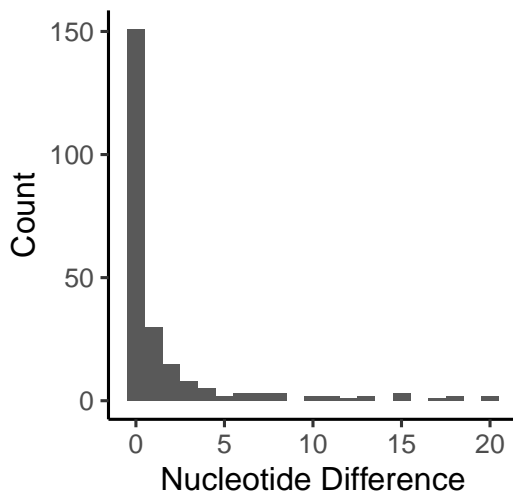
### IGHV1-2\*04

387 sequences assigned  
203 (52.5%) exact matches, in which:  
198 unique CDR3  
6 unique J



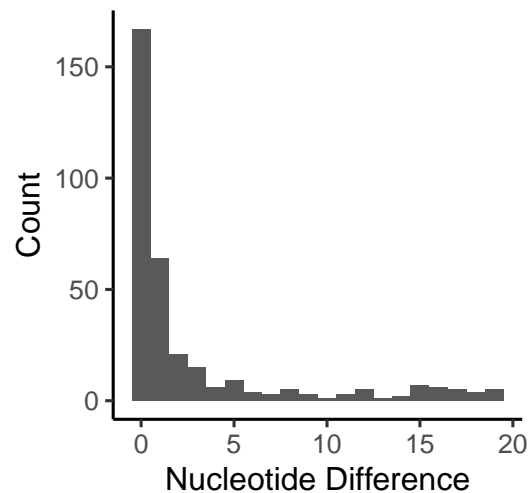
### IGHV1-24\*01

249 sequences assigned  
151 (60.6%) exact matches, in which:  
149 unique CDR3  
5 unique J



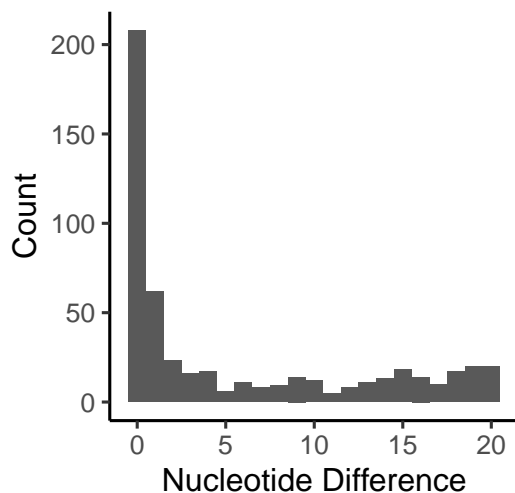
### IGHV1-46\*03

368 sequences assigned  
167 (45.4%) exact matches, in which:  
164 unique CDR3  
5 unique J



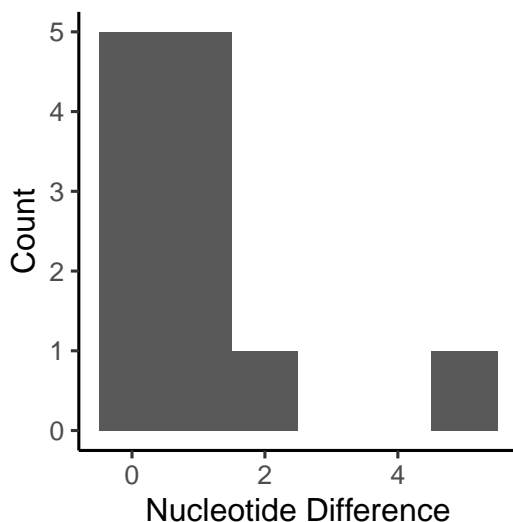
### IGHV1-3\*01

688 sequences assigned  
208 (30.2%) exact matches, in which:  
205 unique CDR3  
5 unique J



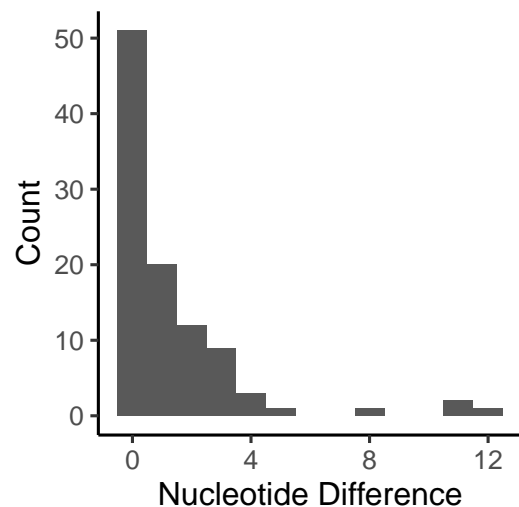
### IGHV1-45\*02

34 sequences assigned  
5 (14.7%) exact matches, in which:  
5 unique CDR3  
3 unique J



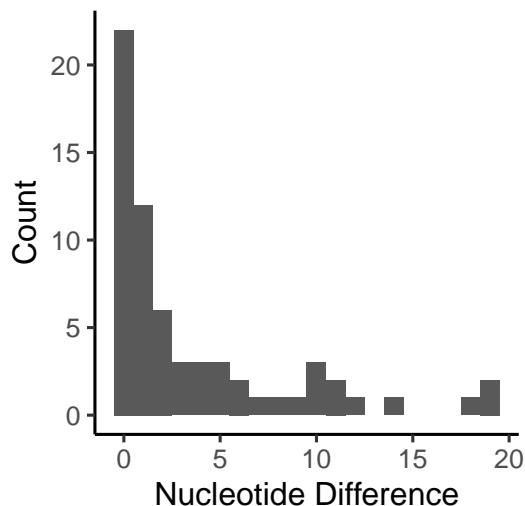
### IGHV1-58\*01

104 sequences assigned  
51 (49%) exact matches, in which:  
51 unique CDR3  
4 unique J



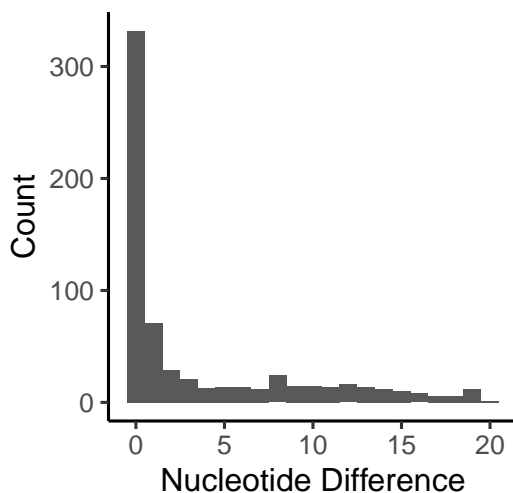
### IGHV1-58\*02

77 sequences assigned  
22 (28.6%) exact matches, in which:  
22 unique CDR3  
5 unique J



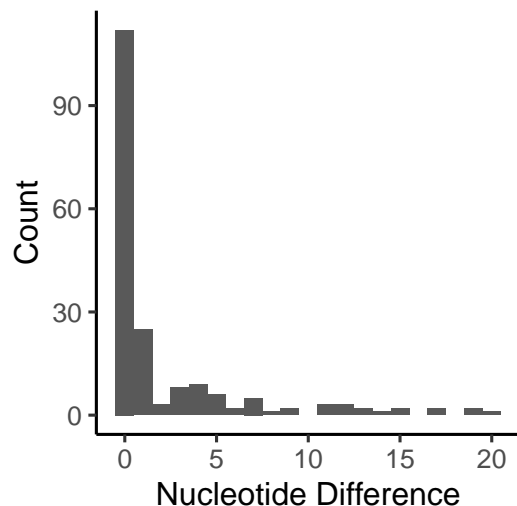
### IGHV2-5\*01

718 sequences assigned  
332 (46.2%) exact matches, in which:  
324 unique CDR3  
6 unique J



### IGHV2-70\*01

194 sequences assigned  
112 (57.7%) exact matches, in which:  
109 unique CDR3  
5 unique J



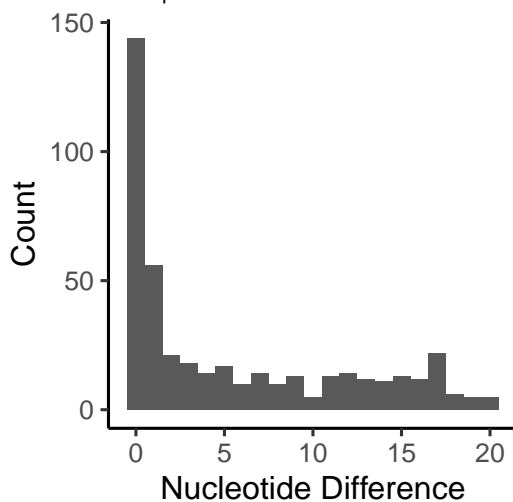
### IGHV1-68\*02

1 sequences assigned  
No exact matches.



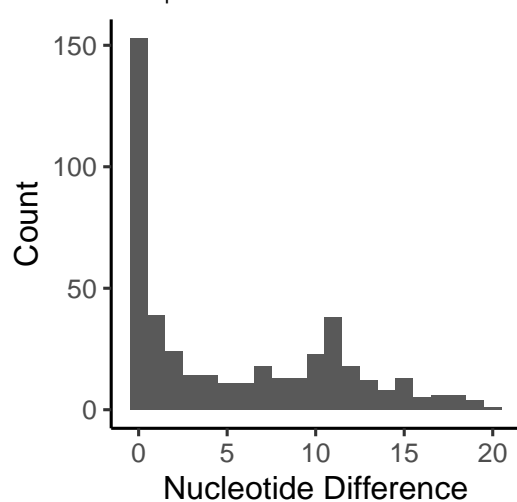
### IGHV2-5\*02

473 sequences assigned  
144 (30.4%) exact matches, in which:  
138 unique CDR3  
6 unique J



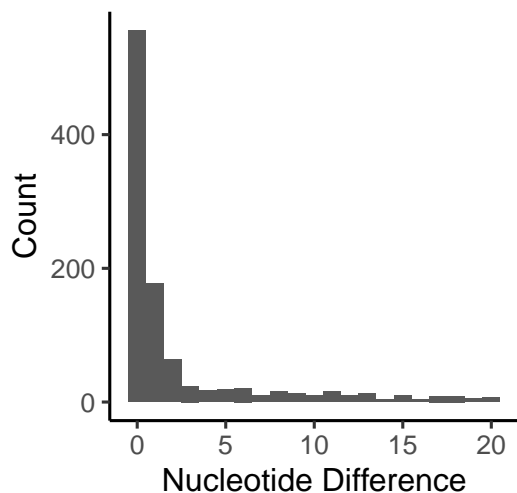
### IGHV2-70\*15

462 sequences assigned  
153 (33.1%) exact matches, in which:  
151 unique CDR3  
6 unique J



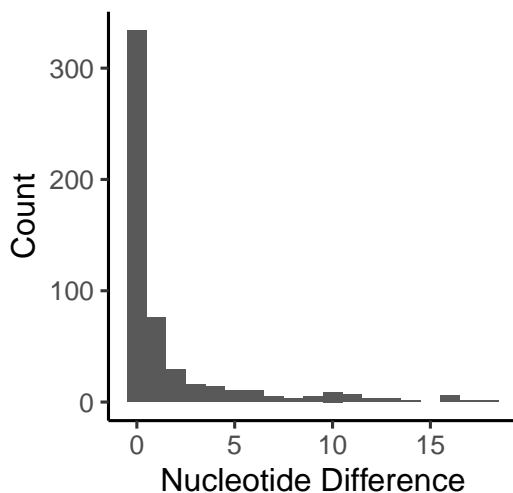
### IGHV1-69\*04

1090 sequences assigned  
556 (51%) exact matches, in which:  
543 unique CDR3  
6 unique J



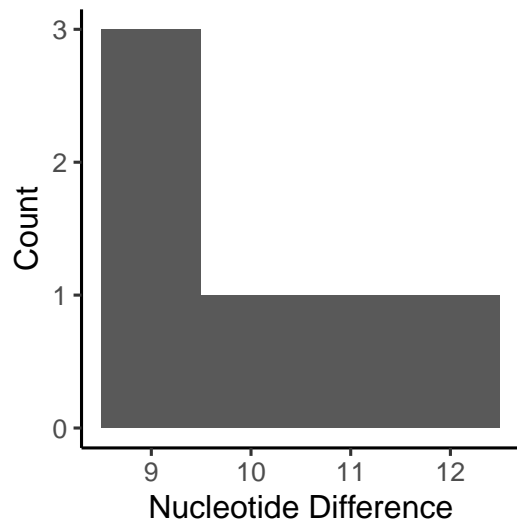
### IGHV2-26\*01

544 sequences assigned  
334 (61.4%) exact matches, in which:  
326 unique CDR3  
6 unique J



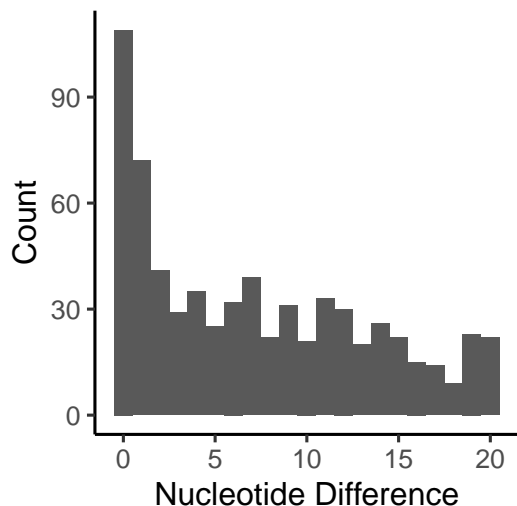
### IGHV2-70D\*04

6 sequences assigned  
No exact matches.



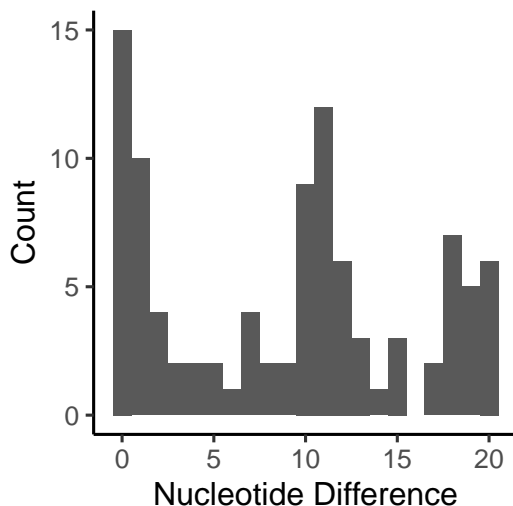
### IGHV3-7\*03

849 sequences assigned  
109 (12.8%) exact matches, in which:  
107 unique CDR3  
5 unique J



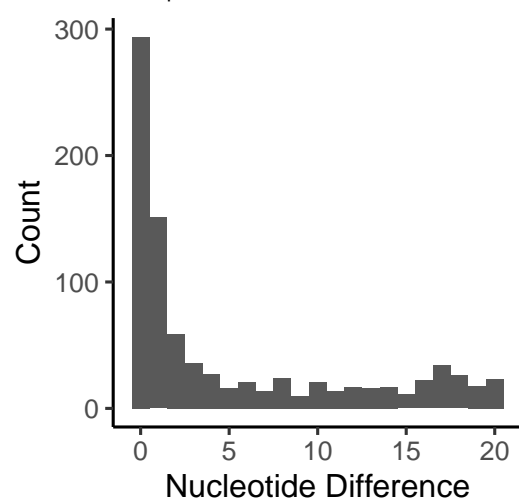
### IGHV3-13\*05

103 sequences assigned  
15 (14.6%) exact matches, in which:  
15 unique CDR3  
5 unique J



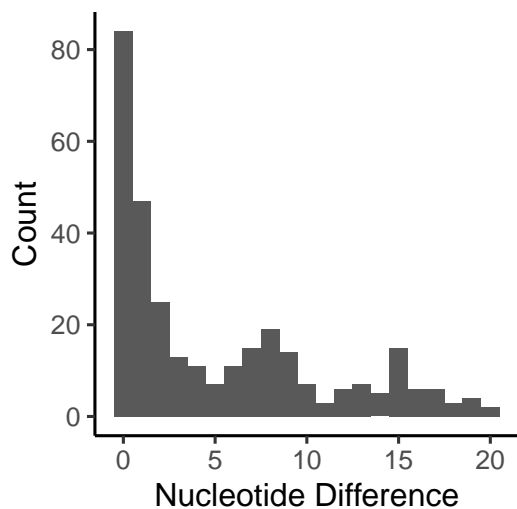
### IGHV3-15\*07

1063 sequences assigned  
294 (27.7%) exact matches, in which:  
287 unique CDR3  
6 unique J



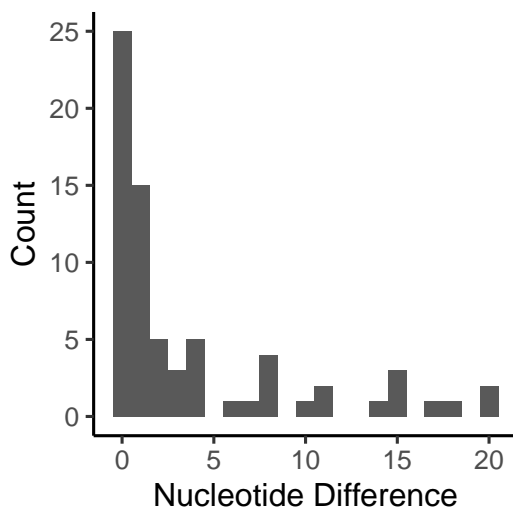
### IGHV3-7\*05

351 sequences assigned  
84 (23.9%) exact matches, in which:  
79 unique CDR3  
5 unique J



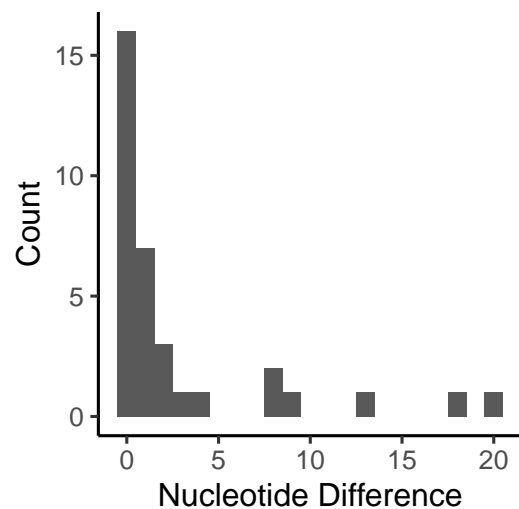
### IGHV3-13\*01\_G290A\_T301A

79 sequences assigned  
25 (31.6%) exact matches, in which:  
24 unique CDR3  
5 unique J



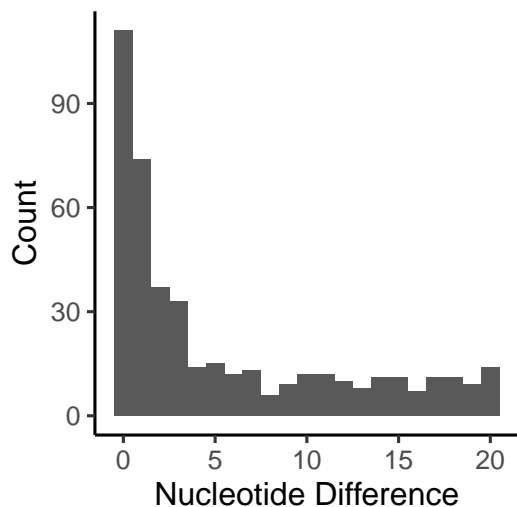
### IGHV3-20\*01

35 sequences assigned  
16 (45.7%) exact matches, in which:  
16 unique CDR3  
3 unique J



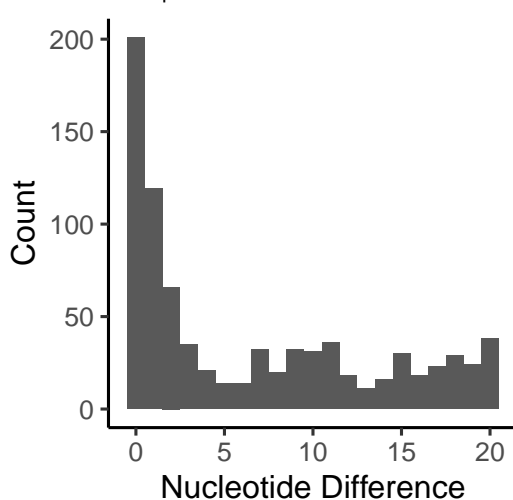
### IGHV3-11\*06

588 sequences assigned  
111 (18.9%) exact matches, in which:  
108 unique CDR3  
5 unique J



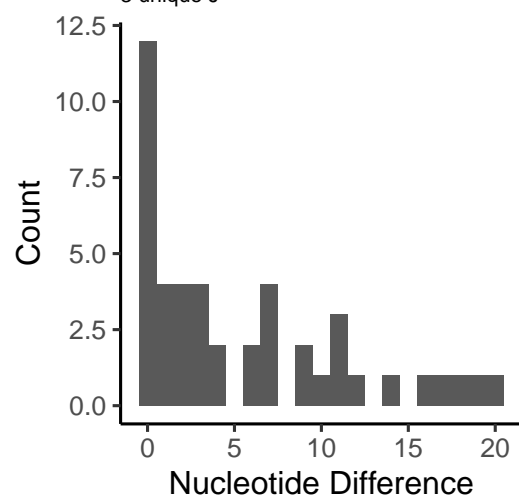
### IGHV3-15\*01

1025 sequences assigned  
201 (19.6%) exact matches, in which:  
195 unique CDR3  
6 unique J



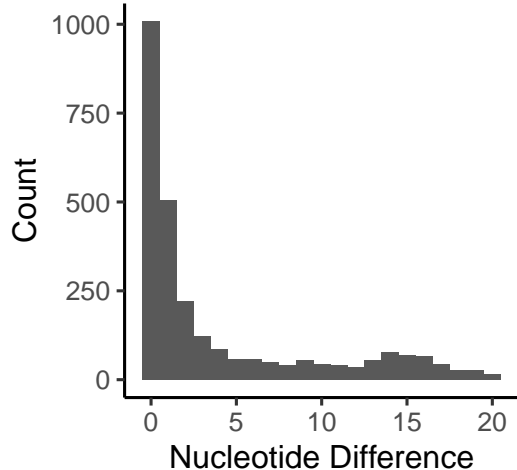
### IGHV3-20\*04

49 sequences assigned  
12 (24.5%) exact matches, in which:  
12 unique CDR3  
3 unique J



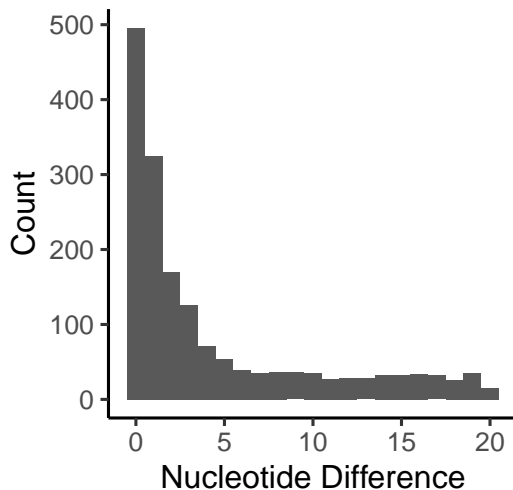
### IGHV3-21\*01

2952 sequences assigned  
1008 (34.1%) exact matches, in which:  
945 unique CDR3  
6 unique J



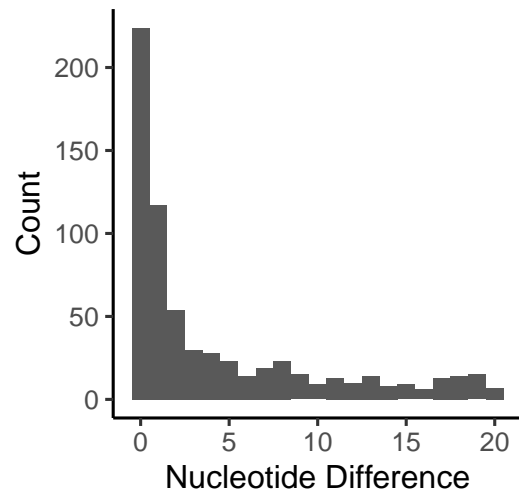
### IGHV3-33\*01

1978 sequences assigned  
496 (25.1%) exact matches, in which:  
493 unique CDR3  
6 unique J



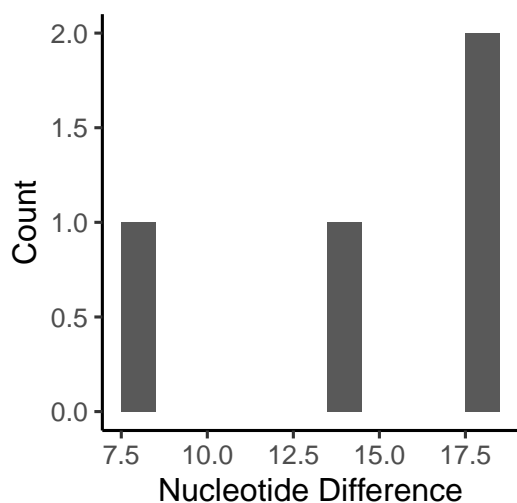
### IGHV3-48\*01

774 sequences assigned  
224 (28.9%) exact matches, in which:  
220 unique CDR3  
5 unique J



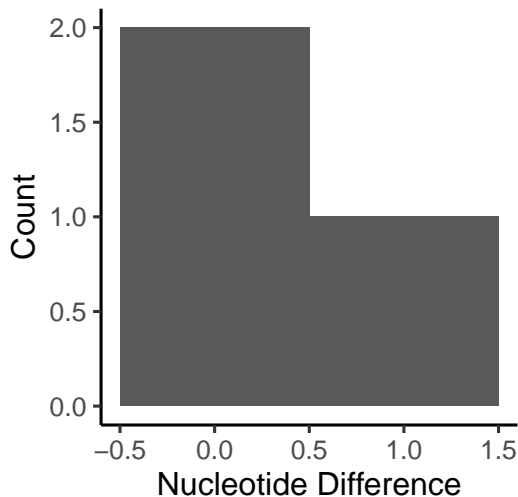
### IGHV3-30-3\*02

6 sequences assigned  
No exact matches.



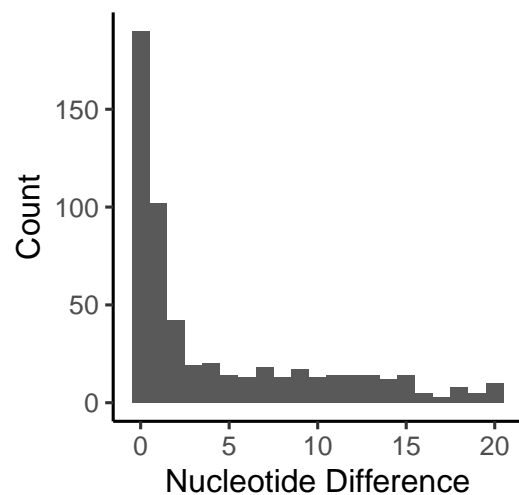
### IGHV3-35\*01

3 sequences assigned  
2 (66.7%) exact matches, in which:  
2 unique CDR3  
2 unique J



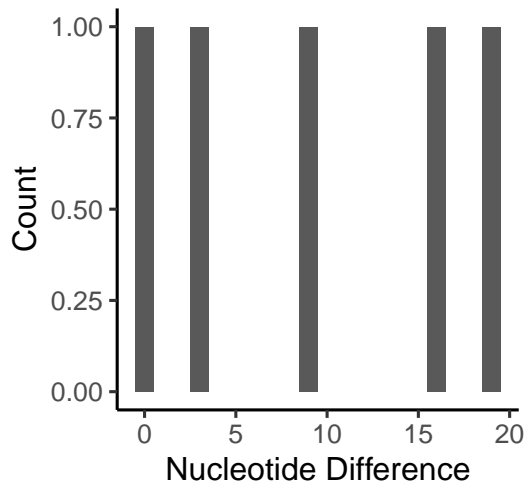
### IGHV3-48\*02

637 sequences assigned  
190 (29.8%) exact matches, in which:  
185 unique CDR3  
6 unique J



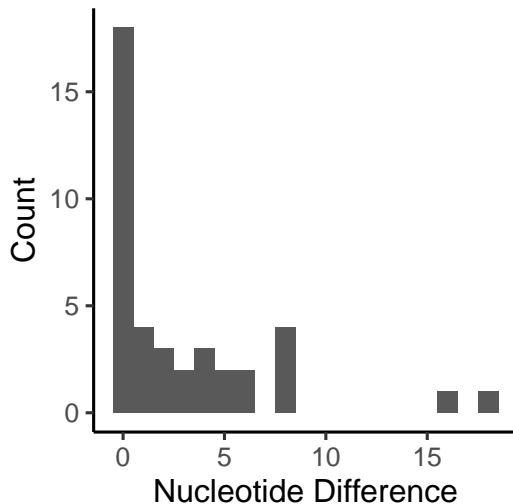
### IGHV3-30-3\*03

9 sequences assigned  
1 (11.1%) exact matches, in which:  
1 unique CDR3  
1 unique J



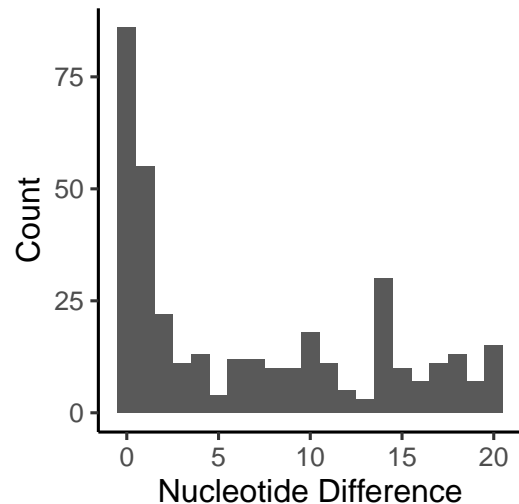
### IGHV3-43\*01

47 sequences assigned  
18 (38.3%) exact matches, in which:  
18 unique CDR3  
3 unique J



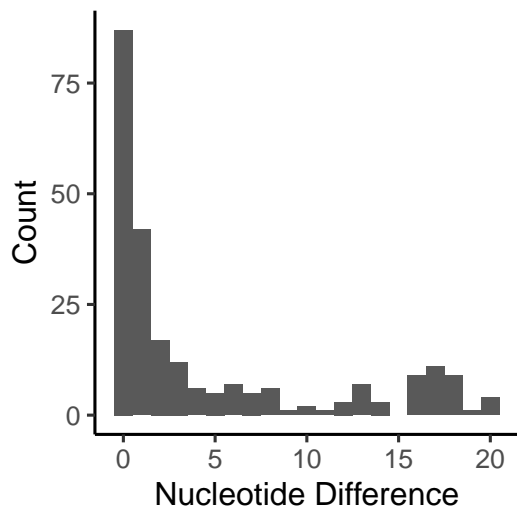
### IGHV3-49\*03

462 sequences assigned  
86 (18.6%) exact matches, in which:  
85 unique CDR3  
6 unique J



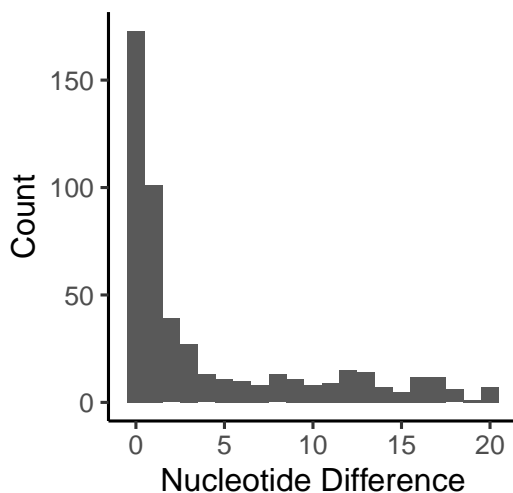
### IGHV3-49\*05

287 sequences assigned  
87 (30.3%) exact matches, in which:  
85 unique CDR3  
6 unique J



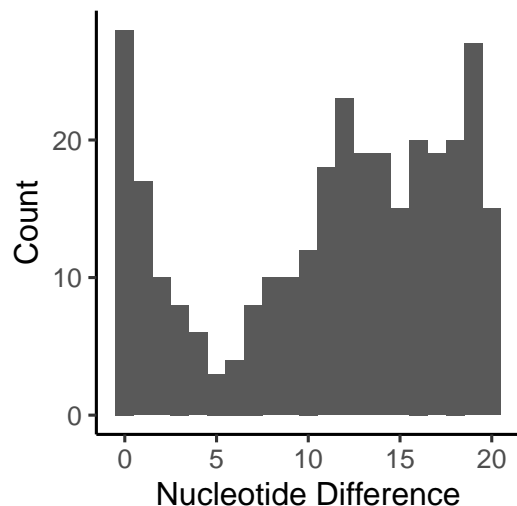
### IGHV3-66\*01

571 sequences assigned  
173 (30.3%) exact matches, in which:  
167 unique CDR3  
6 unique J



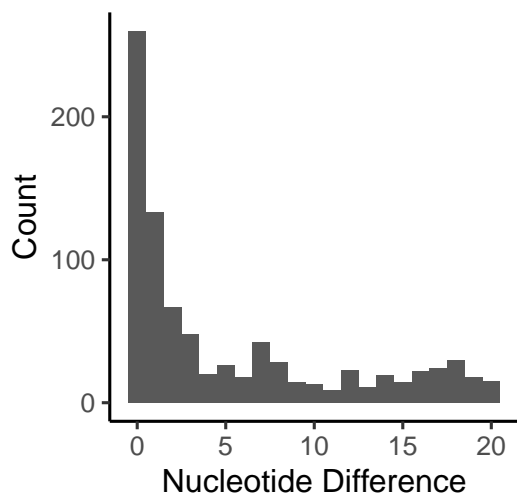
### IGHV3-72\*01

441 sequences assigned  
28 (6.3%) exact matches, in which:  
25 unique CDR3  
4 unique J



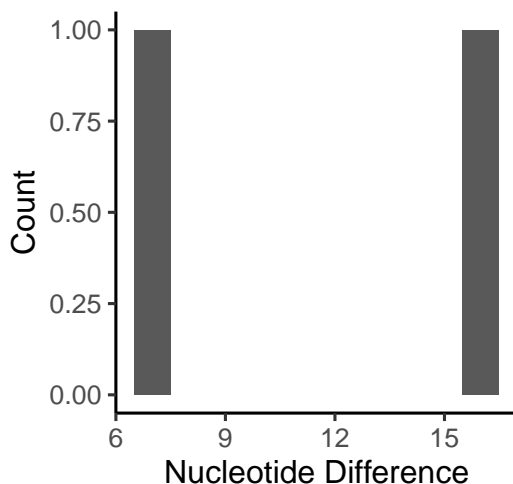
### IGHV3-53\*01

996 sequences assigned  
260 (26.1%) exact matches, in which:  
254 unique CDR3  
6 unique J



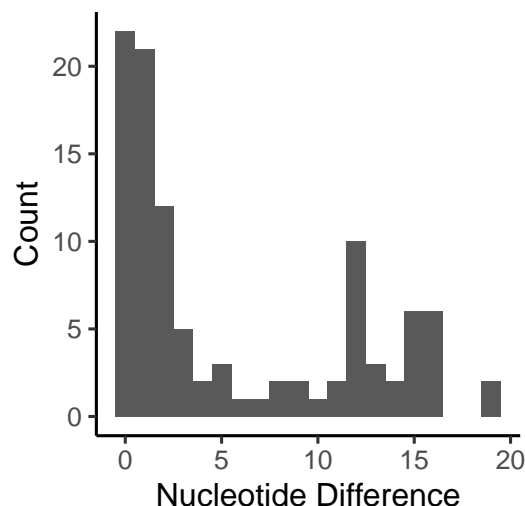
### IGHV3-69-1\*01

2 sequences assigned  
No exact matches.



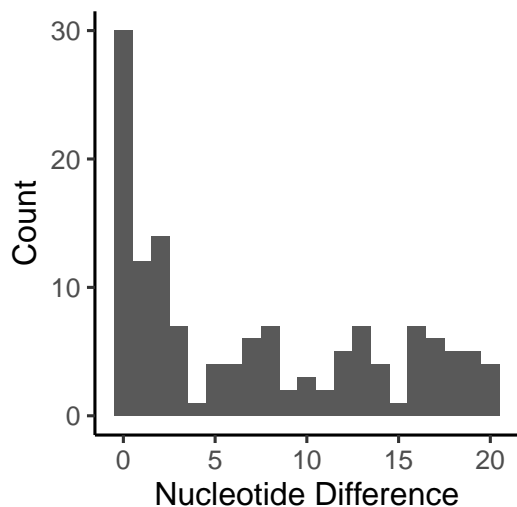
### IGHV3-73\*01

109 sequences assigned  
22 (20.2%) exact matches, in which:  
20 unique CDR3  
4 unique J



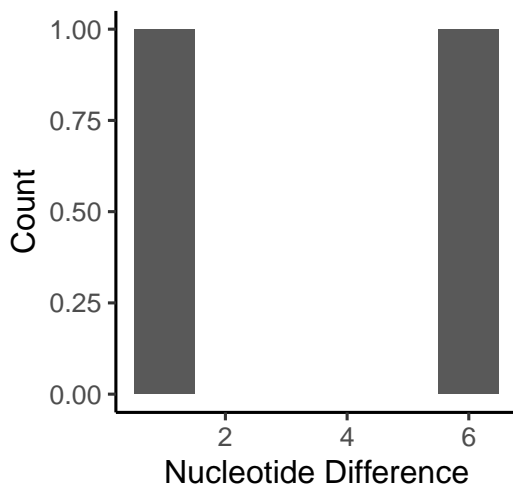
### IGHV3-64\*01

195 sequences assigned  
30 (15.4%) exact matches, in which:  
30 unique CDR3  
5 unique J



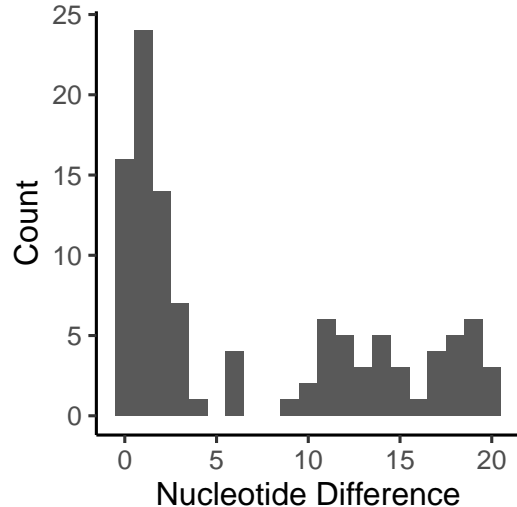
### IGHV3-69-1\*02

3 sequences assigned  
No exact matches.



### IGHV3-73\*02

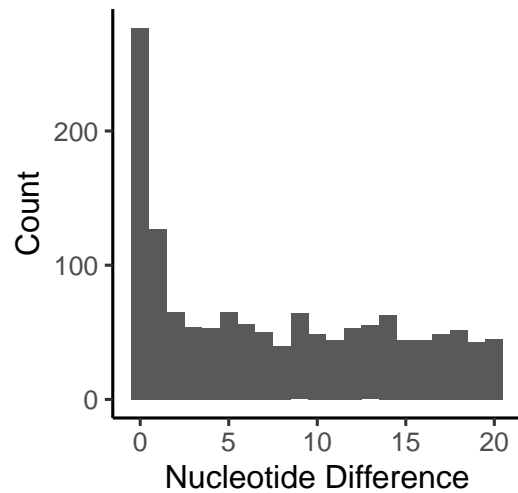
119 sequences assigned  
16 (13.4%) exact matches, in which:  
16 unique CDR3  
5 unique J





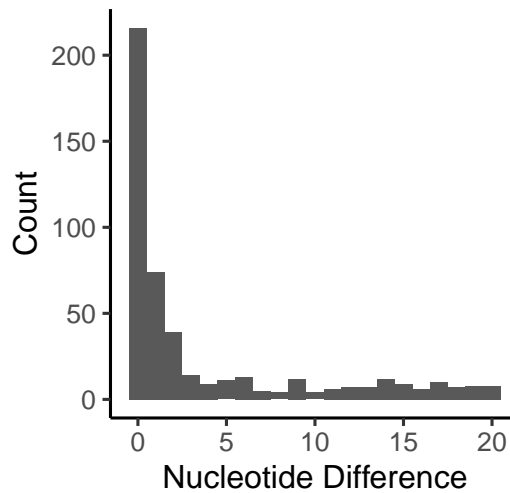
### IGHV3-74\*01

1724 sequences assigned  
277 (16.1%) exact matches, in which:  
269 unique CDR3  
6 unique J



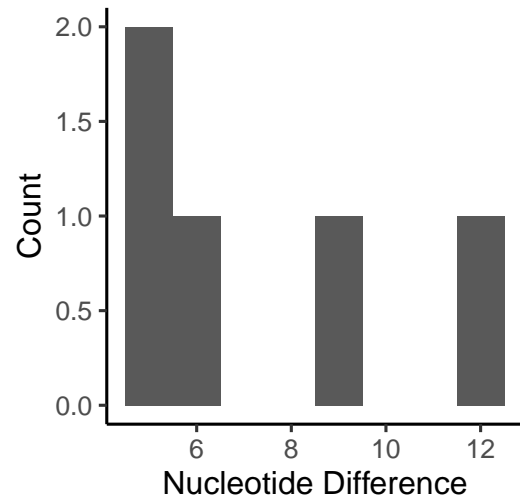
### IGHV4-4\*02

563 sequences assigned  
216 (38.4%) exact matches, in which:  
215 unique CDR3  
6 unique J



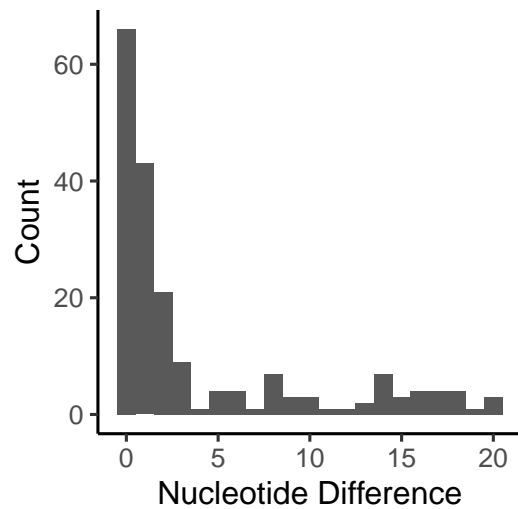
### IGHV4-28\*03

5 sequences assigned  
No exact matches.



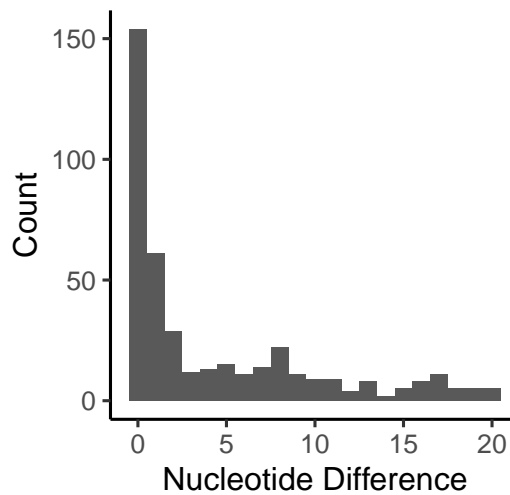
### IGHV3-64D\*06

225 sequences assigned  
66 (29.3%) exact matches, in which:  
65 unique CDR3  
5 unique J



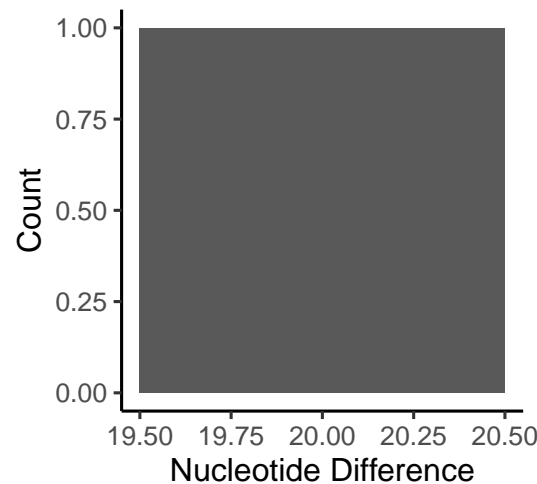
### IGHV4-4\*07

536 sequences assigned  
154 (28.7%) exact matches, in which:  
153 unique CDR3  
5 unique J



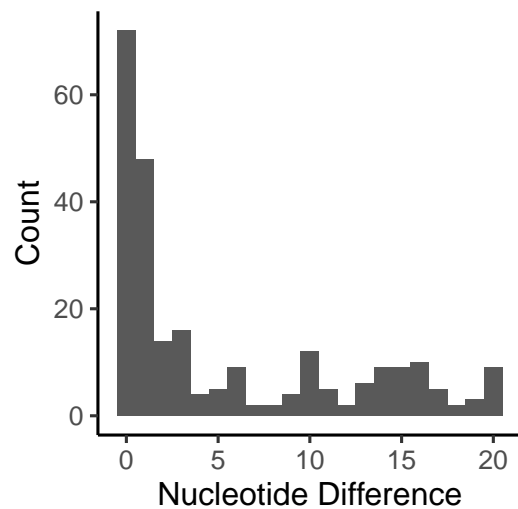
### IGHV4-30-4\*01

2 sequences assigned  
No exact matches.



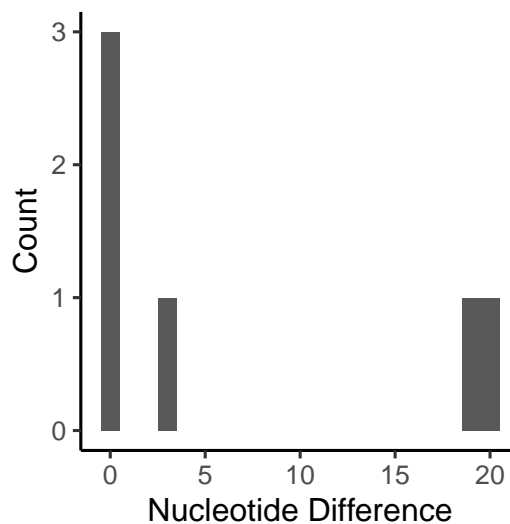
### IGHV3-64D\*08

293 sequences assigned  
72 (24.6%) exact matches, in which:  
72 unique CDR3  
5 unique J



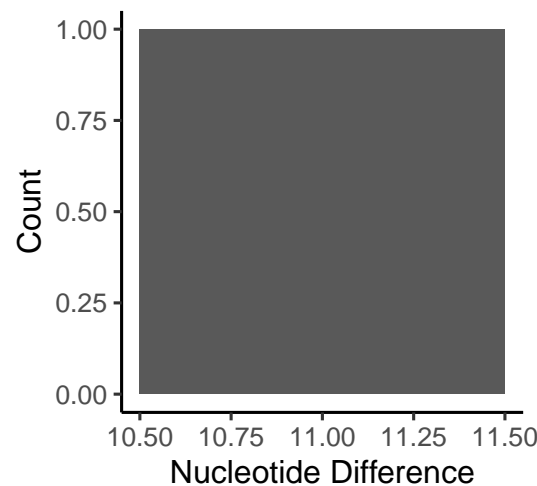
### IGHV4-28\*01

6 sequences assigned  
3 (50%) exact matches, in which:  
3 unique CDR3  
2 unique J



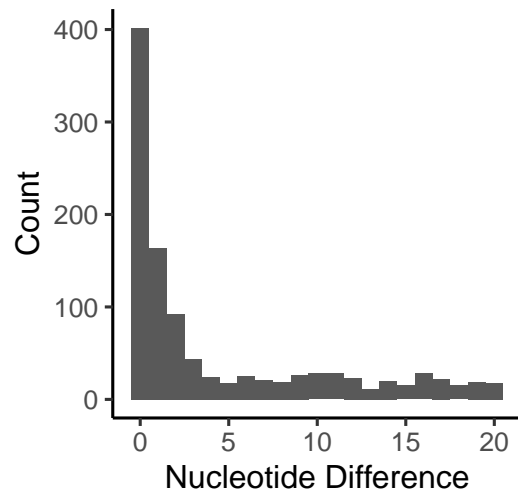
### IGHV4-30-2\*03

1 sequences assigned  
No exact matches.



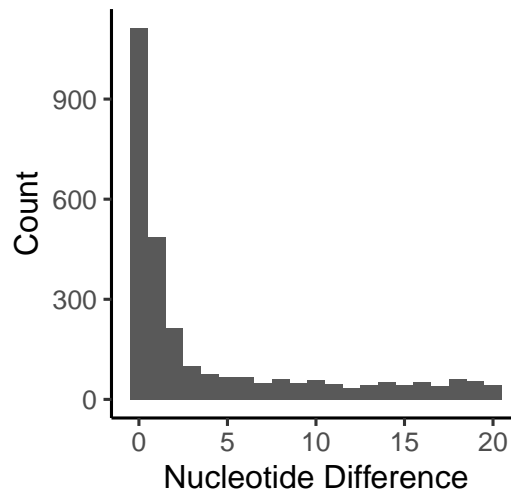
### IGHV4-31\*03

1241 sequences assigned  
402 (32.4%) exact matches, in which:  
398 unique CDR3  
6 unique J



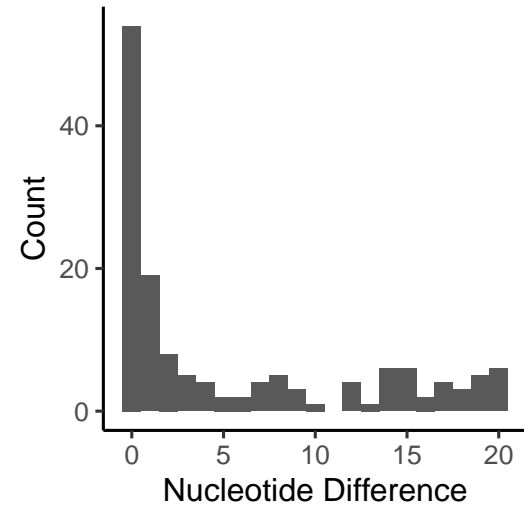
### IGHV4-39\*01

3458 sequences assigned  
1114 (32.2%) exact matches, in which:  
1087 unique CDR3  
6 unique J



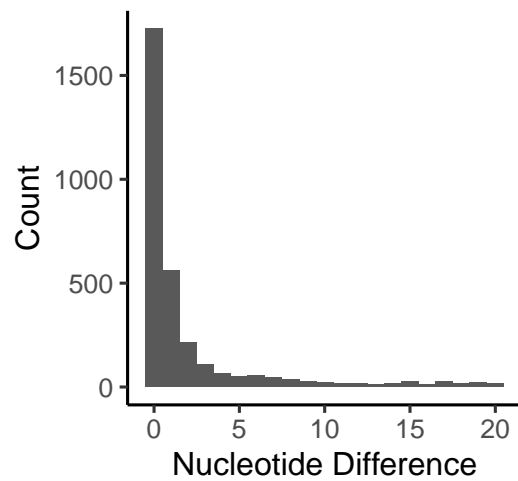
### IGHV4-61\*01

168 sequences assigned  
54 (32.1%) exact matches, in which:  
54 unique CDR3  
6 unique J



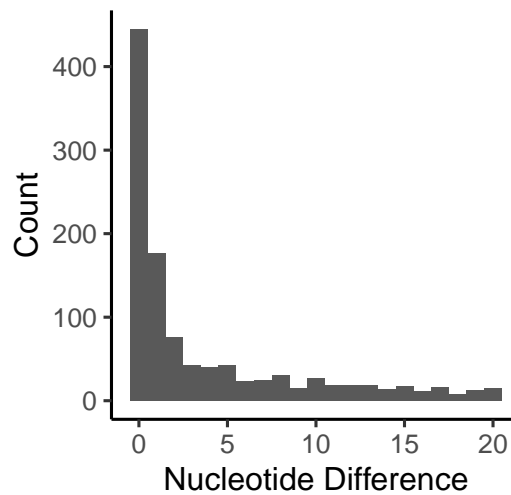
### IGHV4-34\*01

3304 sequences assigned  
1725 (52.2%) exact matches, in which:  
1699 unique CDR3  
6 unique J



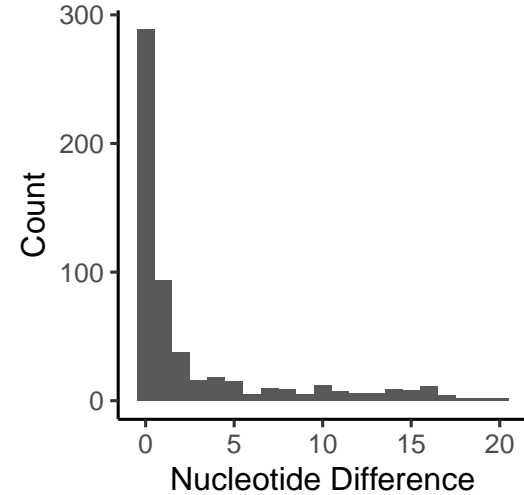
### IGHV4-59\*01

1262 sequences assigned  
445 (35.3%) exact matches, in which:  
440 unique CDR3  
6 unique J



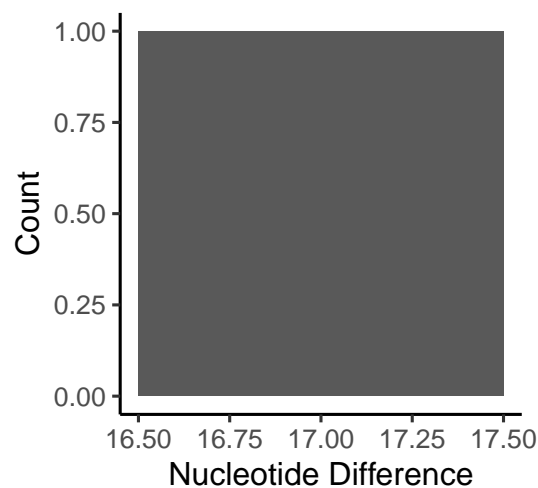
### IGHV5-10-1\*03

610 sequences assigned  
289 (47.4%) exact matches, in which:  
280 unique CDR3  
6 unique J



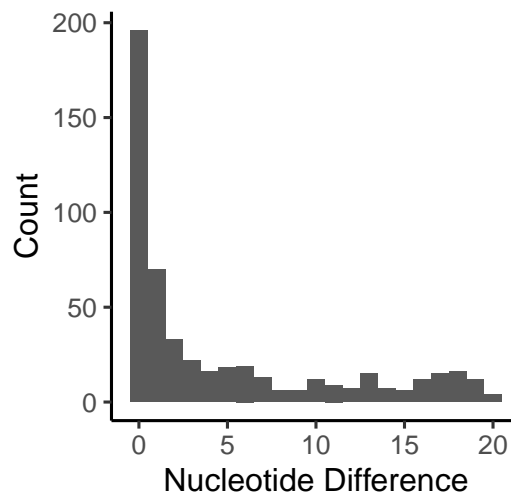
### IGHV4-38-2\*02

2 sequences assigned  
No exact matches.



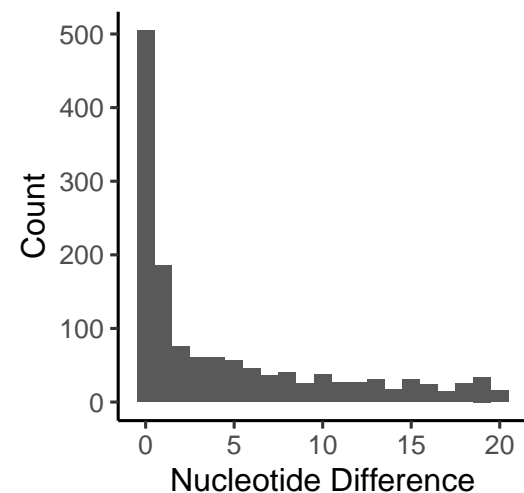
### IGHV4-59\*08\_A291G

674 sequences assigned  
196 (29.1%) exact matches, in which:  
192 unique CDR3  
6 unique J



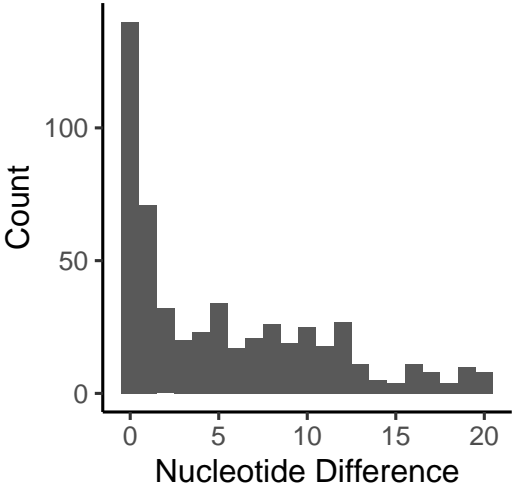
### IGHV5-51\*01

1493 sequences assigned  
505 (33.8%) exact matches, in which:  
494 unique CDR3  
6 unique J



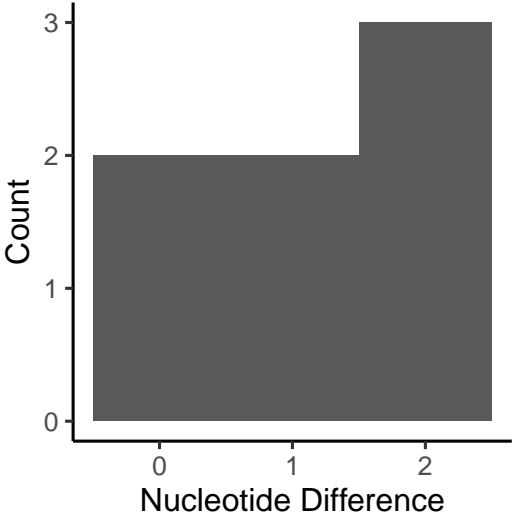
IGHV6-1\*01

592 sequences assigned  
140 (23.6%) exact matches, in which:  
138 unique CDR3  
5 unique J

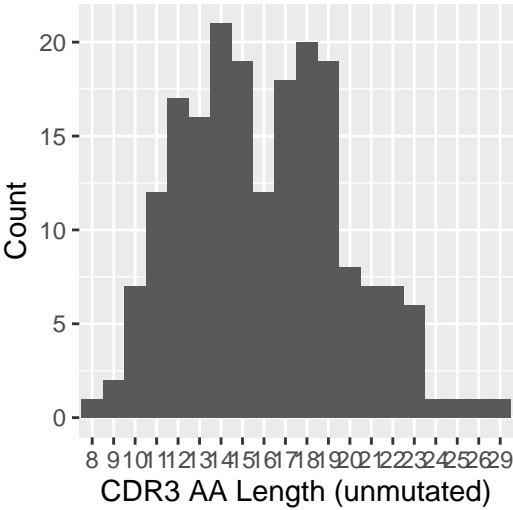


IGHV7-4-1\*01

7 sequences assigned  
2 (28.6%) exact matches, in which:  
2 unique CDR3  
2 unique J



IGHV4-59\*08\_A291G



IGHV3-13\*01\_G290A\_T300C

