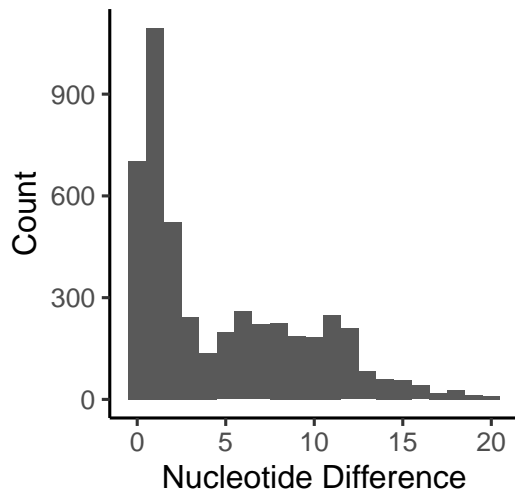


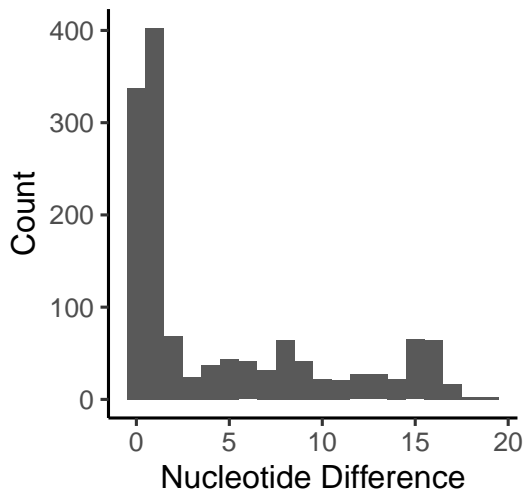
### IGHV1-2\*02

4802 sequences assigned  
703 (14.6%) exact matches, in which:  
594 unique CDR3  
7 unique J



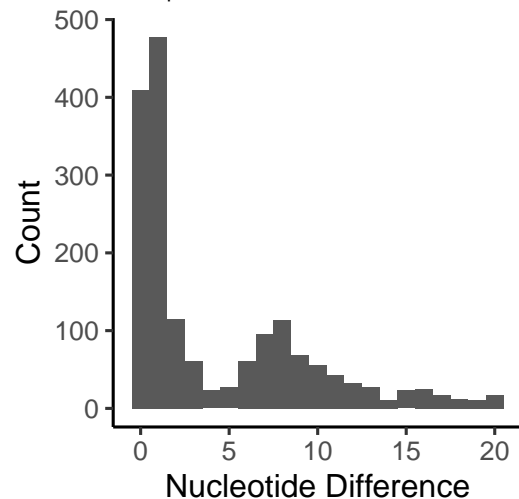
### IGHV1-3\*01\_05

1376 sequences assigned  
338 (24.6%) exact matches, in which:  
254 unique CDR3  
6 unique J



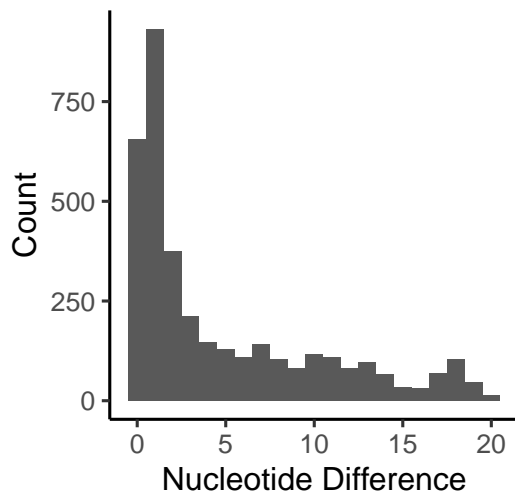
### IGHV1-18\*04

1860 sequences assigned  
409 (22%) exact matches, in which:  
359 unique CDR3  
7 unique J



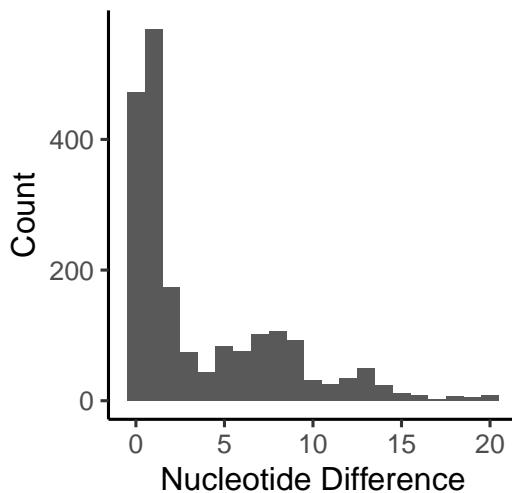
### IGHV1-2\*06

3798 sequences assigned  
655 (17.2%) exact matches, in which:  
550 unique CDR3  
7 unique J



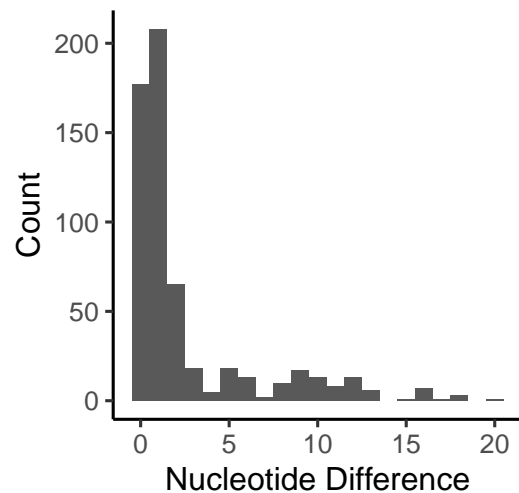
### IGHV1-8\*01

2315 sequences assigned  
472 (20.4%) exact matches, in which:  
404 unique CDR3  
7 unique J



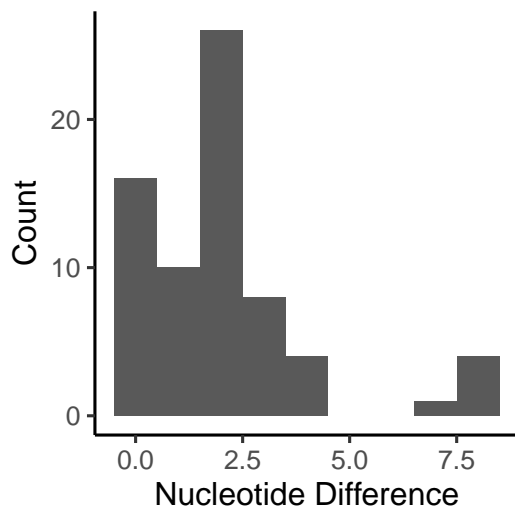
### IGHV1-24\*01

591 sequences assigned  
177 (29.9%) exact matches, in which:  
152 unique CDR3  
7 unique J



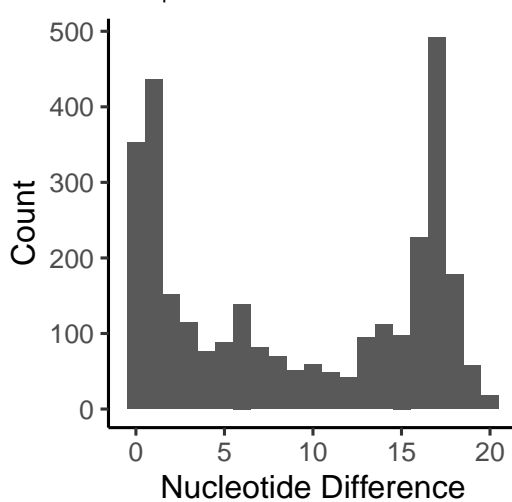
### IGHV1-3\*02

70 sequences assigned  
16 (22.9%) exact matches, in which:  
16 unique CDR3  
5 unique J



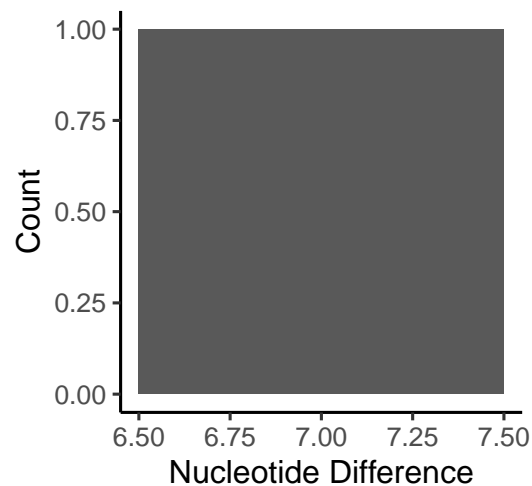
### IGHV1-18\*01

3070 sequences assigned  
353 (11.5%) exact matches, in which:  
305 unique CDR3  
7 unique J



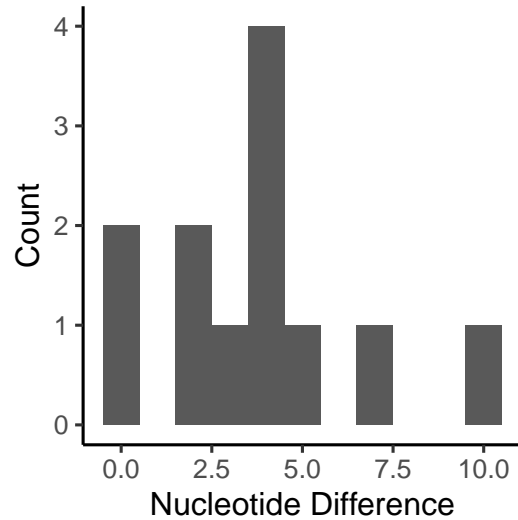
### IGHV1-38-4\*01

1 sequences assigned  
No exact matches.



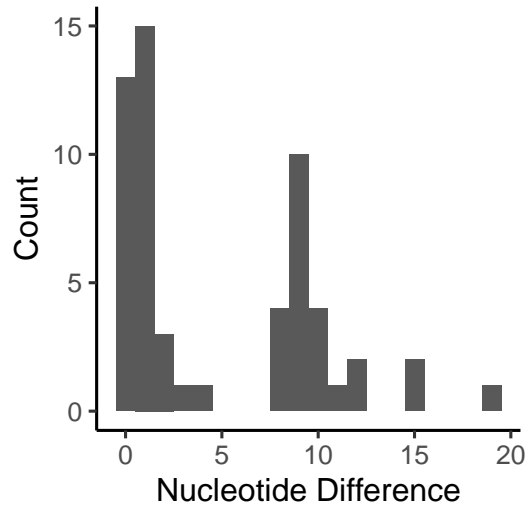
### IGHV1-45\*02

12 sequences assigned  
2 (16.7%) exact matches, in which:  
2 unique CDR3  
2 unique J



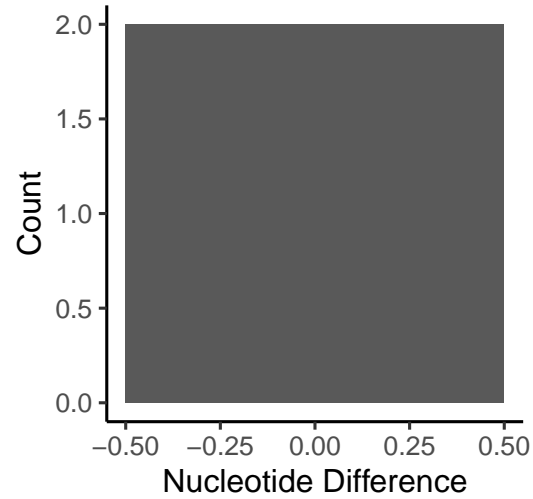
### IGHV1-58\*02

57 sequences assigned  
13 (22.8%) exact matches, in which:  
9 unique CDR3  
5 unique J



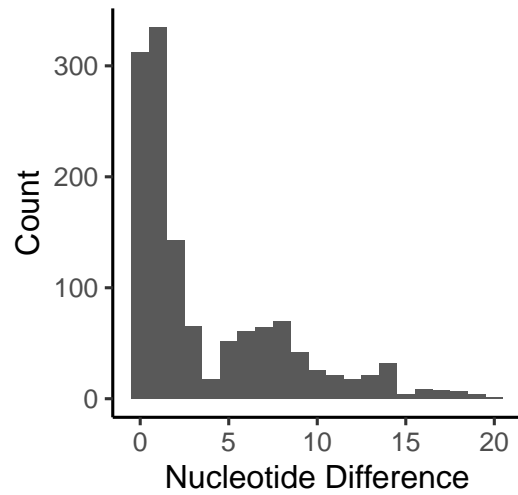
### IGHV1-69-2\*01

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



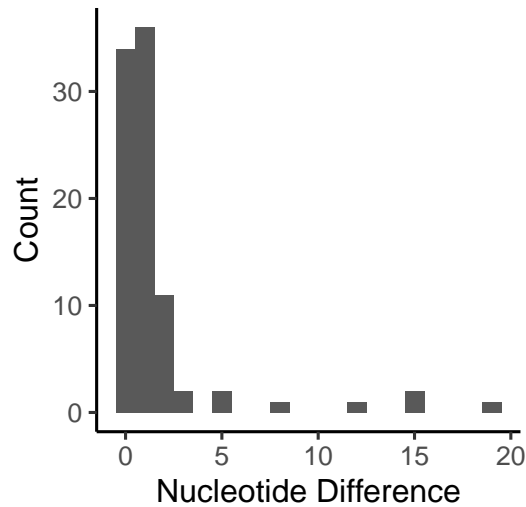
### IGHV1-46\*01

1377 sequences assigned  
312 (22.7%) exact matches, in which:  
288 unique CDR3  
6 unique J



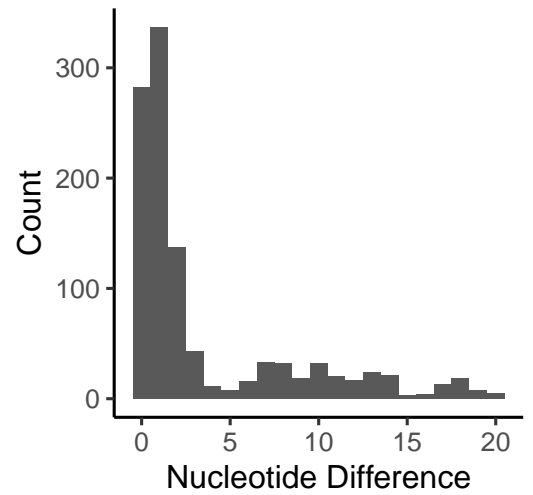
### IGHV1-58\*01\_03

101 sequences assigned  
34 (33.7%) exact matches, in which:  
31 unique CDR3  
6 unique J



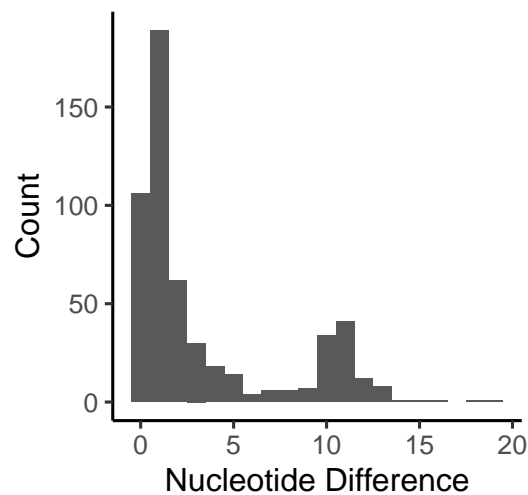
### IGHV1-69\*02

1119 sequences assigned  
282 (25.2%) exact matches, in which:  
255 unique CDR3  
7 unique J



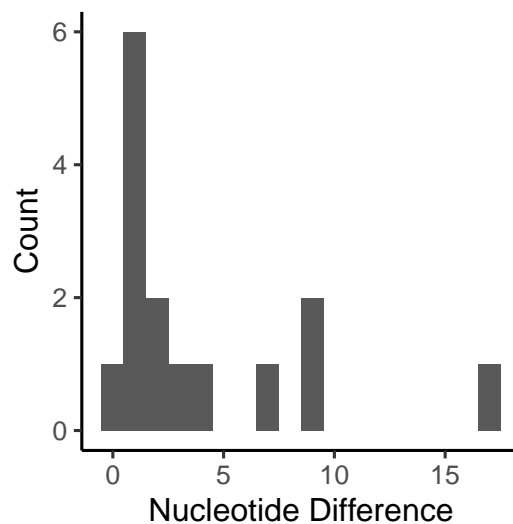
### IGHV1-46\*03

545 sequences assigned  
106 (19.4%) exact matches, in which:  
77 unique CDR3  
6 unique J



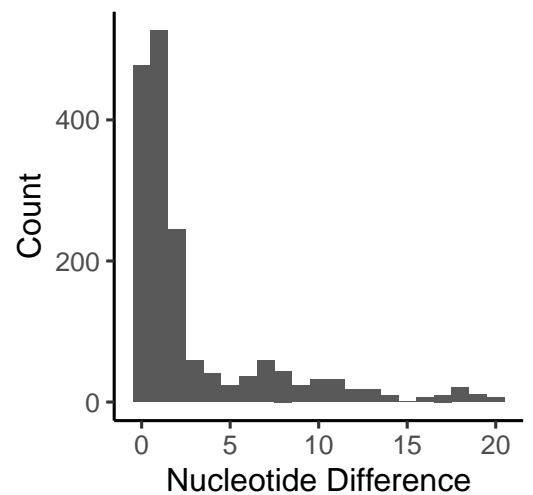
### IGHV1-68\*01

15 sequences assigned  
1 (6.7%) exact matches, in which:  
1 unique CDR3  
1 unique J



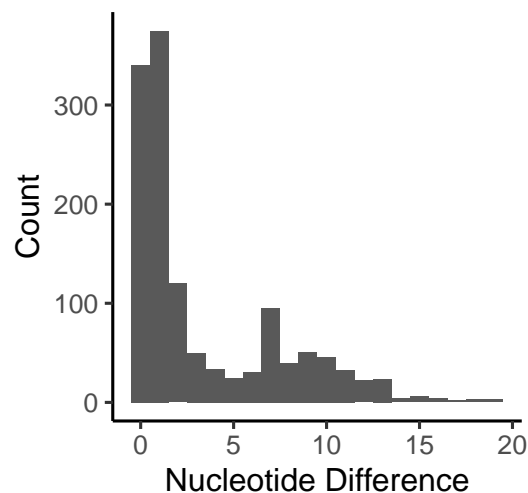
### IGHV1-69\*01\_12\_13

1741 sequences assigned  
477 (27.4%) exact matches, in which:  
425 unique CDR3  
7 unique J



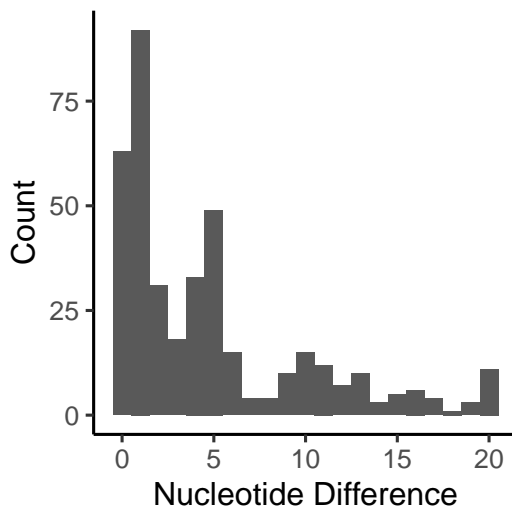
### IGHV1–69\*06\_14

1344 sequences assigned  
340 (25.3%) exact matches, in which:  
309 unique CDR3  
7 unique J



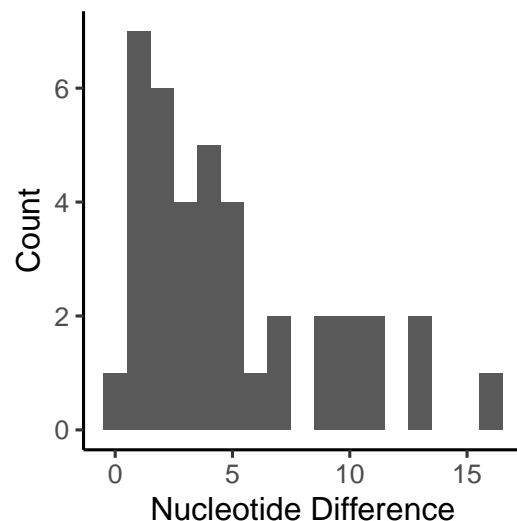
### IGHV2–5\*02

415 sequences assigned  
63 (15.2%) exact matches, in which:  
50 unique CDR3  
6 unique J



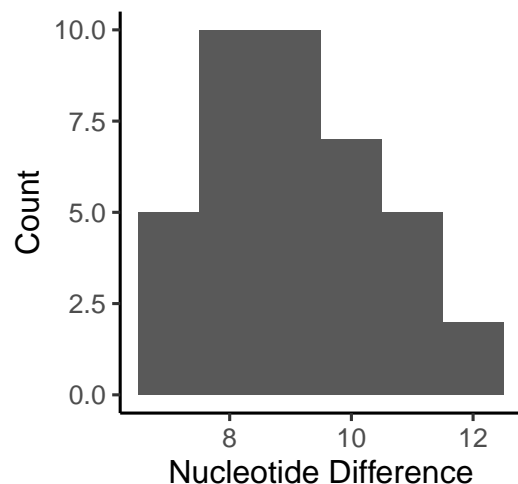
### IGHV2–70\*12

39 sequences assigned  
1 (2.6%) exact matches, in which:  
1 unique CDR3  
1 unique J



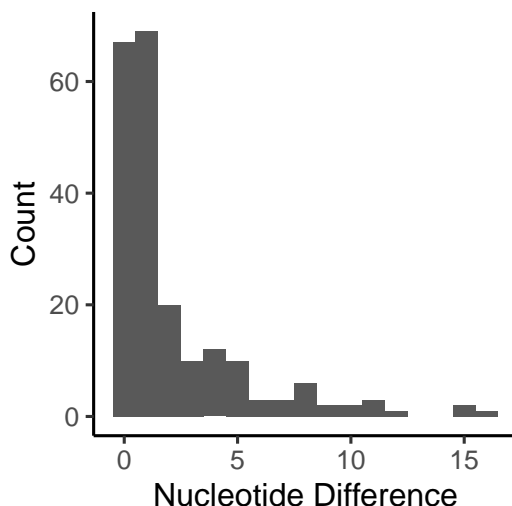
### IGHV1–NL1\*01

39 sequences assigned  
No exact matches.



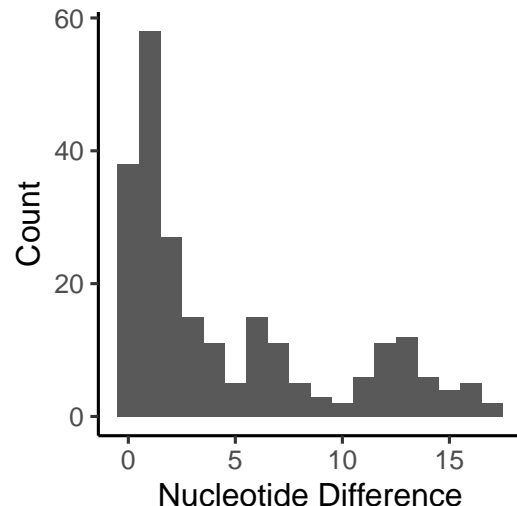
### IGHV2–26\*01

211 sequences assigned  
67 (31.8%) exact matches, in which:  
49 unique CDR3  
5 unique J



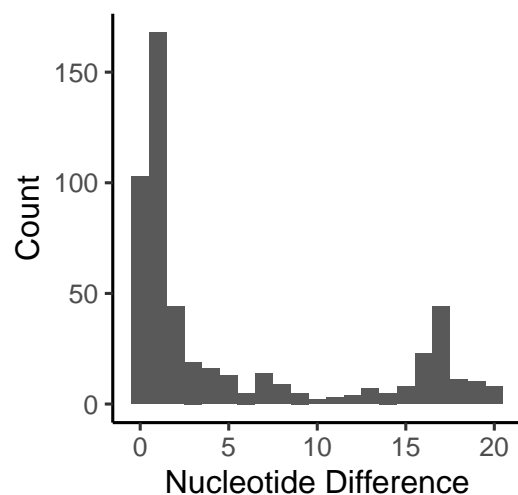
### IGHV2–70\*11\_15

238 sequences assigned  
38 (16%) exact matches, in which:  
28 unique CDR3  
4 unique J



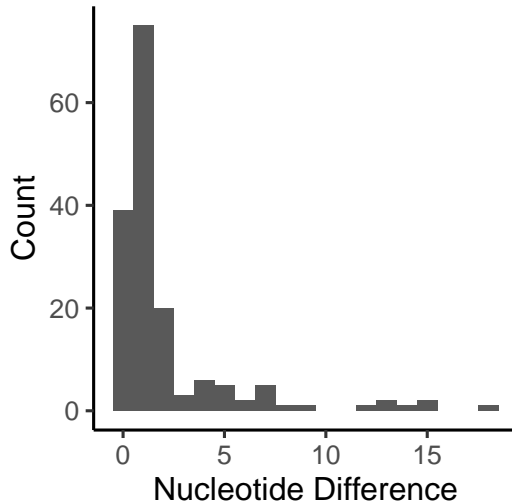
### IGHV2–5\*01

556 sequences assigned  
103 (18.5%) exact matches, in which:  
81 unique CDR3  
7 unique J



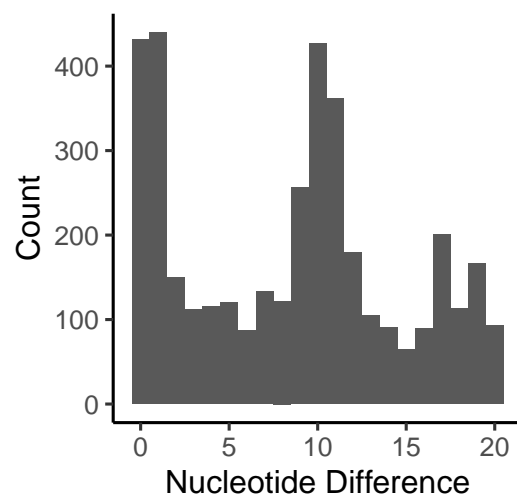
### IGHV2–70\*01

167 sequences assigned  
39 (23.4%) exact matches, in which:  
26 unique CDR3  
5 unique J



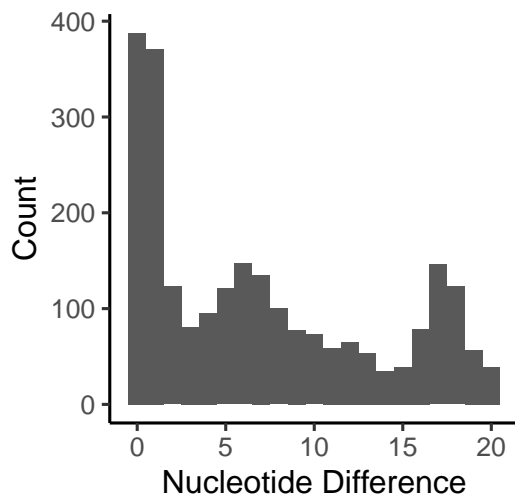
### IGHV3–7\*01

4683 sequences assigned  
432 (9.2%) exact matches, in which:  
311 unique CDR3  
7 unique J



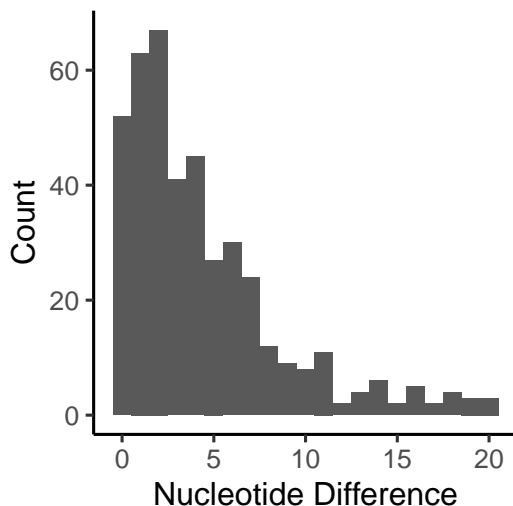
### IGHV3-7\*03

3168 sequences assigned  
388 (12.2%) exact matches, in which:  
281 unique CDR3  
7 unique J



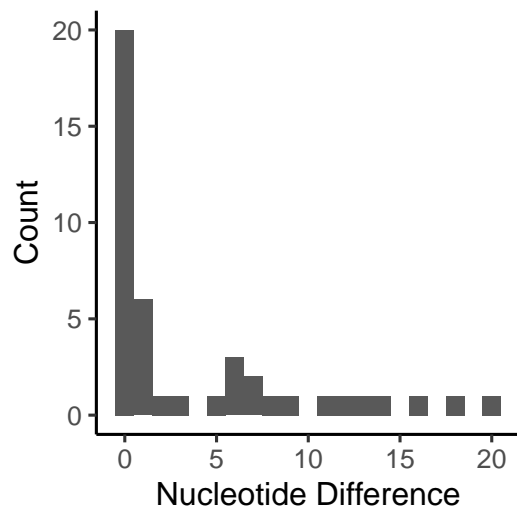
### IGHV3-11\*04

423 sequences assigned  
52 (12.3%) exact matches, in which:  
48 unique CDR3  
7 unique J



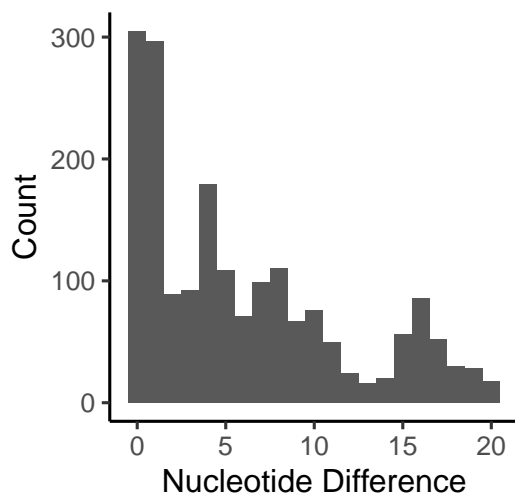
### IGHV3-13\*05

46 sequences assigned  
20 (43.5%) exact matches, in which:  
16 unique CDR3  
6 unique J



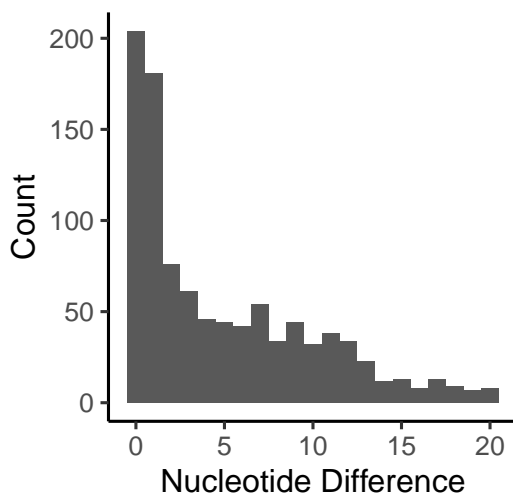
### IGHV3-9\*01

2327 sequences assigned  
305 (13.1%) exact matches, in which:  
201 unique CDR3  
6 unique J



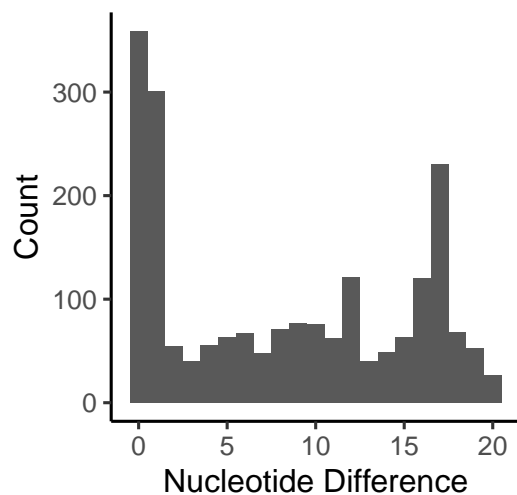
### IGHV3-11\*06

1042 sequences assigned  
204 (19.6%) exact matches, in which:  
147 unique CDR3  
7 unique J



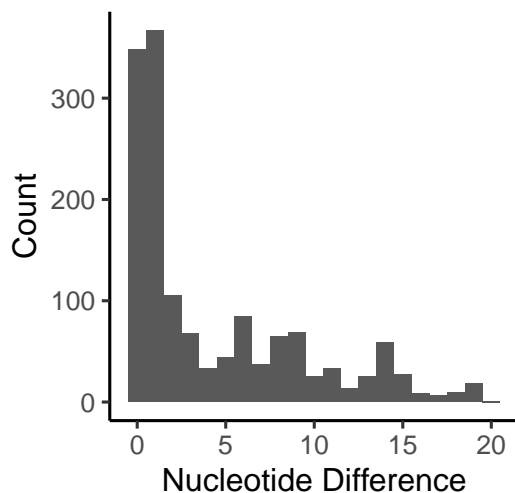
### IGHV3-15\*07

2338 sequences assigned  
359 (15.4%) exact matches, in which:  
238 unique CDR3  
6 unique J



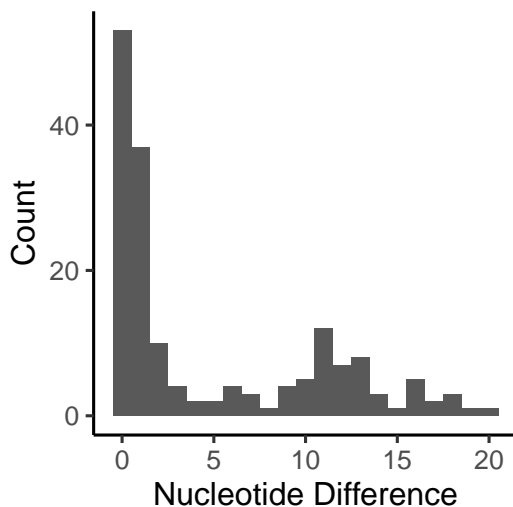
### IGHV3-11\*01

1624 sequences assigned  
348 (21.4%) exact matches, in which:  
242 unique CDR3  
7 unique J



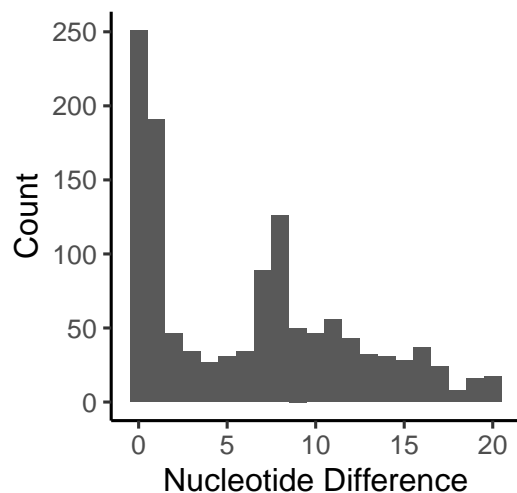
### IGHV3-13\*01

186 sequences assigned  
53 (28.5%) exact matches, in which:  
44 unique CDR3  
6 unique J



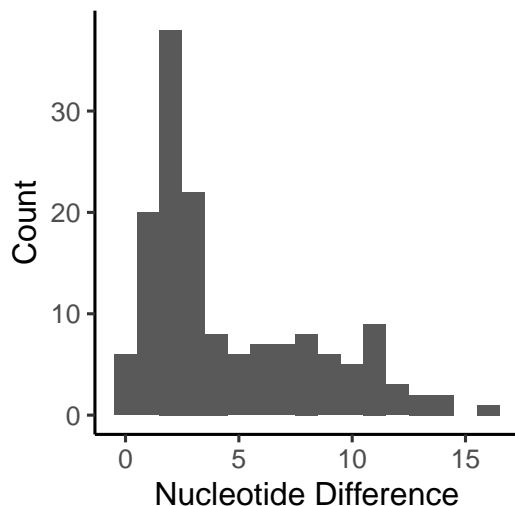
### IGHV3-15\*01\_02

1369 sequences assigned  
251 (18.3%) exact matches, in which:  
165 unique CDR3  
7 unique J



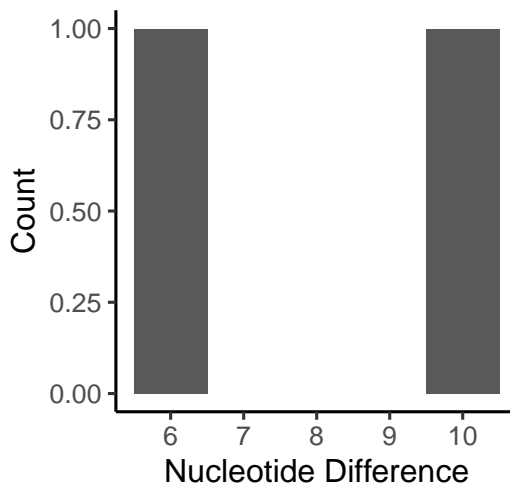
### IGHV3-20\*03\_04

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



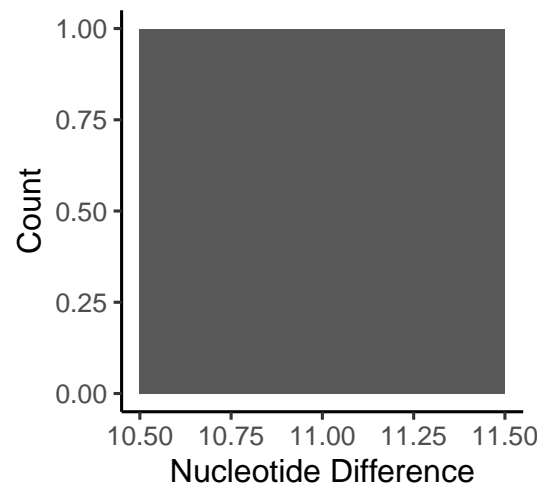
### IGHV3-22\*01\_02

2 sequences assigned  
No exact matches.



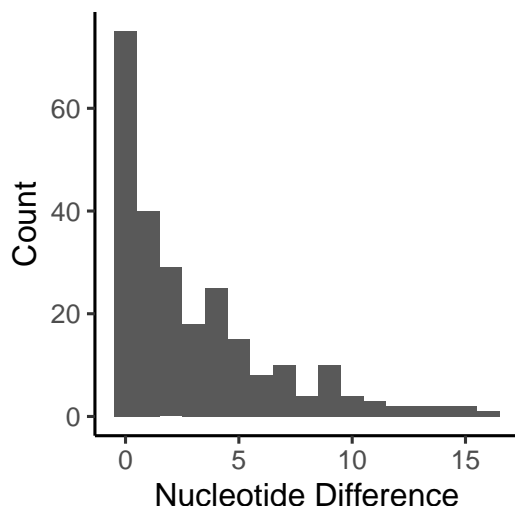
### IGHV3-30-3\*01

1 sequences assigned  
No exact matches.



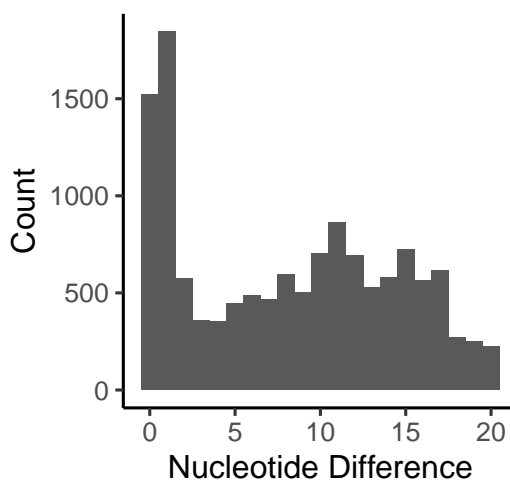
### IGHV3-21\*04

251 sequences assigned  
75 (29.9%) exact matches, in which:  
64 unique CDR3  
5 unique J



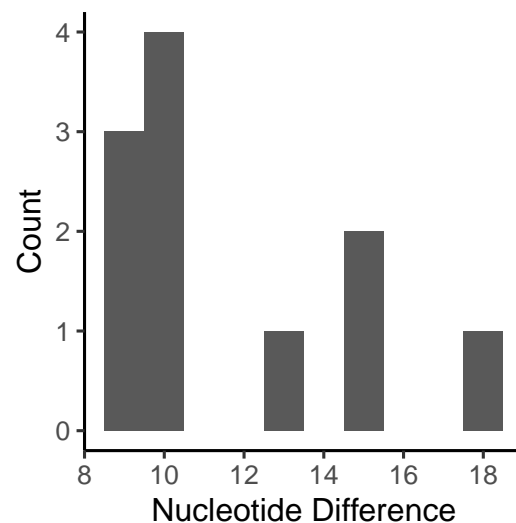
### IGHV3-23\*01\_04

14993 sequences assigned  
1522 (10.2%) exact matches, in which:  
968 unique CDR3  
7 unique J



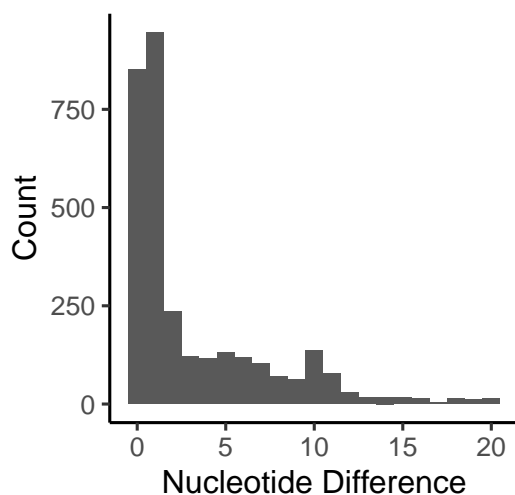
### IGHV3-30-3\*02

13 sequences assigned  
No exact matches.



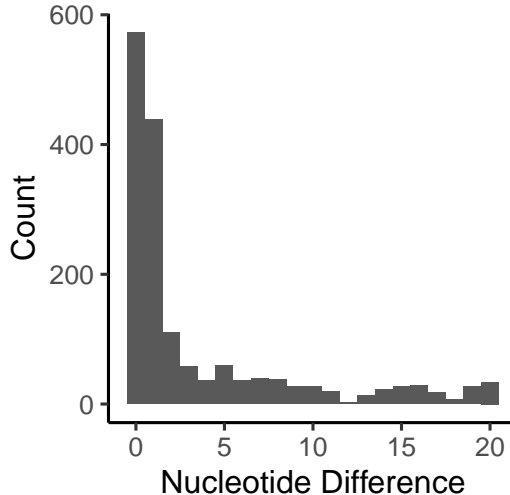
### IGHV3-21\*01\_02

3178 sequences assigned  
852 (26.8%) exact matches, in which:  
549 unique CDR3  
7 unique J



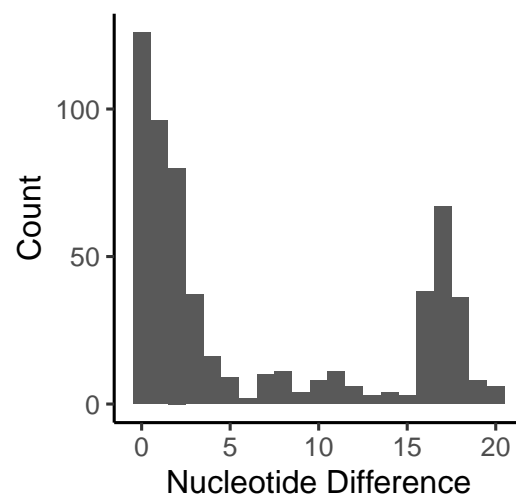
### IGHV3-30\*01

2485 sequences assigned  
573 (23.1%) exact matches, in which:  
397 unique CDR3  
7 unique J



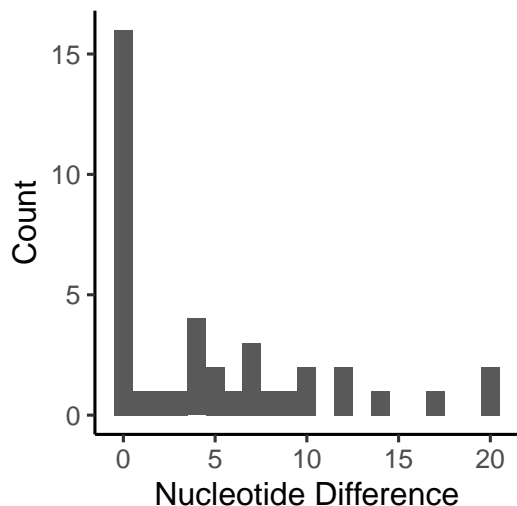
### IGHV3-30\*03

596 sequences assigned  
126 (21.1%) exact matches, in which:  
118 unique CDR3  
7 unique J



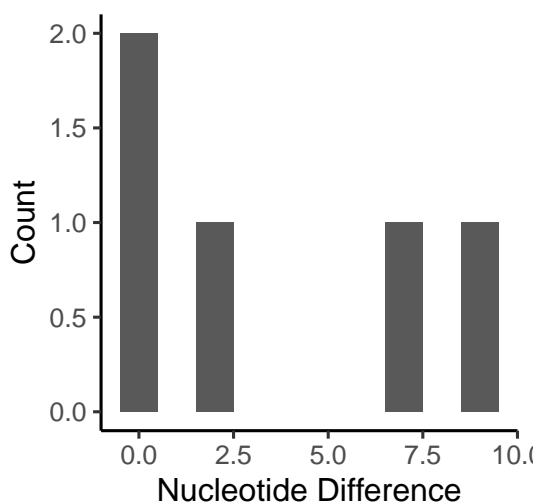
## IGHV3-30-3\*03

43 sequences assigned  
16 (37.2%) exact matches, in which:  
13 unique CDR3  
2 unique J



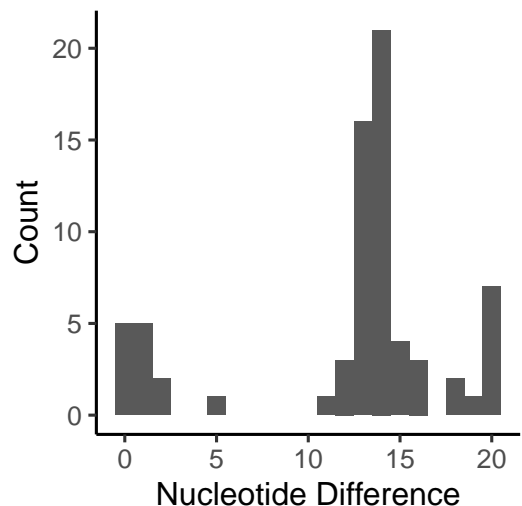
## IGHV3-35\*01

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



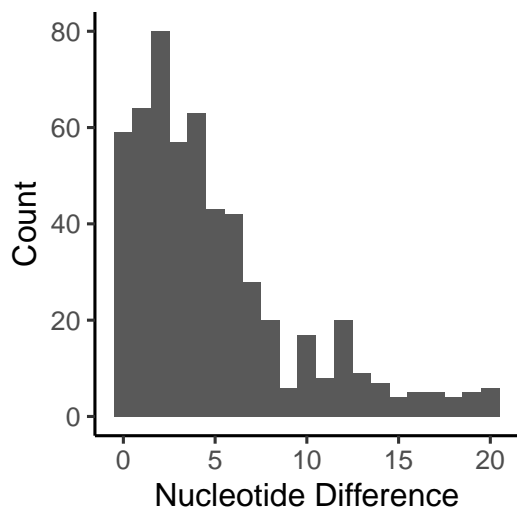
## IGHV3-43\*01

85 sequences assigned  
5 (5.9%) exact matches, in which:  
4 unique CDR3  
3 unique J



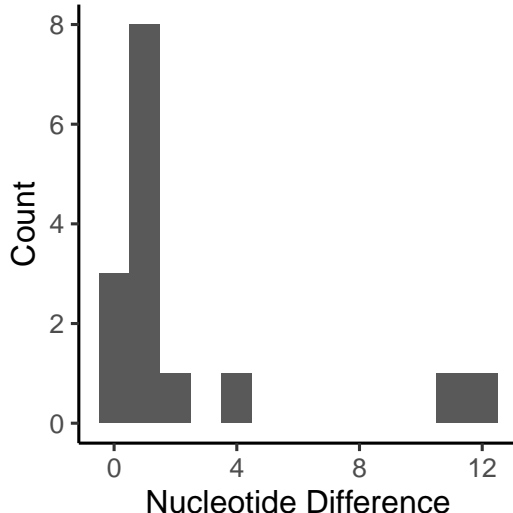
## IGHV3-30\*07

567 sequences assigned  
59 (10.4%) exact matches, in which:  
56 unique CDR3  
7 unique J



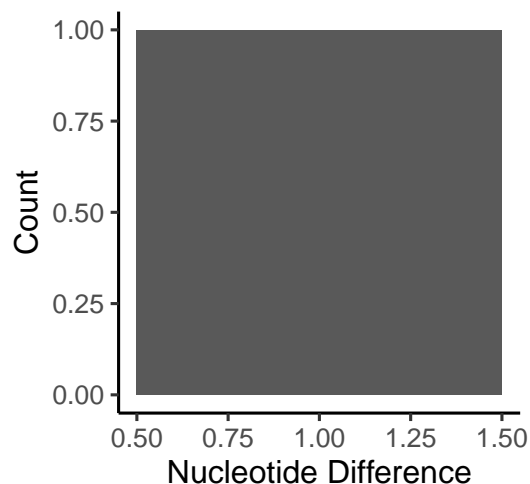
## IGHV3-38-3\*01

15 sequences assigned  
3 (20%) exact matches, in which:  
3 unique CDR3  
2 unique J



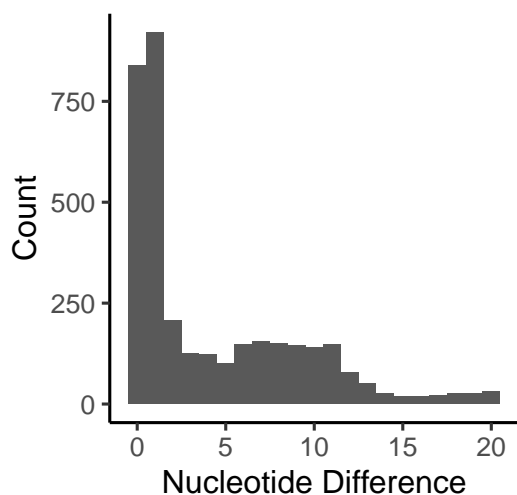
## IGHV3-47\*01

1 sequences assigned  
No exact matches.



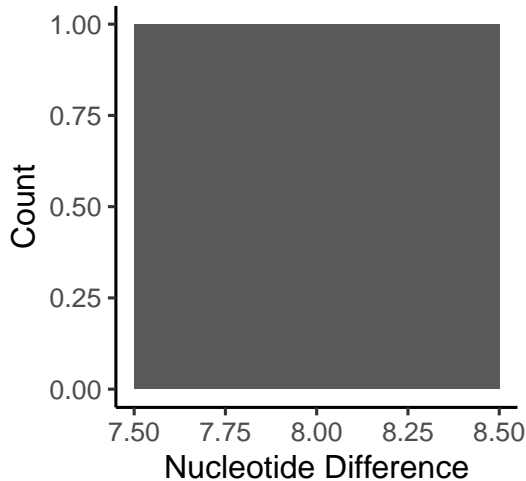
## IGHV3-33\*01

3915 sequences assigned  
839 (21.4%) exact matches, in which:  
568 unique CDR3  
7 unique J



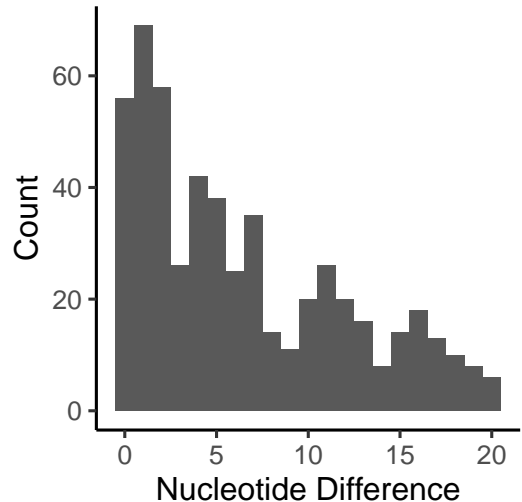
## IGHV3-38\*03

1 sequences assigned  
No exact matches.



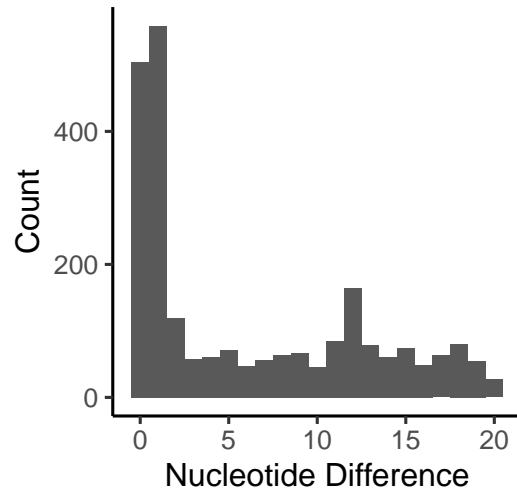
## IGHV3-48\*01

542 sequences assigned  
56 (10.3%) exact matches, in which:  
53 unique CDR3  
6 unique J



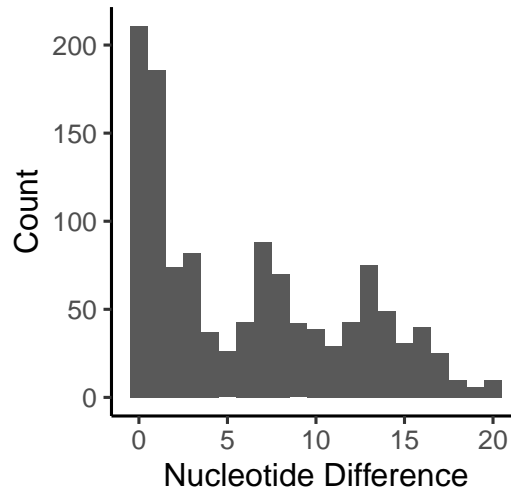
### IGHV3-48\*02

2437 sequences assigned  
504 (20.7%) exact matches, in which:  
307 unique CDR3  
7 unique J



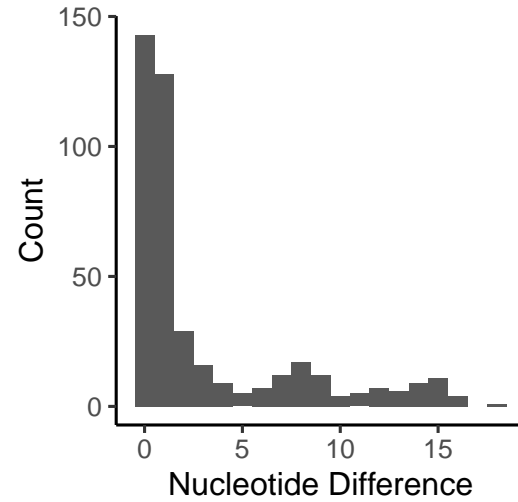
### IGHV3-49\*04

1241 sequences assigned  
211 (17%) exact matches, in which:  
138 unique CDR3  
7 unique J



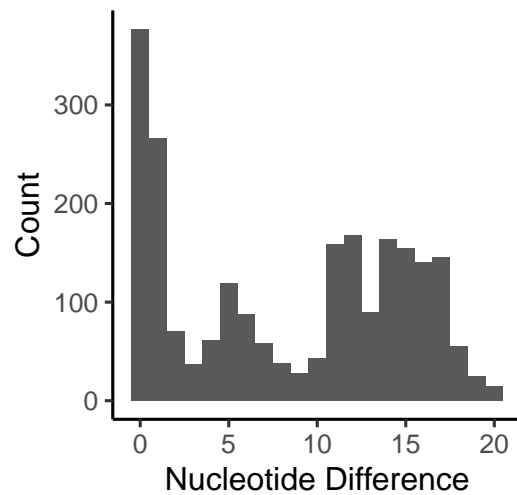
### IGHV3-53\*01\_02

429 sequences assigned  
143 (33.3%) exact matches, in which:  
104 unique CDR3  
6 unique J



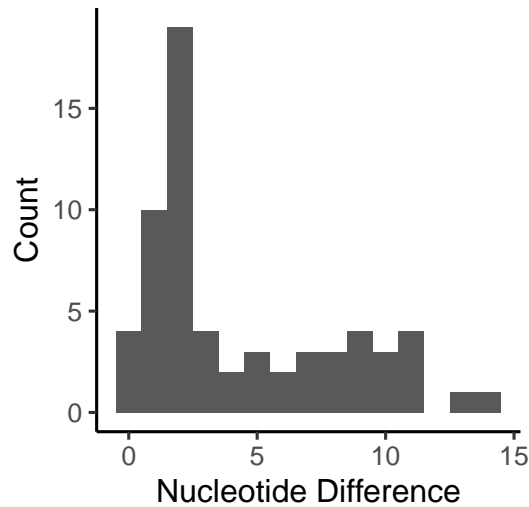
### IGHV3-48\*03

2610 sequences assigned  
377 (14.4%) exact matches, in which:  
248 unique CDR3  
7 unique J



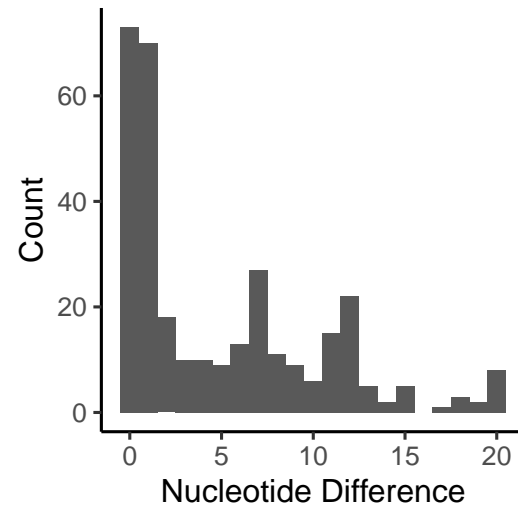
### IGHV3-52\*01\_03

63 sequences assigned  
4 (6.3%) exact matches, in which:  
4 unique CDR3  
3 unique J



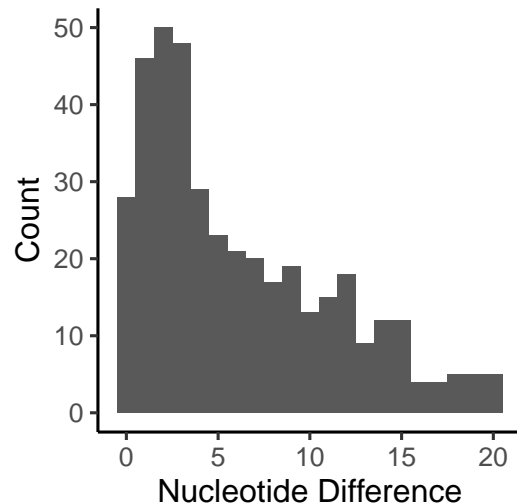
### IGHV3-64\*01

365 sequences assigned  
73 (20%) exact matches, in which:  
50 unique CDR3  
4 unique J



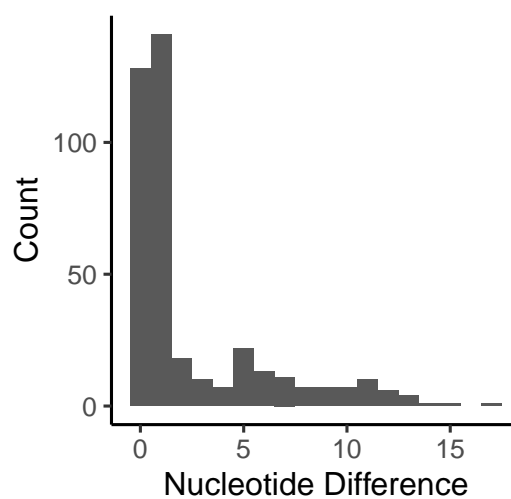
### IGHV3-48\*04

408 sequences assigned  
28 (6.9%) exact matches, in which:  
23 unique CDR3  
6 unique J



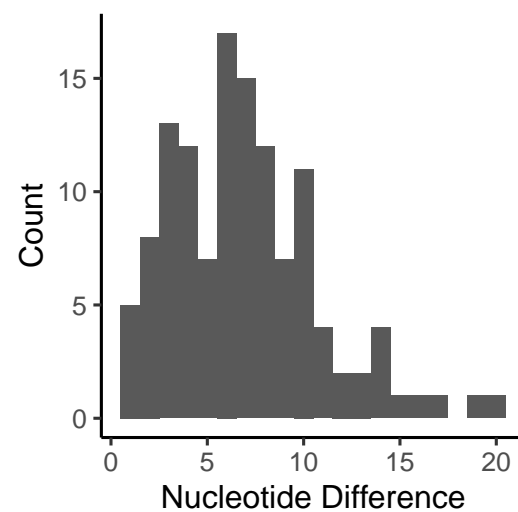
### IGHV3-53\*04

395 sequences assigned  
128 (32.4%) exact matches, in which:  
93 unique CDR3  
5 unique J



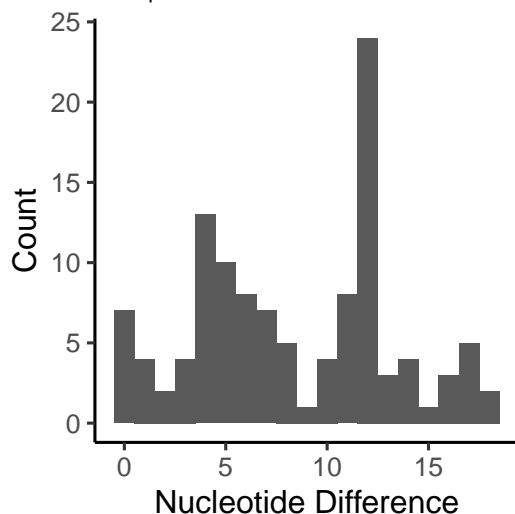
### IGHV3-64\*04

127 sequences assigned  
No exact matches.



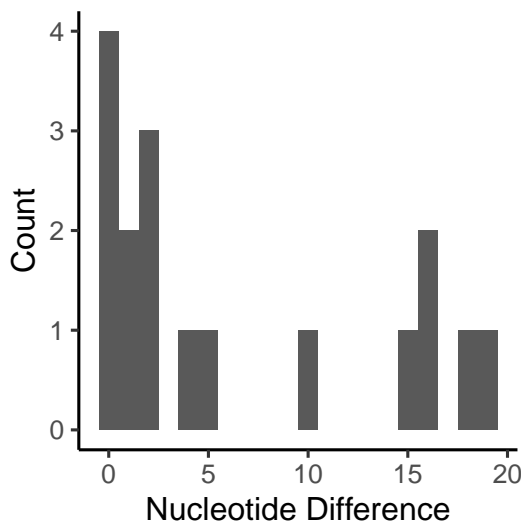
### IGHV3-64\*02\_07

117 sequences assigned  
7 (6%) exact matches, in which:  
7 unique CDR3  
3 unique J



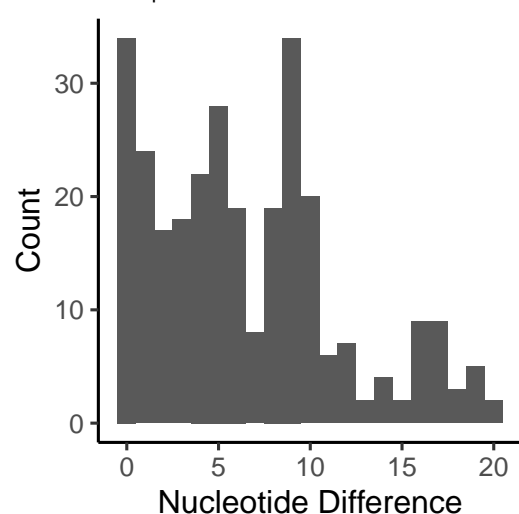
### IGHV3-69-1\*02

17 sequences assigned  
4 (23.5%) exact matches, in which:  
4 unique CDR3  
2 unique J



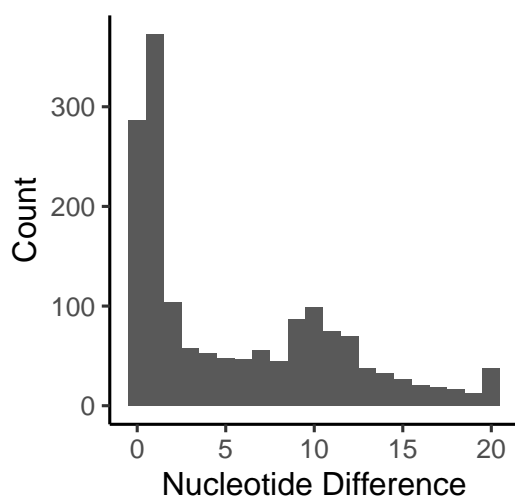
### IGHV3-72\*01

301 sequences assigned  
34 (11.3%) exact matches, in which:  
26 unique CDR3  
7 unique J



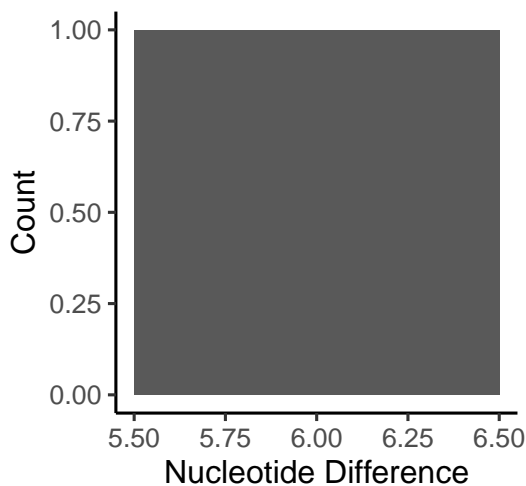
### IGHV3-66\*01

1706 sequences assigned  
286 (16.8%) exact matches, in which:  
205 unique CDR3  
7 unique J



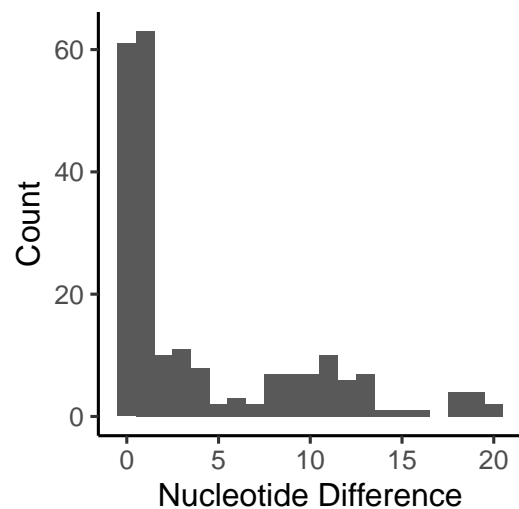
### IGHV3-71\*03

1 sequences assigned  
No exact matches.



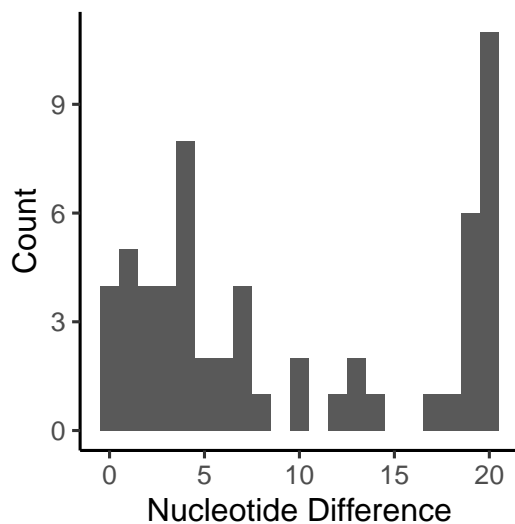
### IGHV3-73\*01\_02

232 sequences assigned  
61 (26.3%) exact matches, in which:  
40 unique CDR3  
6 unique J



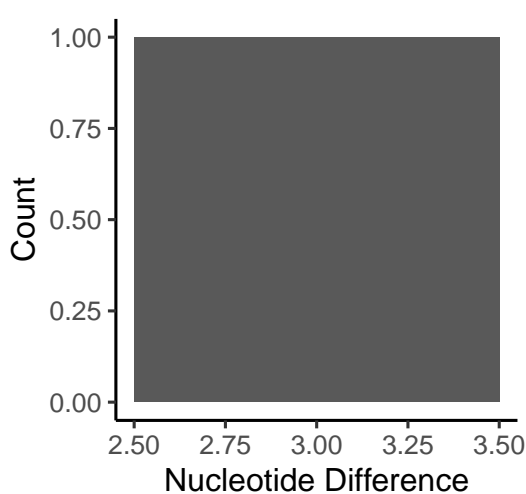
### IGHV3-69-1\*01

70 sequences assigned  
4 (5.7%) exact matches, in which:  
4 unique CDR3  
3 unique J



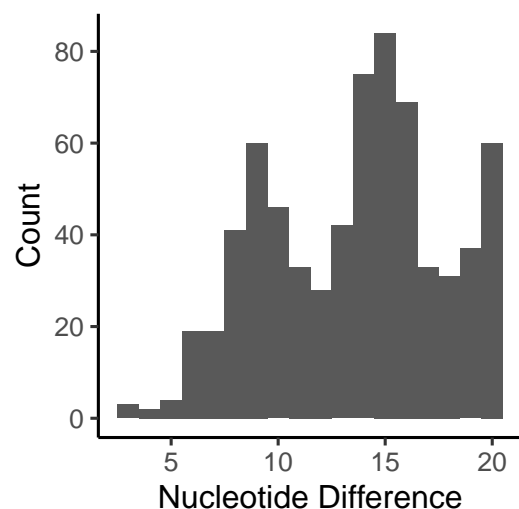
### IGHV3-71\*01\_04

2 sequences assigned  
No exact matches.



### IGHV3-74\*03

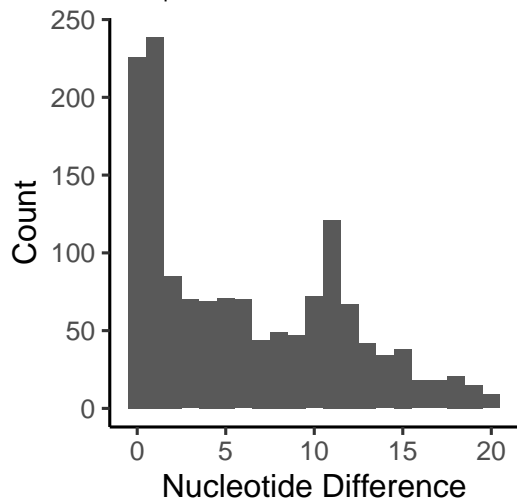
920 sequences assigned  
No exact matches.





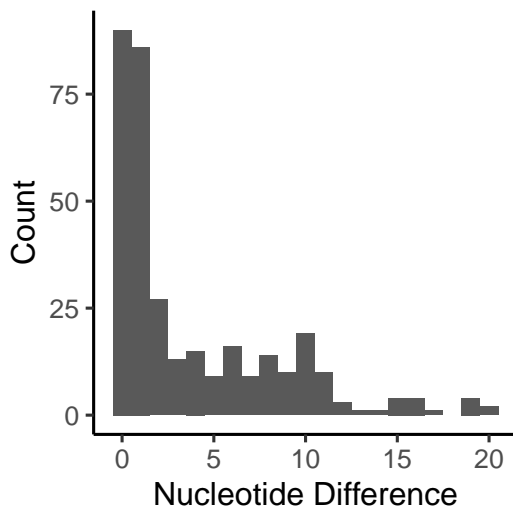
### IGHV3-74\*01\_02

1767 sequences assigned  
226 (12.8%) exact matches, in which:  
157 unique CDR3  
6 unique J



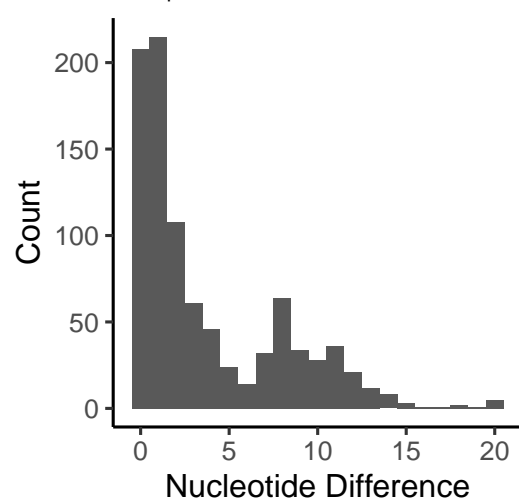
### IGHV3-64D\*06

378 sequences assigned  
90 (23.8%) exact matches, in which:  
60 unique CDR3  
6 unique J



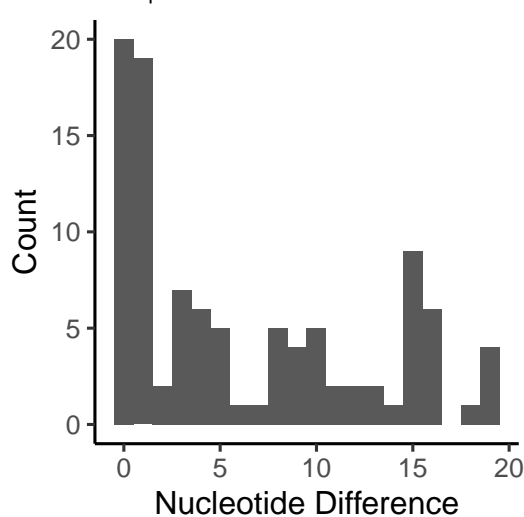
### IGHV4-4\*02\_03

966 sequences assigned  
208 (21.5%) exact matches, in which:  
166 unique CDR3  
7 unique J



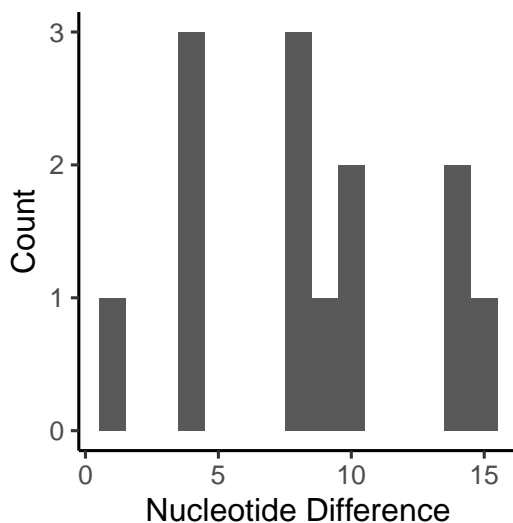
### IGHV3-43D\*03

110 sequences assigned  
20 (18.2%) exact matches, in which:  
11 unique CDR3  
4 unique J



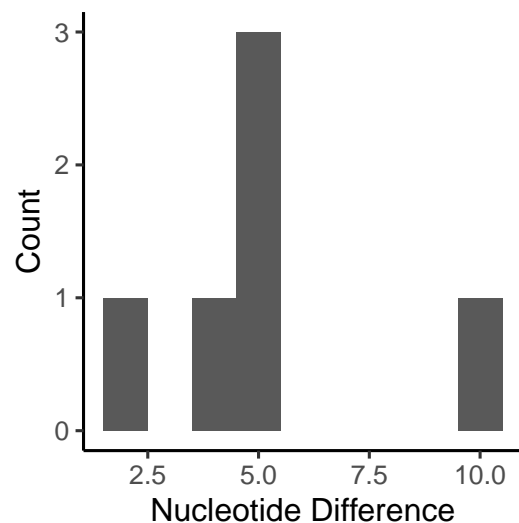
### IGHV3-NL1\*01

15 sequences assigned  
No exact matches.



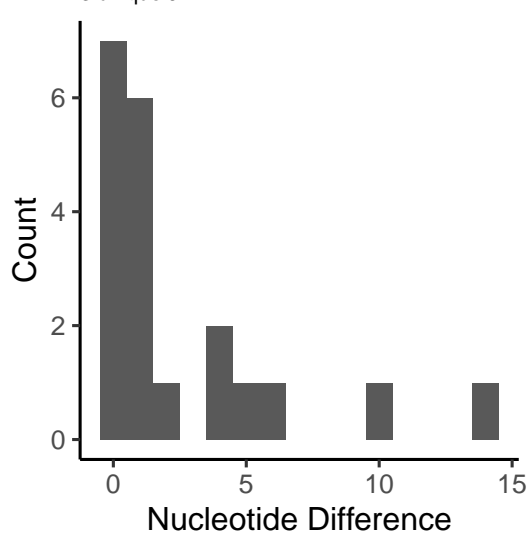
### IGHV4-28\*03

6 sequences assigned  
No exact matches.



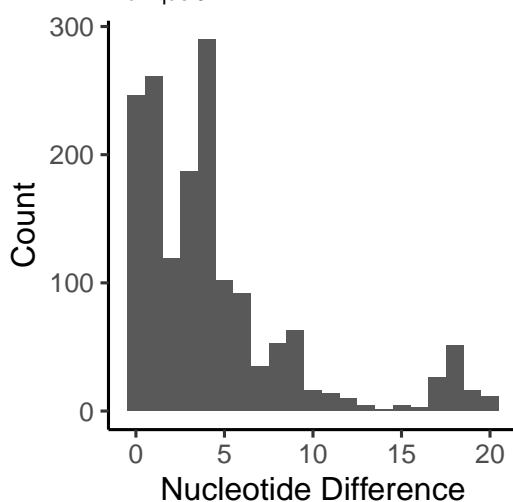
### IGHV3-43D\*04

20 sequences assigned  
7 (35%) exact matches, in which:  
5 unique CDR3  
3 unique J



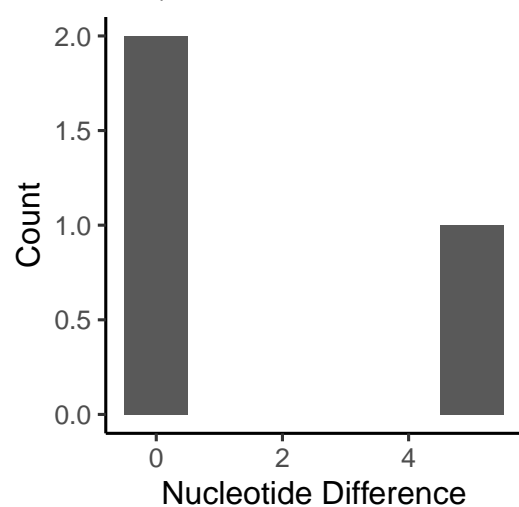
### IGHV4-4\*07

1640 sequences assigned  
246 (15%) exact matches, in which:  
214 unique CDR3  
7 unique J



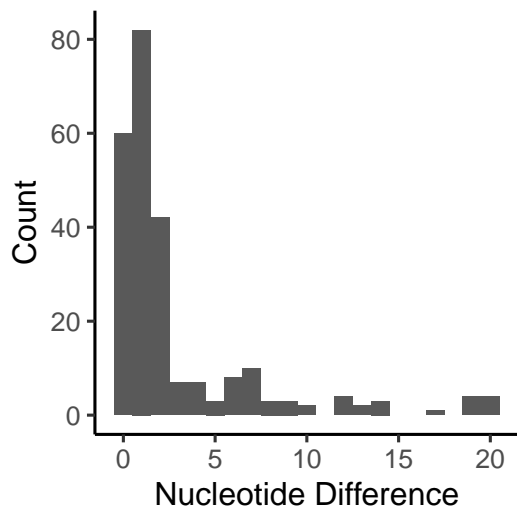
### IGHV4-28\*02\_05

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



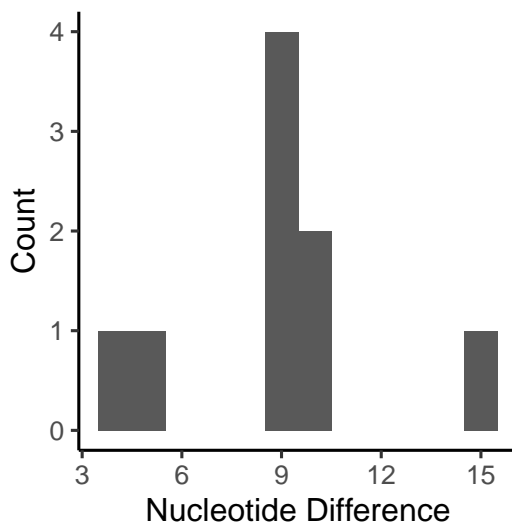
### IGHV4-30-2\*01

277 sequences assigned  
60 (21.7%) exact matches, in which:  
37 unique CDR3  
6 unique J



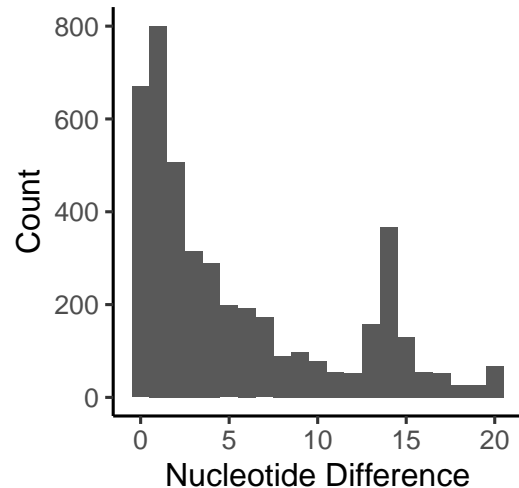
### IGHV4-30-4\*07

10 sequences assigned  
No exact matches.



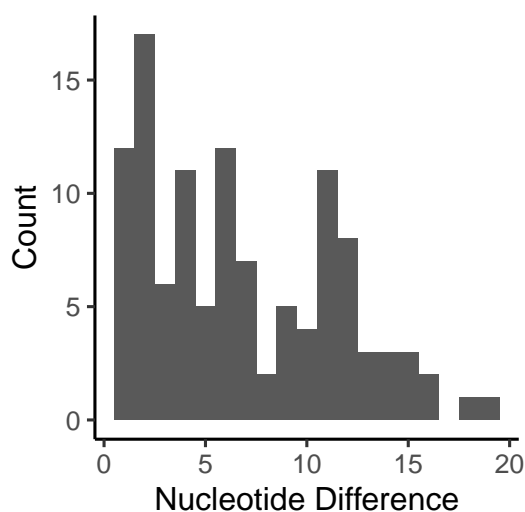
### IGHV4-34\*01\_02

4813 sequences assigned  
670 (13.9%) exact matches, in which:  
494 unique CDR3  
7 unique J



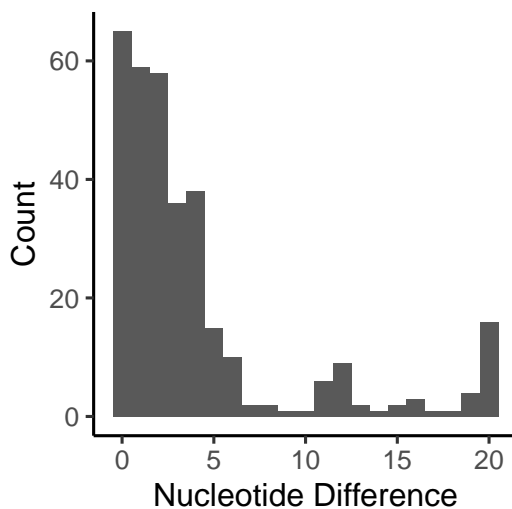
### IGHV4-30-2\*03

157 sequences assigned  
No exact matches.



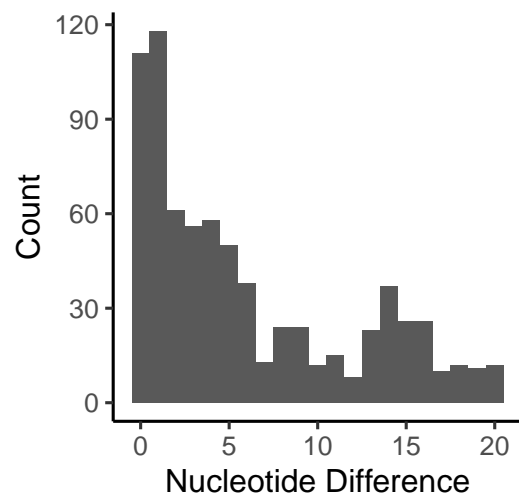
### IGHV4-31\*01

340 sequences assigned  
65 (19.1%) exact matches, in which:  
54 unique CDR3  
5 unique J



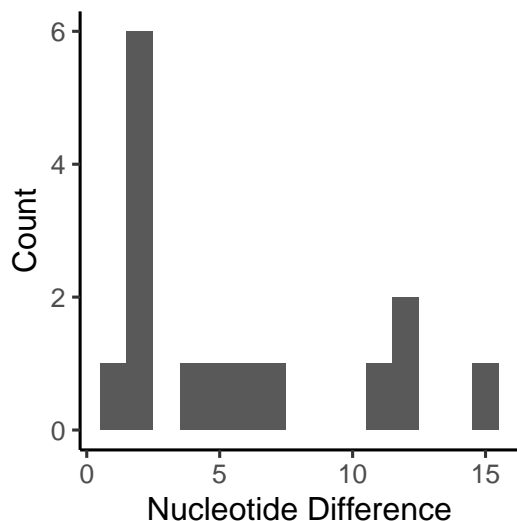
### IGHV4-38-2\*01

854 sequences assigned  
111 (13%) exact matches, in which:  
103 unique CDR3  
7 unique J



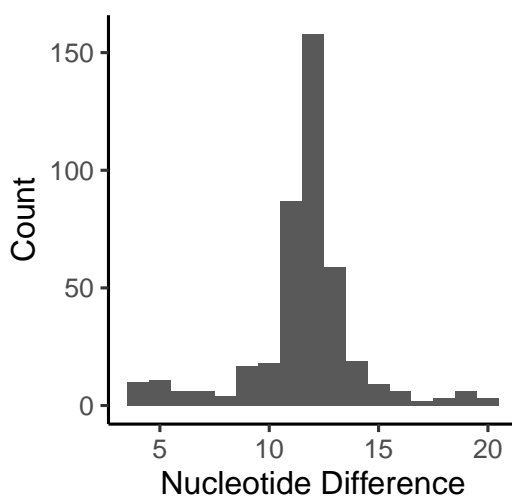
### IGHV4-30-2\*04

15 sequences assigned  
No exact matches.



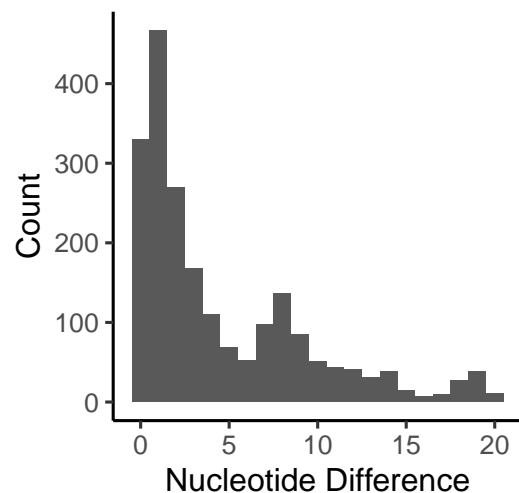
### IGHV4-31\*02

432 sequences assigned  
No exact matches.



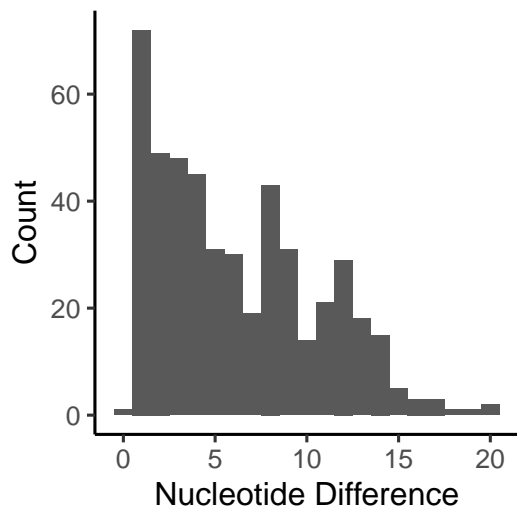
### IGHV4-38-2\*02

2155 sequences assigned  
330 (15.3%) exact matches, in which:  
268 unique CDR3  
7 unique J



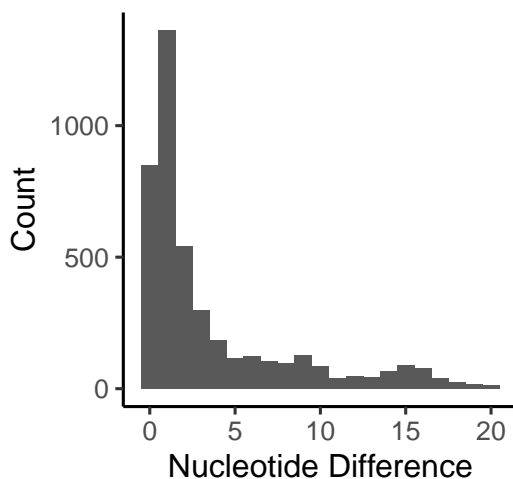
### IGHV4-39\*07

488 sequences assigned  
1 (0.2%) exact matches, in which:  
1 unique CDR3  
1 unique J



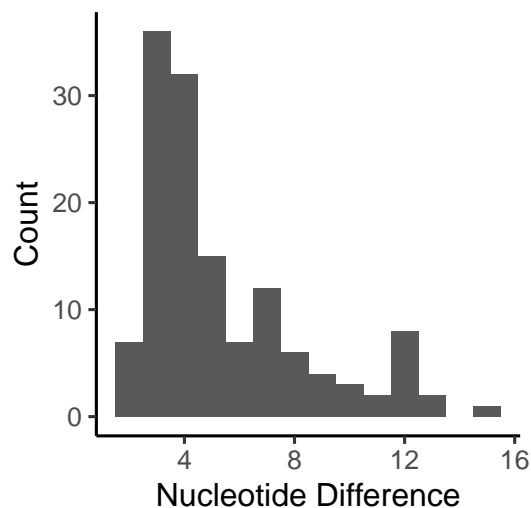
### IGHV4-59\*01\_07

4678 sequences assigned  
849 (18.1%) exact matches, in which:  
635 unique CDR3  
7 unique J



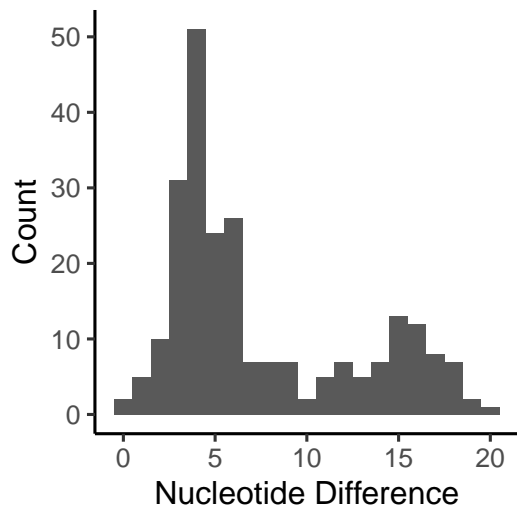
### IGHV4-61\*05

137 sequences assigned  
No exact matches.



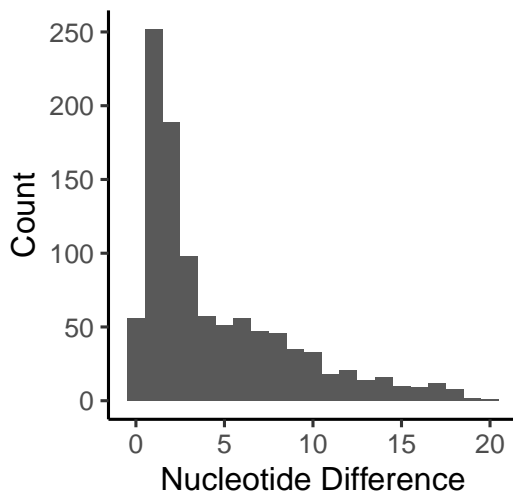
### IGHV4-59\*02

514 sequences assigned  
2 (0.4%) exact matches, in which:  
2 unique CDR3  
1 unique J



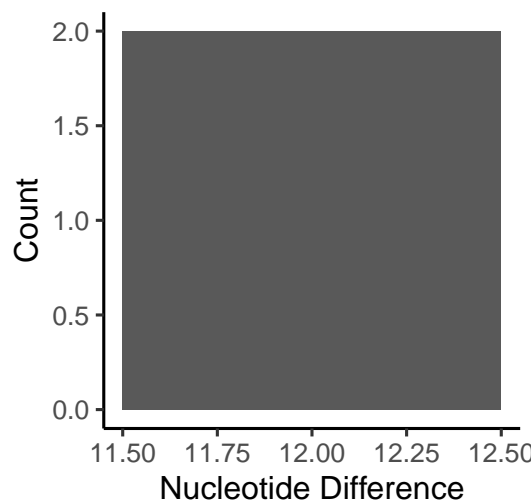
### IGHV4-59\*12

1057 sequences assigned  
56 (5.3%) exact matches, in which:  
54 unique CDR3  
6 unique J



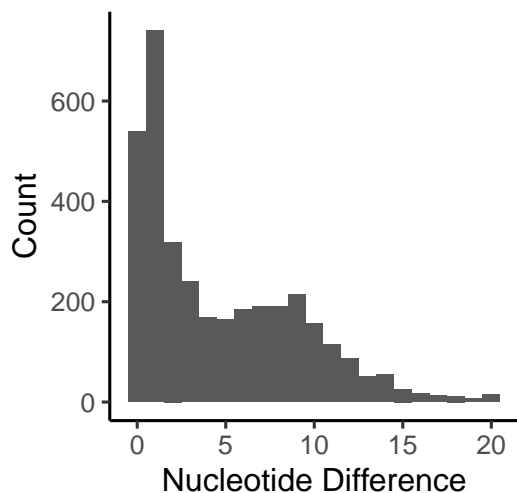
### IGHV1/OR15-2\*02\_03

2 sequences assigned  
No exact matches.



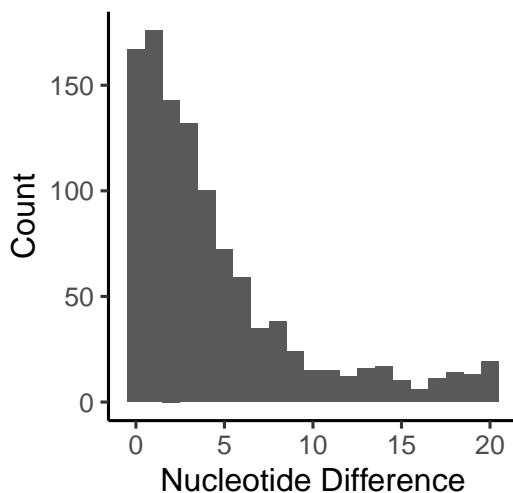
### IGHV4-59\*08

3714 sequences assigned  
540 (14.5%) exact matches, in which:  
442 unique CDR3  
7 unique J



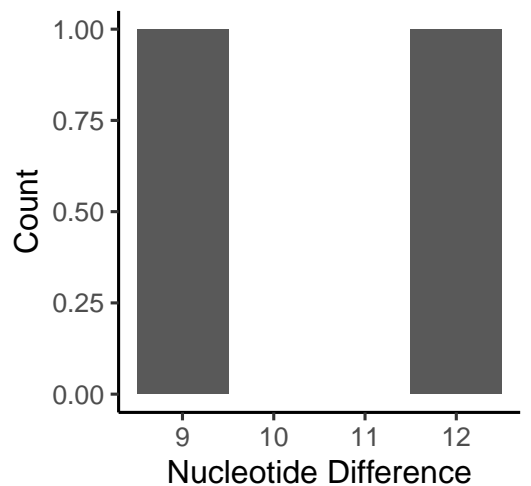
### IGHV4-61\*01

1133 sequences assigned  
167 (14.7%) exact matches, in which:  
145 unique CDR3  
7 unique J



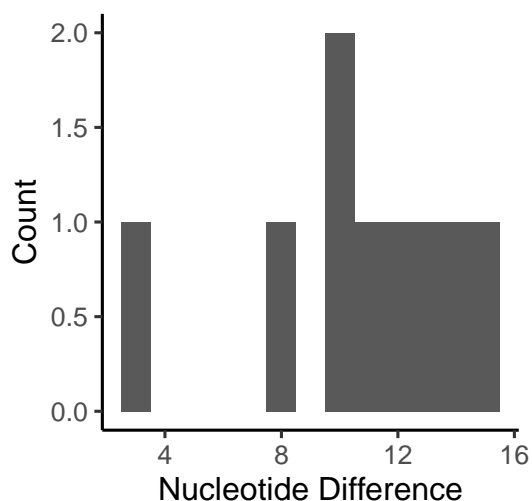
### IGHV1/OR15-3\*02

2 sequences assigned  
No exact matches.



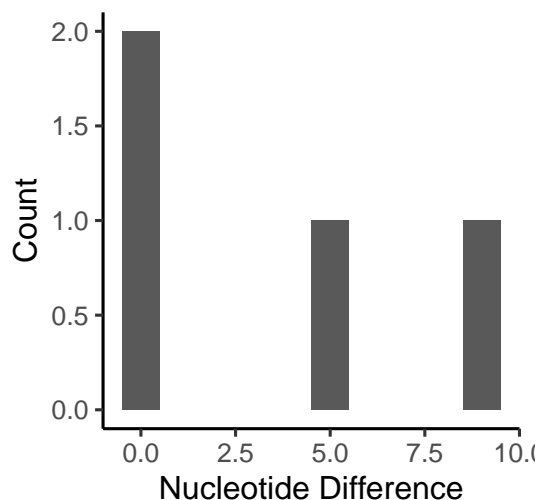
### IGHV4/OR15-8\*01

9 sequences assigned  
No exact matches.



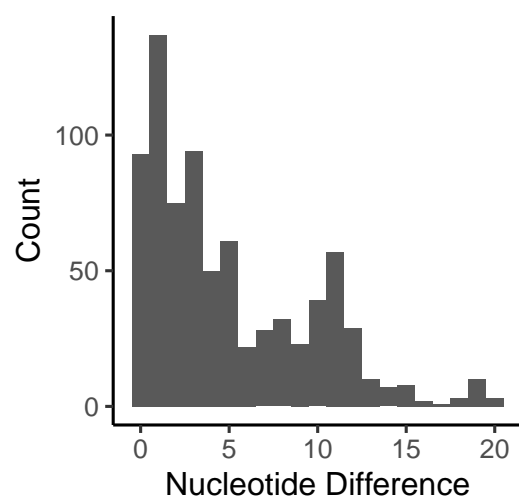
### IGHV5-51\*06

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



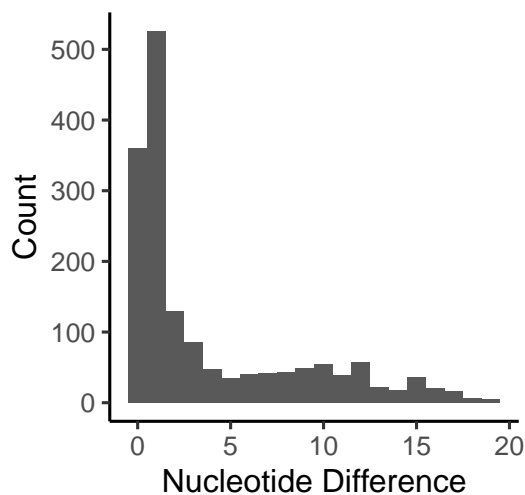
### IGHV7-4-1\*02

832 sequences assigned  
93 (11.2%) exact matches, in which:  
81 unique CDR3  
5 unique J



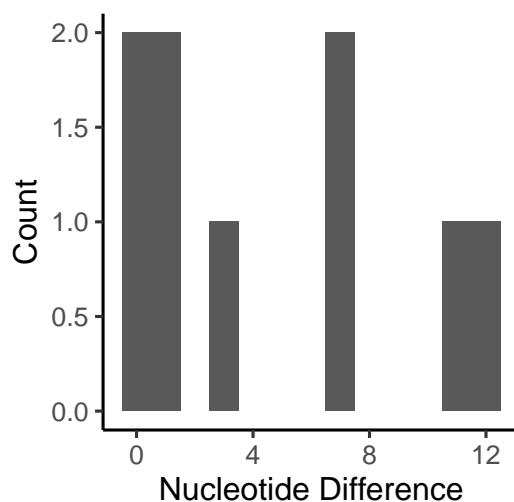
### IGHV5-10-1\*01\_03

1687 sequences assigned  
360 (21.3%) exact matches, in which:  
241 unique CDR3  
7 unique J



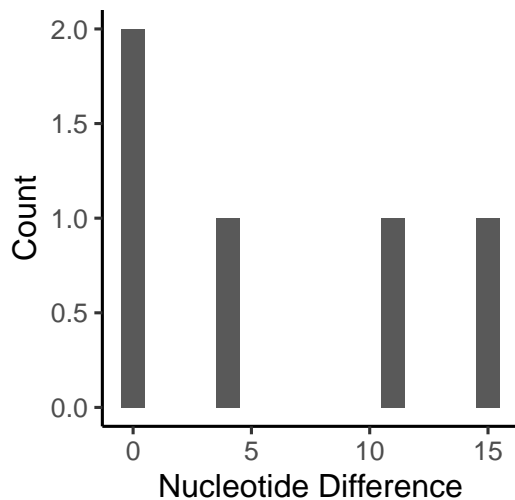
### IGHV5-51\*07

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



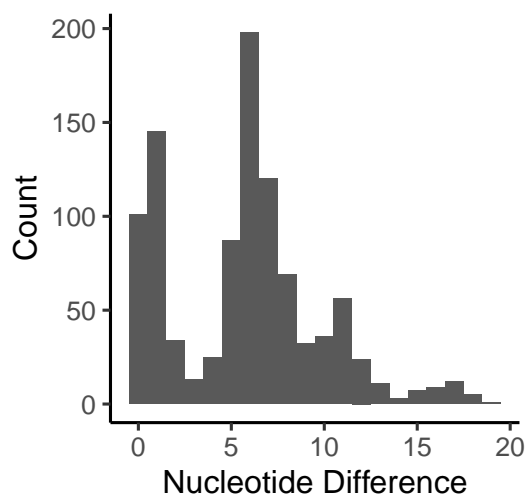
### IGHV5-51\*04

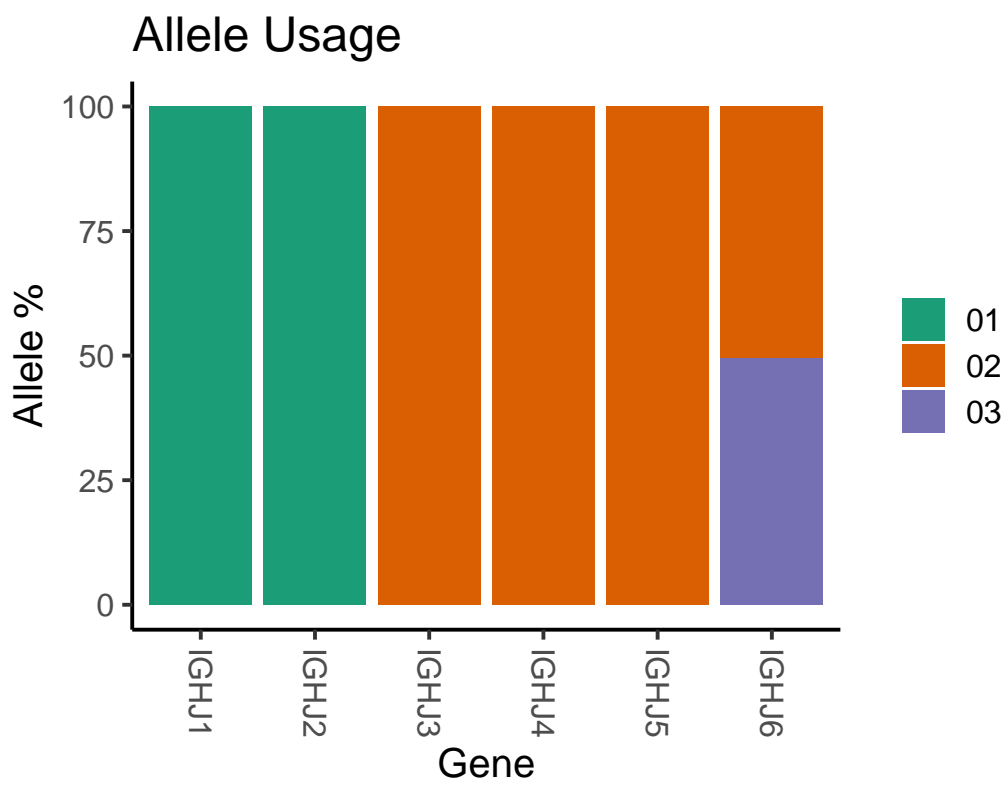
5 sequences assigned  
2 (40%) exact matches, in which:  
1 unique CDR3  
1 unique J



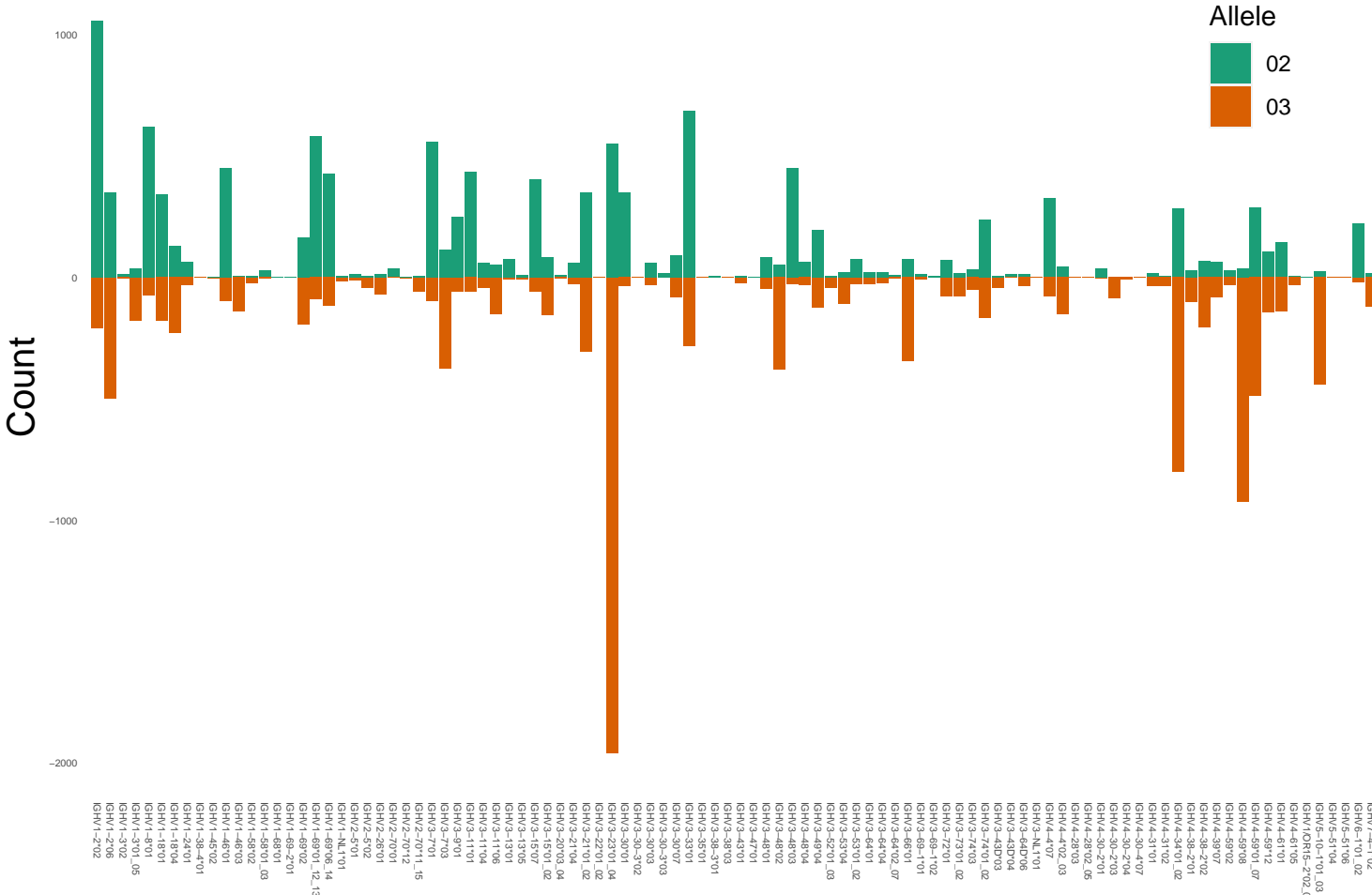
### IGHV6-1\*01\_02

1091 sequences assigned  
101 (9.3%) exact matches, in which:  
87 unique CDR3  
7 unique J





## Sequence Count by IGHJ6 allele usage



[illegible]