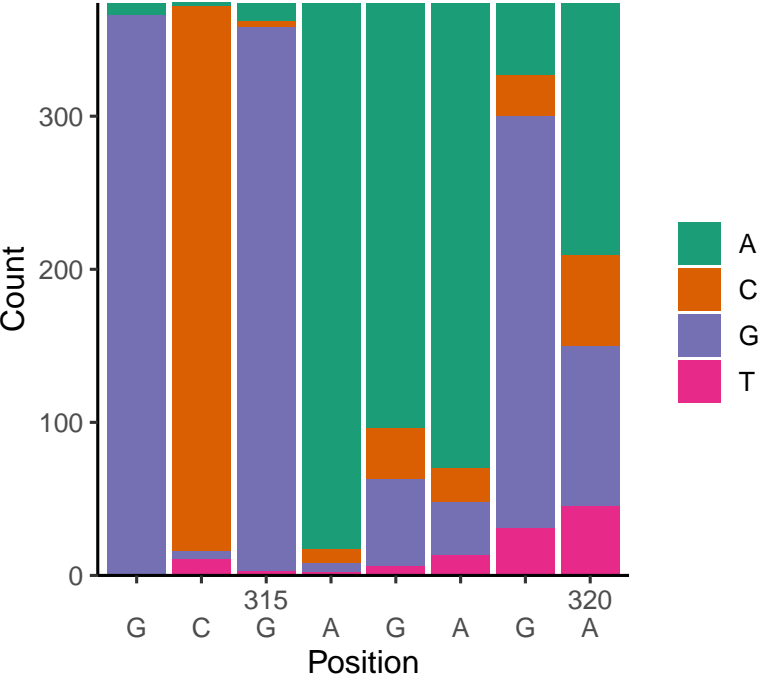
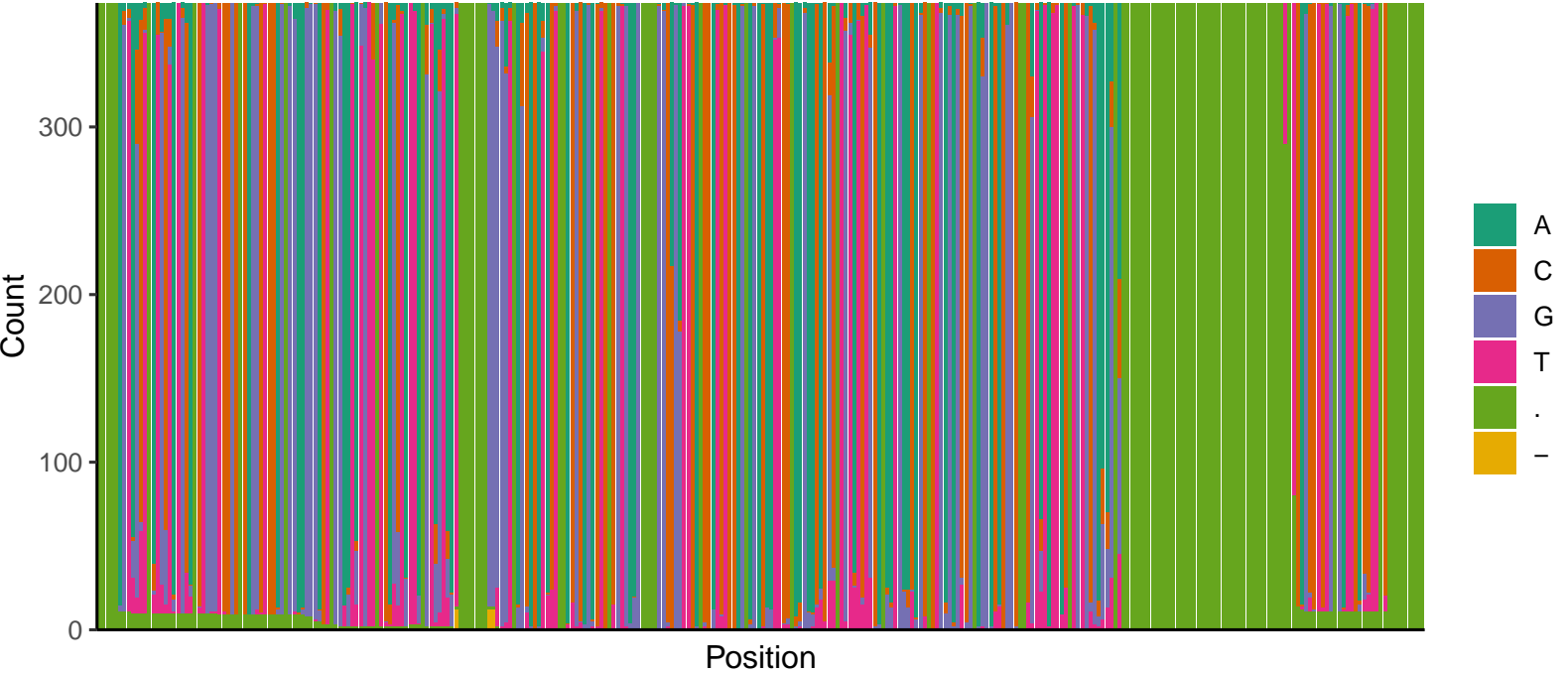


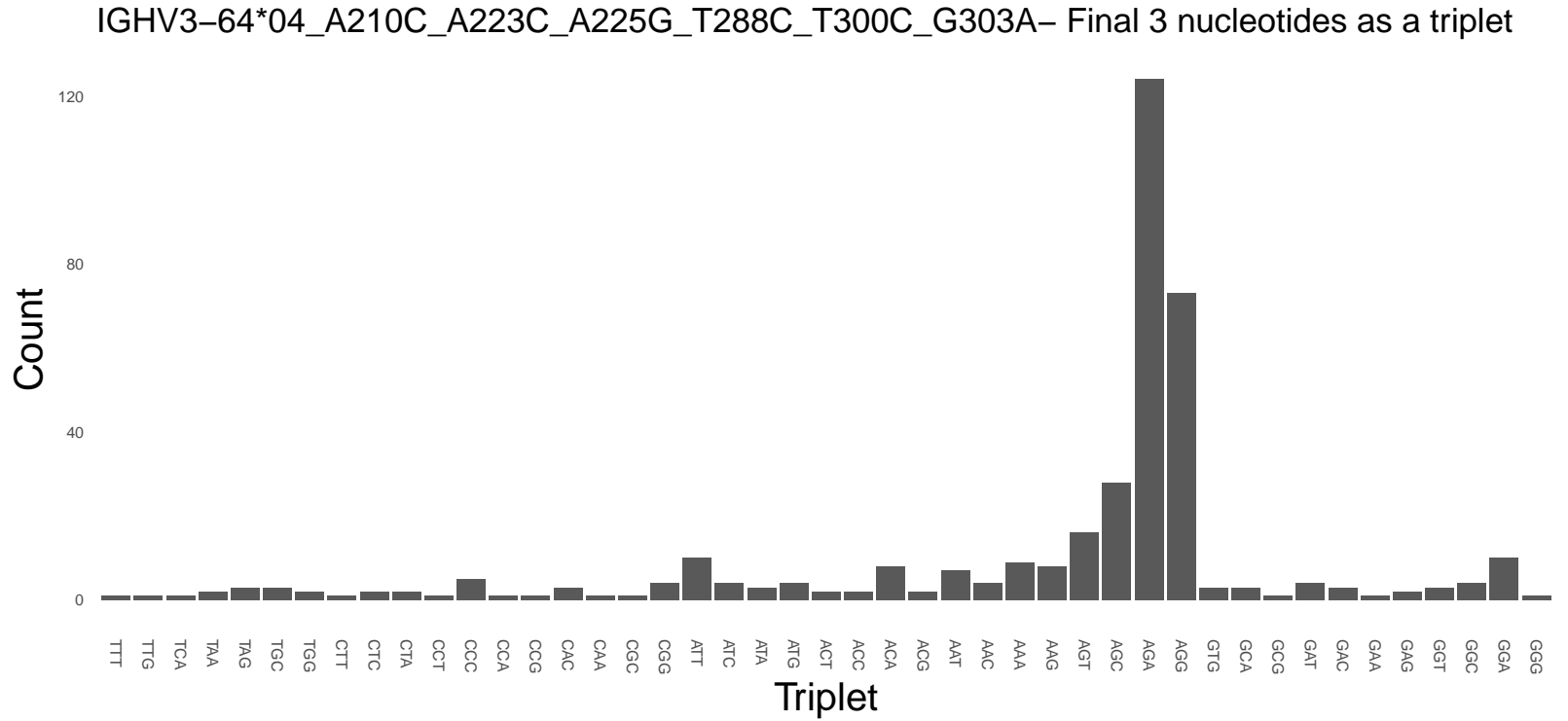
Gene IGHV3-64\*04\_A210C\_A223C\_A225G\_T288C\_T300C\_G303A



Gene IGHV3-64\*04\_A210C\_A223C\_A225G\_T288C\_T300C\_G303A

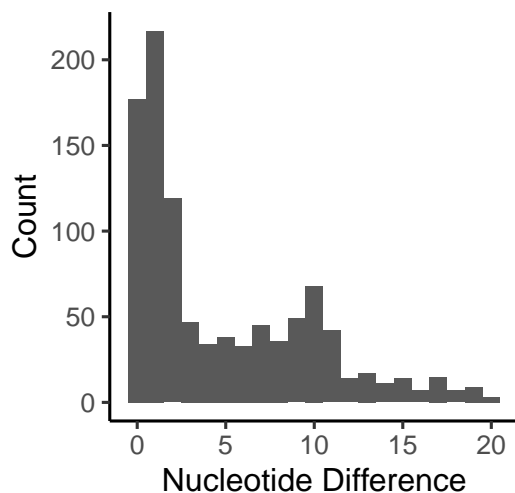


IGHV3-64\*04\_A210C\_A223C\_A225G\_T288C\_T300C\_G303A- Final 3 nucleotides as a triplet



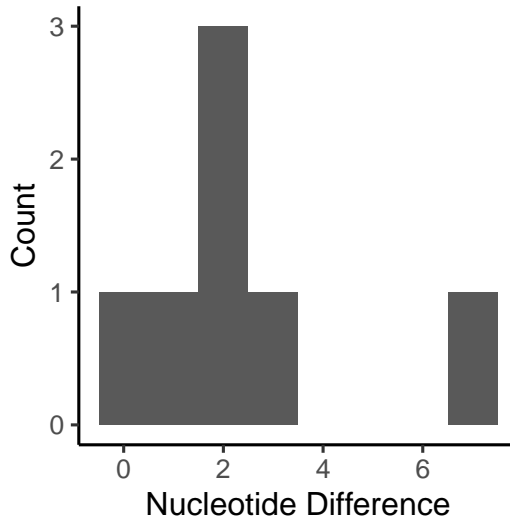
### IGHV1-2\*04

1008 sequences assigned  
177 (17.6%) exact matches, in which:  
149 unique CDR3  
6 unique J



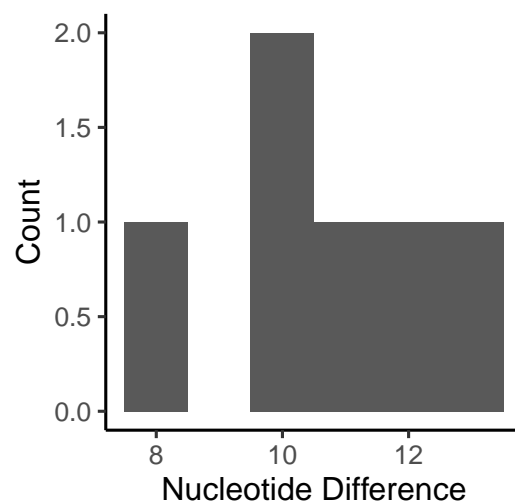
### IGHV1-8\*01

8 sequences assigned  
1 (12.5%) exact matches, in which:  
1 unique CDR3  
1 unique J



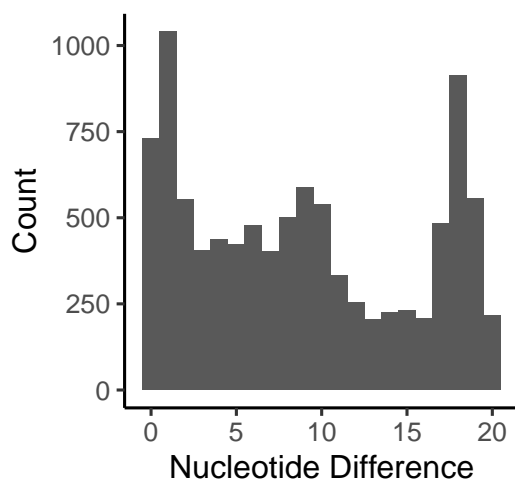
### IGHV1-45\*02

6 sequences assigned  
No exact matches.



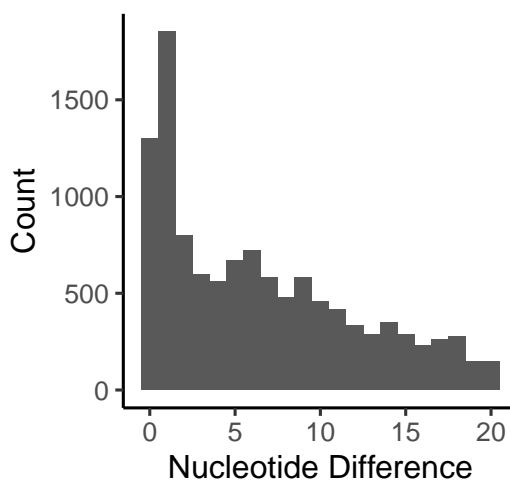
### IGHV1-2\*06

10439 sequences assigned  
731 (7%) exact matches, in which:  
563 unique CDR3  
7 unique J



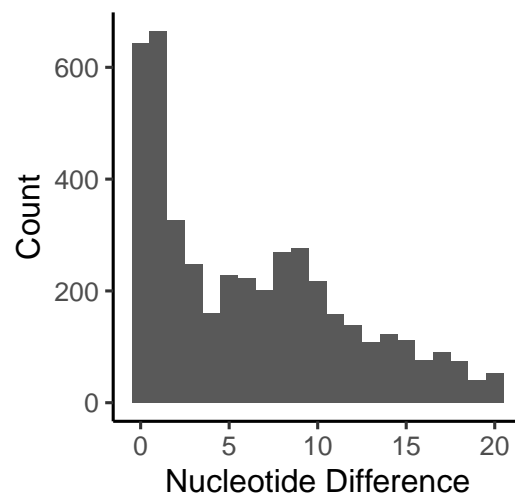
### IGHV1-18\*01

12461 sequences assigned  
1300 (10.4%) exact matches, in which:  
991 unique CDR3  
7 unique J



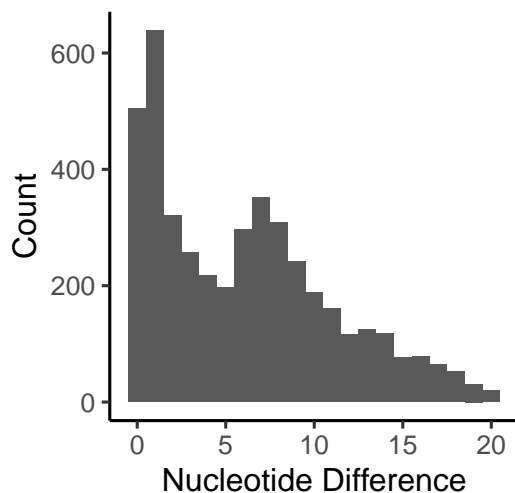
### IGHV1-46\*01

7585 sequences assigned  
643 (8.5%) exact matches, in which:  
540 unique CDR3  
7 unique J



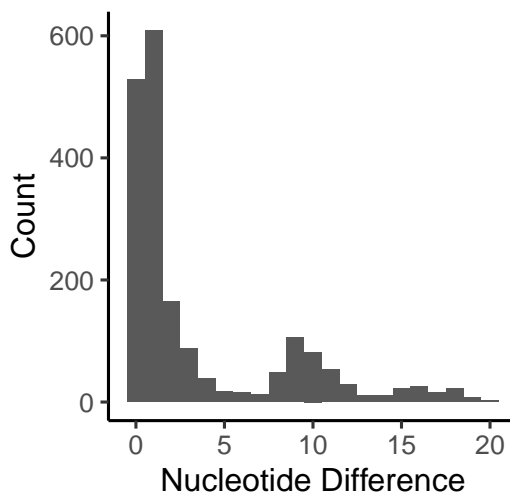
### IGHV1-3\*01\_05

4669 sequences assigned  
505 (10.8%) exact matches, in which:  
404 unique CDR3  
7 unique J



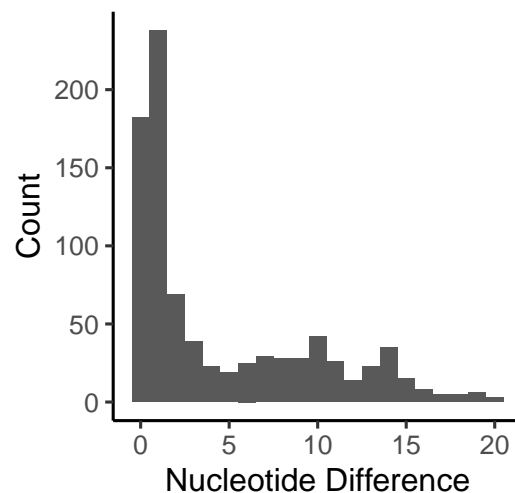
### IGHV1-24\*01

1925 sequences assigned  
528 (27.4%) exact matches, in which:  
404 unique CDR3  
7 unique J



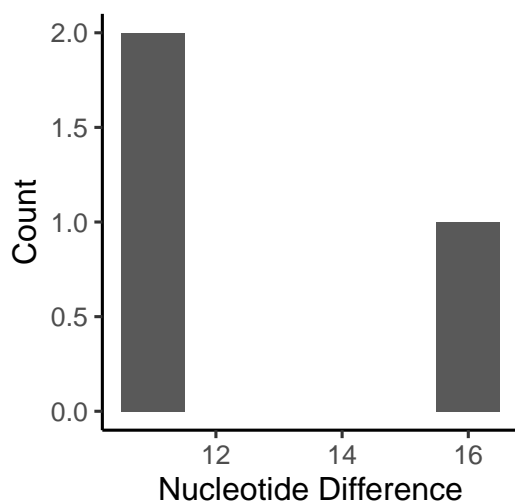
### IGHV1-58\*01\_03

878 sequences assigned  
182 (20.7%) exact matches, in which:  
146 unique CDR3  
7 unique J



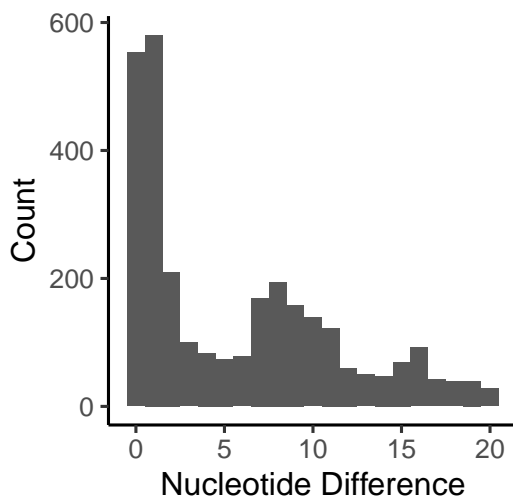
### IGHV1-68\*01

3 sequences assigned  
No exact matches.



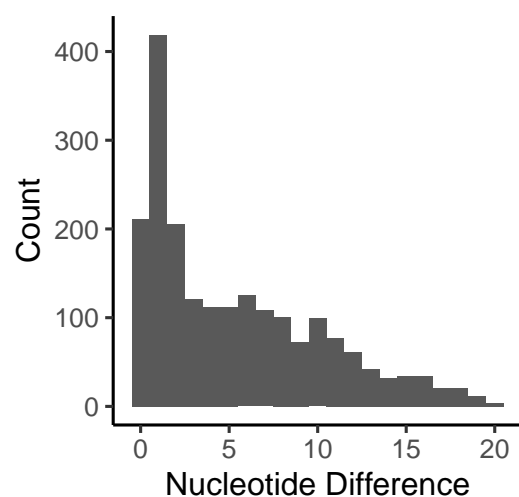
### IGHV1-69\*06\_14

3252 sequences assigned  
553 (17%) exact matches, in which:  
476 unique CDR3  
7 unique J



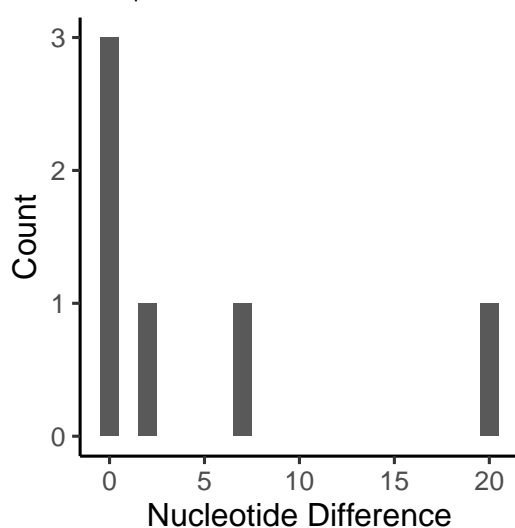
### IGHV2-5\*02

2183 sequences assigned  
211 (9.7%) exact matches, in which:  
150 unique CDR3  
5 unique J



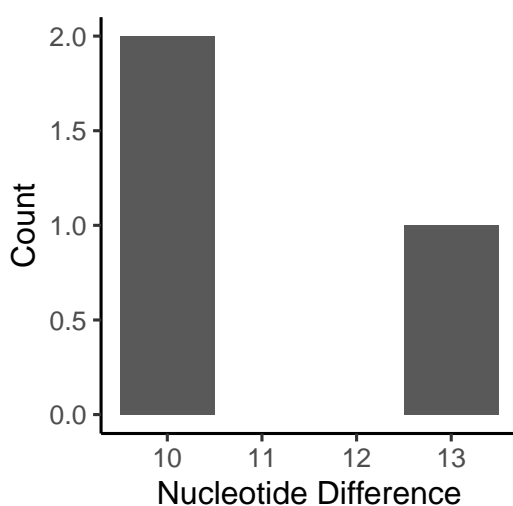
### IGHV1-69-2\*01

7 sequences assigned  
3 (42.9%) exact matches, in which:  
3 unique CDR3  
2 unique J



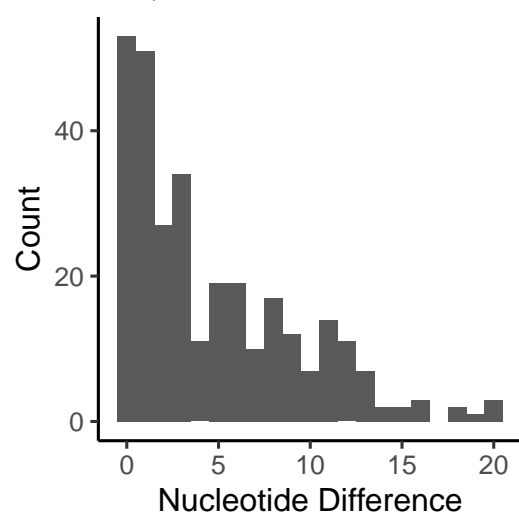
### IGHV1-NL1\*01

3 sequences assigned  
No exact matches.



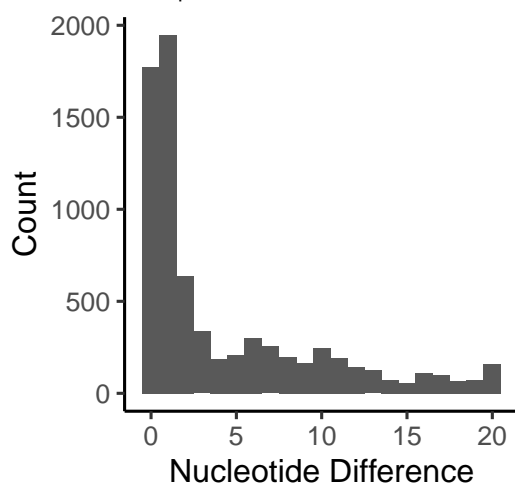
### IGHV2-26\*01

312 sequences assigned  
53 (17%) exact matches, in which:  
44 unique CDR3  
6 unique J



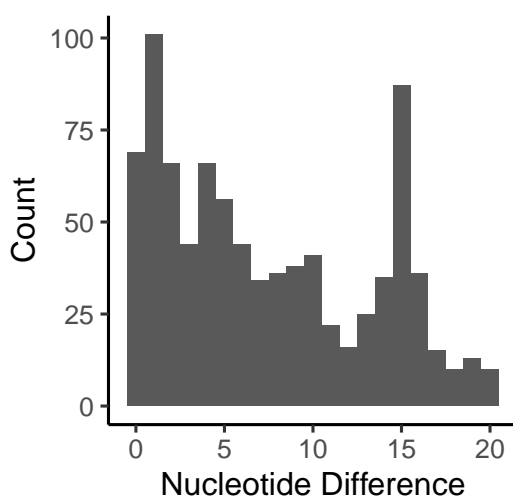
### IGHV1-69\*01\_12\_13

7883 sequences assigned  
1772 (22.5%) exact matches, in which:  
1452 unique CDR3  
7 unique J



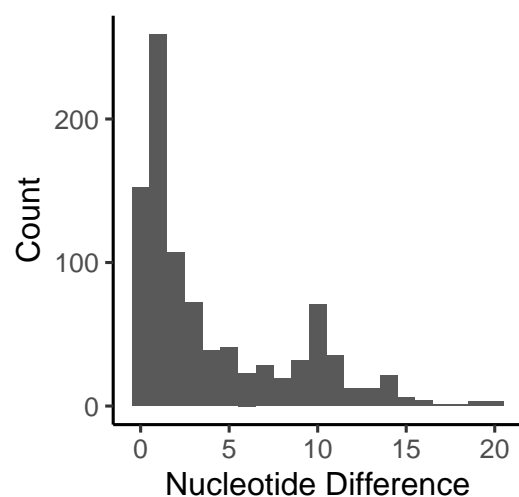
### IGHV2-5\*01

963 sequences assigned  
69 (7.2%) exact matches, in which:  
57 unique CDR3  
5 unique J



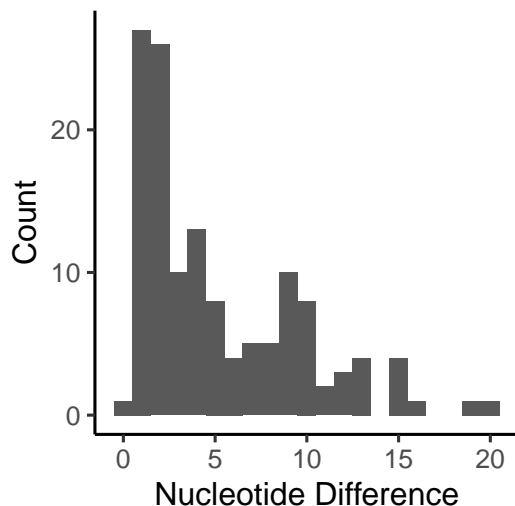
### IGHV2-70\*01

998 sequences assigned  
152 (15.2%) exact matches, in which:  
105 unique CDR3  
6 unique J



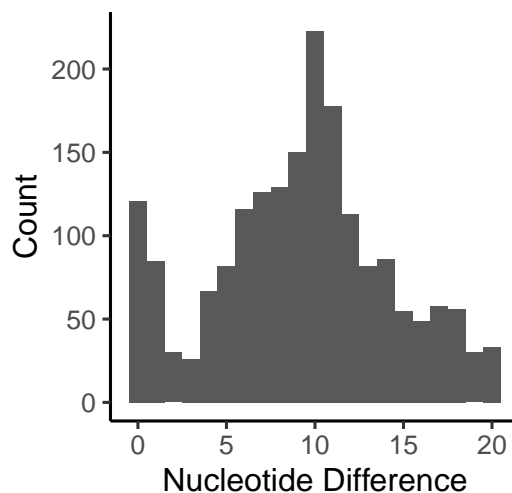
## IGHV2-70\*12

138 sequences assigned  
1 (0.7%) exact matches, in which:  
1 unique CDR3  
1 unique J



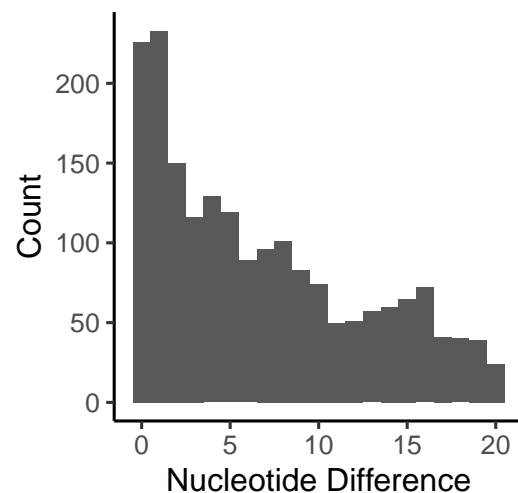
## IGHV3-7\*05

1995 sequences assigned  
121 (6.1%) exact matches, in which:  
80 unique CDR3  
7 unique J



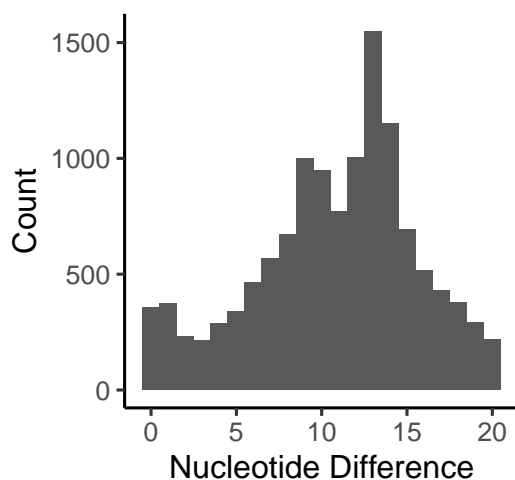
## IGHV3-11\*06

2017 sequences assigned  
226 (11.2%) exact matches, in which:  
133 unique CDR3  
7 unique J



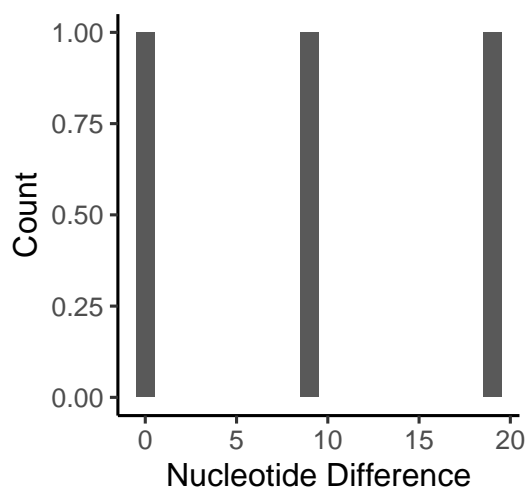
## IGHV3-7\*01

13398 sequences assigned  
357 (2.7%) exact matches, in which:  
244 unique CDR3  
7 unique J



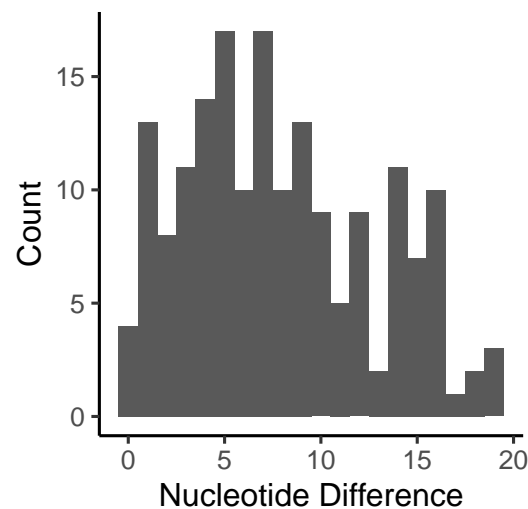
## IGHV3-9\*01

4 sequences assigned  
1 (25%) exact matches, in which:  
1 unique CDR3  
1 unique J



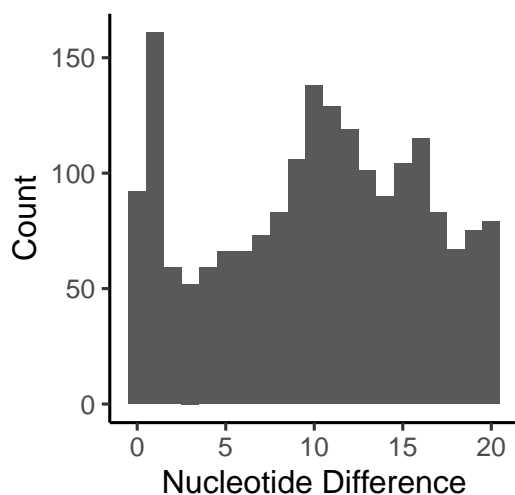
## IGHV3-11\*03\_05

183 sequences assigned  
4 (2.2%) exact matches, in which:  
4 unique CDR3  
2 unique J



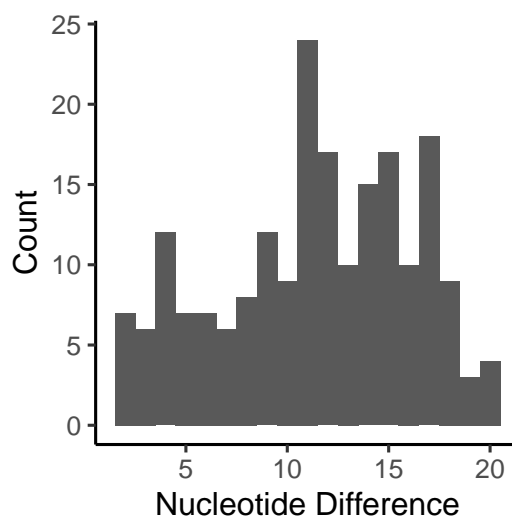
## IGHV3-7\*03

2444 sequences assigned  
92 (3.8%) exact matches, in which:  
53 unique CDR3  
6 unique J



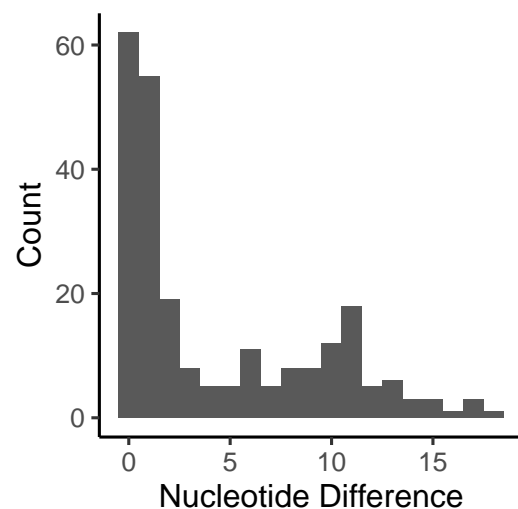
## IGHV3-11\*04

228 sequences assigned  
No exact matches.



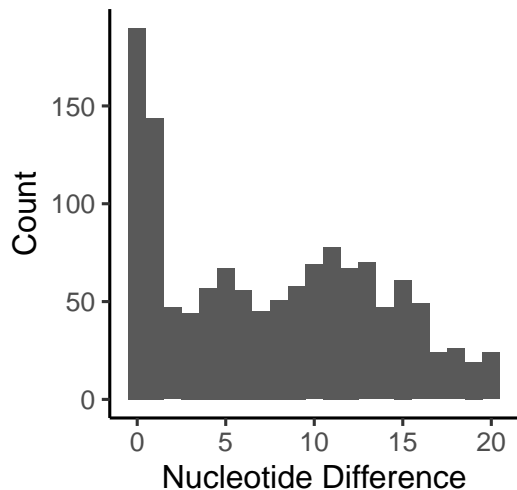
## IGHV3-13\*05

238 sequences assigned  
62 (26.1%) exact matches, in which:  
44 unique CDR3  
7 unique J



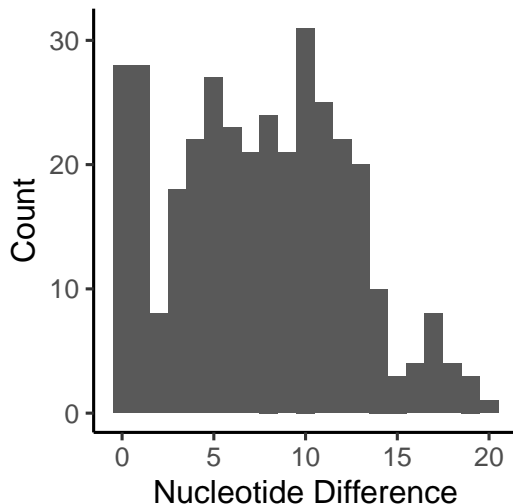
### IGHV3-15\*07

1398 sequences assigned  
190 (13.6%) exact matches, in which:  
124 unique CDR3  
6 unique J



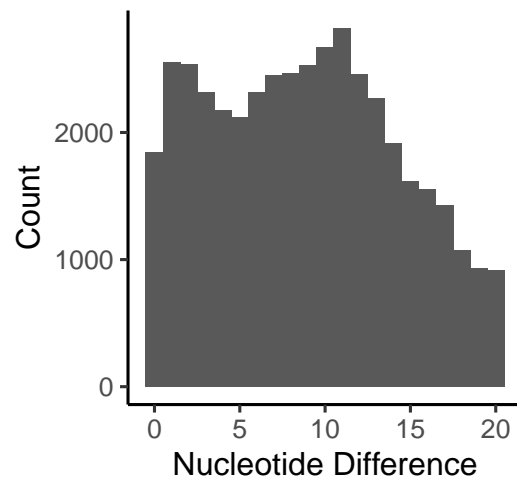
### IGHV3-20\*03\_04

363 sequences assigned  
28 (7.7%) exact matches, in which:  
16 unique CDR3  
3 unique J



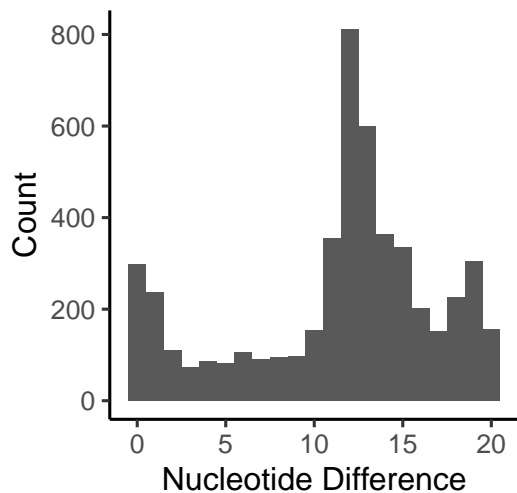
### IGHV3-23\*01\_04

53645 sequences assigned  
1849 (3.4%) exact matches, in which:  
1104 unique CDR3  
7 unique J



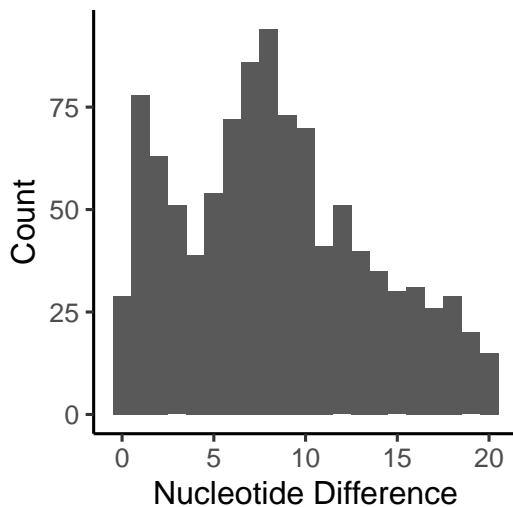
### IGHV3-15\*01\_02

5268 sequences assigned  
299 (5.7%) exact matches, in which:  
196 unique CDR3  
7 unique J



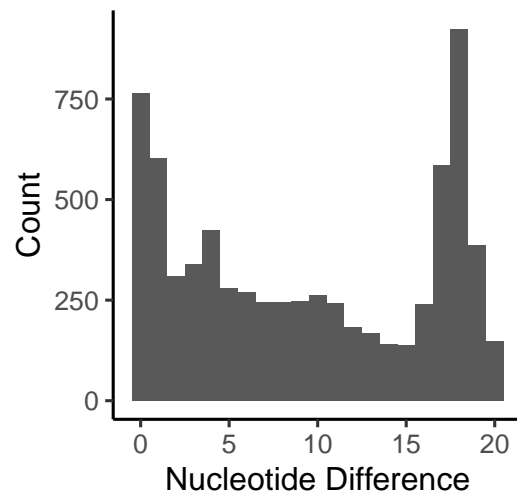
### IGHV3-21\*04

1120 sequences assigned  
29 (2.6%) exact matches, in which:  
29 unique CDR3  
6 unique J



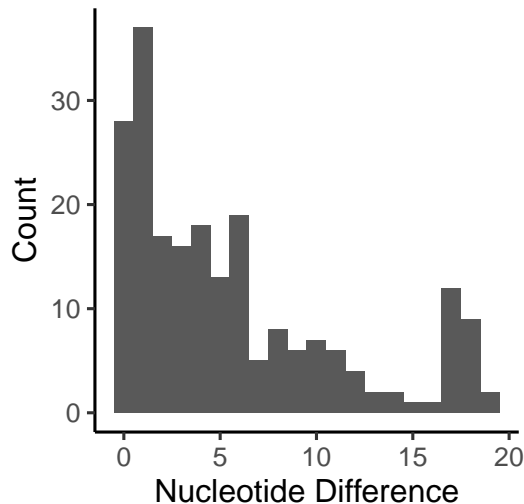
### IGHV3-30\*01

7621 sequences assigned  
764 (10%) exact matches, in which:  
503 unique CDR3  
7 unique J



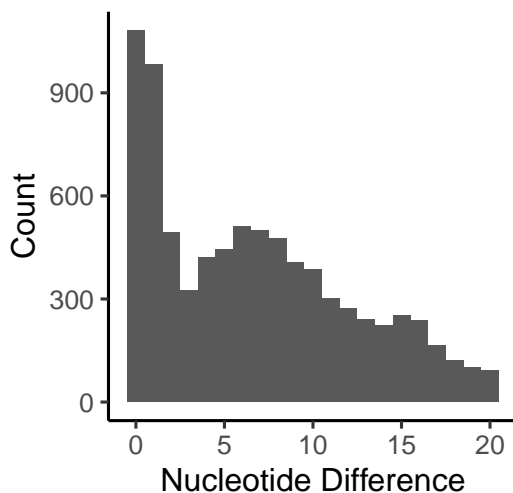
### IGHV3-20\*01\_02

216 sequences assigned  
28 (13%) exact matches, in which:  
14 unique CDR3  
4 unique J



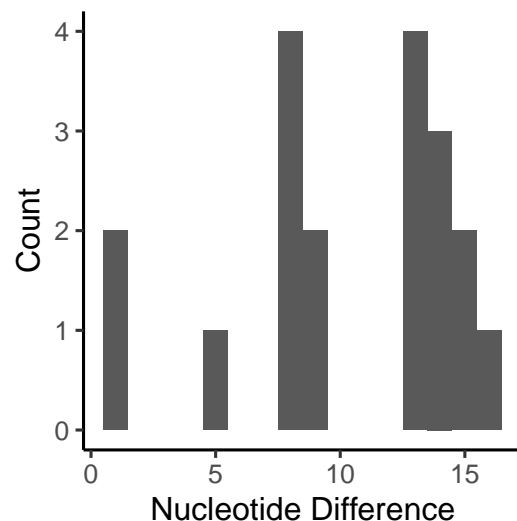
### IGHV3-21\*01\_02

14707 sequences assigned  
1082 (7.4%) exact matches, in which:  
679 unique CDR3  
7 unique J



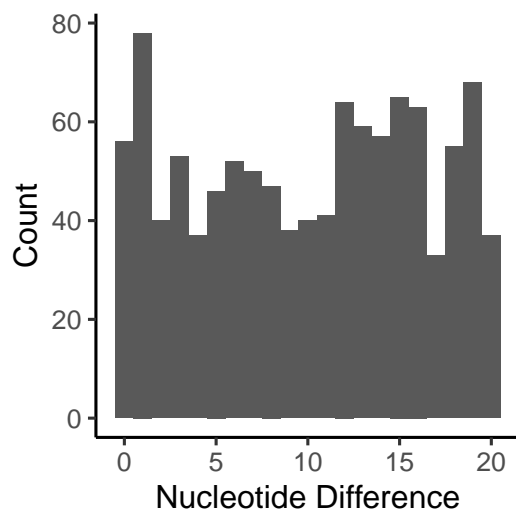
### IGHV3-30-3\*01

25 sequences assigned  
No exact matches.



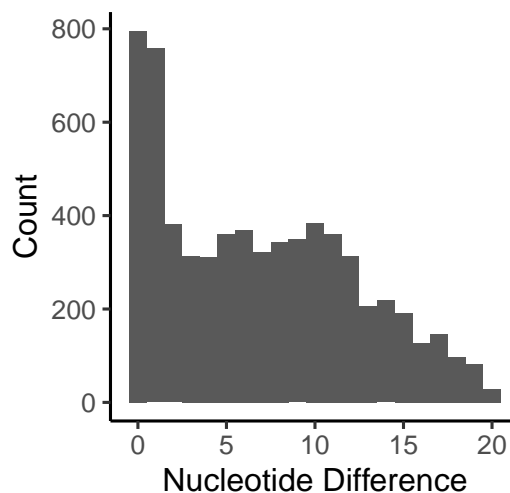
### IGHV3-30\*03

1533 sequences assigned  
56 (3.7%) exact matches, in which:  
56 unique CDR3  
5 unique J



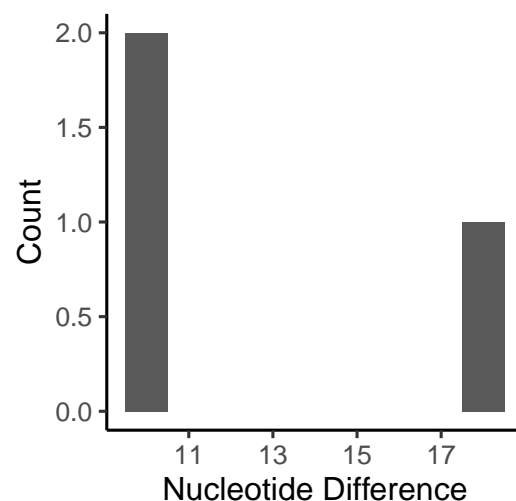
### IGHV3-33\*01

6820 sequences assigned  
796 (11.7%) exact matches, in which:  
543 unique CDR3  
7 unique J



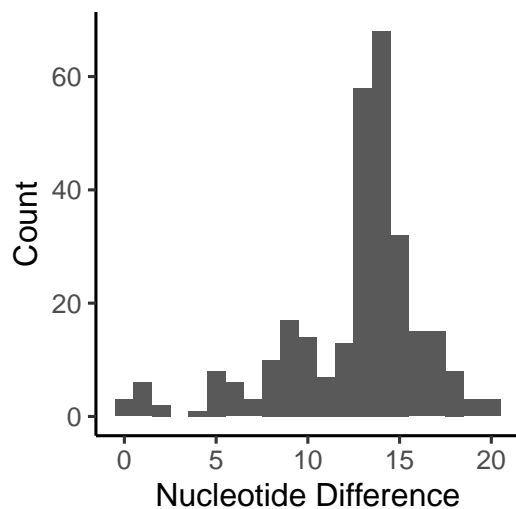
### IGHV3-43\*01

4 sequences assigned  
No exact matches.



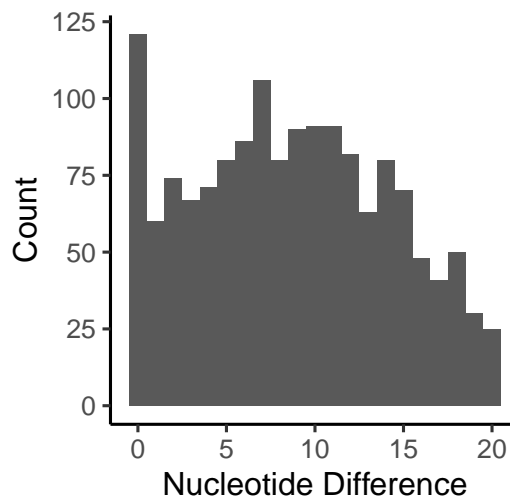
### IGHV3-30-3\*03

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



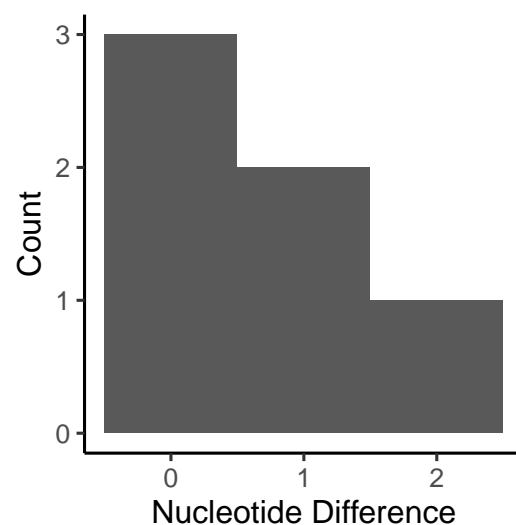
### IGHV3-33\*08

1624 sequences assigned  
121 (7.5%) exact matches, in which:  
93 unique CDR3  
7 unique J



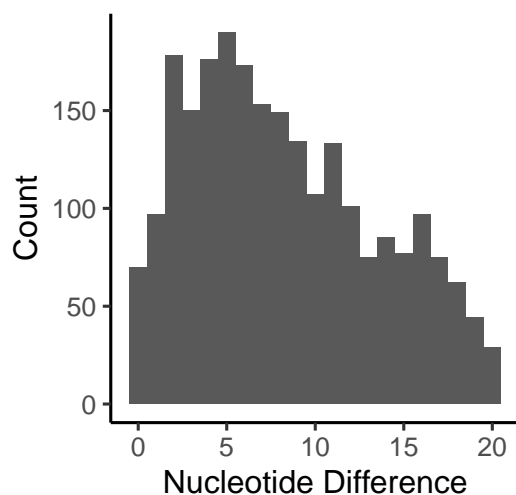
### IGHV3-47\*01

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



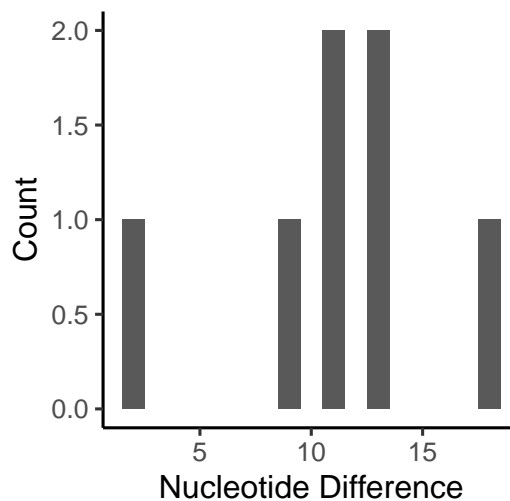
### IGHV3-30\*07

2487 sequences assigned  
70 (2.8%) exact matches, in which:  
66 unique CDR3  
6 unique J



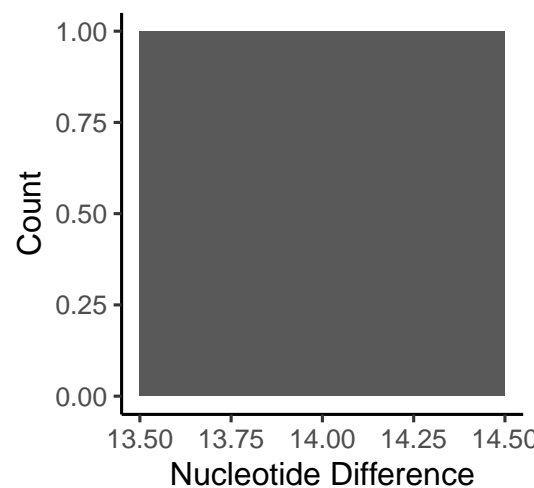
### IGHV3-35\*01

7 sequences assigned  
No exact matches.



### IGHV3-47\*02

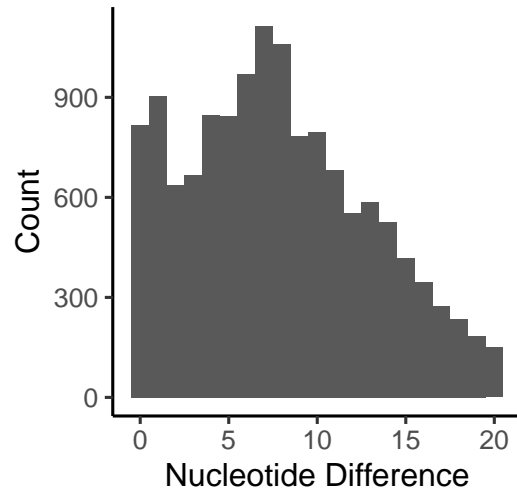
1 sequences assigned  
No exact matches.





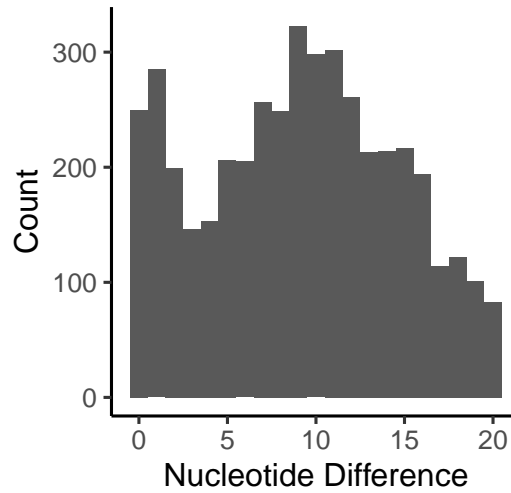
### IGHV3-48\*03

14126 sequences assigned  
817 (5.8%) exact matches, in which:  
491 unique CDR3  
7 unique J



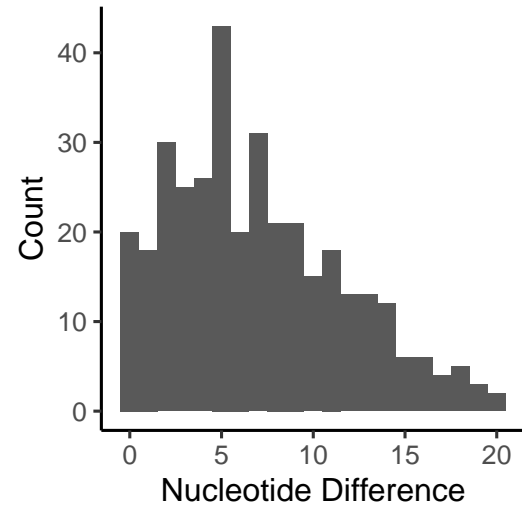
### IGHV3-53\*01\_02

5222 sequences assigned  
250 (4.8%) exact matches, in which:  
148 unique CDR3  
7 unique J



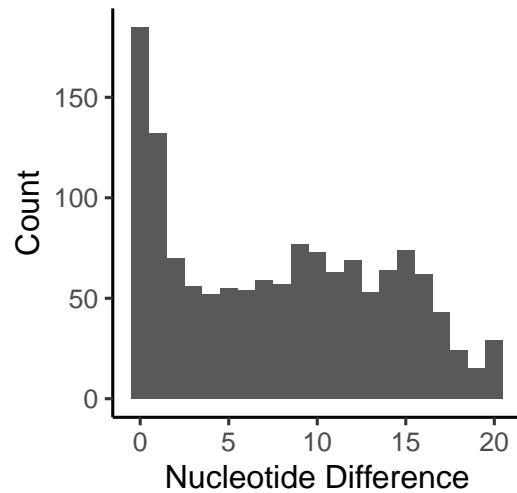
### IGHV3-64\*04\_A210C\_A22

374 sequences assigned  
20 (5.3%) exact matches, in which:  
20 unique CDR3  
7 unique J



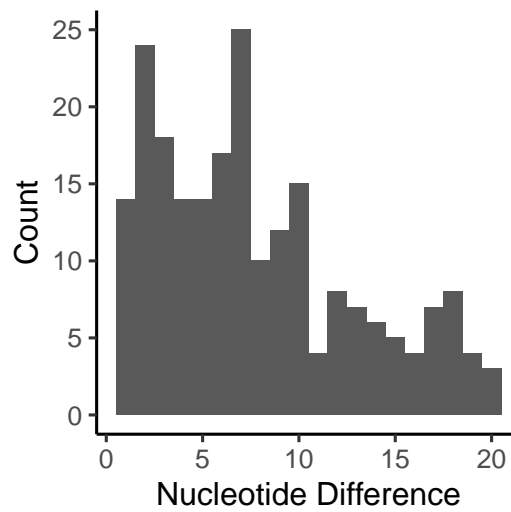
### IGHV3-49\*04

1499 sequences assigned  
185 (12.3%) exact matches, in which:  
115 unique CDR3  
7 unique J



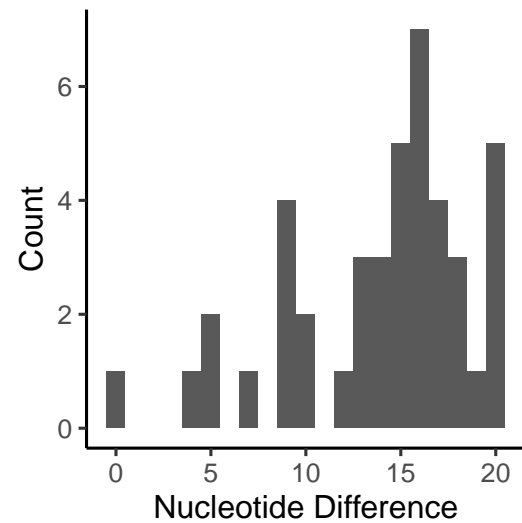
### IGHV3-64\*04

226 sequences assigned  
No exact matches.



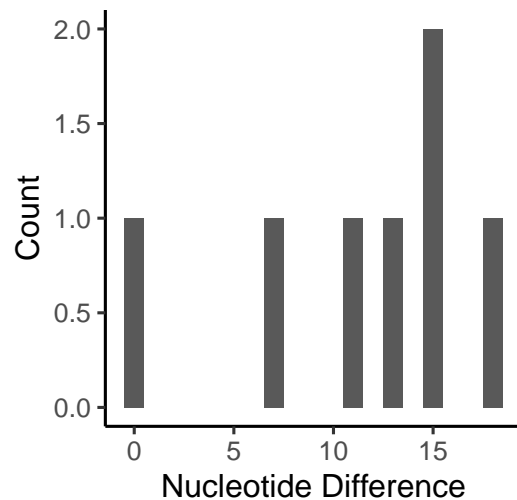
### IGHV3-66\*01

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



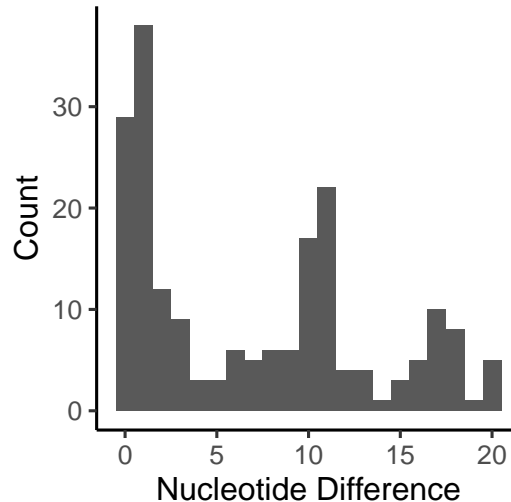
### IGHV3-52\*01\_03

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



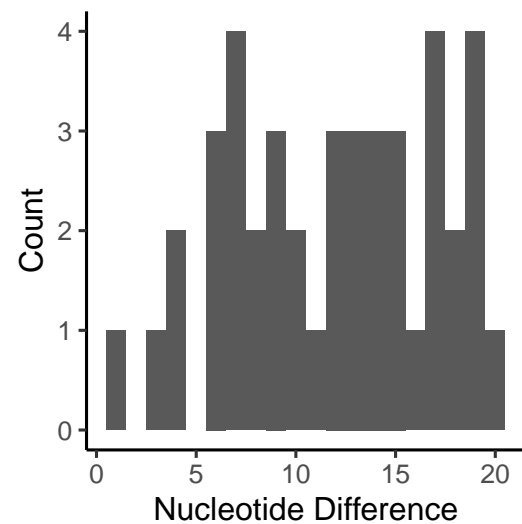
### IGHV3-64\*02\_07

198 sequences assigned  
29 (14.6%) exact matches, in which:  
18 unique CDR3  
4 unique J



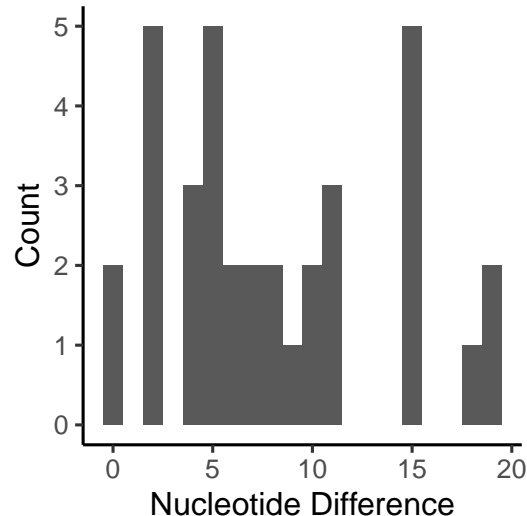
### IGHV3-66\*02

52 sequences assigned  
No exact matches.



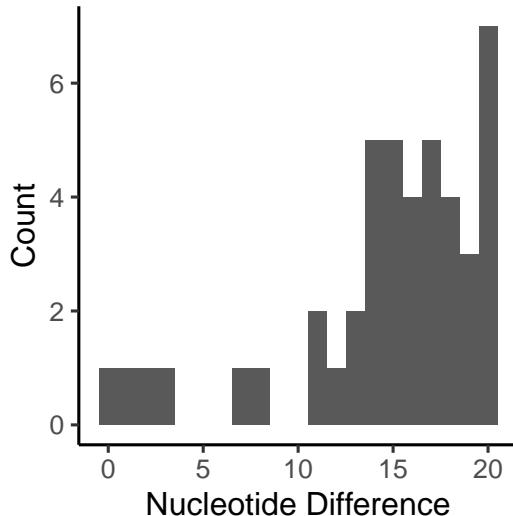
### IGHV3-66\*03

36 sequences assigned  
2 (5.6%) exact matches, in which:  
2 unique CDR3  
1 unique J



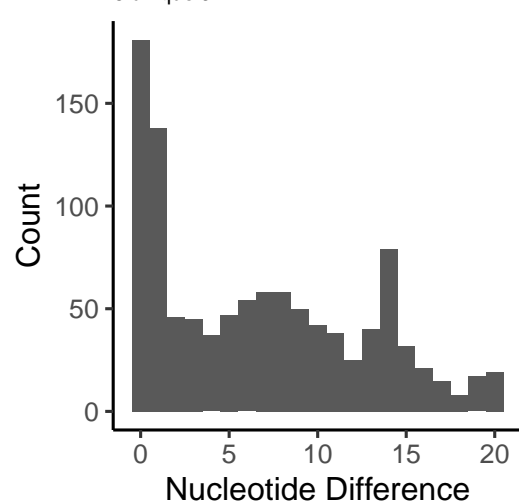
### IGHV3-69-1\*02

56 sequences assigned  
1 (1.8%) exact matches, in which:  
1 unique CDR3  
1 unique J



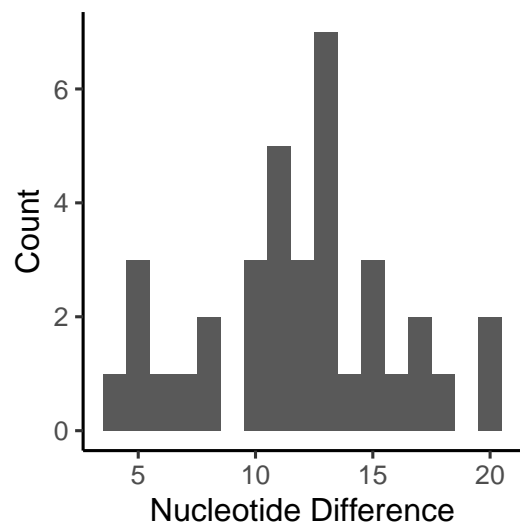
### IGHV3-73\*01\_02

1165 sequences assigned  
181 (15.5%) exact matches, in which:  
105 unique CDR3  
6 unique J



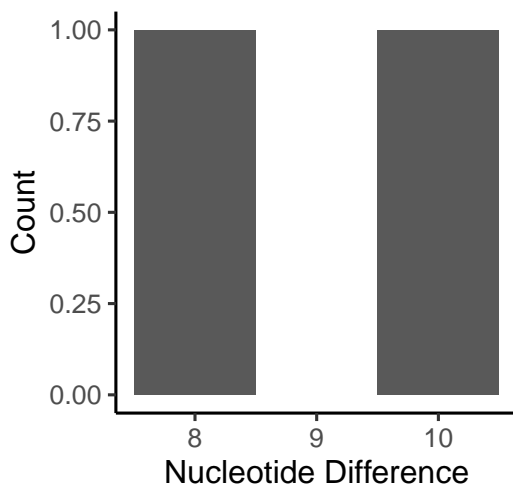
### IGHV3-66\*04

37 sequences assigned  
No exact matches.



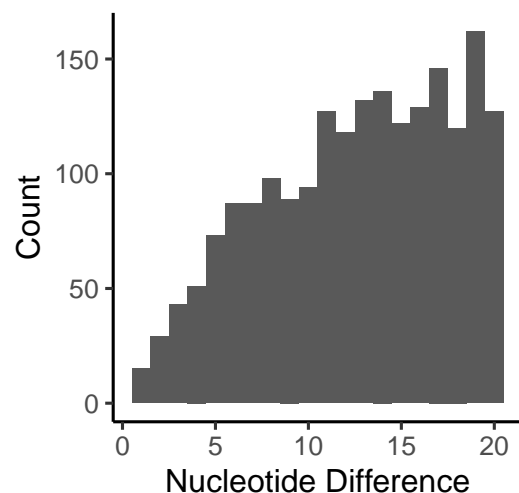
### IGHV3-71\*01\_04

2 sequences assigned  
No exact matches.



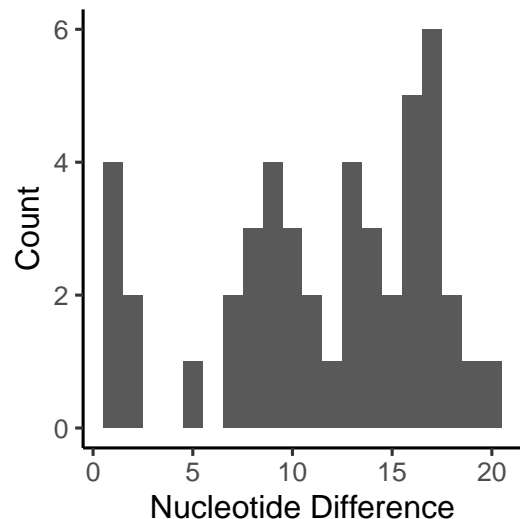
### IGHV3-74\*03

6319 sequences assigned  
No exact matches.



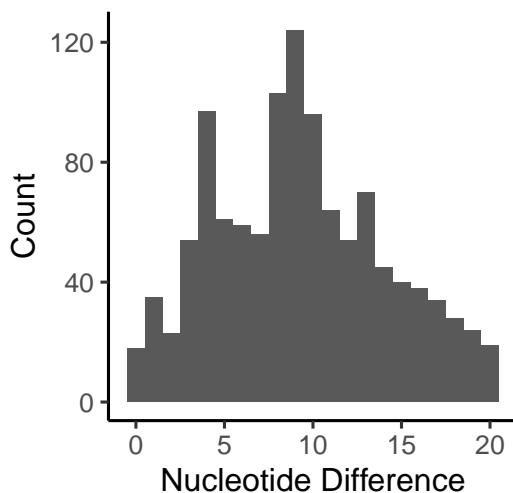
### IGHV3-69-1\*01

57 sequences assigned  
No exact matches.



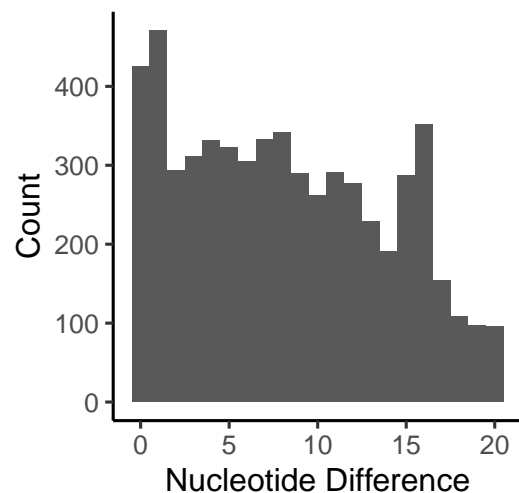
### IGHV3-72\*01

1192 sequences assigned  
18 (1.5%) exact matches, in which:  
11 unique CDR3  
4 unique J



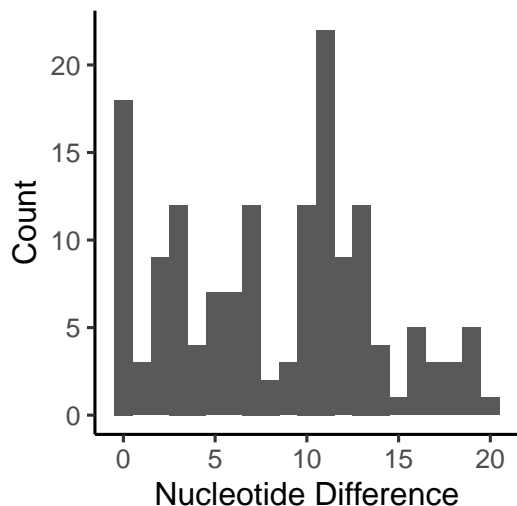
### IGHV3-74\*01\_02

6442 sequences assigned  
425 (6.6%) exact matches, in which:  
277 unique CDR3  
6 unique J



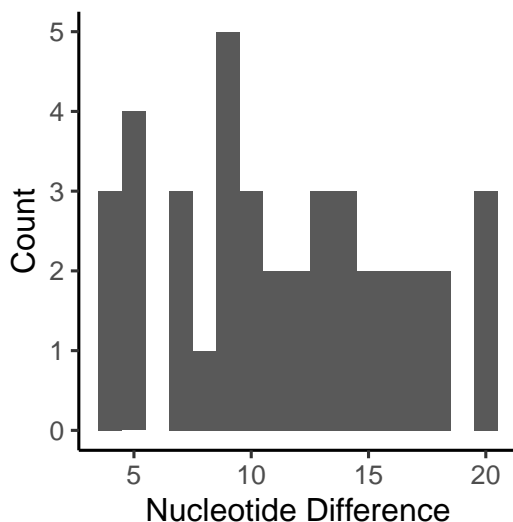
### IGHV3-43D\*04

158 sequences assigned  
18 (11.4%) exact matches, in which:  
10 unique CDR3  
4 unique J



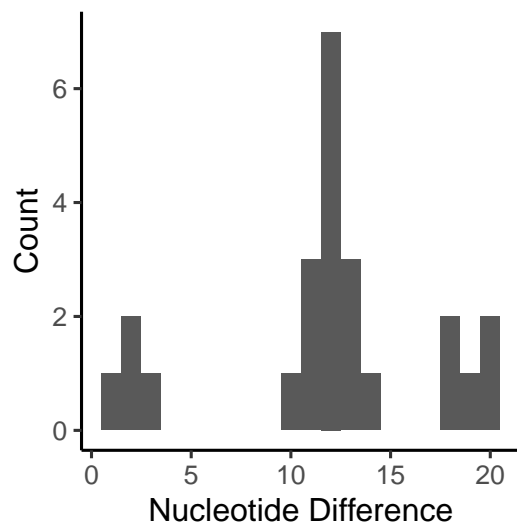
### IGHV3-NL1\*01

55 sequences assigned  
No exact matches.



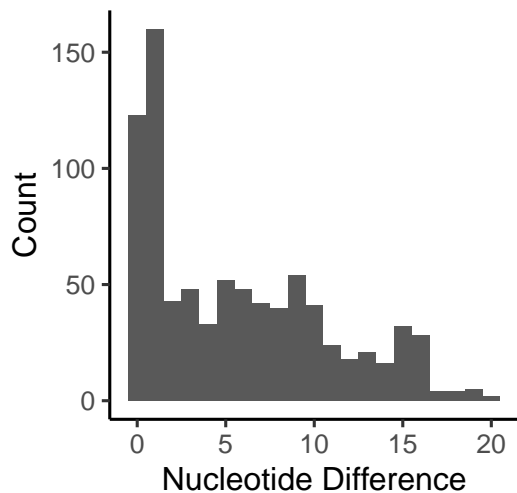
### IGHV4-28\*01\_07

25 sequences assigned  
No exact matches.



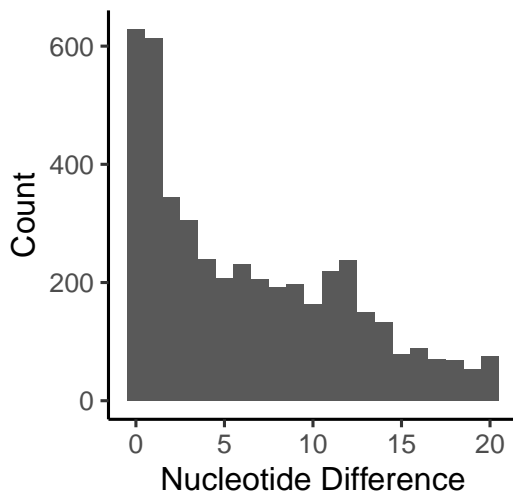
### IGHV3-64D\*06

882 sequences assigned  
123 (13.9%) exact matches, in which:  
62 unique CDR3  
6 unique J



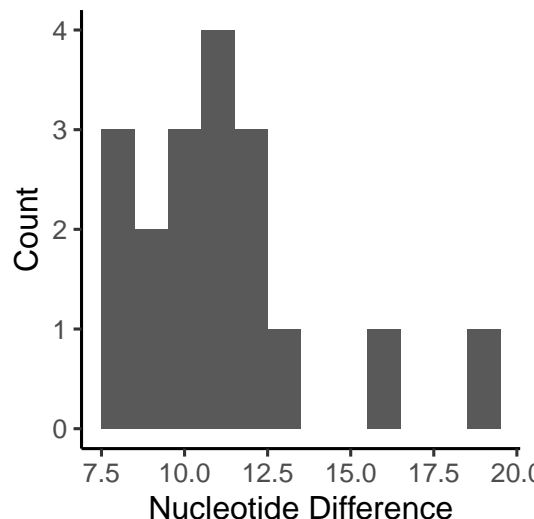
### IGHV4-4\*02\_03

5060 sequences assigned  
629 (12.4%) exact matches, in which:  
422 unique CDR3  
7 unique J



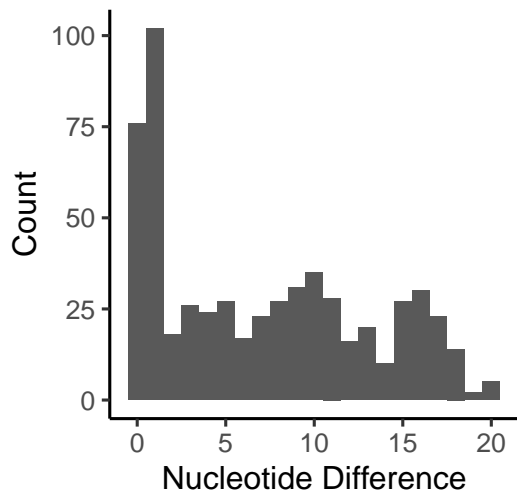
### IGHV4-30-4\*01

20 sequences assigned  
No exact matches.



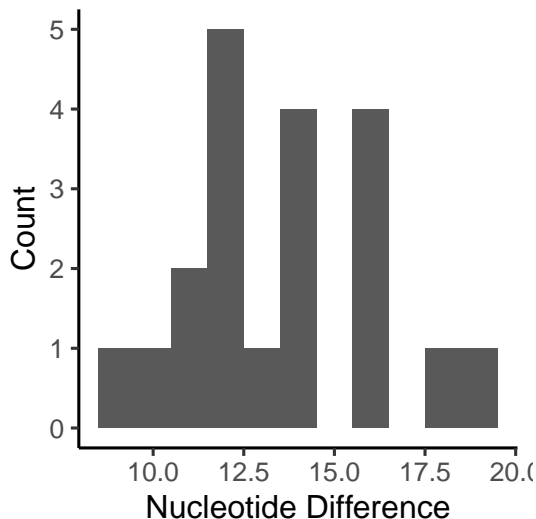
### IGHV3-64D\*08

676 sequences assigned  
76 (11.2%) exact matches, in which:  
44 unique CDR3  
6 unique J



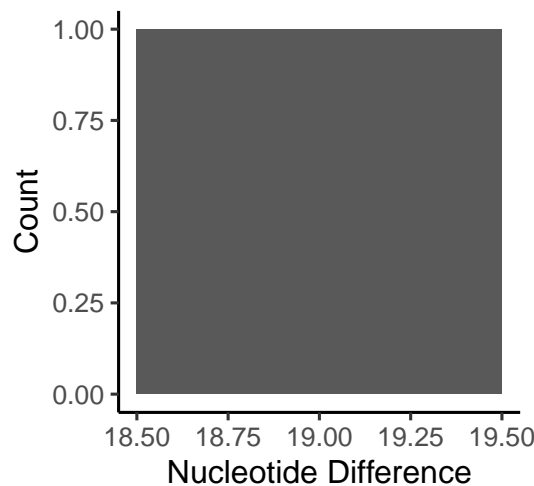
### IGHV4-28\*03

22 sequences assigned  
No exact matches.



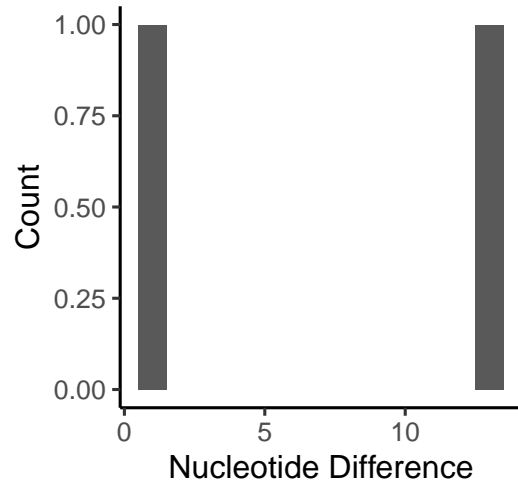
### IGHV4-30-2\*01

2 sequences assigned  
No exact matches.



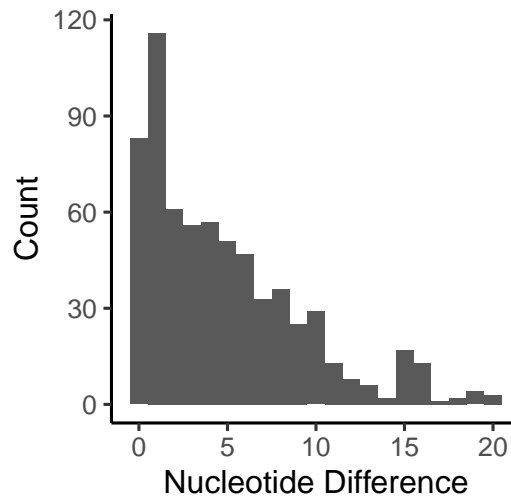
### IGHV4-30-2\*03

2 sequences assigned  
No exact matches.



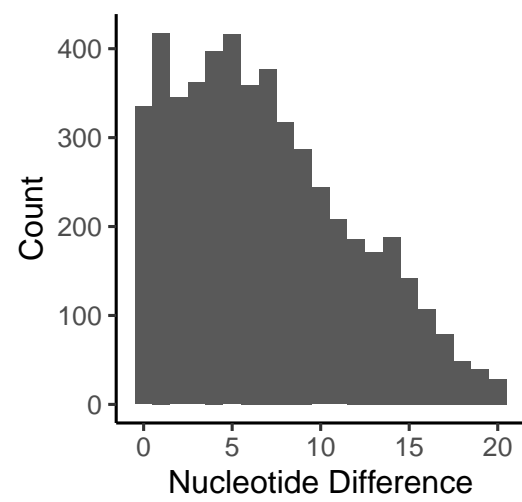
### IGHV4-31\*01

679 sequences assigned  
83 (12.2%) exact matches, in which:  
72 unique CDR3  
5 unique J



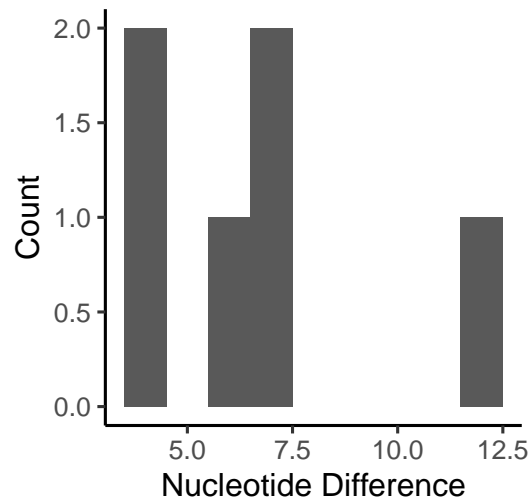
### IGHV4-38-2\*01

5244 sequences assigned  
335 (6.4%) exact matches, in which:  
272 unique CDR3  
7 unique J



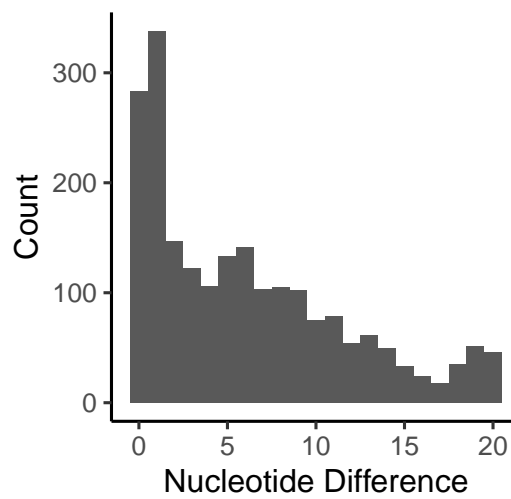
### IGHV4-30-2\*04

7 sequences assigned  
No exact matches.



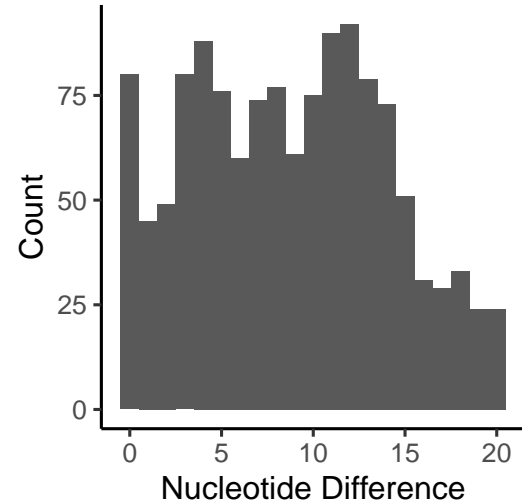
### IGHV4-31\*02

2425 sequences assigned  
283 (11.7%) exact matches, in which:  
218 unique CDR3  
7 unique J



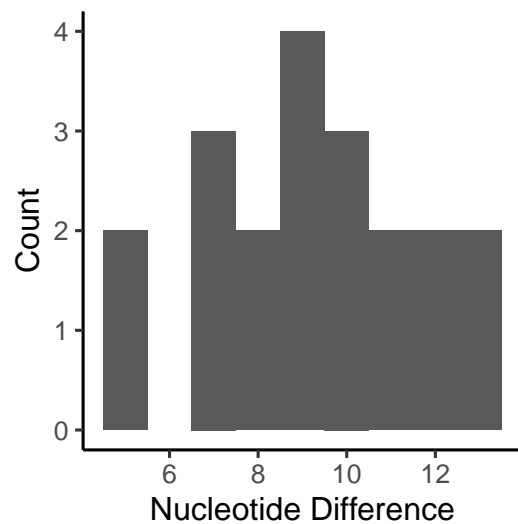
### IGHV4-38-2\*02

1449 sequences assigned  
80 (5.5%) exact matches, in which:  
65 unique CDR3  
6 unique J



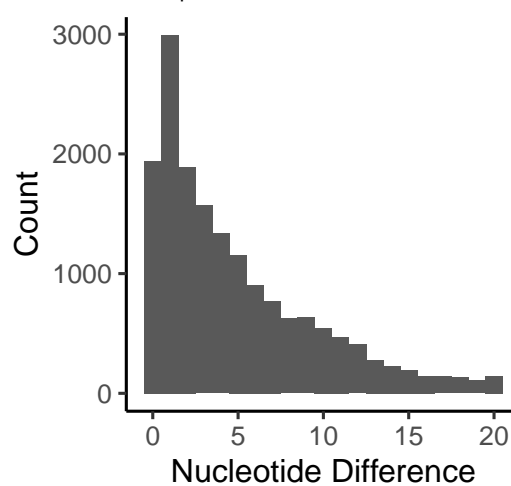
### IGHV4-30-4\*08

20 sequences assigned  
No exact matches.



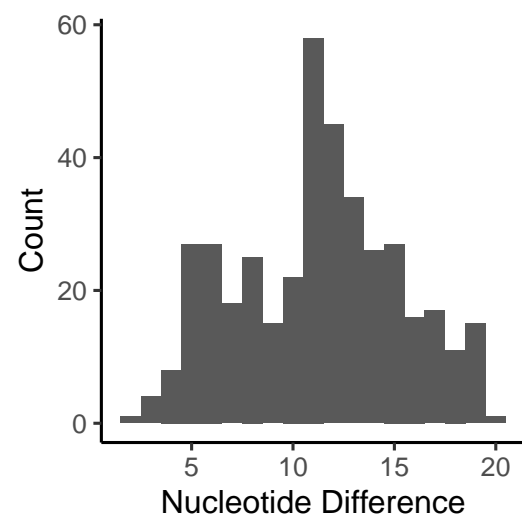
### IGHV4-34\*01\_02

18297 sequences assigned  
1940 (10.6%) exact matches, in which:  
1264 unique CDR3  
7 unique J



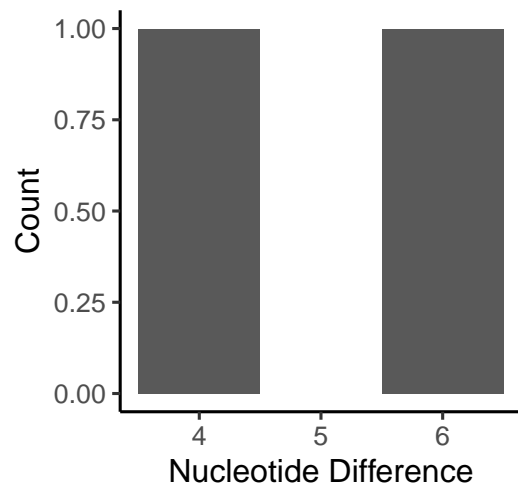
### IGHV4-39\*07

418 sequences assigned  
No exact matches.



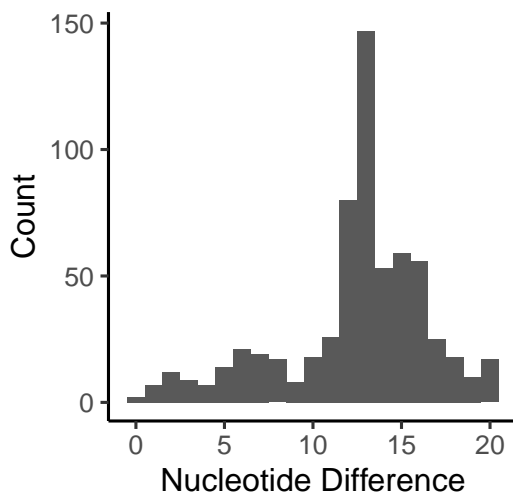
### IGHV4-55\*09

2 sequences assigned  
No exact matches.



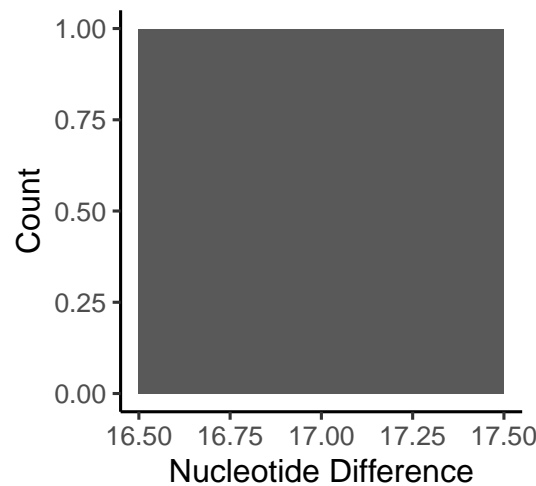
### IGHV4-59\*11

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



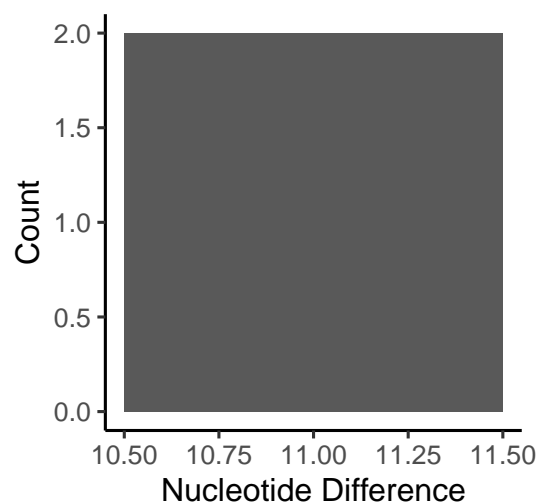
### IGHV1/OR15-1\*04

1 sequences assigned  
No exact matches.



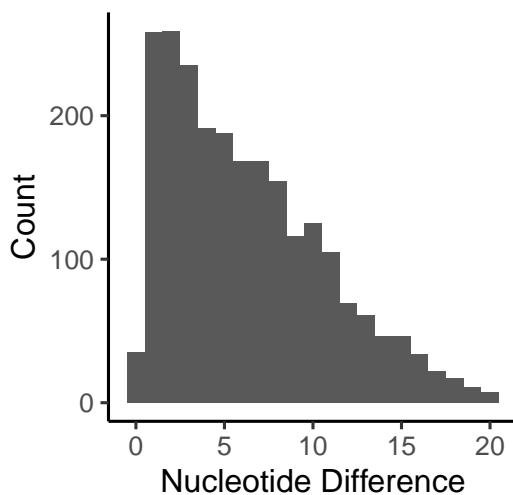
### IGHV4-55\*01\_05

2 sequences assigned  
No exact matches.



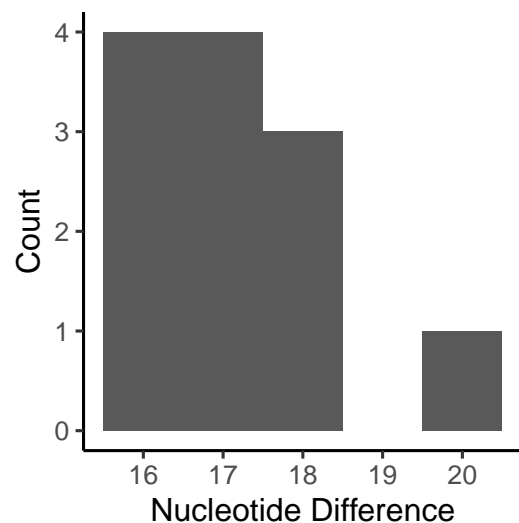
### IGHV4-59\*12

2578 sequences assigned  
35 (1.4%) exact matches, in which:  
35 unique CDR3  
7 unique J



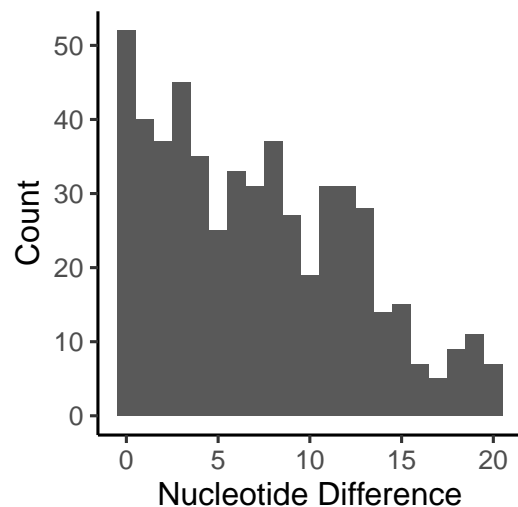
### IGHV1/OR15-2\*02\_03

12 sequences assigned  
No exact matches.



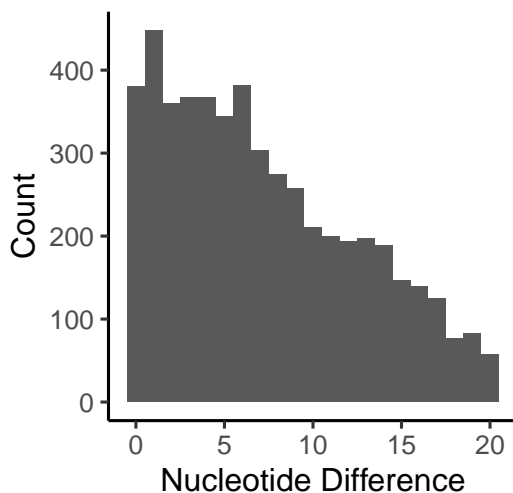
### IGHV4-59\*08

670 sequences assigned  
52 (7.8%) exact matches, in which:  
49 unique CDR3  
7 unique J



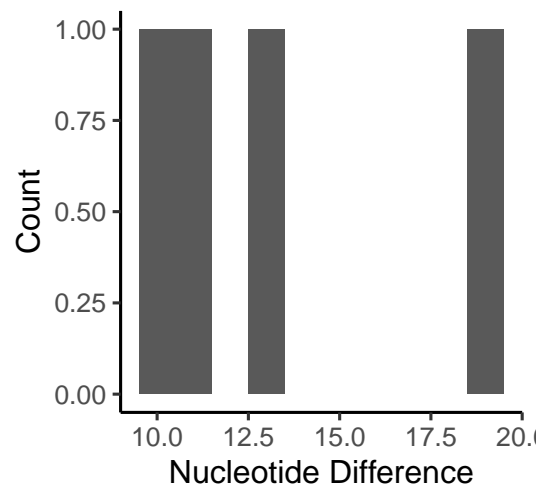
### IGHV4-61\*01

9092 sequences assigned  
380 (4.2%) exact matches, in which:  
325 unique CDR3  
7 unique J



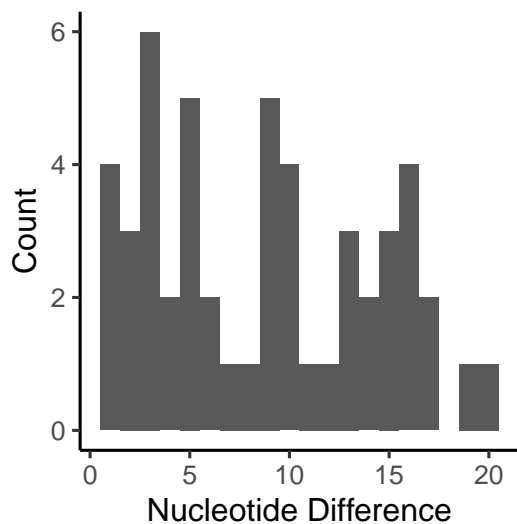
### IGHV1/OR15-3\*02

8 sequences assigned  
No exact matches.



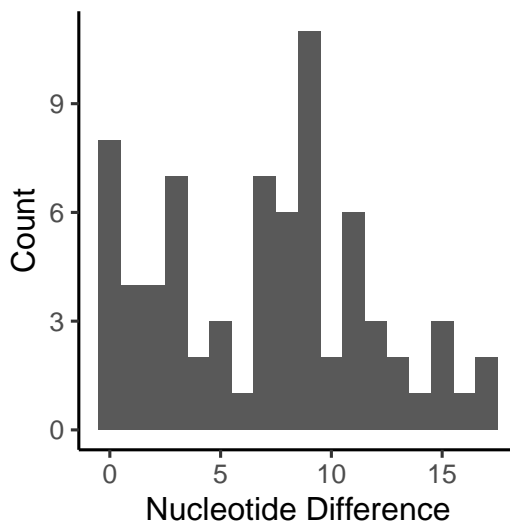
### IGHV4/OR15-8\*01

61 sequences assigned  
No exact matches.



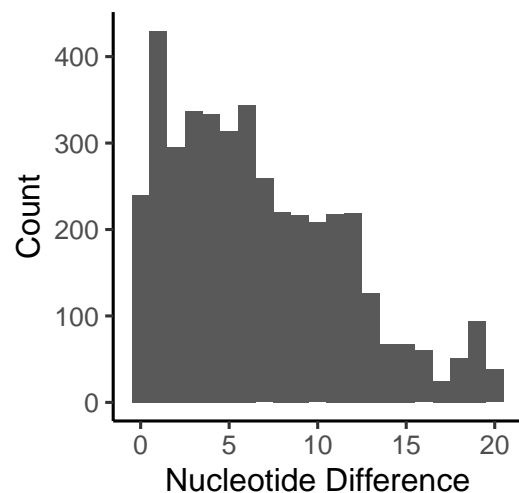
### IGHV5-51\*04

76 sequences assigned  
8 (10.5%) exact matches, in which:  
8 unique CDR3  
5 unique J



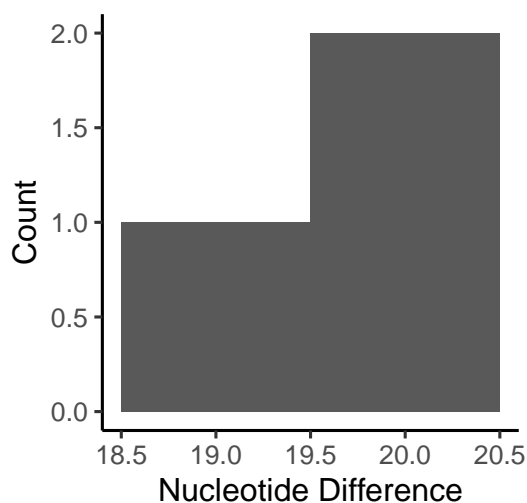
### IGHV6-1\*01\_02

4382 sequences assigned  
240 (5.5%) exact matches, in which:  
190 unique CDR3  
7 unique J



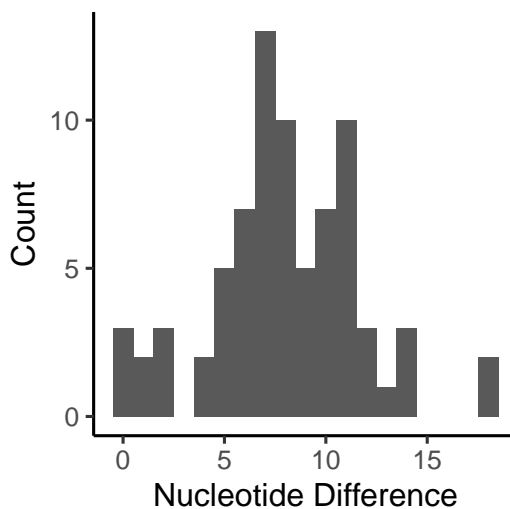
### IGHV4/OR15-8\*02

10 sequences assigned  
No exact matches.



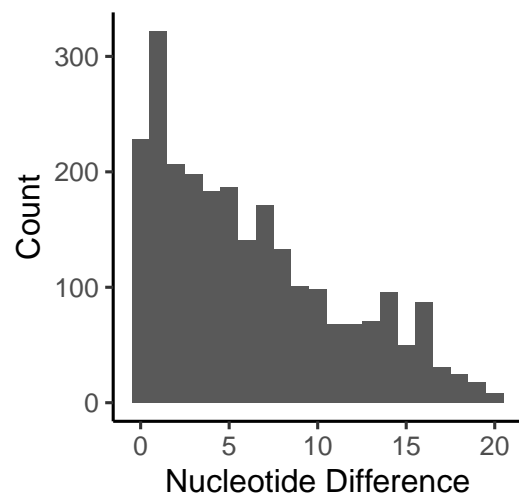
### IGHV5-51\*06

76 sequences assigned  
3 (3.9%) exact matches, in which:  
3 unique CDR3  
2 unique J



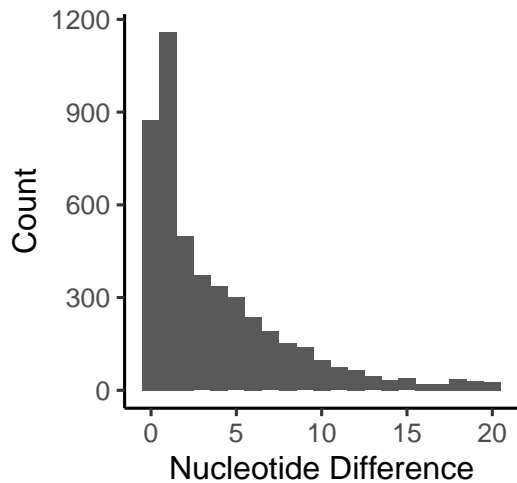
### IGHV7-4-1\*02

2542 sequences assigned  
228 (9%) exact matches, in which:  
182 unique CDR3  
7 unique J



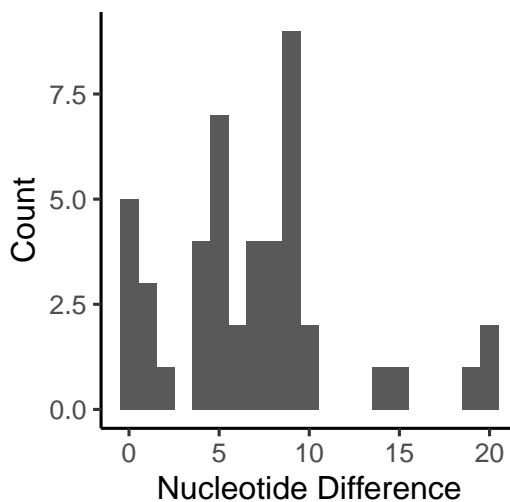
### IGHV5-10-1\*01\_03

5013 sequences assigned  
874 (17.4%) exact matches, in which:  
538 unique CDR3  
7 unique J



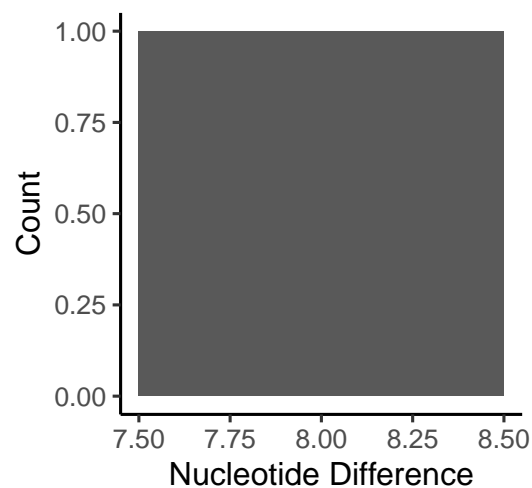
### IGHV5-51\*07

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

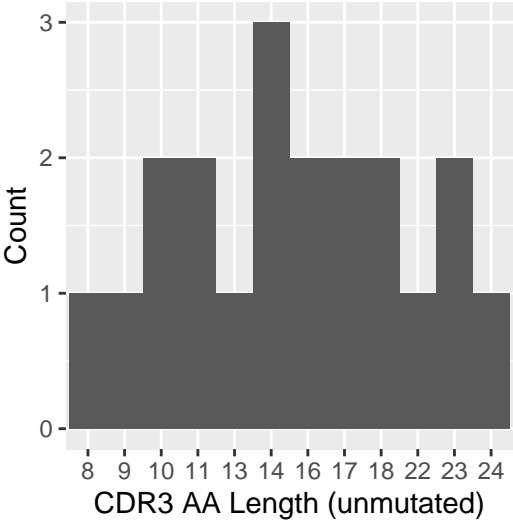


### IGHV7-81\*01

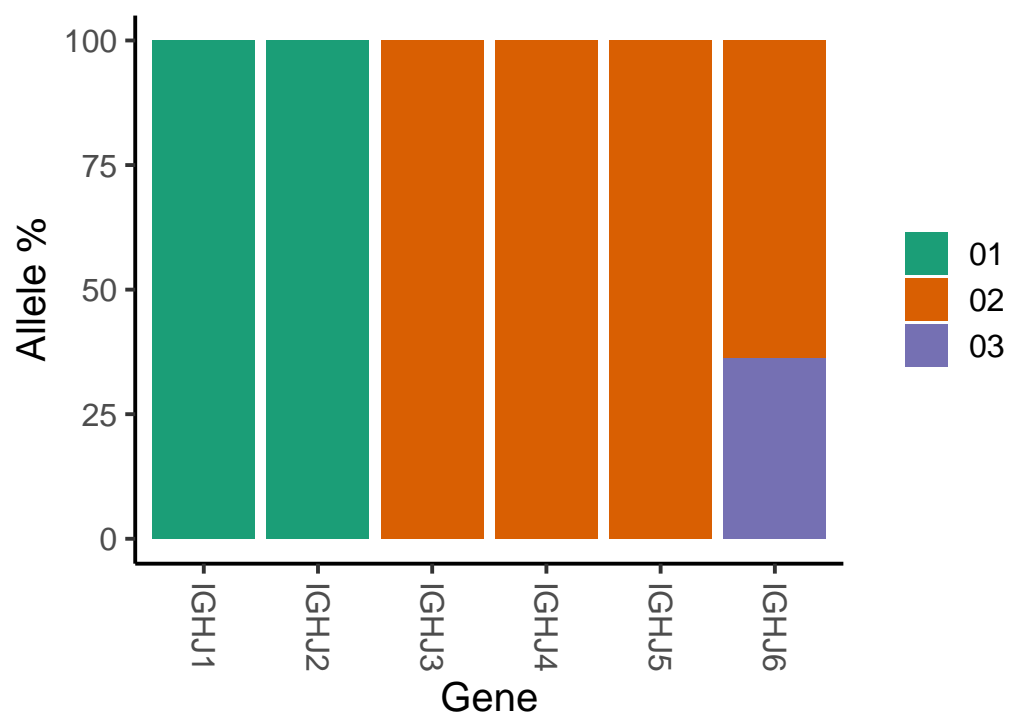
1 sequences assigned  
No exact matches.



IGHV3-64\*04\_A210C\_A223C\_A225G\_T288C\_T300C\_G303A

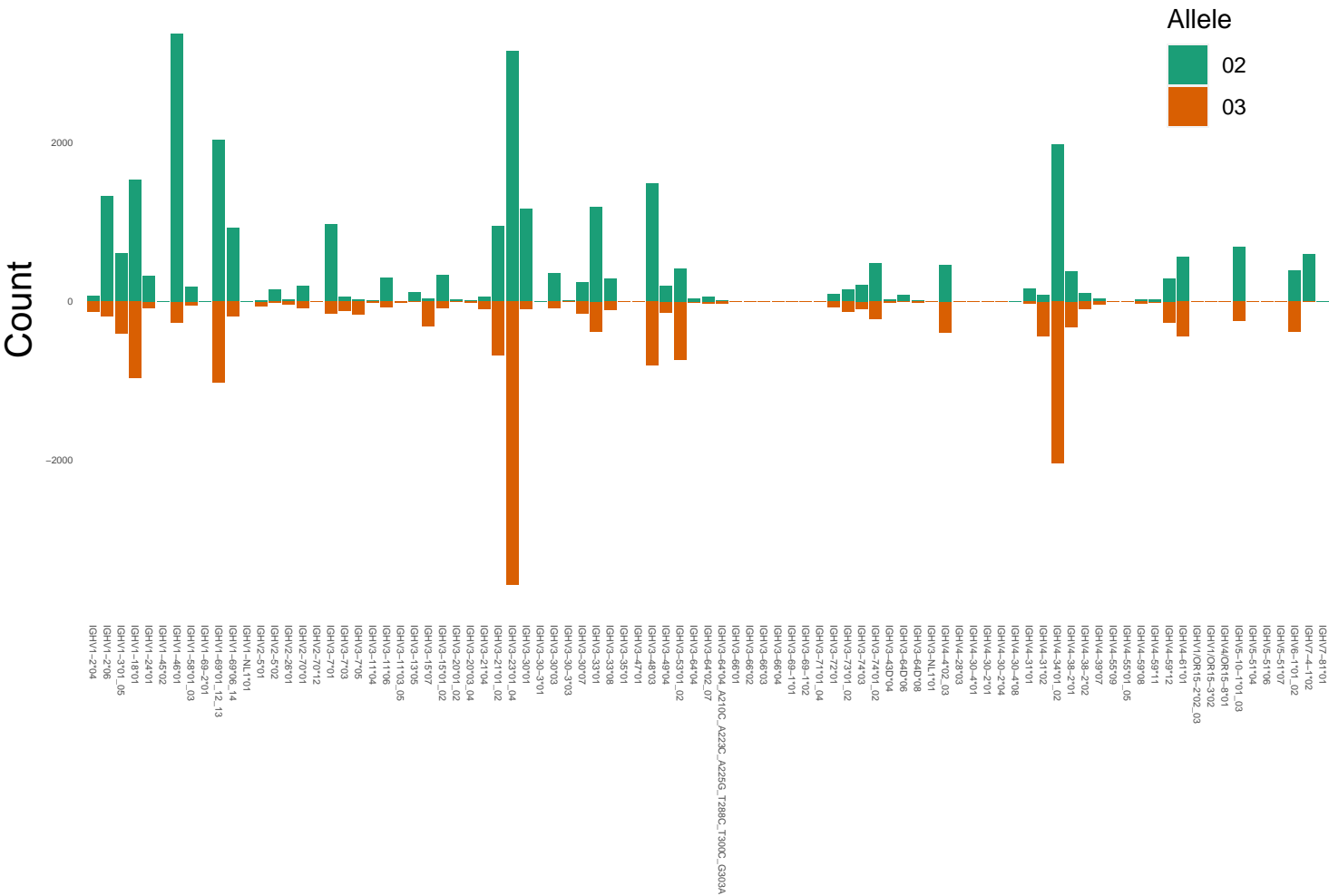


Allele Usage





## Sequence Count by IGHJ6 allele usage



[illegible]