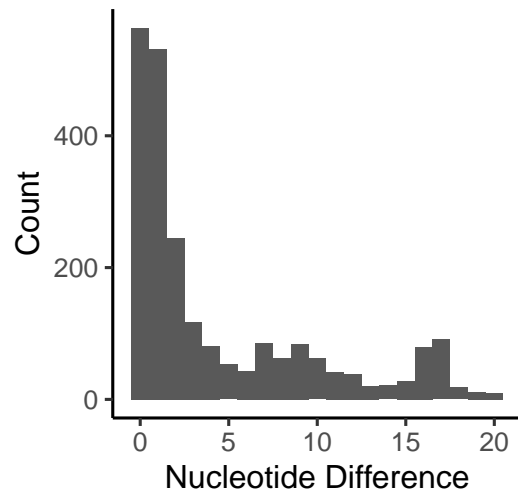


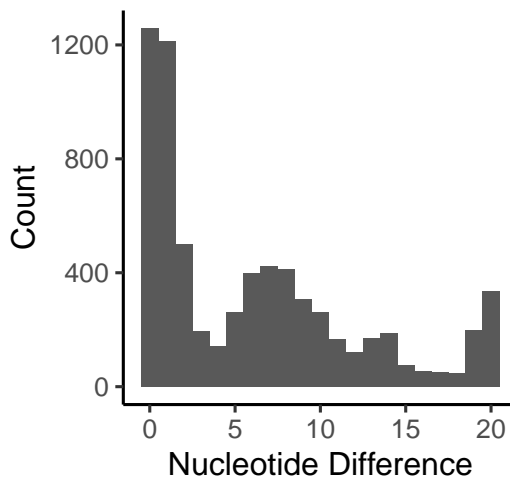
### IGHV1-2\*04

2413 sequences assigned  
564 (23.4%) exact matches, in which:  
475 unique CDR3  
7 unique J



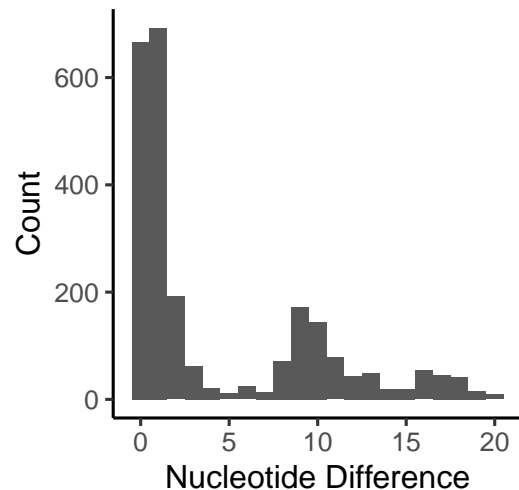
### IGHV1-8\*01

7577 sequences assigned  
1258 (16.6%) exact matches, in which:  
1059 unique CDR3  
7 unique J



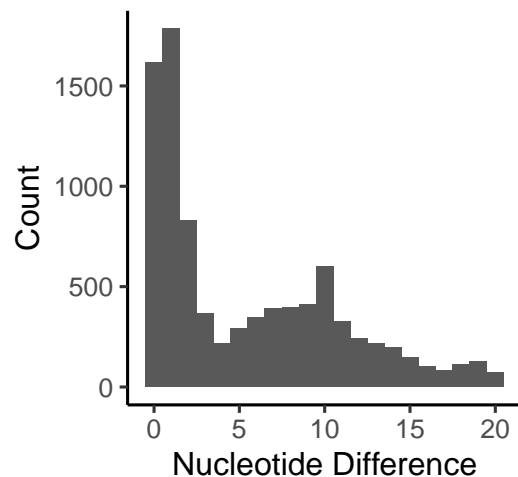
### IGHV1-24\*01

2916 sequences assigned  
667 (22.9%) exact matches, in which:  
536 unique CDR3  
7 unique J



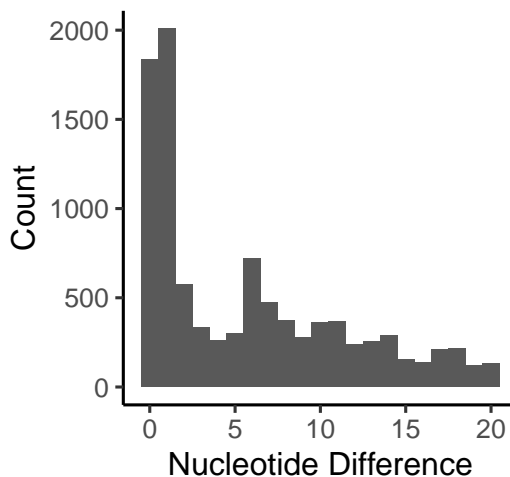
### IGHV1-2\*06

10677 sequences assigned  
1616 (15.1%) exact matches, in which:  
1264 unique CDR3  
7 unique J



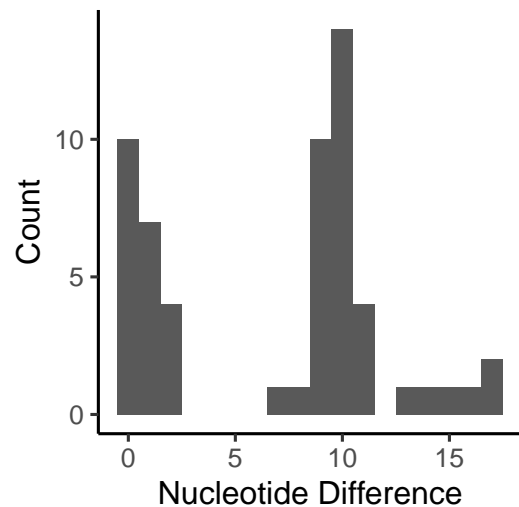
### IGHV1-18\*01

12308 sequences assigned  
1834 (14.9%) exact matches, in which:  
1486 unique CDR3  
7 unique J



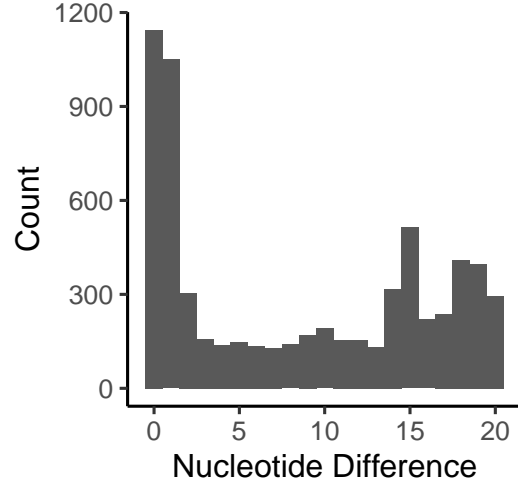
### IGHV1-45\*02

60 sequences assigned  
10 (16.7%) exact matches, in which:  
3 unique CDR3  
2 unique J



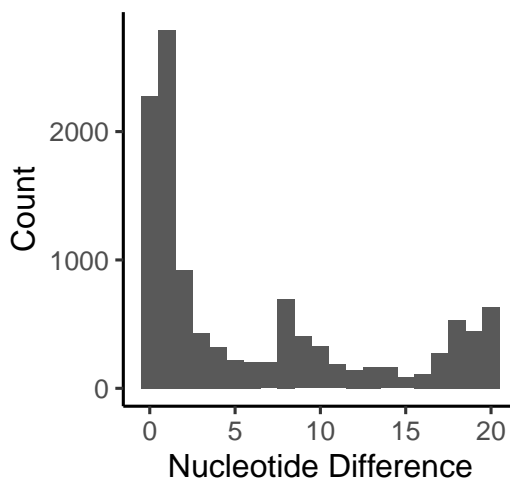
### IGHV1-3\*01\_05

8308 sequences assigned  
1144 (13.8%) exact matches, in which:  
877 unique CDR3  
7 unique J



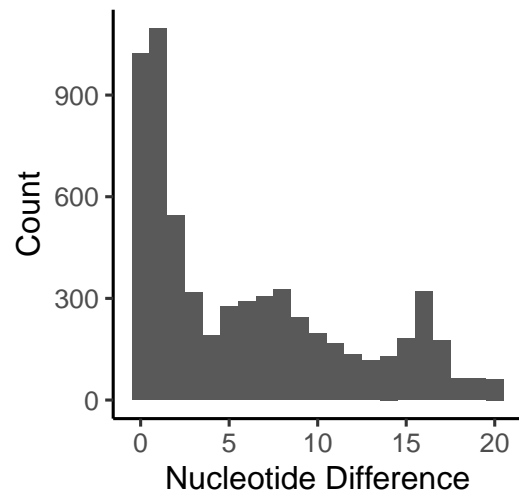
### IGHV1-18\*04

12341 sequences assigned  
2275 (18.4%) exact matches, in which:  
1778 unique CDR3  
7 unique J



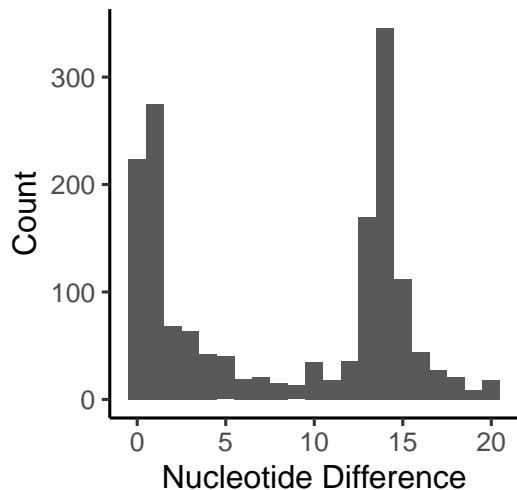
### IGHV1-46\*01

6905 sequences assigned  
1022 (14.8%) exact matches, in which:  
871 unique CDR3  
7 unique J



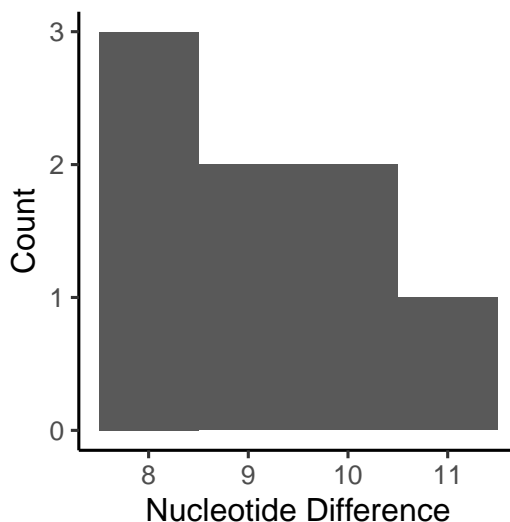
### IGHV1–58\*01\_03

1646 sequences assigned  
224 (13.6%) exact matches, in which:  
184 unique CDR3  
7 unique J



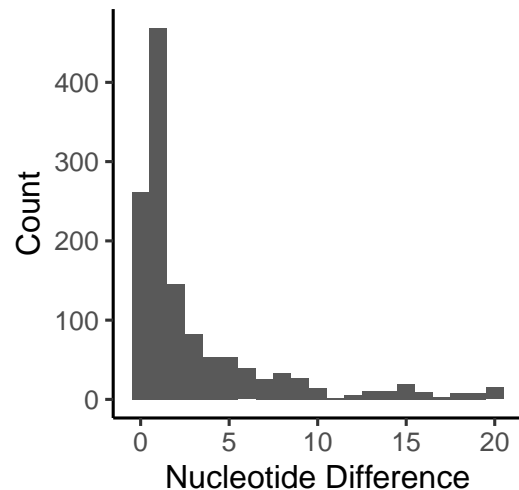
### IGHV1–NL1\*01

8 sequences assigned  
No exact matches.



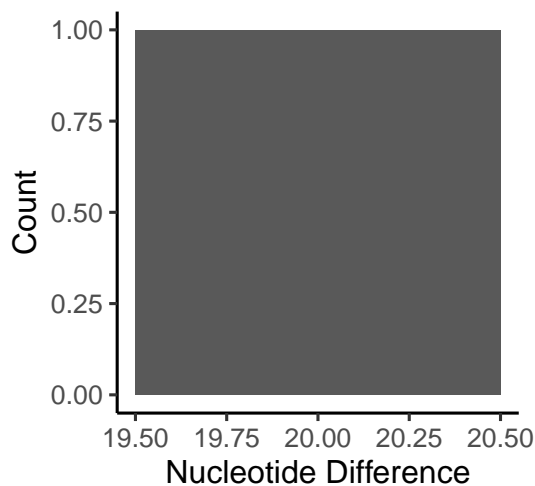
### IGHV2–70\*01

1308 sequences assigned  
262 (20%) exact matches, in which:  
172 unique CDR3  
6 unique J



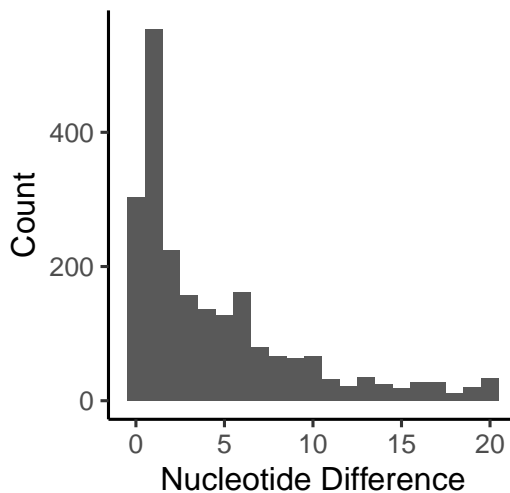
### IGHV1–69–2\*01

2 sequences assigned  
No exact matches.



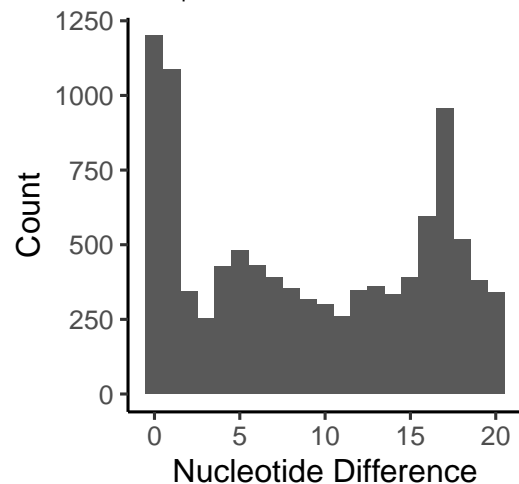
### IGHV2–5\*02

3520 sequences assigned  
304 (8.6%) exact matches, in which:  
232 unique CDR3  
7 unique J



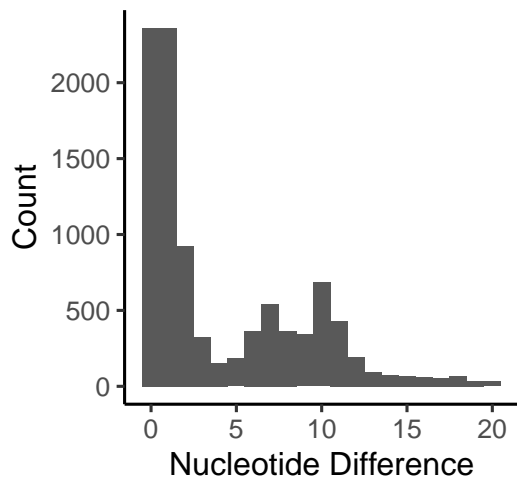
### IGHV3–7\*01

11368 sequences assigned  
1200 (10.6%) exact matches, in which:  
866 unique CDR3  
7 unique J



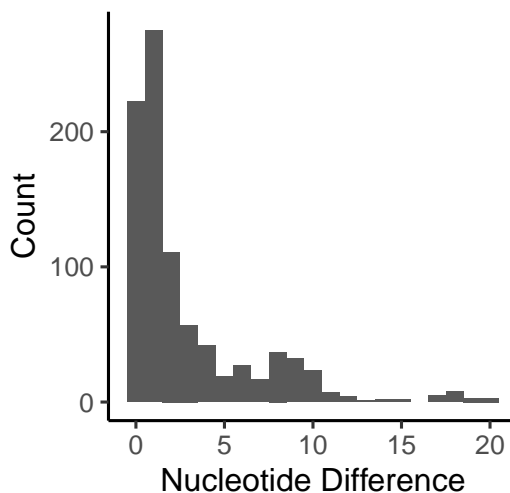
### IGHV1–69\*01\_12\_13

10133 sequences assigned  
2360 (23.3%) exact matches, in which:  
1956 unique CDR3  
7 unique J



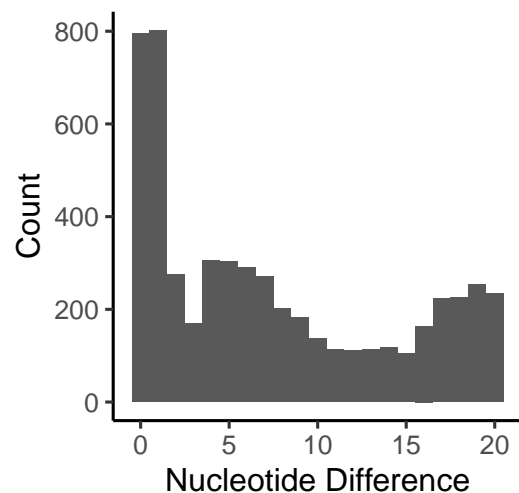
### IGHV2–26\*01

957 sequences assigned  
222 (23.2%) exact matches, in which:  
177 unique CDR3  
7 unique J



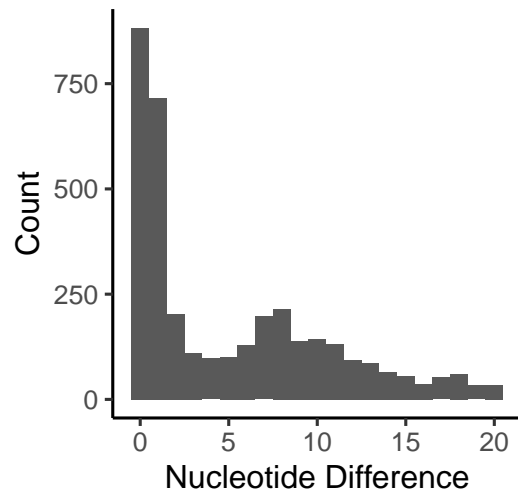
### IGHV3–7\*03

10417 sequences assigned  
796 (7.6%) exact matches, in which:  
531 unique CDR3  
7 unique J



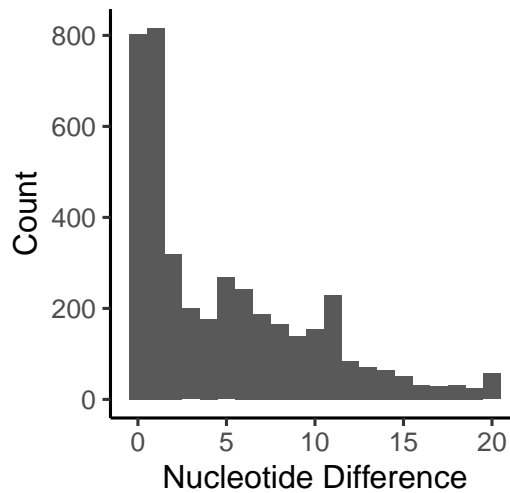
### IGHV3-9\*01

3700 sequences assigned  
883 (23.9%) exact matches, in which:  
529 unique CDR3  
7 unique J



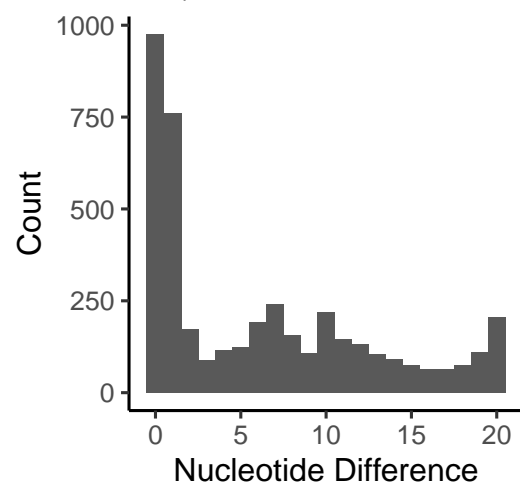
### IGHV3-11\*06

4363 sequences assigned  
803 (18.4%) exact matches, in which:  
540 unique CDR3  
7 unique J



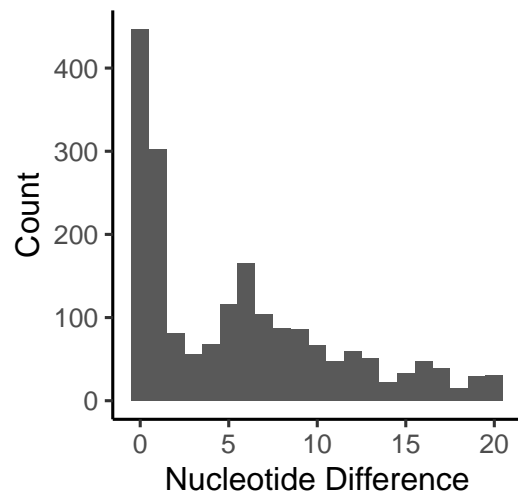
### IGHV3-15\*01\_02

4740 sequences assigned  
975 (20.6%) exact matches, in which:  
559 unique CDR3  
7 unique J



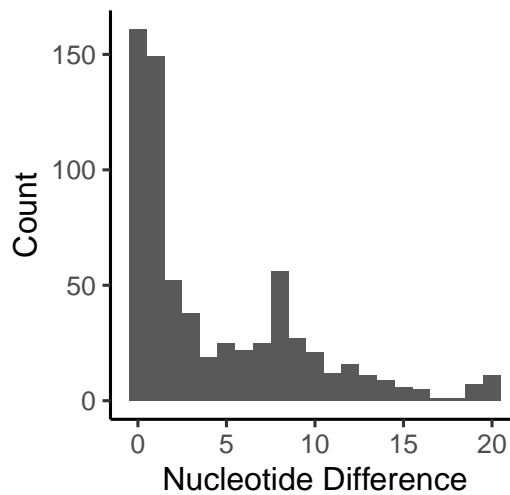
### IGHV3-11\*01

2839 sequences assigned  
447 (15.7%) exact matches, in which:  
313 unique CDR3  
7 unique J



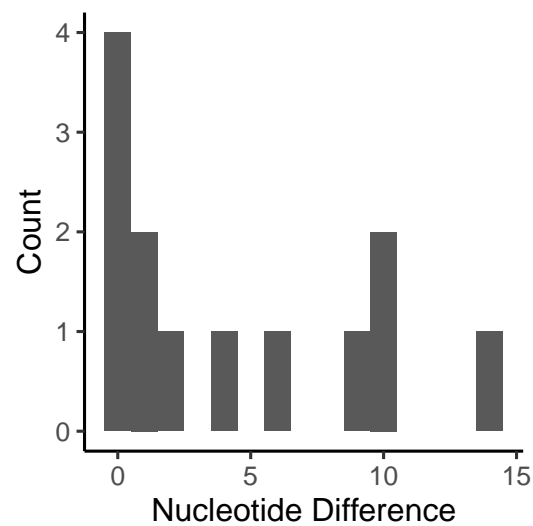
### IGHV3-13\*01

705 sequences assigned  
161 (22.8%) exact matches, in which:  
108 unique CDR3  
6 unique J



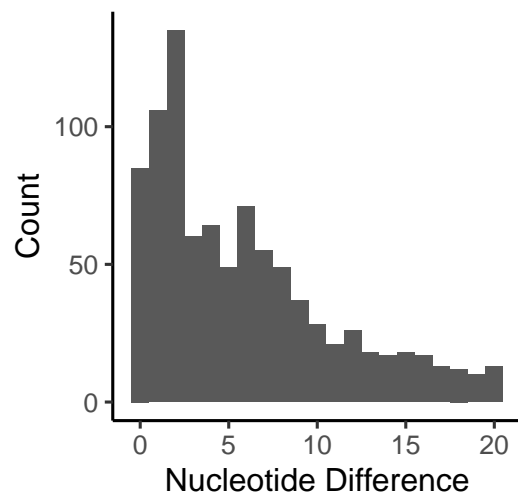
### IGHV3-19\*01

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



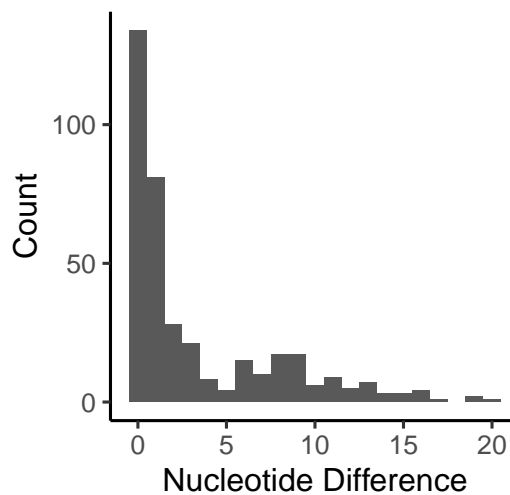
### IGHV3-11\*04

972 sequences assigned  
85 (8.7%) exact matches, in which:  
84 unique CDR3  
7 unique J



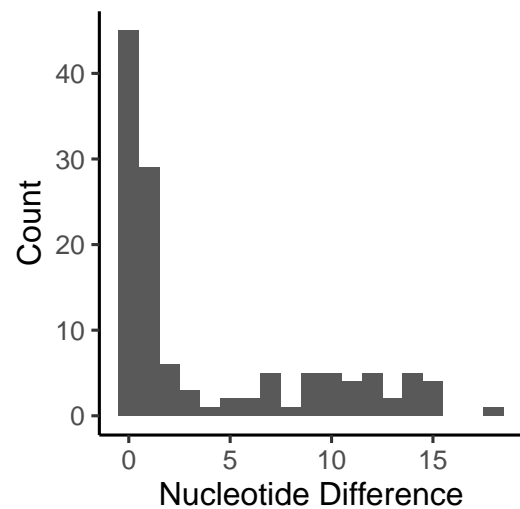
### IGHV3-13\*05

945 sequences assigned  
134 (14.2%) exact matches, in which:  
88 unique CDR3  
7 unique J



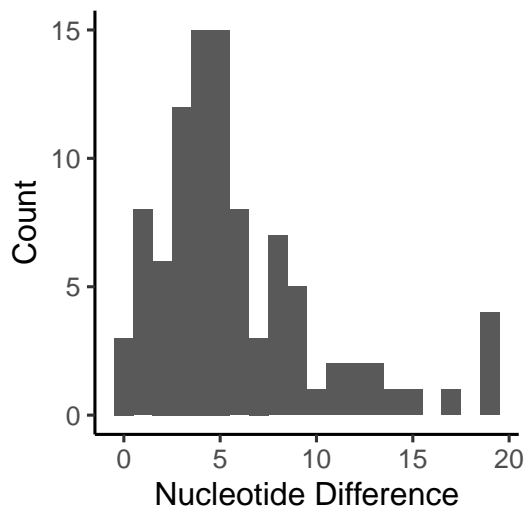
### IGHV3-20\*01\_02

125 sequences assigned  
45 (36%) exact matches, in which:  
30 unique CDR3  
4 unique J



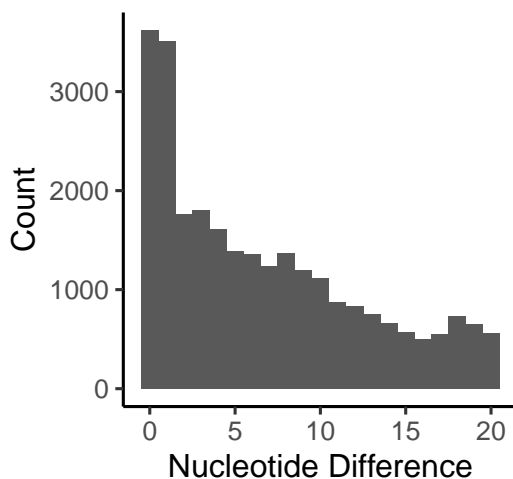
### IGHV3-20\*03\_04

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



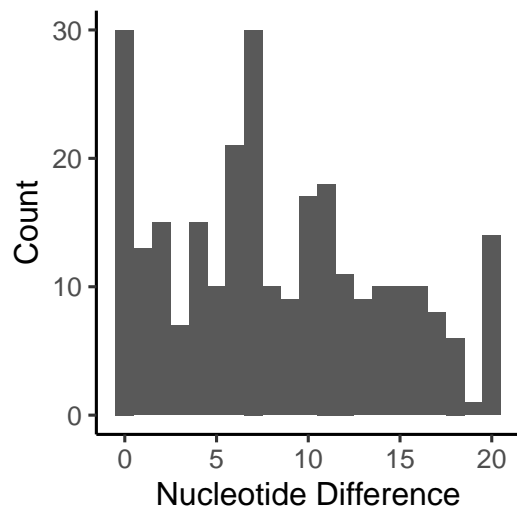
### IGHV3-23\*01\_04

30699 sequences assigned  
3618 (11.8%) exact matches, in which:  
2095 unique CDR3  
7 unique J



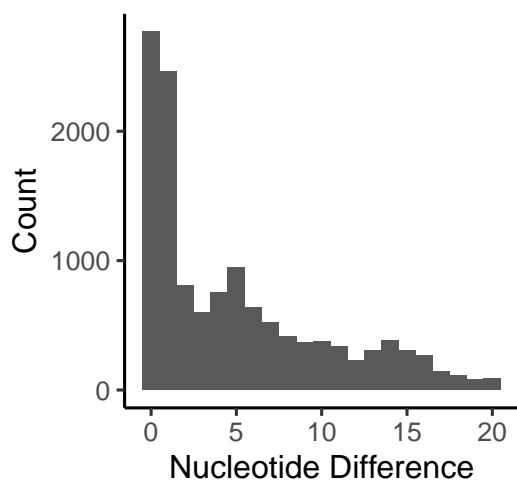
### IGHV3-30\*04

395 sequences assigned  
30 (7.6%) exact matches, in which:  
30 unique CDR3  
5 unique J



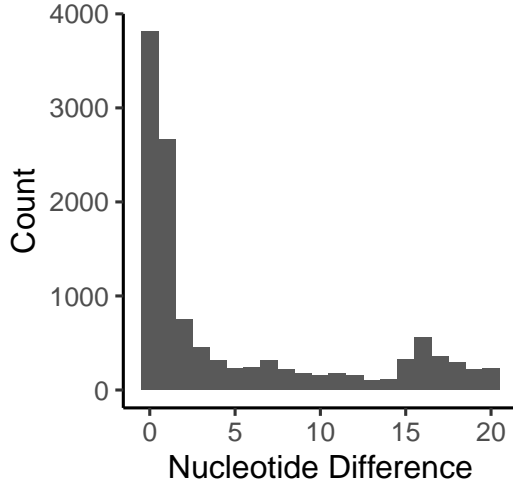
### IGHV3-21\*01\_02

14170 sequences assigned  
2769 (19.5%) exact matches, in which:  
1755 unique CDR3  
7 unique J



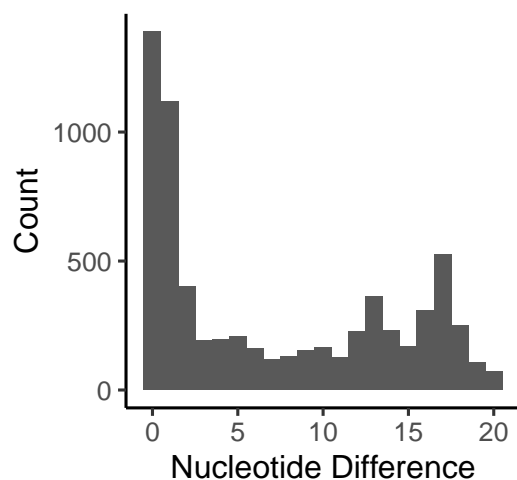
### IGHV3-30-3\*01

12292 sequences assigned  
3810 (31%) exact matches, in which:  
2384 unique CDR3  
7 unique J



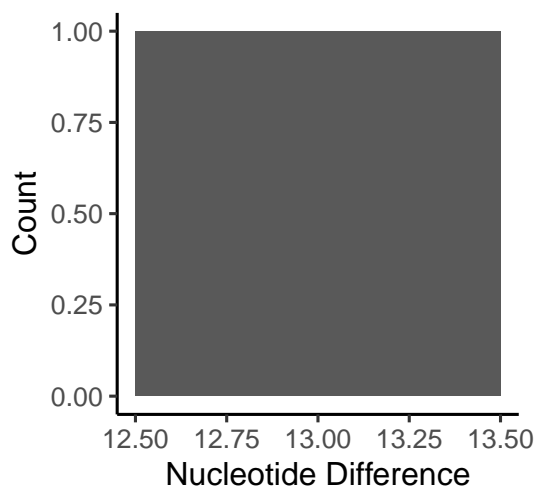
### IGHV3-33\*01

7308 sequences assigned  
1389 (19%) exact matches, in which:  
926 unique CDR3  
7 unique J



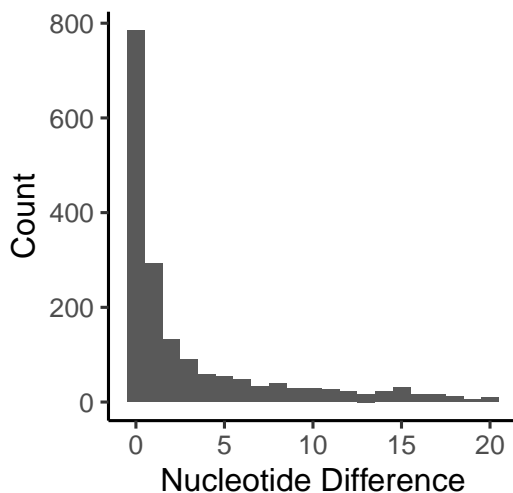
### IGHV3-22\*01\_02

1 sequences assigned  
No exact matches.



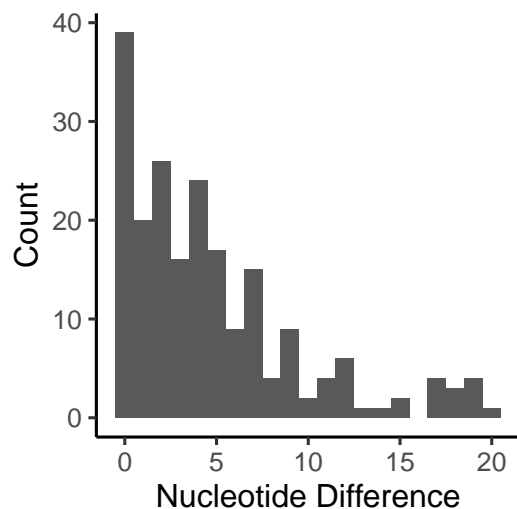
### IGHV3-30\*03

1829 sequences assigned  
785 (42.9%) exact matches, in which:  
659 unique CDR3  
7 unique J



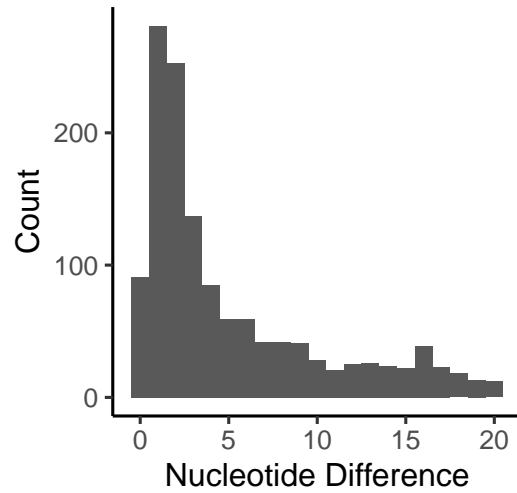
### IGHV3-33\*05

237 sequences assigned  
39 (16.5%) exact matches, in which:  
34 unique CDR3  
5 unique J



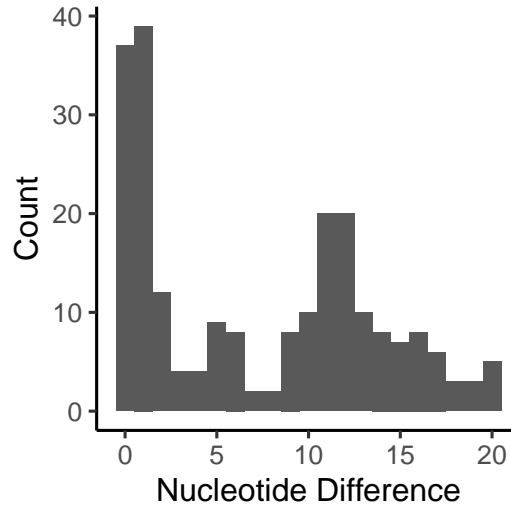
### IGHV3–33\*06

1441 sequences assigned  
91 (6.3%) exact matches, in which:  
88 unique CDR3  
7 unique J



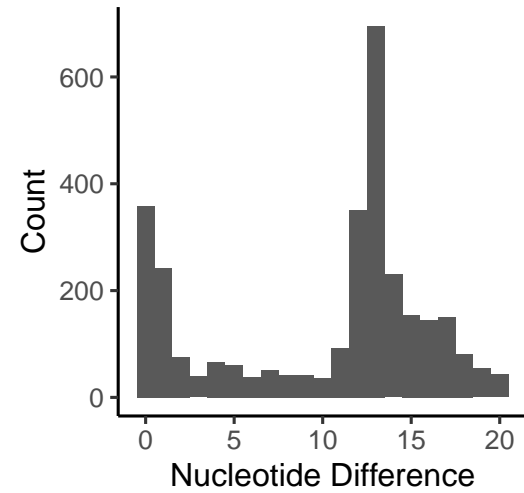
### IGHV3–43\*01

254 sequences assigned  
37 (14.6%) exact matches, in which:  
26 unique CDR3  
5 unique J



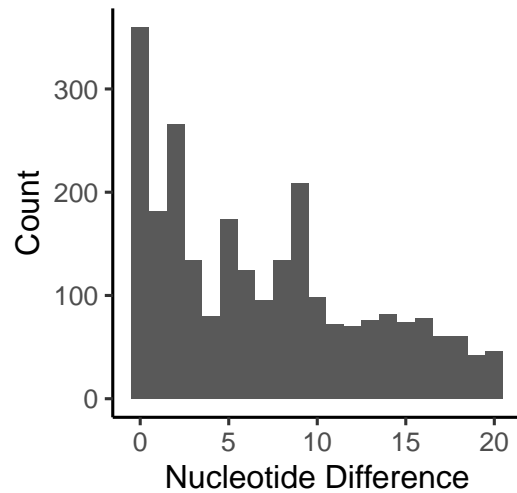
### IGHV3–48\*02

3282 sequences assigned  
358 (10.9%) exact matches, in which:  
243 unique CDR3  
7 unique J



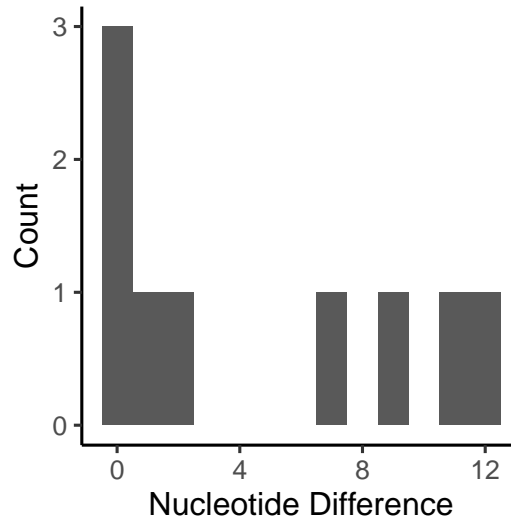
### IGHV3–33\*08

2965 sequences assigned  
360 (12.1%) exact matches, in which:  
285 unique CDR3  
7 unique J



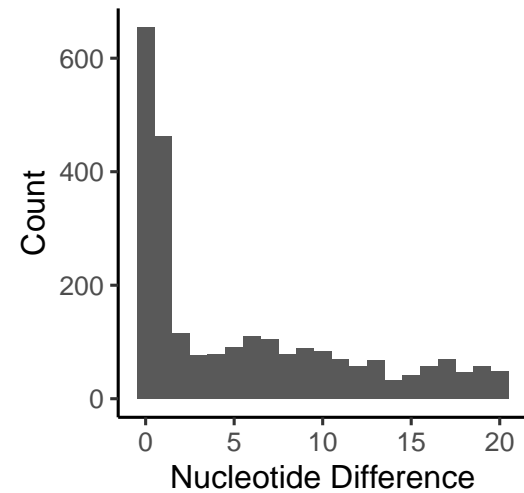
### IGHV3–47\*02

9 sequences assigned  
3 (33.3%) exact matches, in which:  
2 unique CDR3  
2 unique J



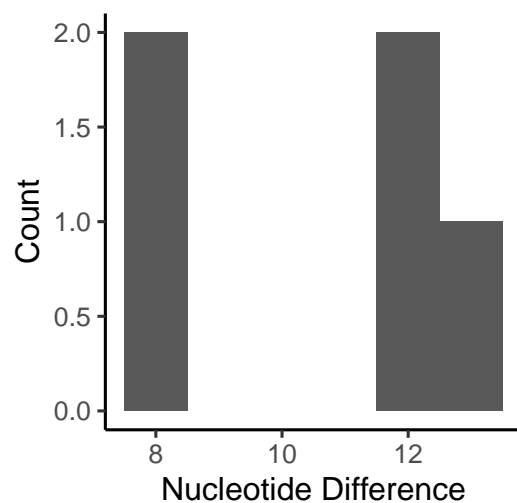
### IGHV3–48\*03

2877 sequences assigned  
655 (22.8%) exact matches, in which:  
422 unique CDR3  
7 unique J



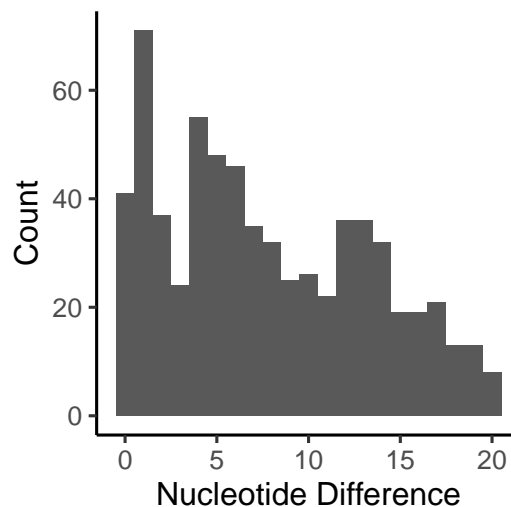
### IGHV3–35\*01

5 sequences assigned  
No exact matches.



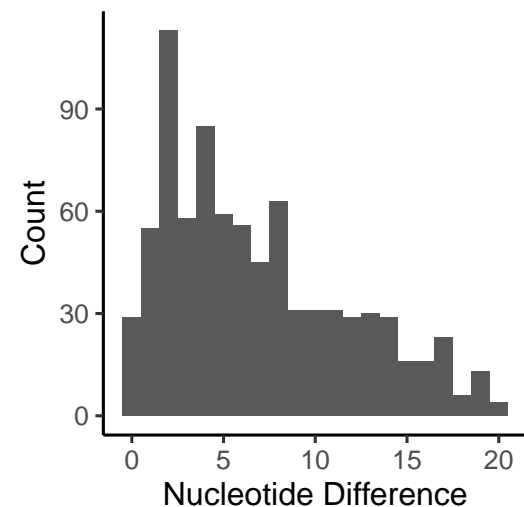
### IGHV3–48\*01

689 sequences assigned  
41 (6%) exact matches, in which:  
41 unique CDR3  
7 unique J



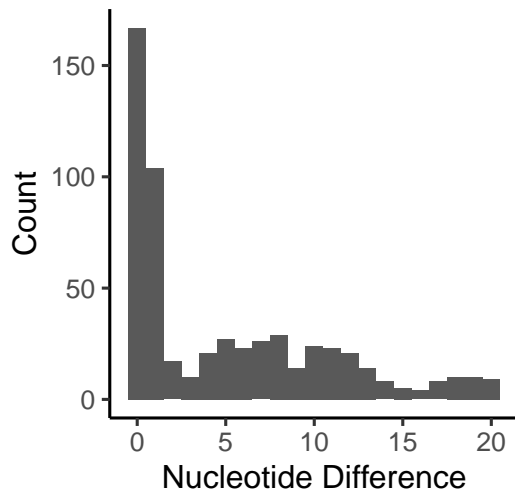
### IGHV3–48\*04

861 sequences assigned  
29 (3.4%) exact matches, in which:  
29 unique CDR3  
5 unique J



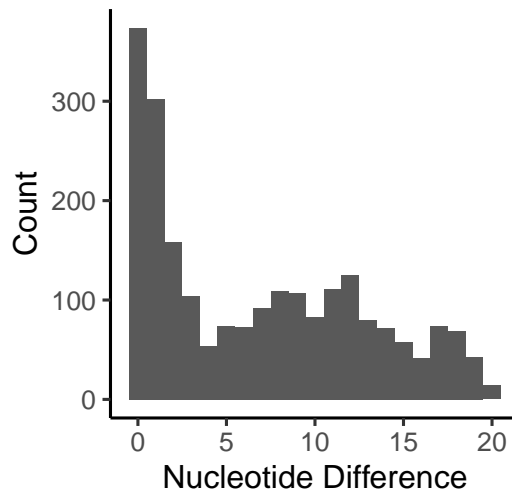
### IGHV3-49\*04

1137 sequences assigned  
167 (14.7%) exact matches, in which:  
107 unique CDR3  
7 unique J



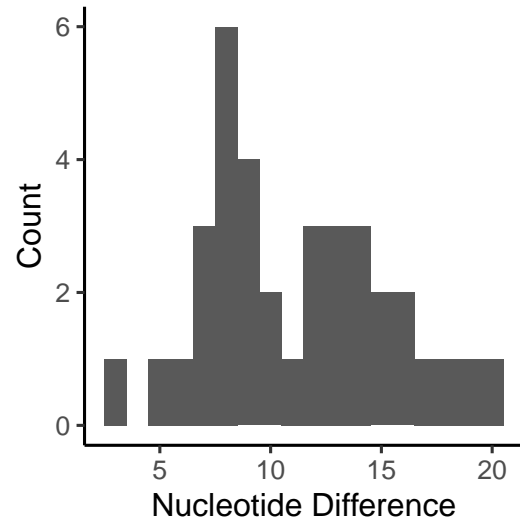
### IGHV3-53\*01\_02

2633 sequences assigned  
374 (14.2%) exact matches, in which:  
235 unique CDR3  
7 unique J



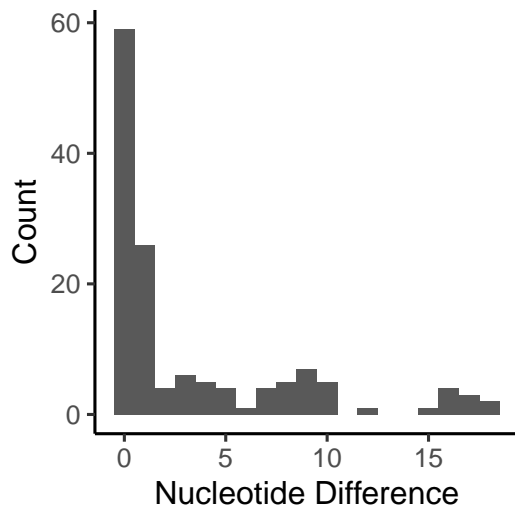
### IGHV3-66\*01

41 sequences assigned  
No exact matches.



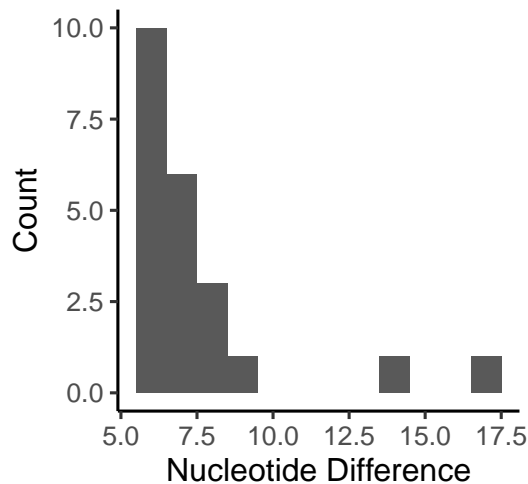
### IGHV3-49\*03\_05

293 sequences assigned  
59 (20.1%) exact matches, in which:  
44 unique CDR3  
5 unique J



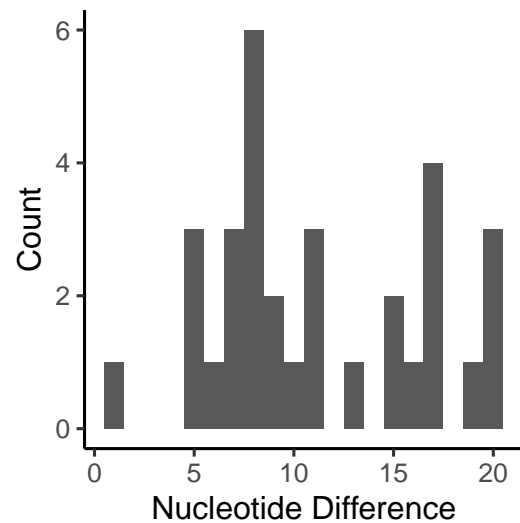
### IGHV3-64\*04

22 sequences assigned  
No exact matches.



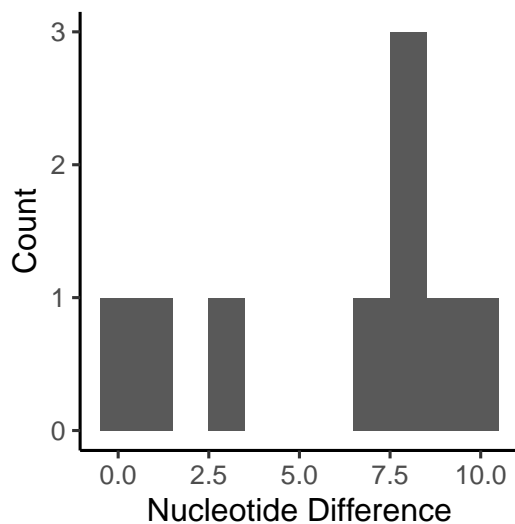
### IGHV3-66\*02

40 sequences assigned  
No exact matches.



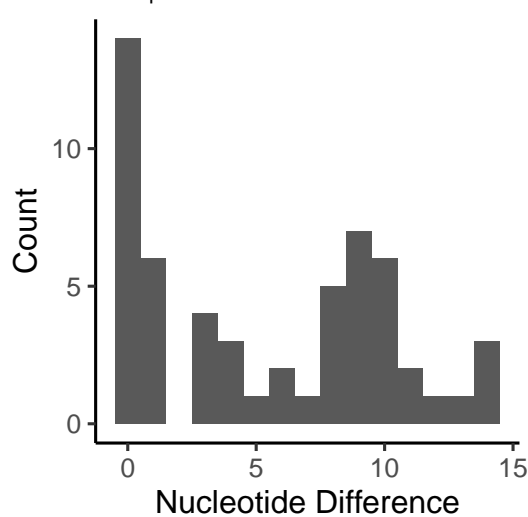
### IGHV3-52\*01\_03

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



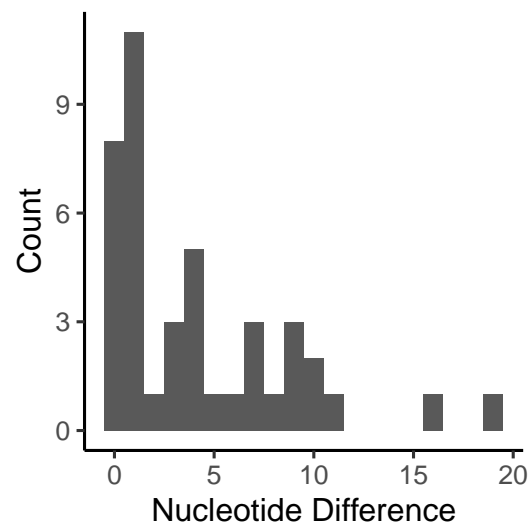
### IGHV3-64\*02\_07

60 sequences assigned  
14 (23.3%) exact matches, in which:  
9 unique CDR3  
3 unique J



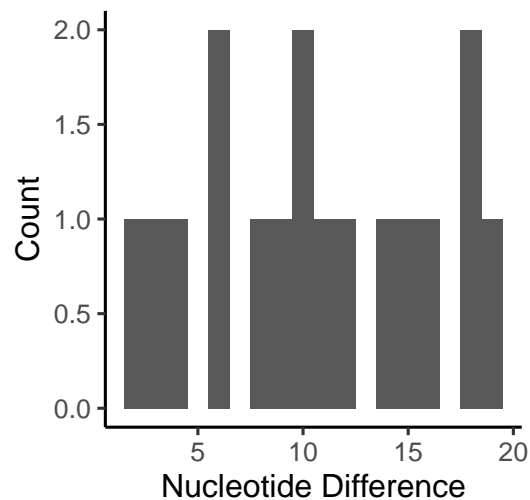
### IGHV3-66\*03

44 sequences assigned  
8 (18.2%) exact matches, in which:  
8 unique CDR3  
4 unique J



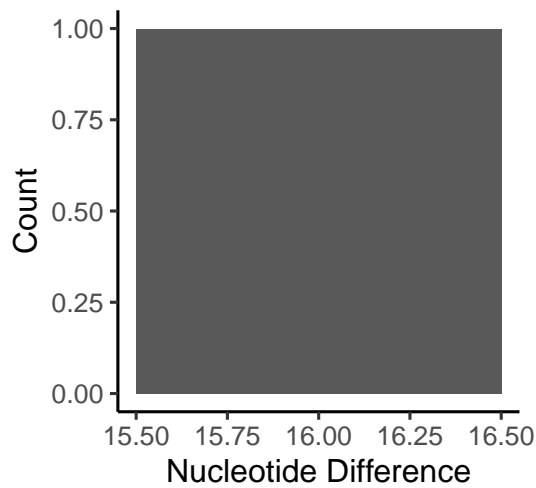
### IGHV3-66\*04

22 sequences assigned  
No exact matches.



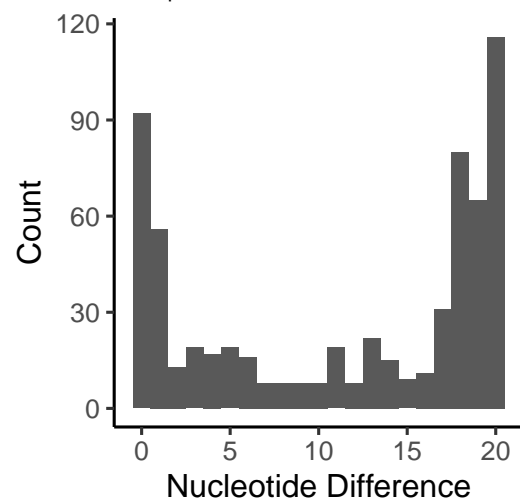
### IGHV3-71\*03

1 sequences assigned  
No exact matches.



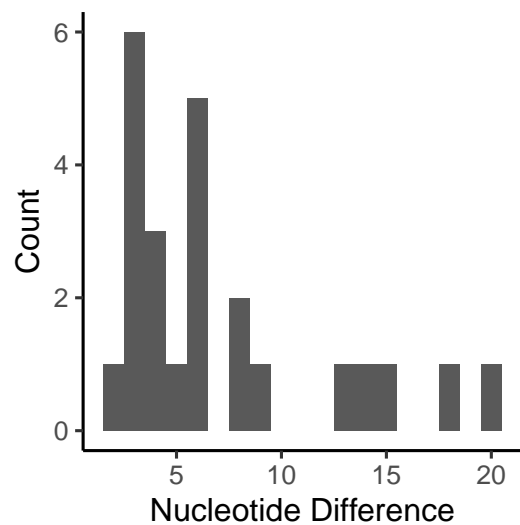
### IGHV3-73\*01\_02

778 sequences assigned  
92 (11.8%) exact matches, in which:  
58 unique CDR3  
6 unique J



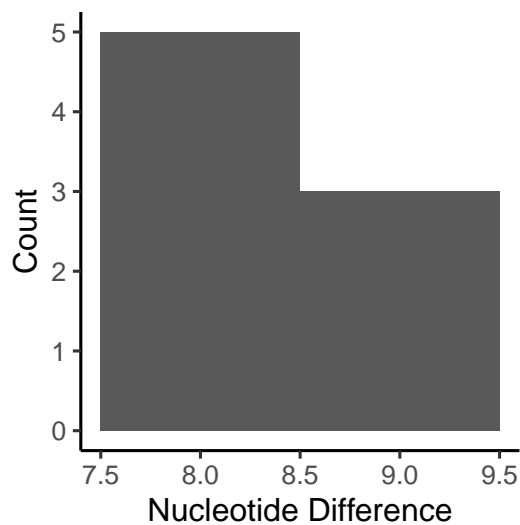
### IGHV3-69-1\*01

26 sequences assigned  
No exact matches.



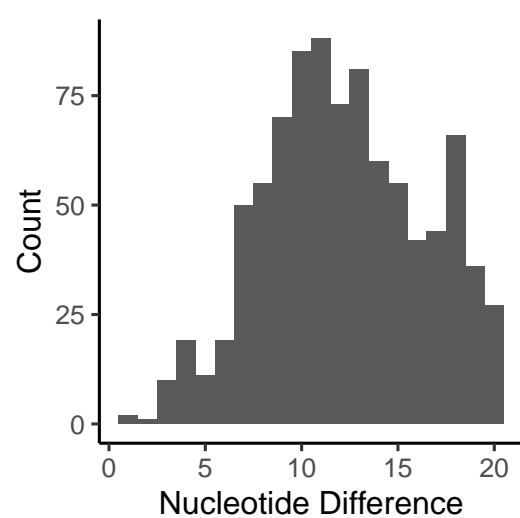
### IGHV3-71\*01\_04

9 sequences assigned  
No exact matches.



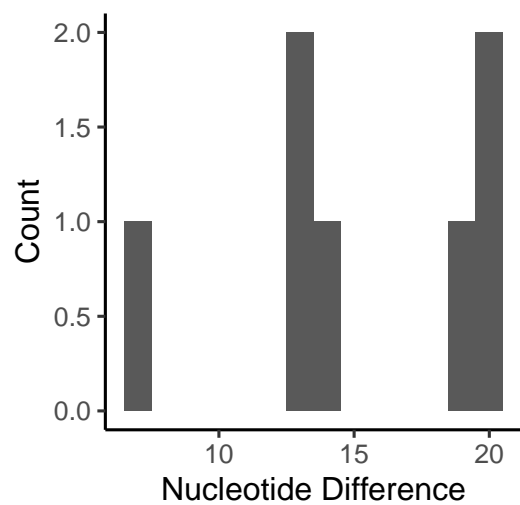
### IGHV3-74\*03

1420 sequences assigned  
No exact matches.



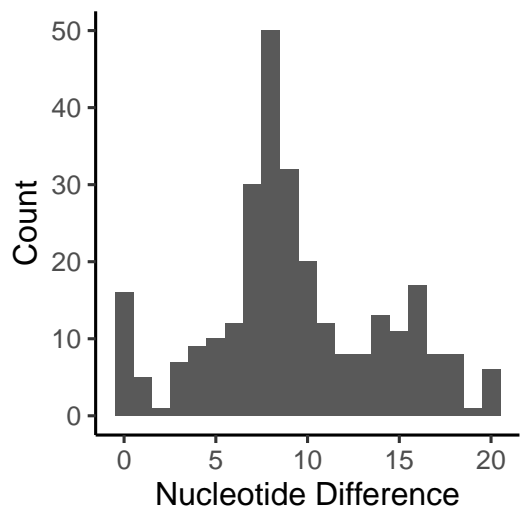
### IGHV3-69-1\*02

11 sequences assigned  
No exact matches.



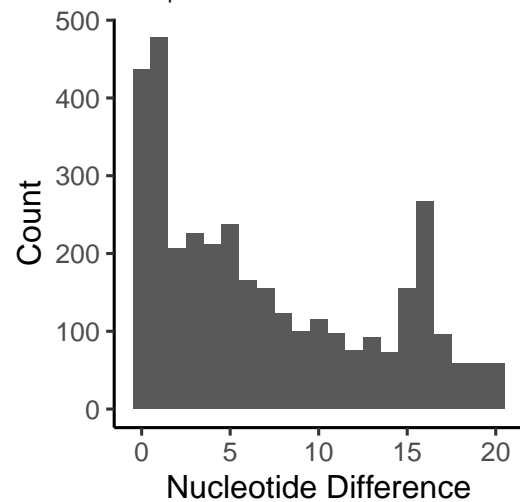
### IGHV3-72\*01

292 sequences assigned  
16 (5.5%) exact matches, in which:  
9 unique CDR3  
4 unique J



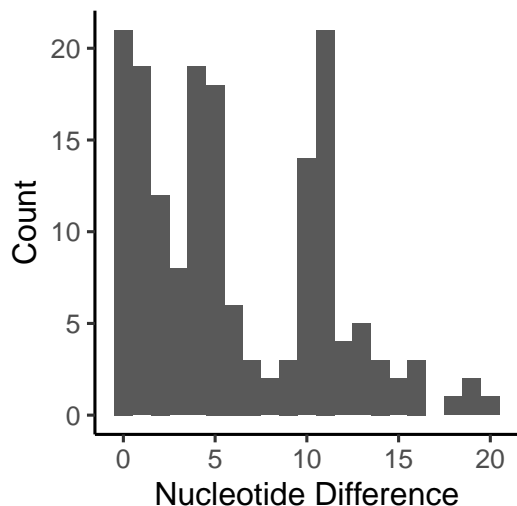
### IGHV3-74\*01\_02

3687 sequences assigned  
437 (11.9%) exact matches, in which:  
295 unique CDR3  
7 unique J



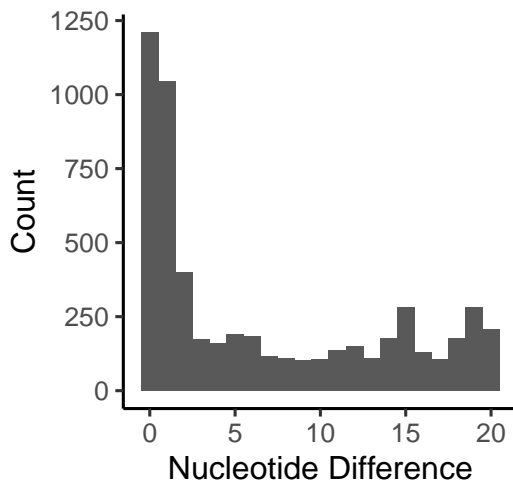
### IGHV3-43D\*04

172 sequences assigned  
21 (12.2%) exact matches, in which:  
14 unique CDR3  
3 unique J



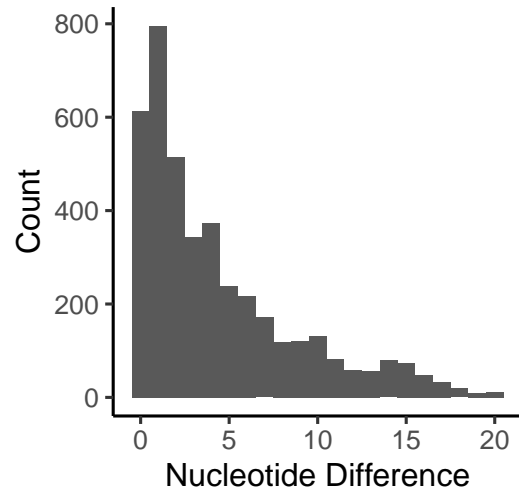
### IGHV4-4\*02\_03

6175 sequences assigned  
1210 (19.6%) exact matches, in which:  
853 unique CDR3  
7 unique J



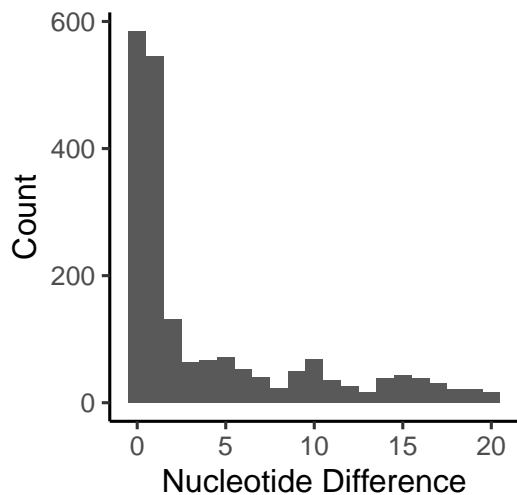
### IGHV4-30-2\*01

4260 sequences assigned  
613 (14.4%) exact matches, in which:  
414 unique CDR3  
7 unique J



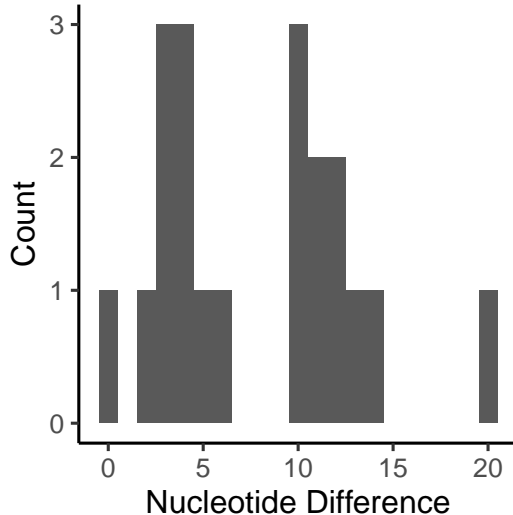
### IGHV3-64D\*06

2036 sequences assigned  
585 (28.7%) exact matches, in which:  
274 unique CDR3  
7 unique J



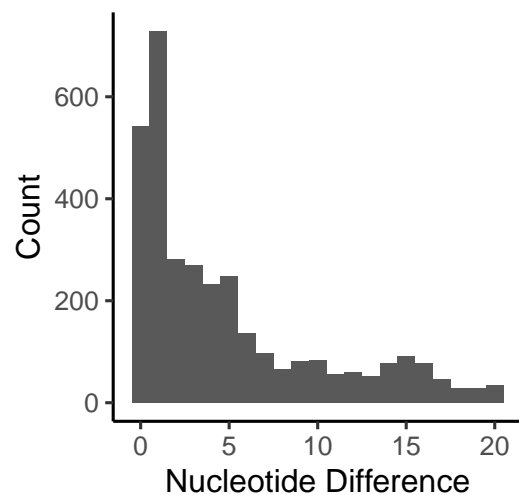
### IGHV4-28\*03

27 sequences assigned  
1 (3.7%) exact matches, in which:  
1 unique CDR3  
1 unique J



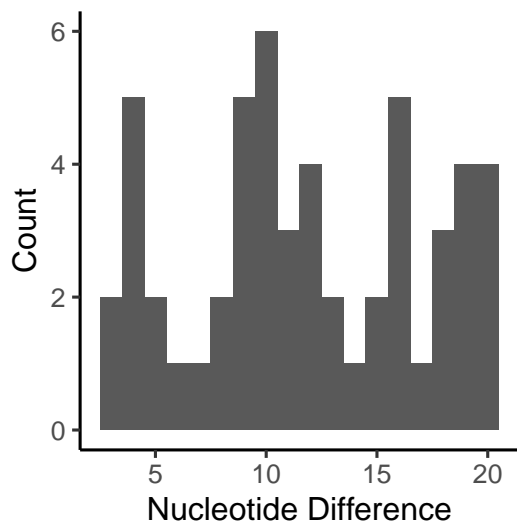
### IGHV4-30-4\*01

3830 sequences assigned  
542 (14.2%) exact matches, in which:  
366 unique CDR3  
7 unique J



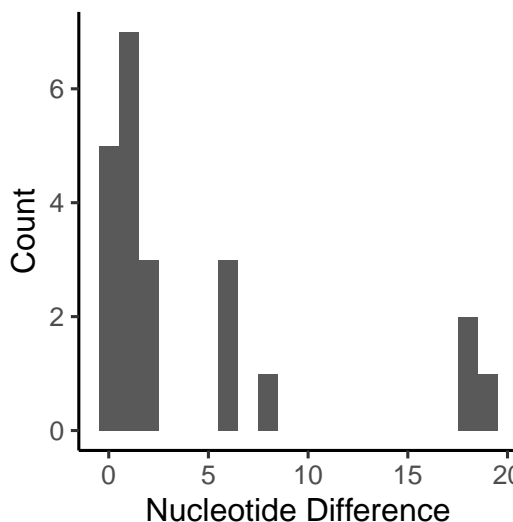
### IGHV3-NL1\*01

73 sequences assigned  
No exact matches.



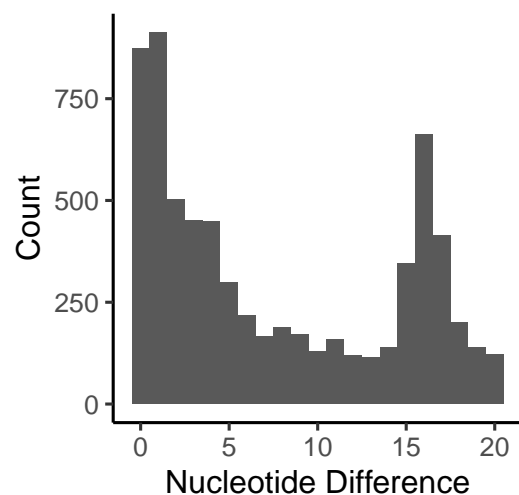
### IGHV4-28\*01\_07

23 sequences assigned  
5 (21.7%) exact matches, in which:  
2 unique CDR3  
2 unique J



### IGHV4-31\*02

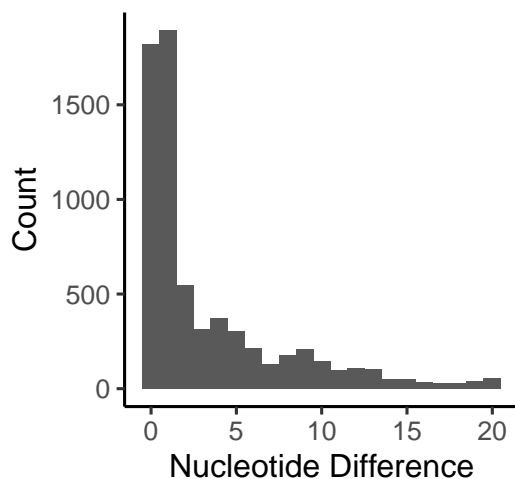
8268 sequences assigned  
873 (10.6%) exact matches, in which:  
667 unique CDR3  
7 unique J





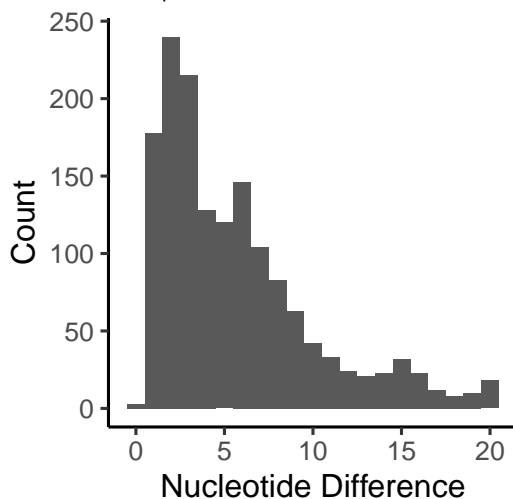
### IGHV4-34\*01\_02

8732 sequences assigned  
1819 (20.8%) exact matches, in which:  
1224 unique CDR3  
7 unique J



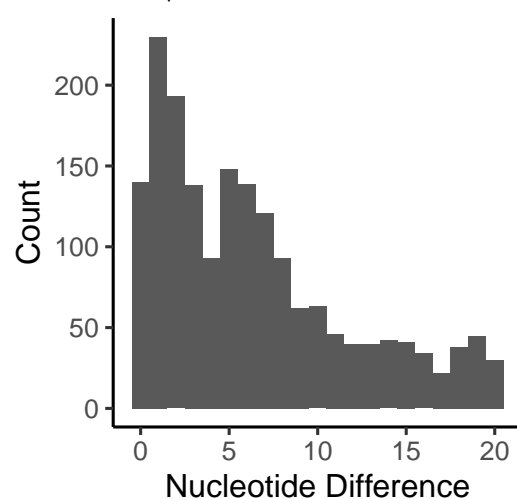
### IGHV4-39\*07

1692 sequences assigned  
3 (0.2%) exact matches, in which:  
3 unique CDR3  
3 unique J



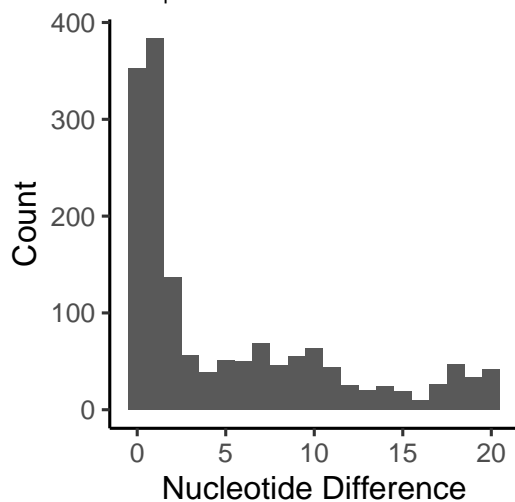
### IGHV4-59\*12

2295 sequences assigned  
140 (6.1%) exact matches, in which:  
135 unique CDR3  
7 unique J



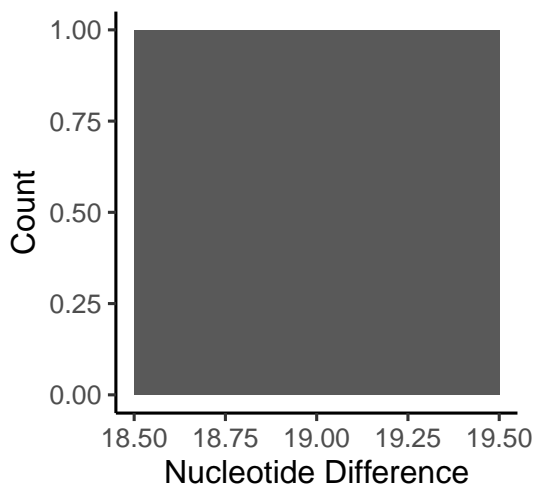
### IGHV4-38-2\*01

2450 sequences assigned  
353 (14.4%) exact matches, in which:  
296 unique CDR3  
7 unique J



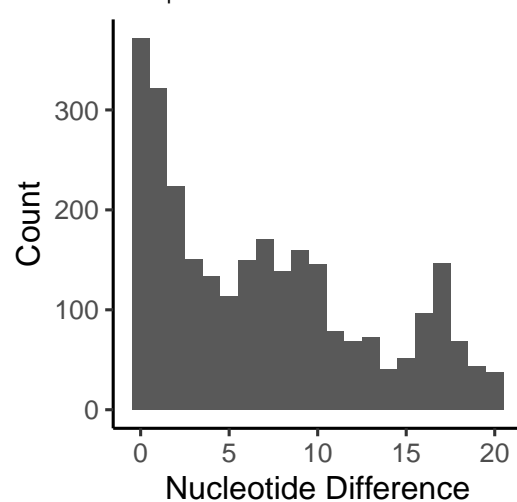
### IGHV4-55\*09

2 sequences assigned  
No exact matches.



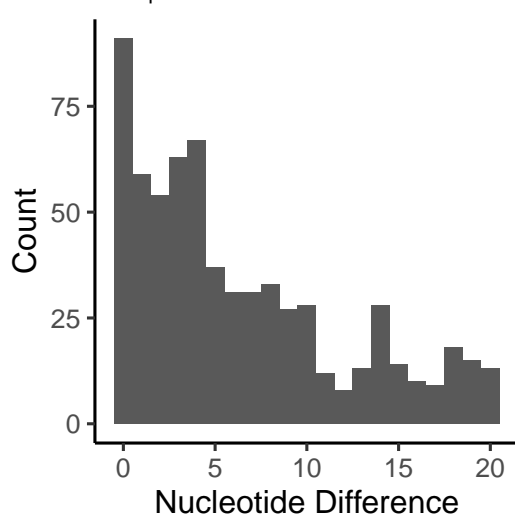
### IGHV4-61\*01

3227 sequences assigned  
372 (11.5%) exact matches, in which:  
313 unique CDR3  
7 unique J



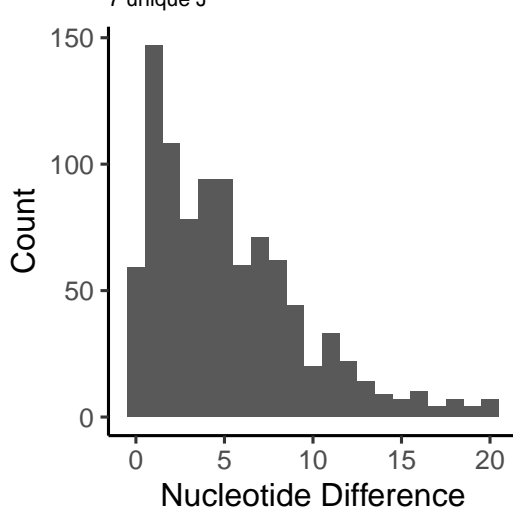
### IGHV4-38-2\*02

833 sequences assigned  
91 (10.9%) exact matches, in which:  
71 unique CDR3  
6 unique J



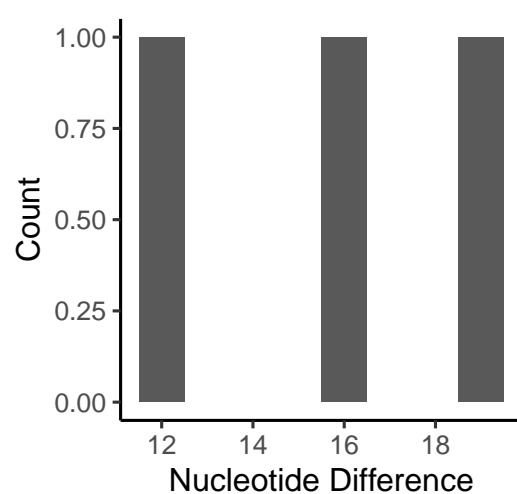
### IGHV4-59\*08

1003 sequences assigned  
59 (5.9%) exact matches, in which:  
57 unique CDR3  
7 unique J



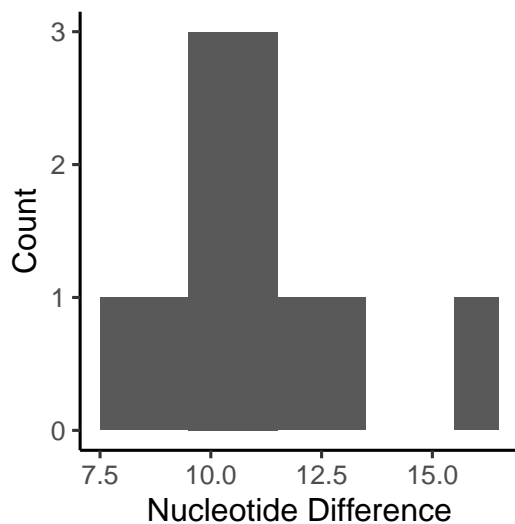
### IGHV1/OR15-2\*02\_03

3 sequences assigned  
No exact matches.



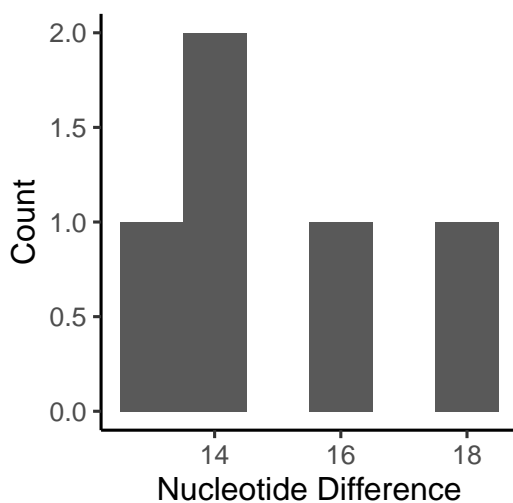
### IGHV1/OR15–3\*02

22 sequences assigned  
No exact matches.



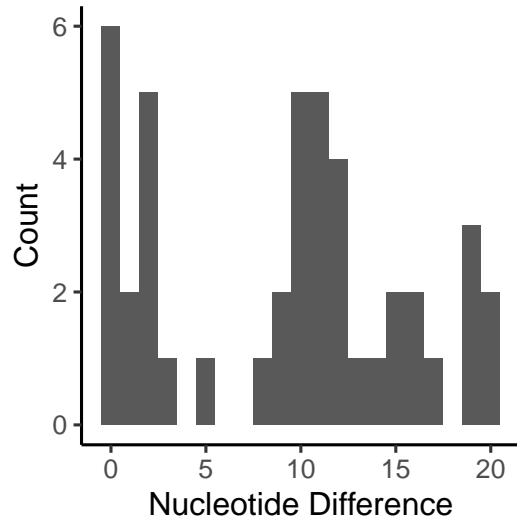
### IGHV4/OR15–8\*02

30 sequences assigned  
No exact matches.



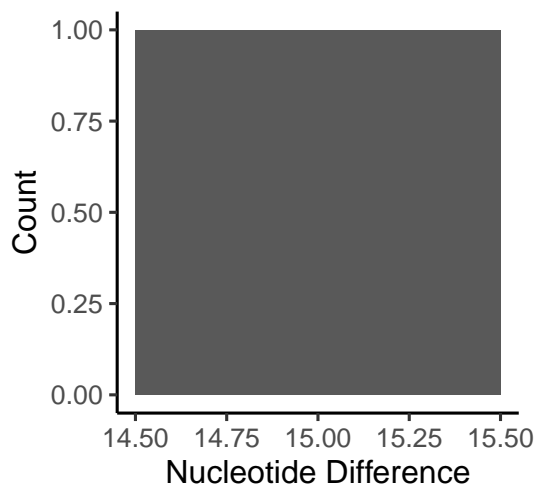
### IGHV5–51\*04

60 sequences assigned  
6 (10%) exact matches, in which:  
6 unique CDR3  
2 unique J



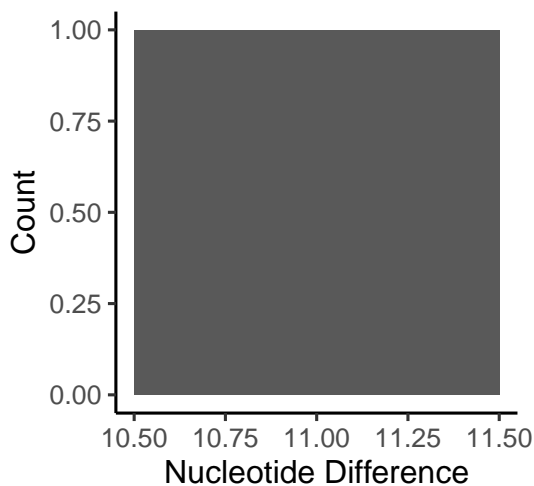
### IGHV1/OR15–4\*01

1 sequences assigned  
No exact matches.



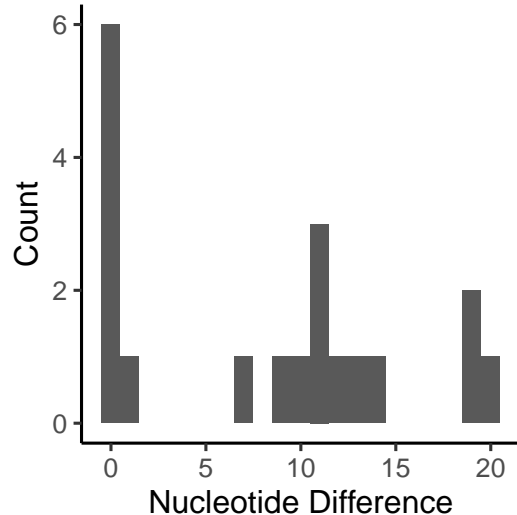
### IGHV1/OR15–9\*01

1 sequences assigned  
No exact matches.



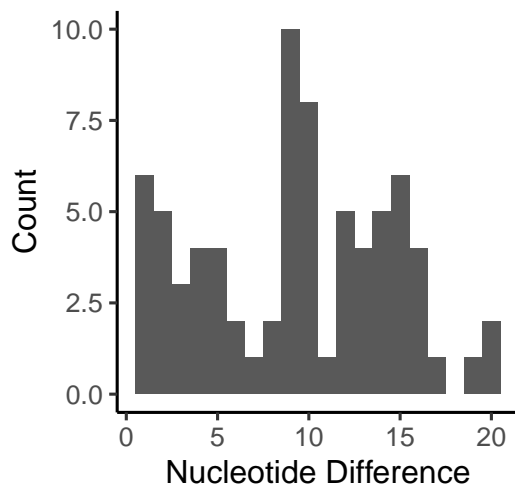
### IGHV5–51\*06

23 sequences assigned  
6 (26.1%) exact matches, in which:  
6 unique CDR3  
5 unique J



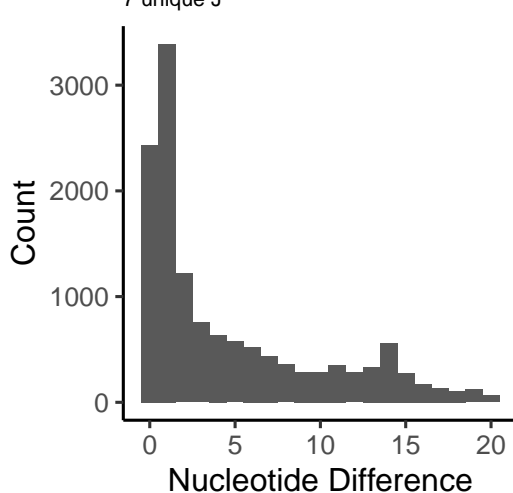
### IGHV4/OR15–8\*01

79 sequences assigned  
No exact matches.



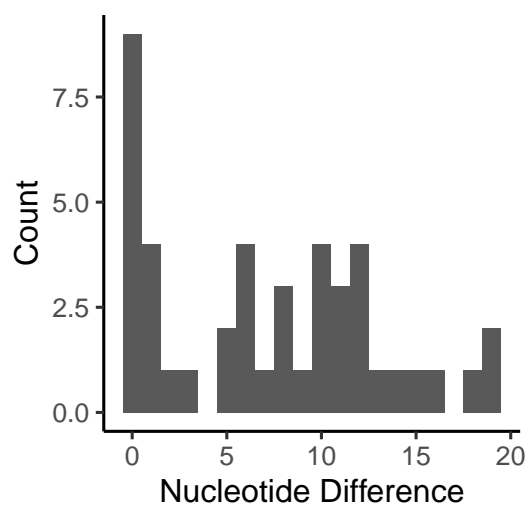
### IGHV5–10–1\*01\_03

13472 sequences assigned  
2435 (18.1%) exact matches, in which:  
1343 unique CDR3  
7 unique J



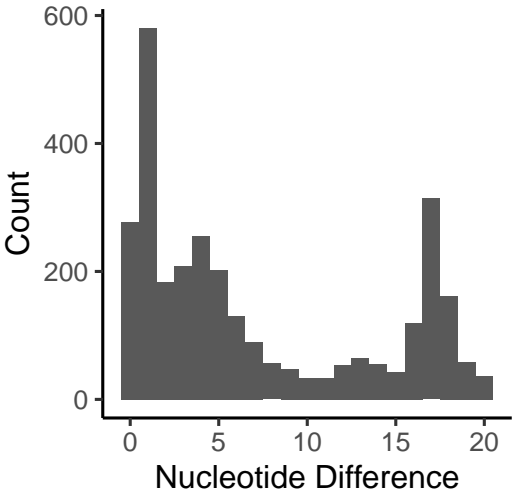
### IGHV5–51\*07

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



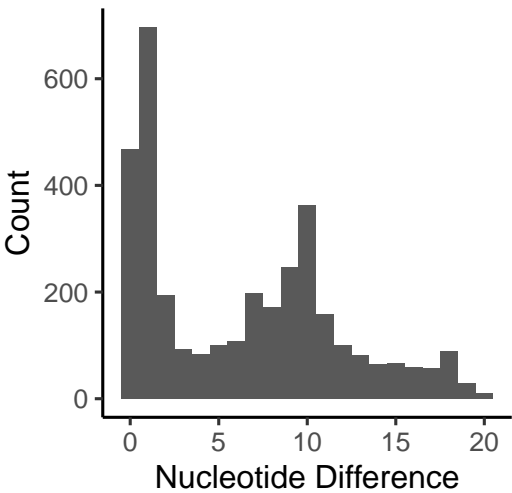
IGHV6-1\*01\_02

3125 sequences assigned  
277 (8.9%) exact matches, in which:  
229 unique CDR3  
7 unique J



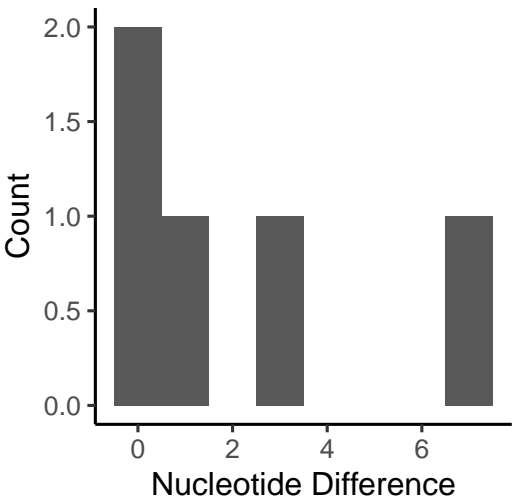
IGHV7-4-1\*02

3624 sequences assigned  
467 (12.9%) exact matches, in which:  
360 unique CDR3  
7 unique J

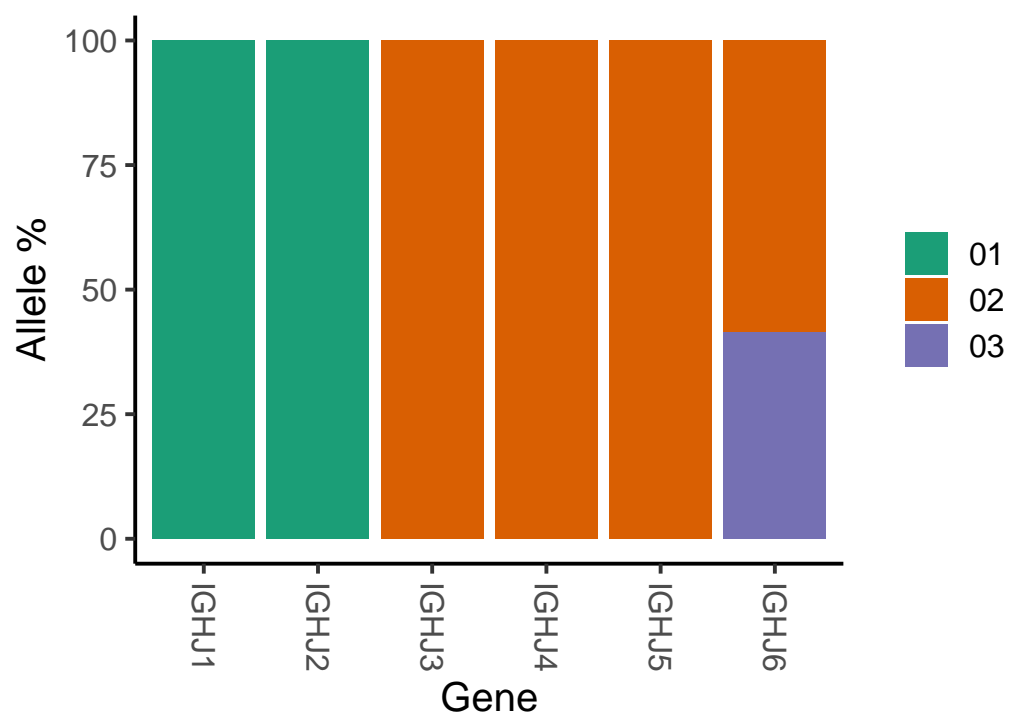


IGHV7-81\*01

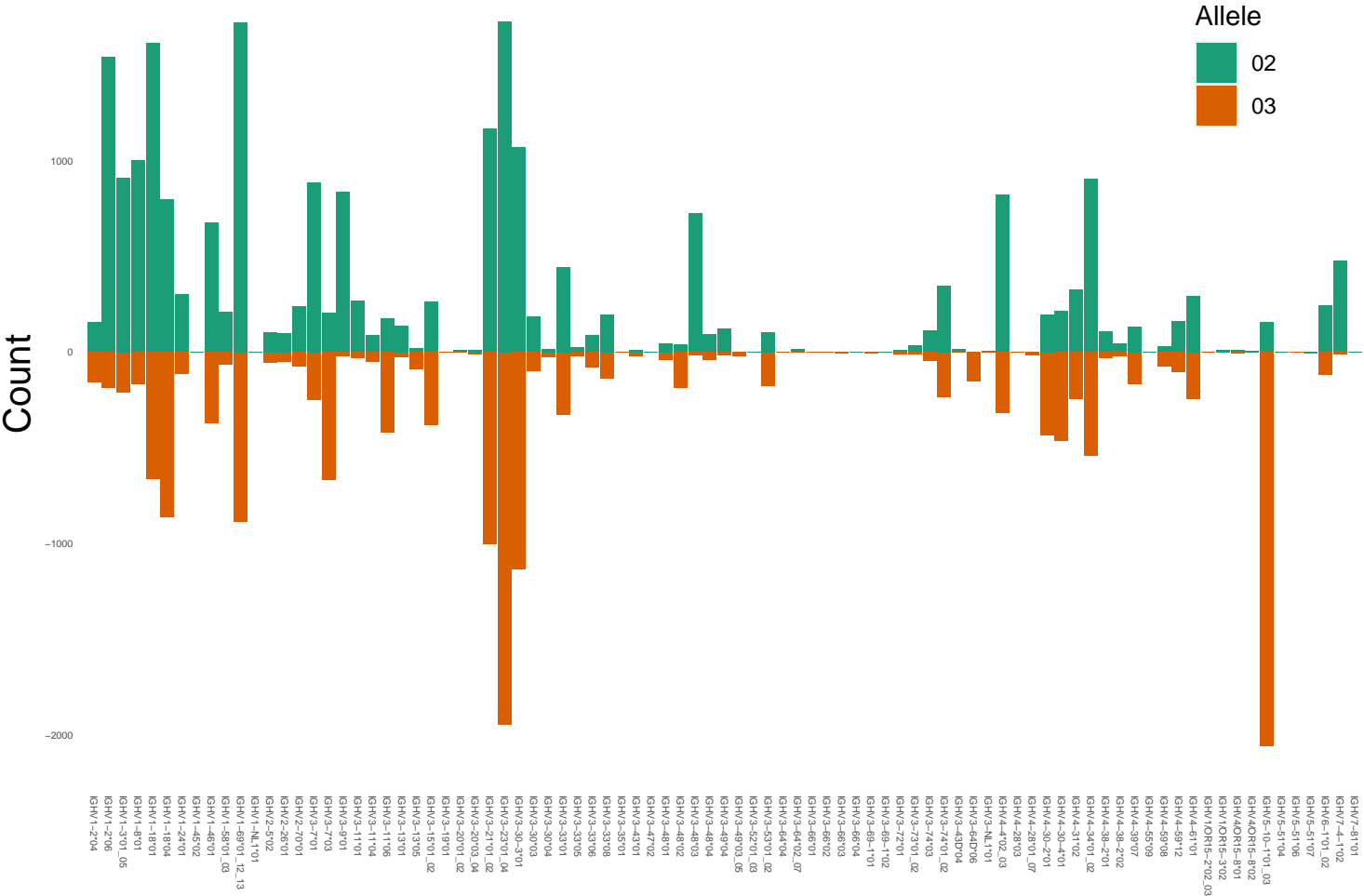
5 sequences assigned  
2 (40%) exact matches, in which:  
2 unique CDR3  
2 unique J



Allele Usage



Sequence Count by IGHJ6 allele usage



[illegible]