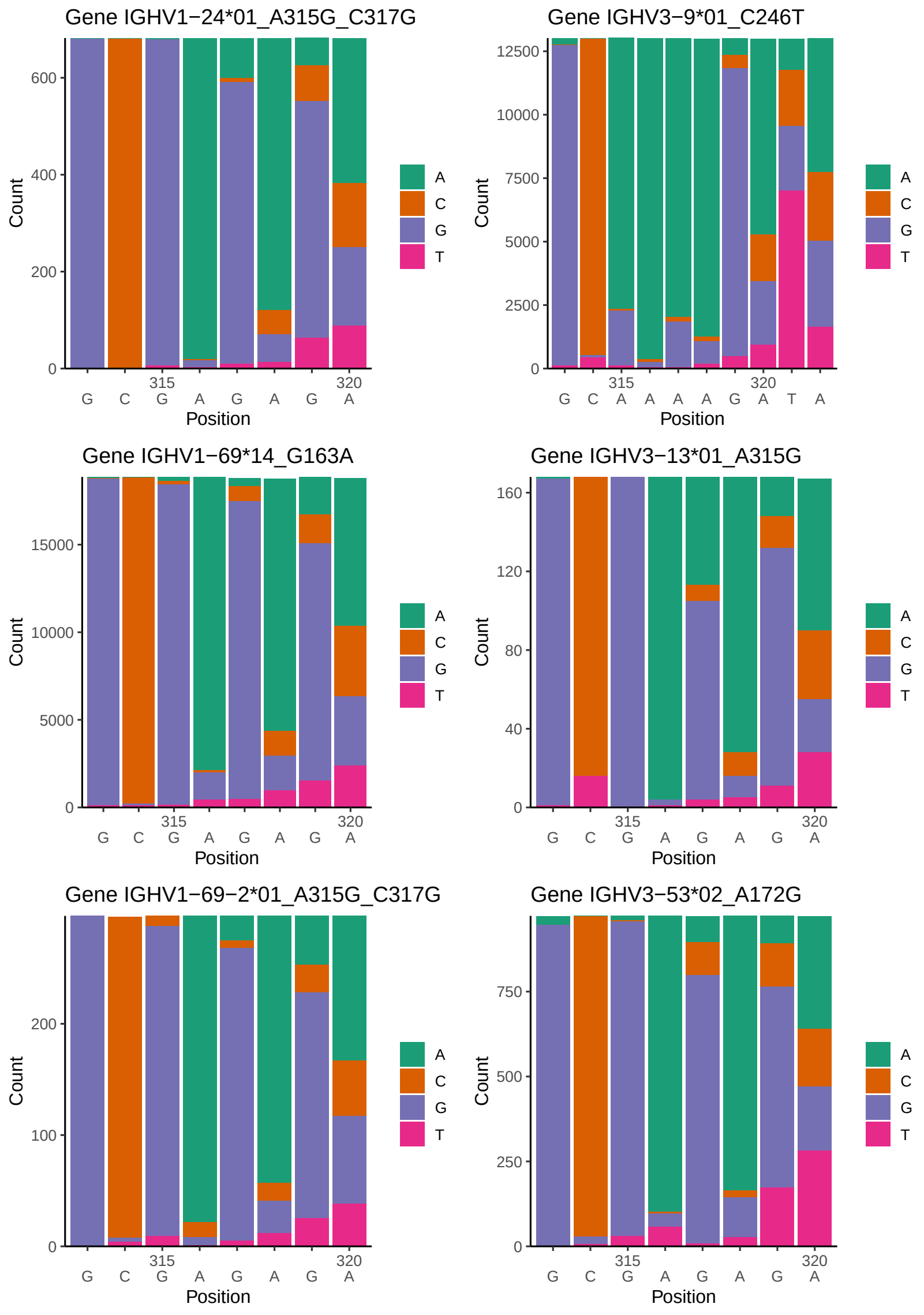
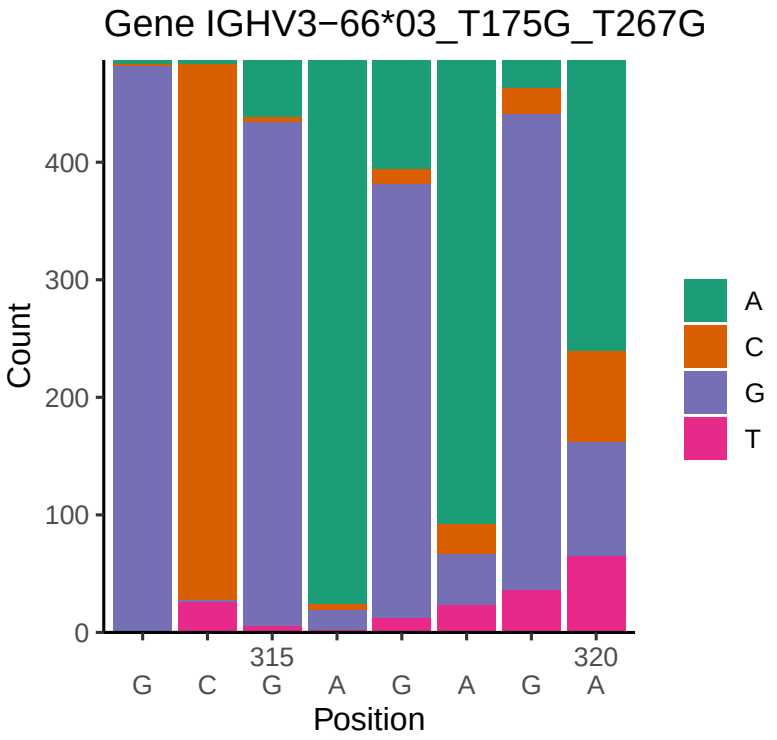
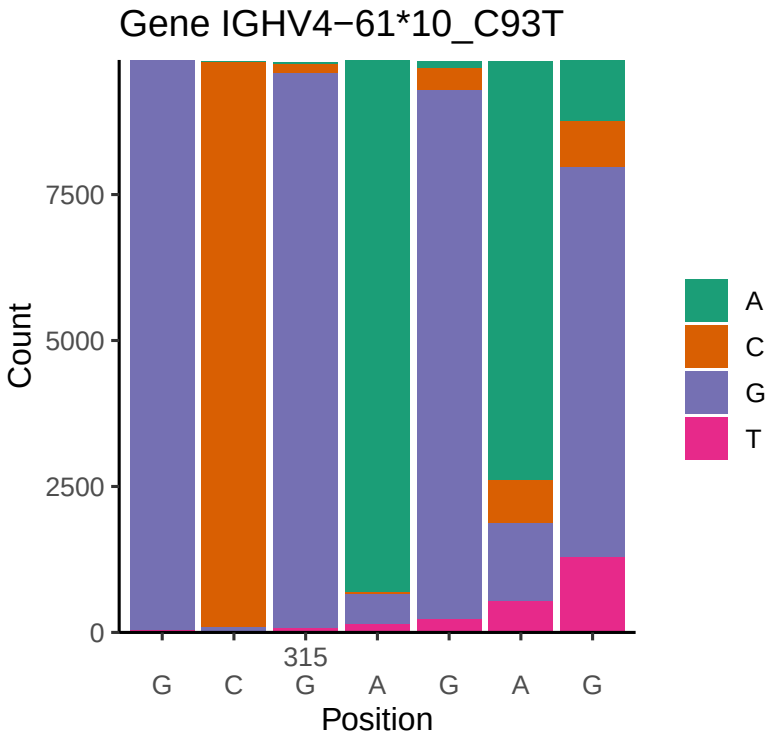
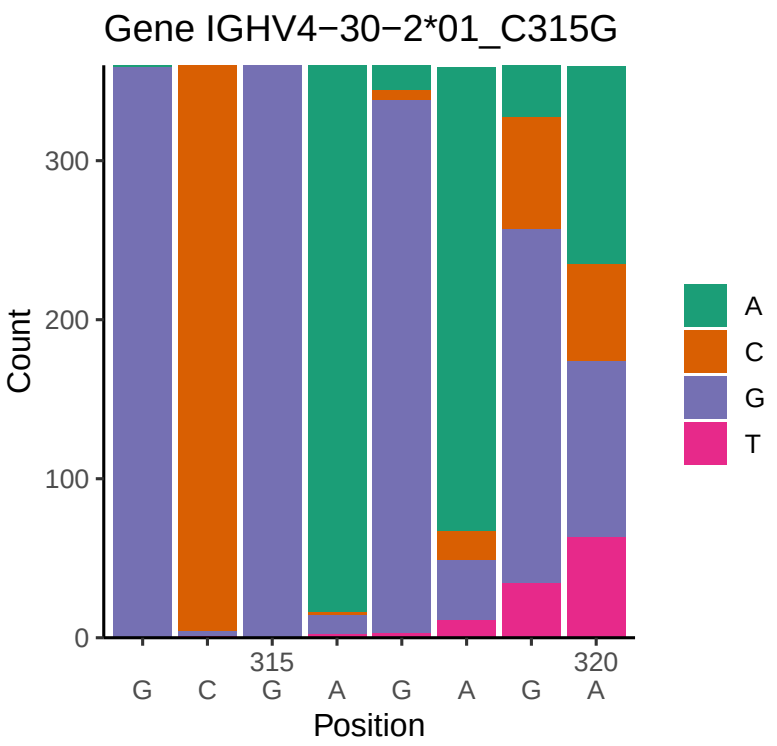
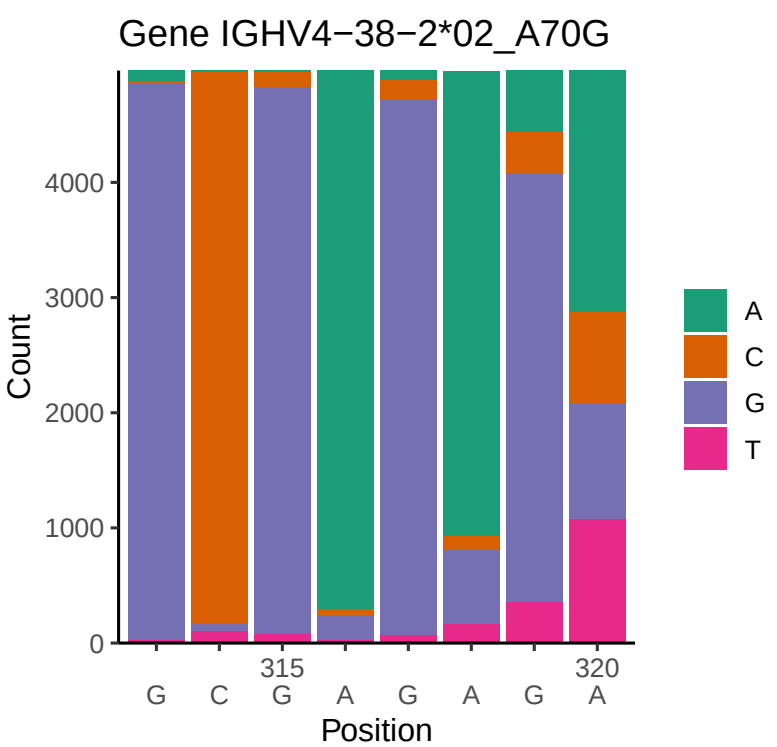

Gene IGHV1−24*01_A315G_C317G
Count
Position
315
320
G C G A G A G A
A
C
G
T
Gene IGHV3−9*01_C246T
Count
Position
315
320
G C A A A A G A T A
A
C
G
T
Gene IGHV1−69*14_G163A
Count
Position
315
320
G C G A G A G A
A
C
G
T
Gene IGHV3−13*01_A315G
Count
Position
315
320
G C G A G A G A
A
C
G
T
Gene IGHV1−69−2*01_A315G_C317G
Count
Position
315
320
G C G A G A G A
A
C
G
T
Gene IGHV3−53*02_A172G
Count
Position
315
320
G C G A G A G A
A
C
G
T

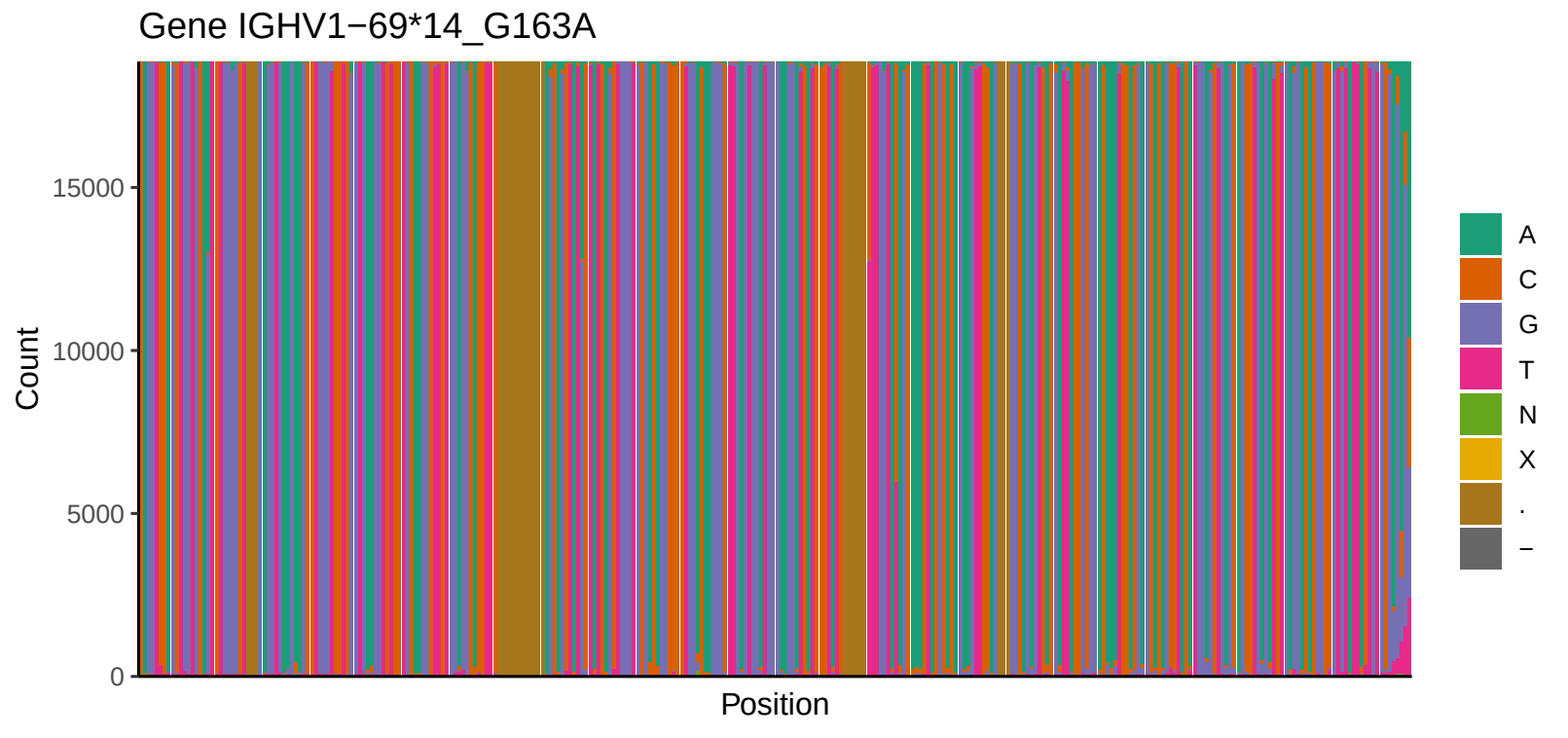

Gene IGHV3−66*03_T175G_T267G
Count
400
300
200
100
0
315
320
G C G A G A G A
Position
A
C
G
T

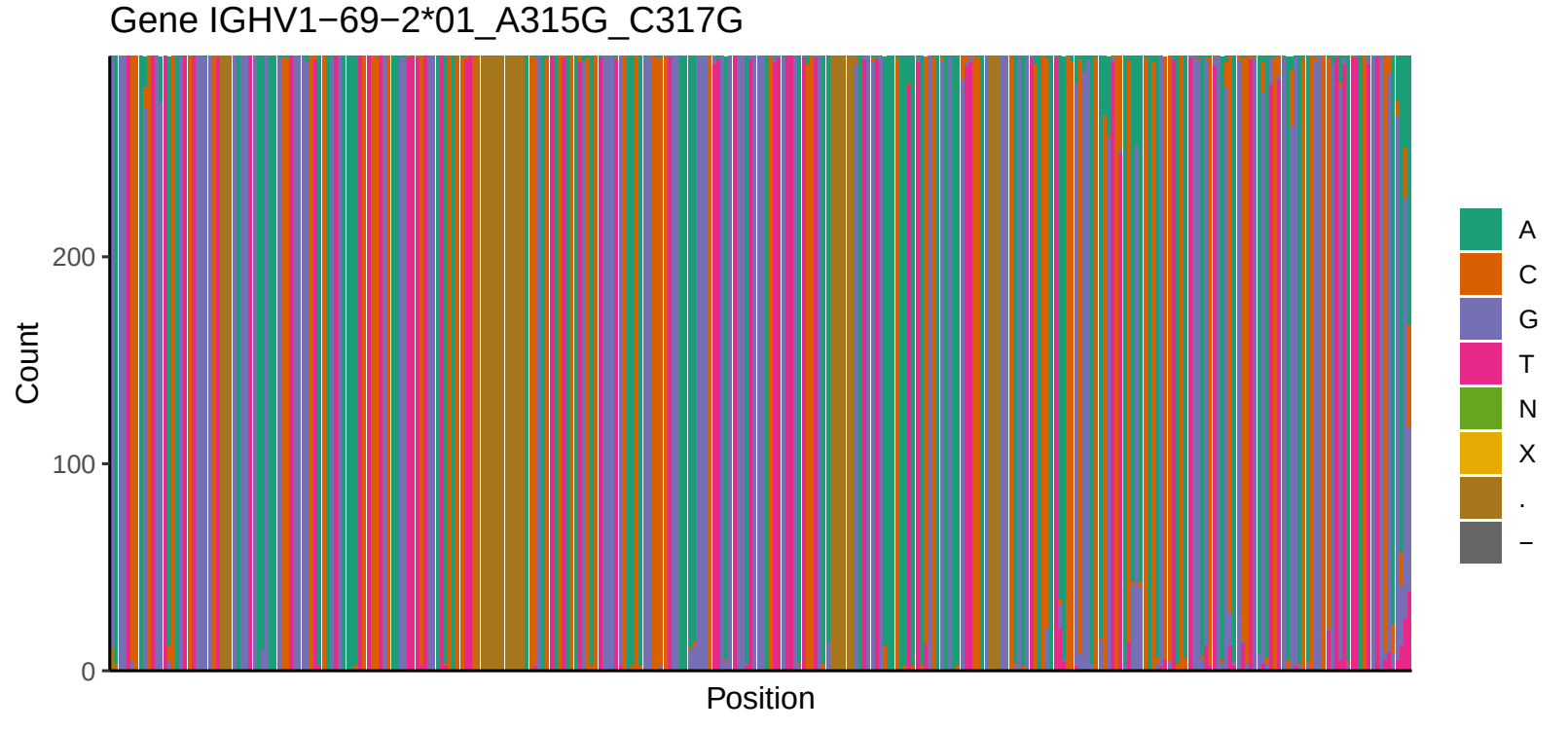

Gene IGHV4−61*10_C93T
Count
7500
5000
2500
0
315
G C G A G A G
Position
A
C
G
T

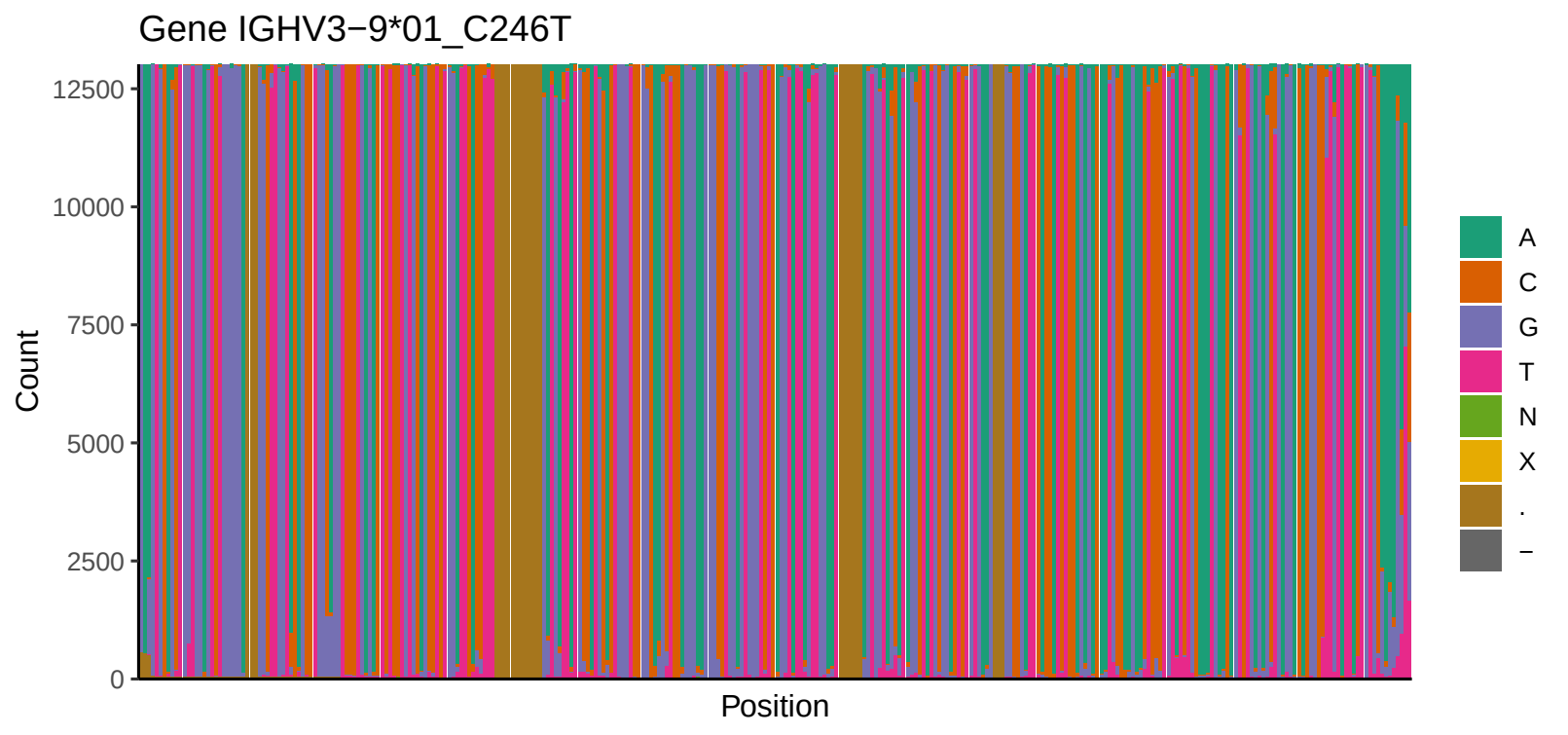

Gene IGHV4−30−2*01_C315G
Count
300
200
100
0
315
320
G C G A G A G A
Position
A
C
G
T


Gene IGHV4−38−2*02_A70G
Count
4000
3000
2000
1000
0
315
320
G C G A G A G A
Position
A
C
G
T

Gene IGHV1−24*01_A315G_C317G
Count
600
400
200
0
Position
A
C
G
T
N
X
.
–

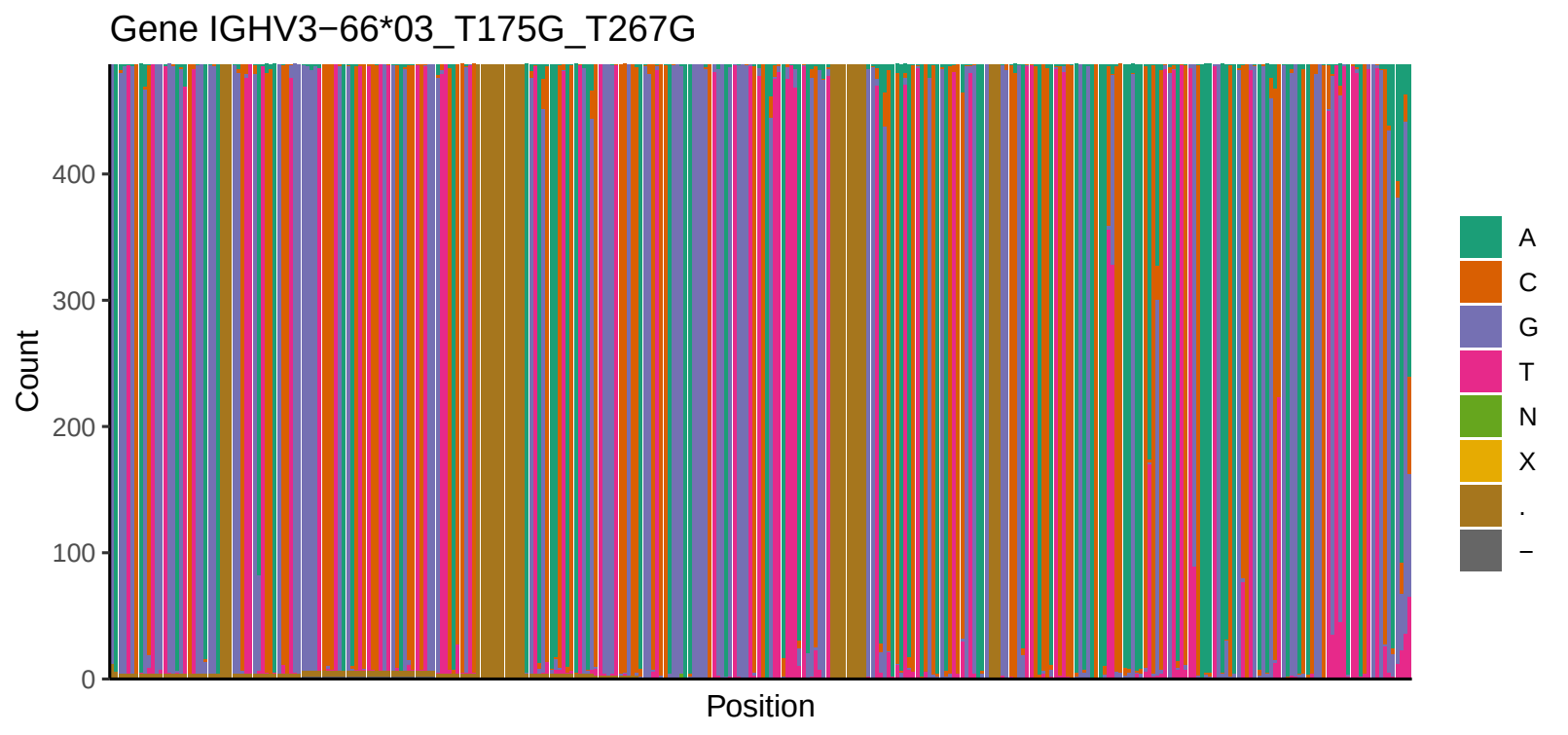

Gene IGHV1−69*14_G163A
Count
15000
10000
5000
0
Position
A
C
G
T
N
X
.
–

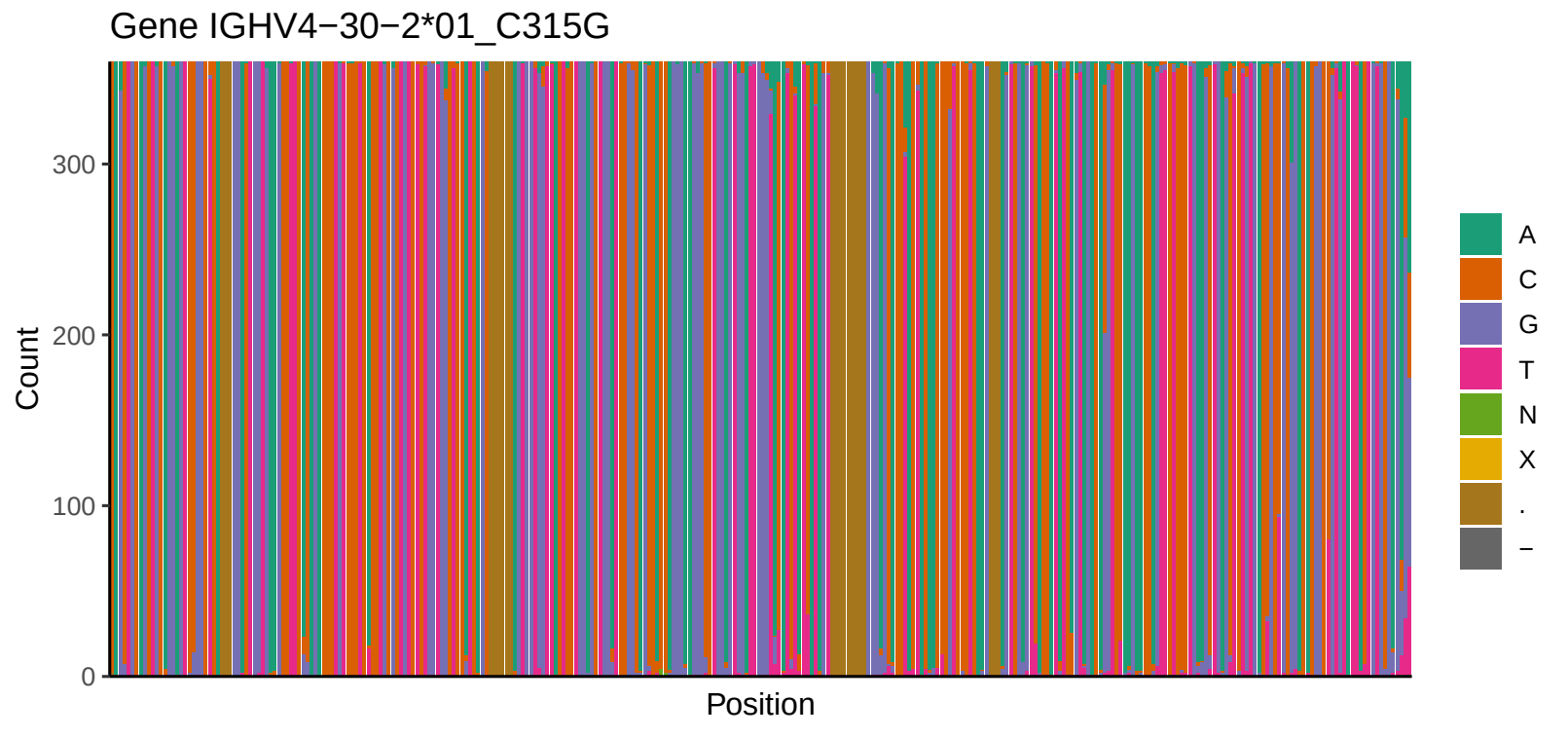

Gene IGHV1−69−2*01_A315G_C317G
Count
200
100
0
Position
A
C
G
T
N
X
.
–


Gene IGHV3−9*01_C246T
12500
10000
7500
5000
2500
0
Count
Position
A
C
G
T
N
X
.
–

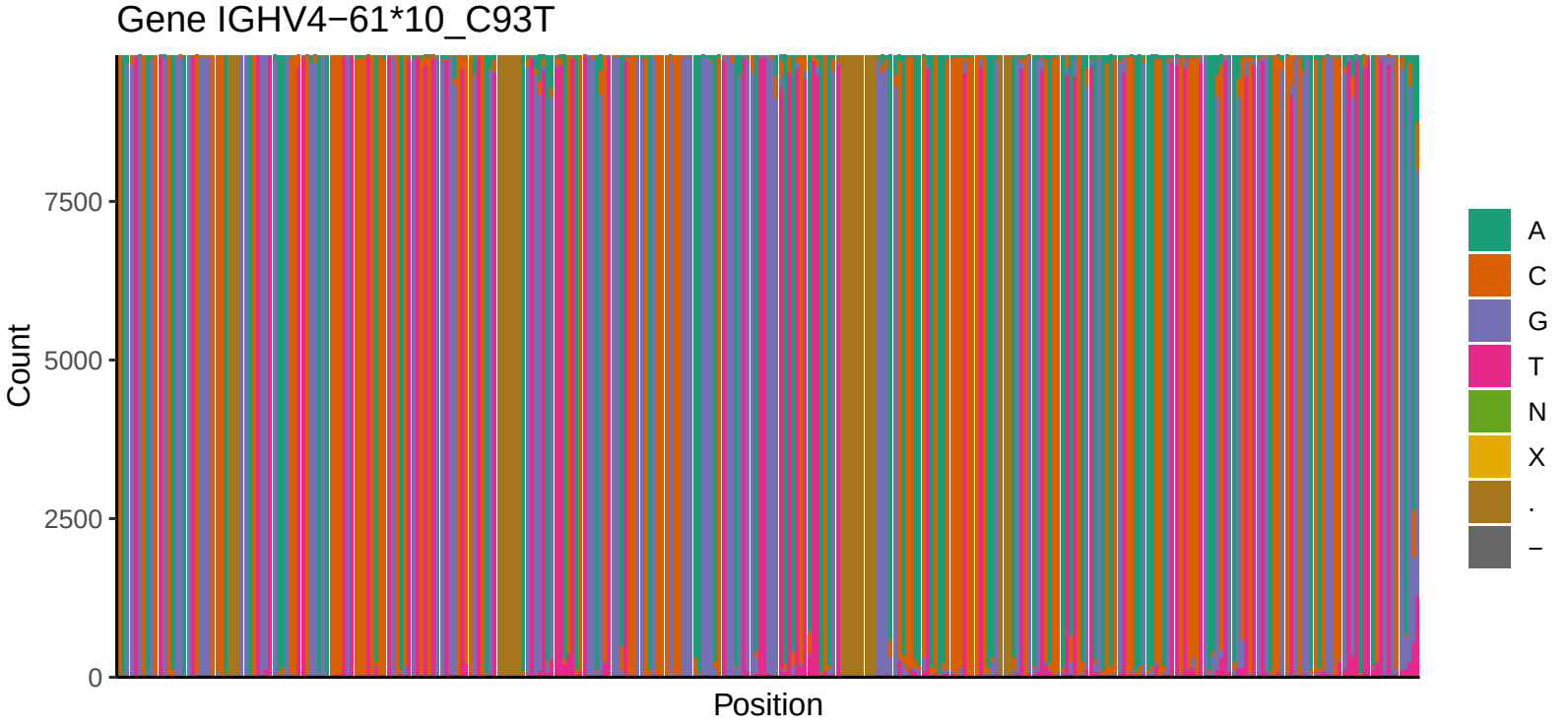
Gene IGHV3−13*01_A315G
160
120
80
40
0
Count
Position
A
C
G
T
N
X
.
–

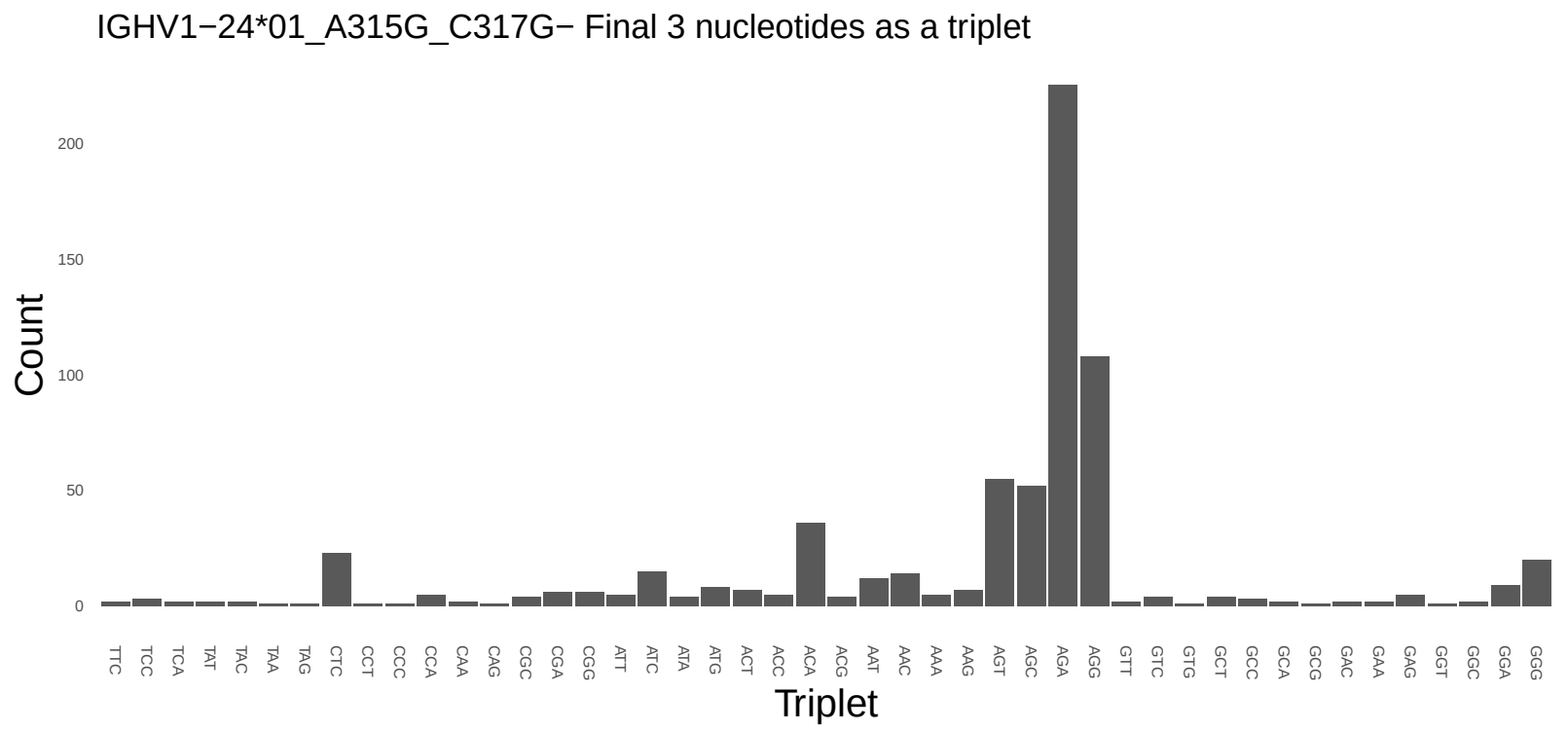
Gene IGHV3−53*02_A172G
750
500
250
0
Count
Position
A
C
G
T
N
X
.
–

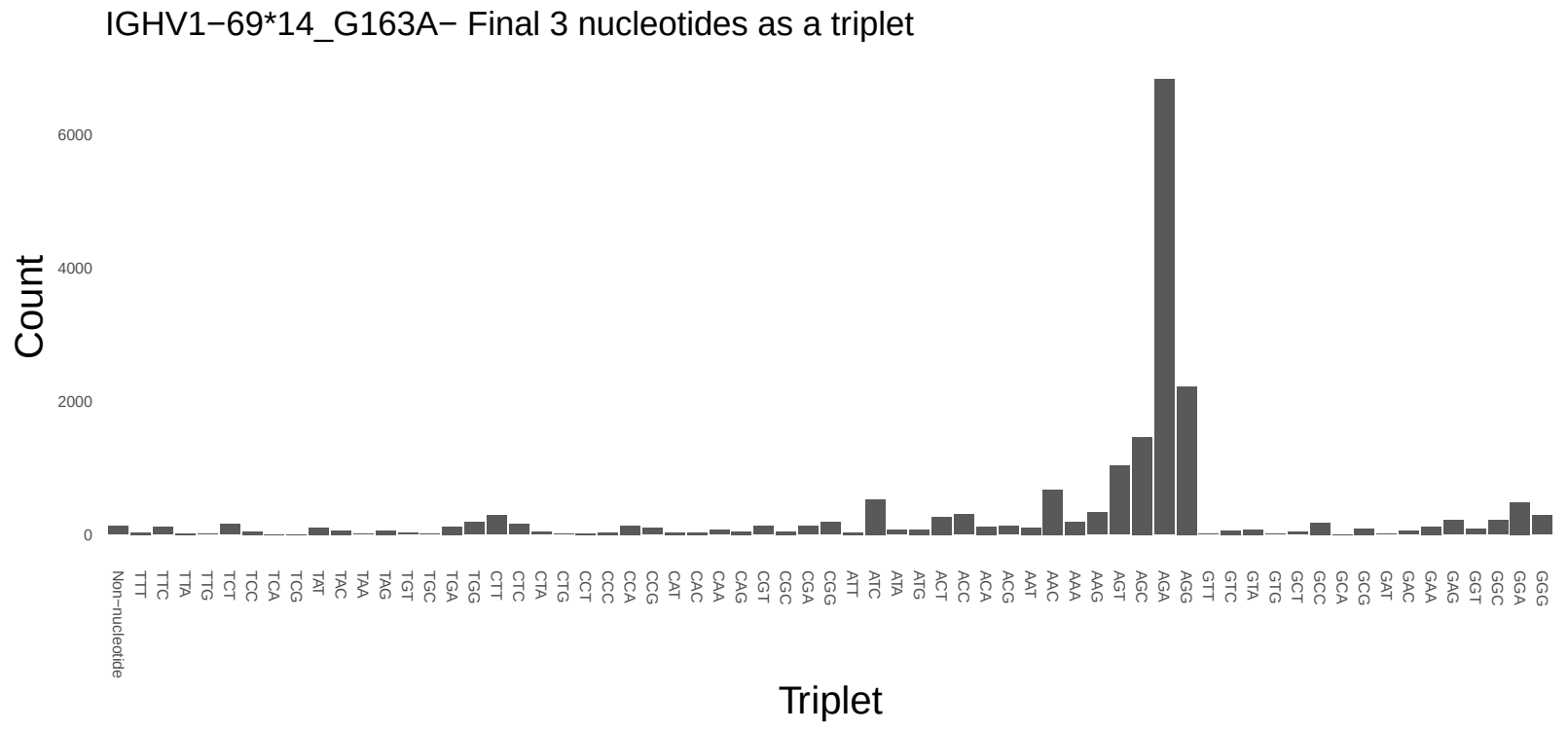

Gene IGHV3−66*03_T175G_T267G
Count
0
100
200
300
400
Position
A
C
G
T
N
X
.
–

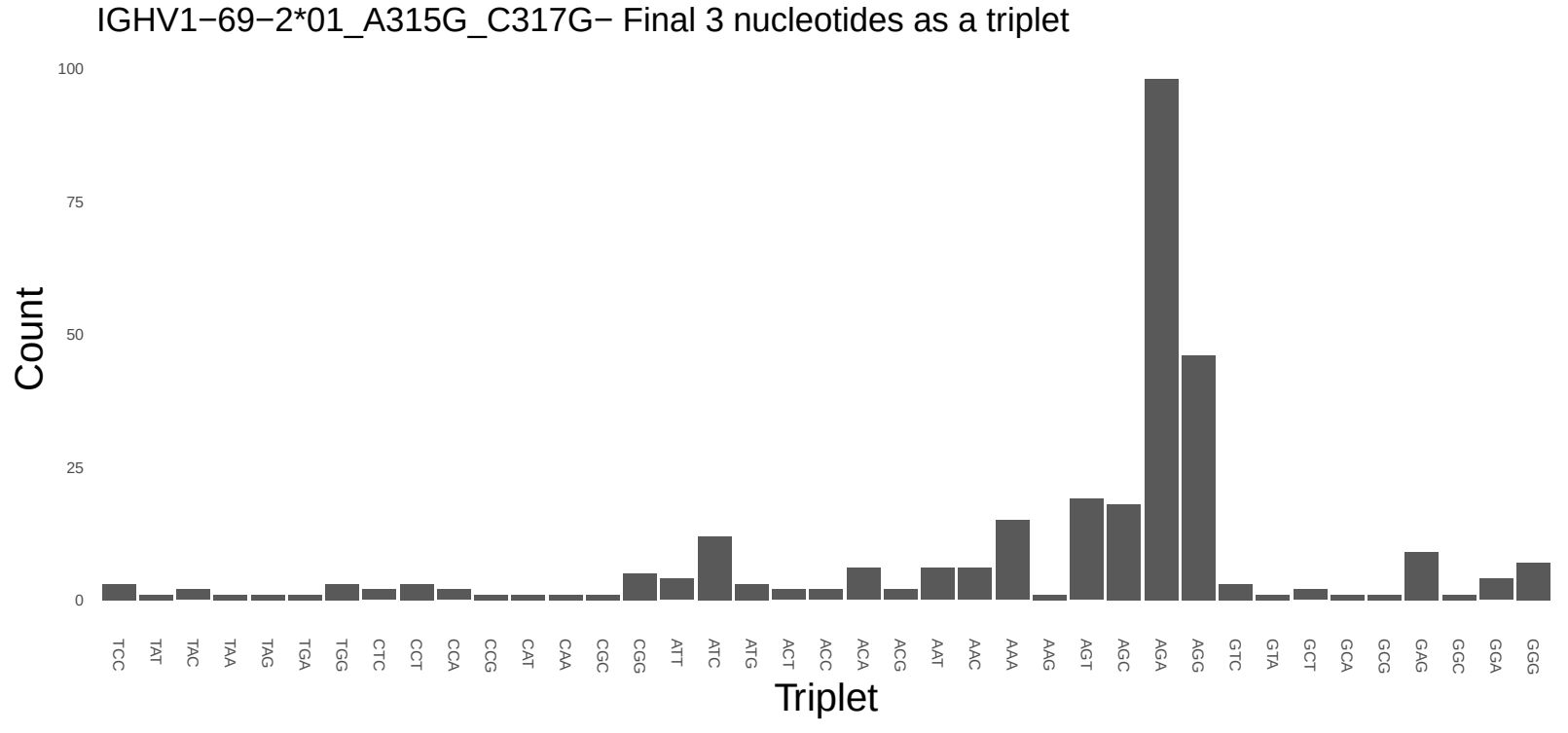

Gene IGHV4−30−2*01_C315G
Count
0
100
200
300
Position
A
C
G
T
N
X
.
–

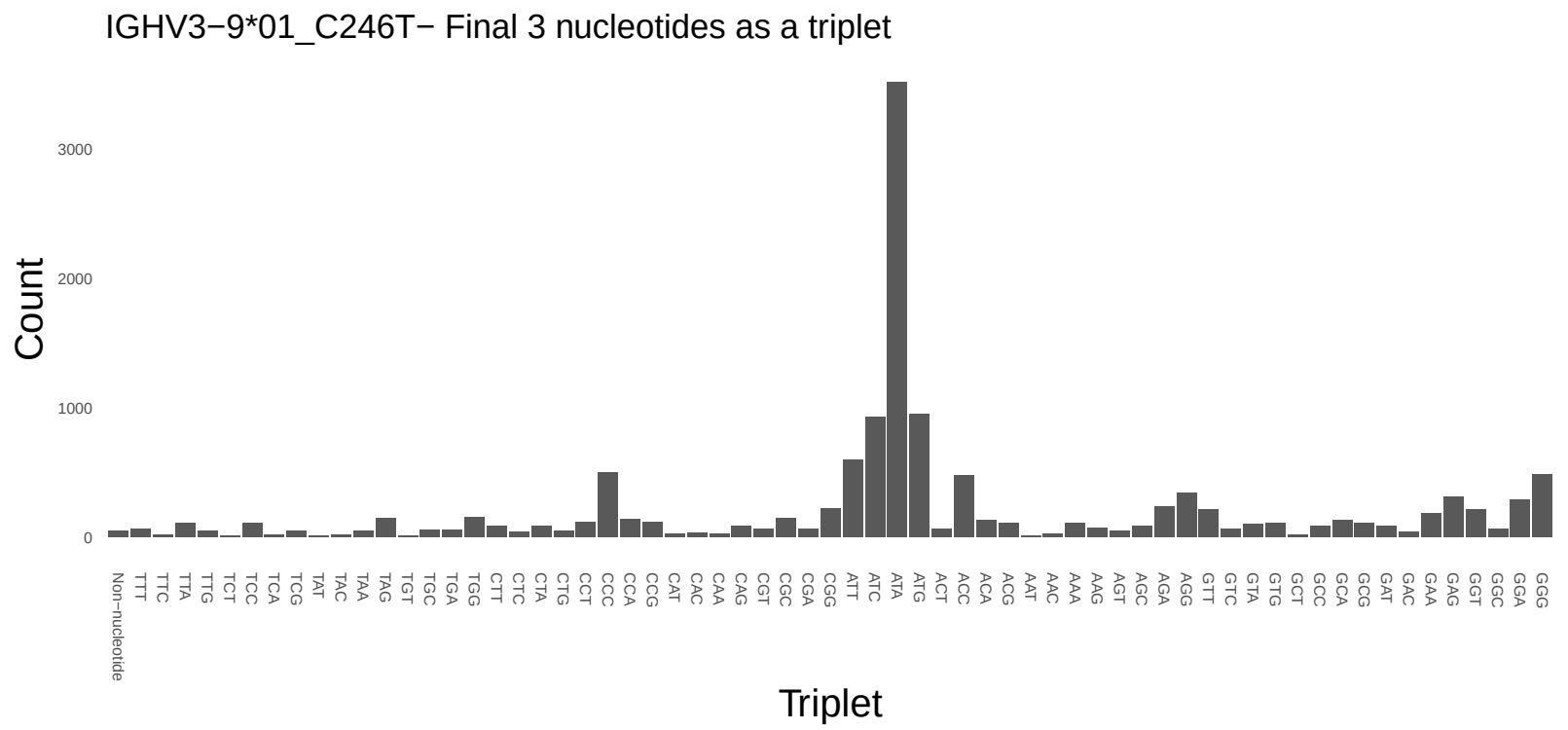
Gene IGHV4−38−2*02_A70G
Count
0
1000
2000
3000
4000
Position
A
C
G
T
N
X
.
–

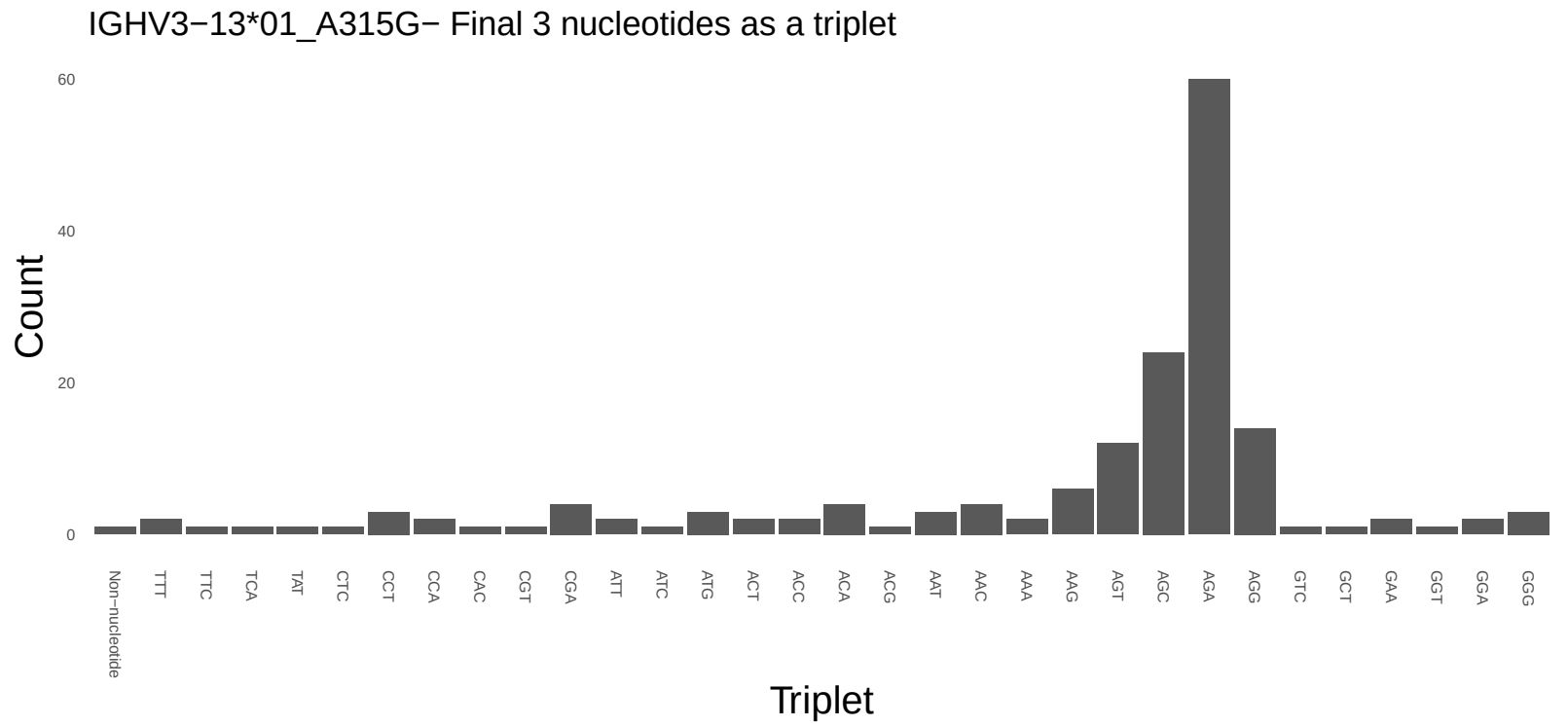

Gene IGHV4−61*10_C93T
Count
7500
5000
2500
0
Position
A
C
G
T
N
X
.
–

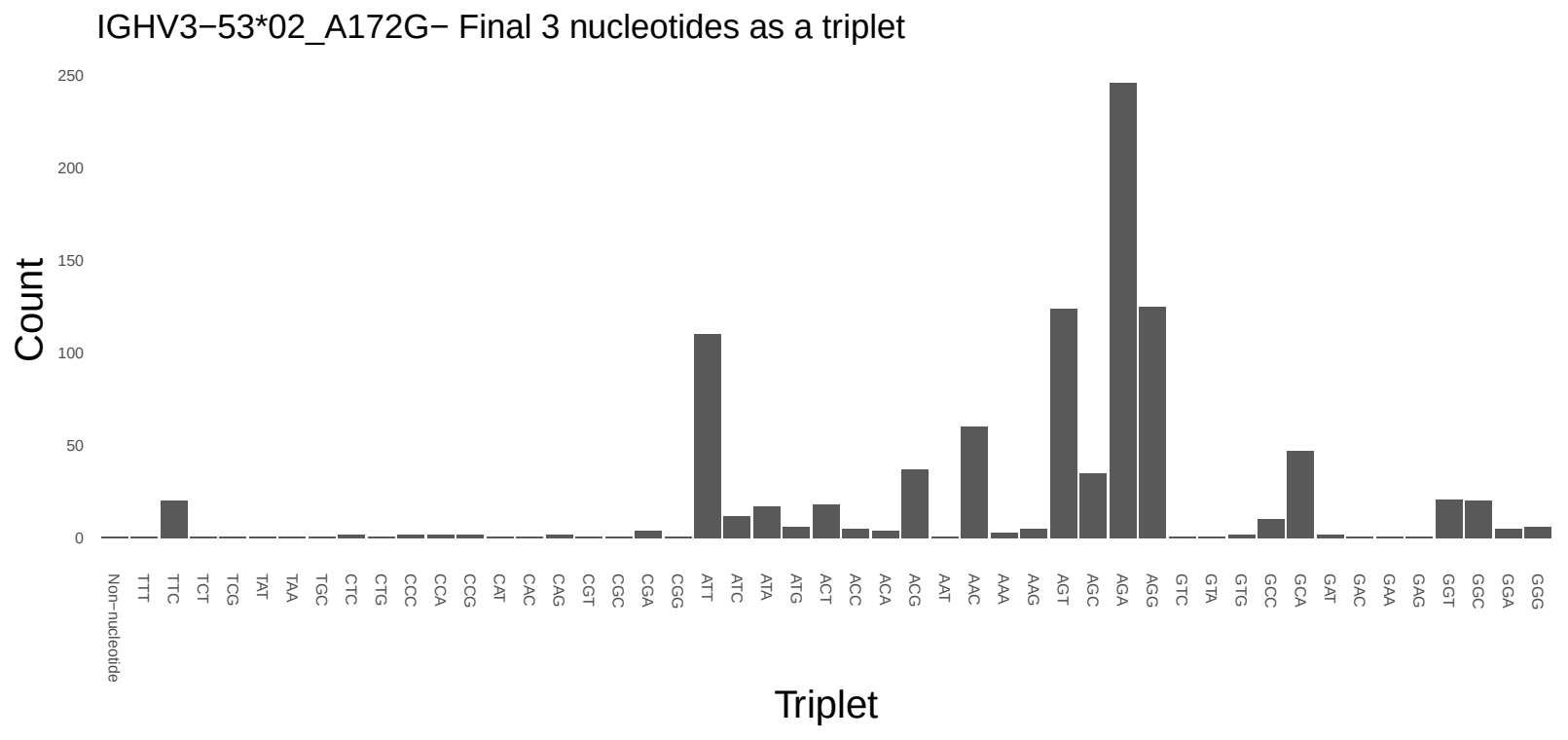

IGHV1−24*01_A315G_C317G− Final 3 nucleotides as a triplet
Count
200
150
100
50
0
TTC TCC TCA TAT TAC TAA TAG CTC CCT CCC CCA CAA CAG CGC CGA CGG ATT ATC ATA ATG ACT ACC ACA ACG AAT AAC AAA AAG AGT AGC AGA AGG GTT GTC GTG GCT GCC GCA GCG GAC GAA GAG GGT GGC GGA GGG
Triplet

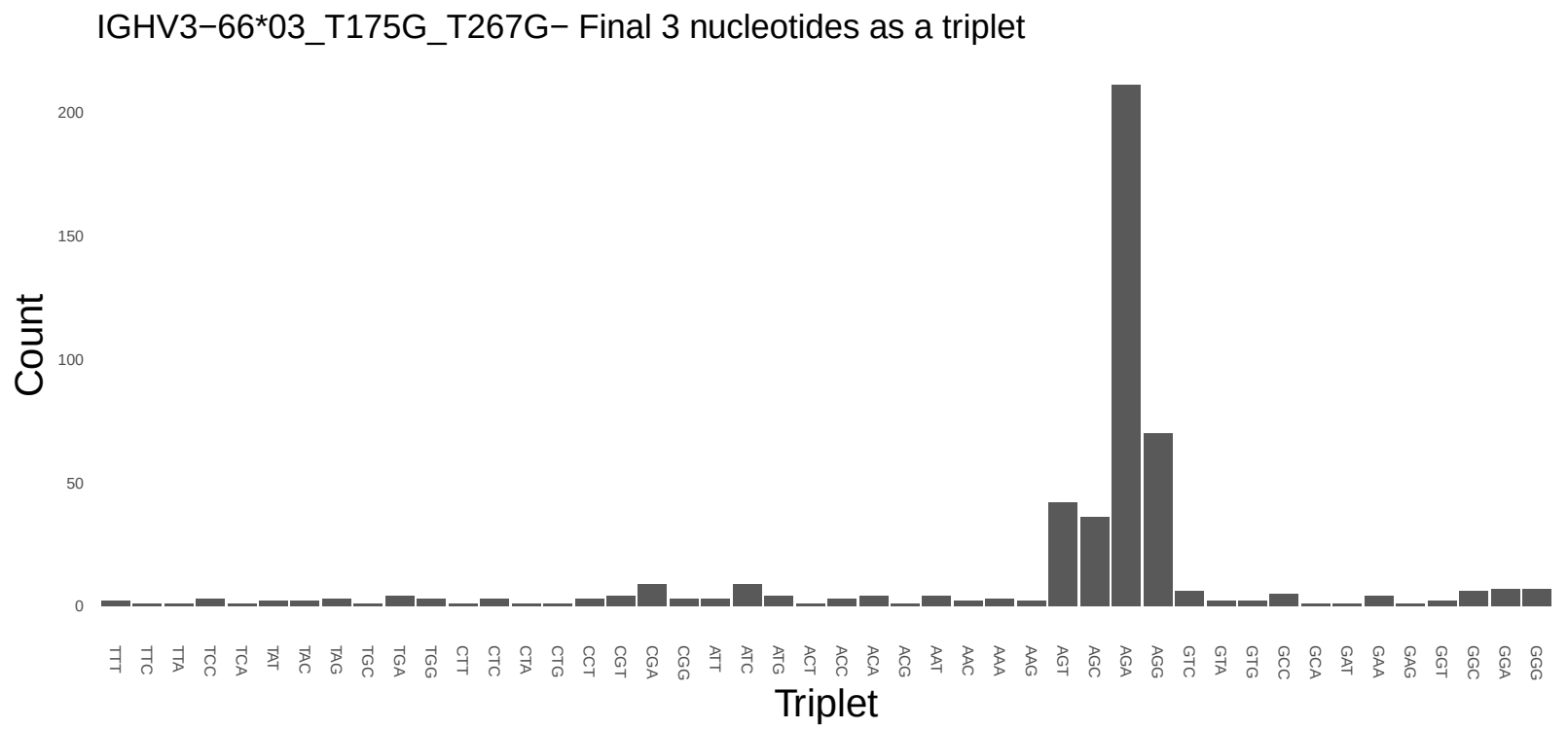

IGHV1−69*14_G163A− Final 3 nucleotides as a triplet
Count
6000
4000
2000
0
Non−nucleotide TTT TTC TTA TTG TCT TCC TCA TCG TAT TAC TAA TAG TGT TGC TGA TGG CTT CTC CTA CTG CCT CCC CCA CCG CAT CAC CAA CAG CGT CGC CGA CGG ATT ATC ATA ATG ACT ACC ACA ACG AAT AAC AAA AAG AGT AGC AGA AGG GTT GTC GTA GTG GCT GCC GCA GCG GAT GAC GAA GAG GGT GGC GGA GGG
Triplet

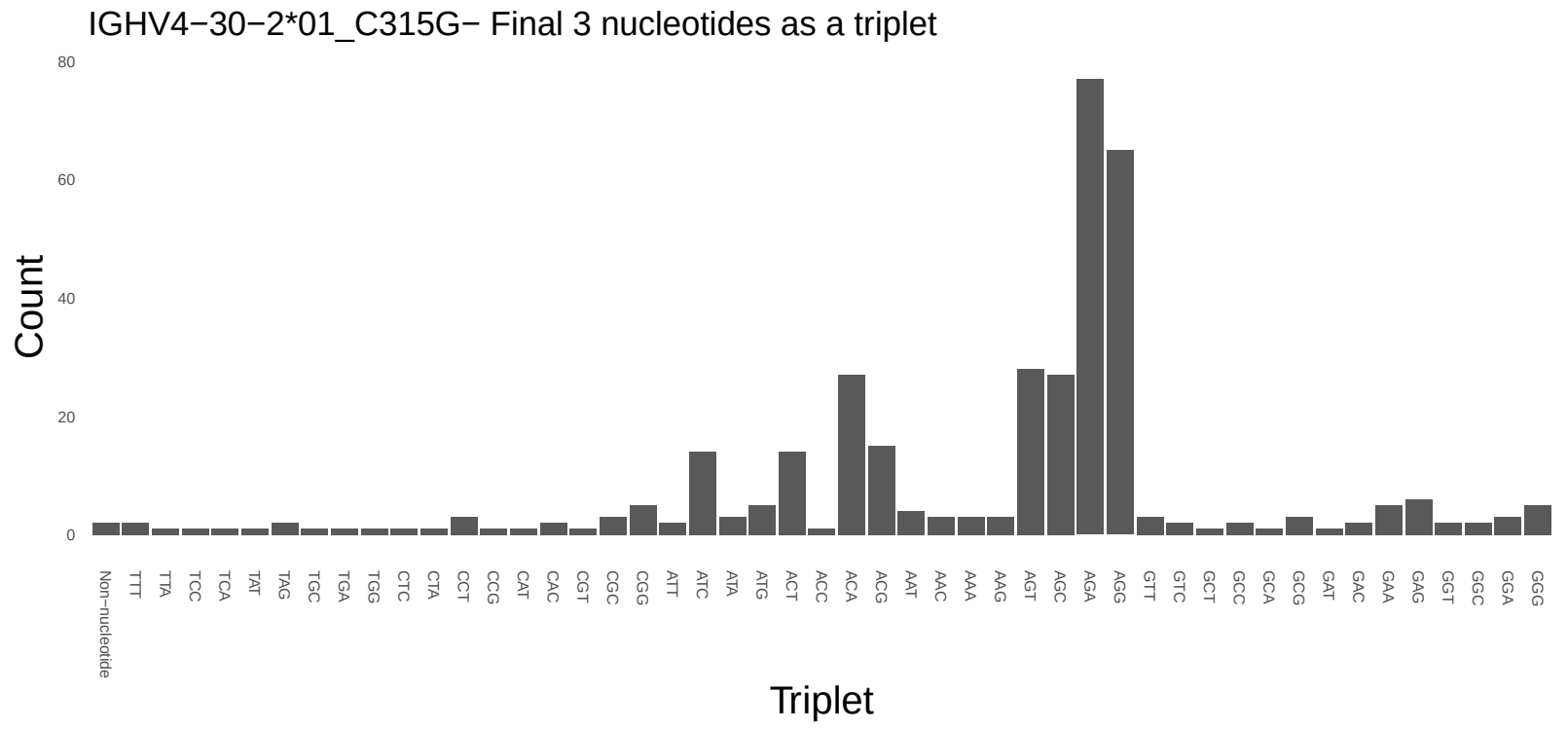

IGHV1−69−2*01_A315G_C317G− Final 3 nucleotides as a triplet
Count
100
75
50
25
0
TCC TAT TAC TAA TAG TGA TGG CTC CCT CCA CCG CAT CAA CGC CGG ATT ATC ATG ACT ACC ACA ACG AAT AAC AAA AAG AGT AGC AGA AGG GTC GTA GCT GCA GCG GAG GGC GGA GGG
Triplet

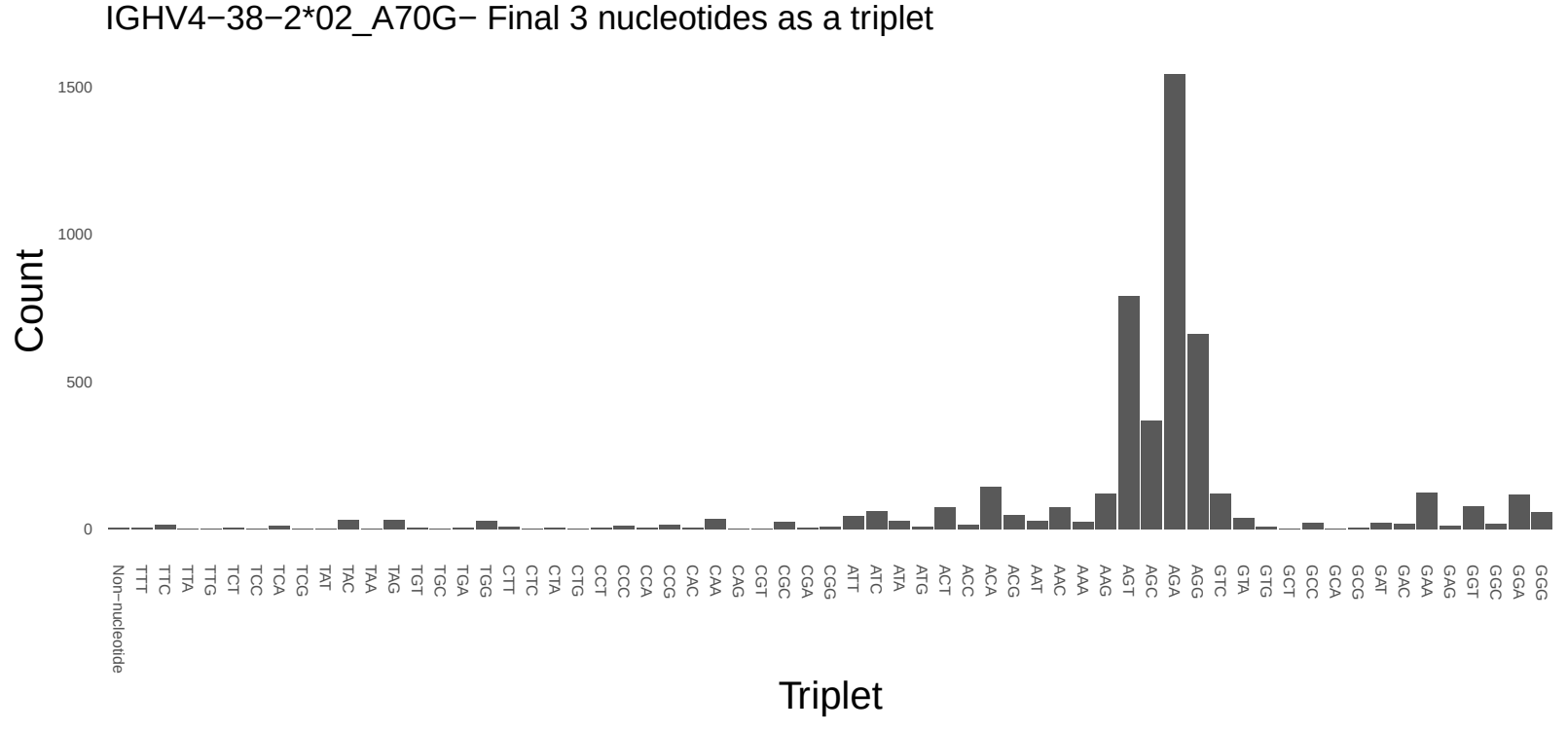

IGHV3−9*01_C246T− Final 3 nucleotides as a triplet
Count
3000
2000
1000
0
Non−nucleotide
TTT TTC TTA TTG TCT TCC TCA TCG TAT TAC TAA TAG TGT TGC TGA TGG CTT CTC CTA CTG CCT CCC CCA CCG CAT CAC CAA CAG CGT CGC CGA CGG ATT ATC ATA ATG ACT ACC ACA ACG AAT AAC AAA AAG AGT AGC AGA AGG GTT GTC GTA GTG GCT GCC GCA GCG GAT GAC GAA GAG GGT GGC GGA GGG
Triplet

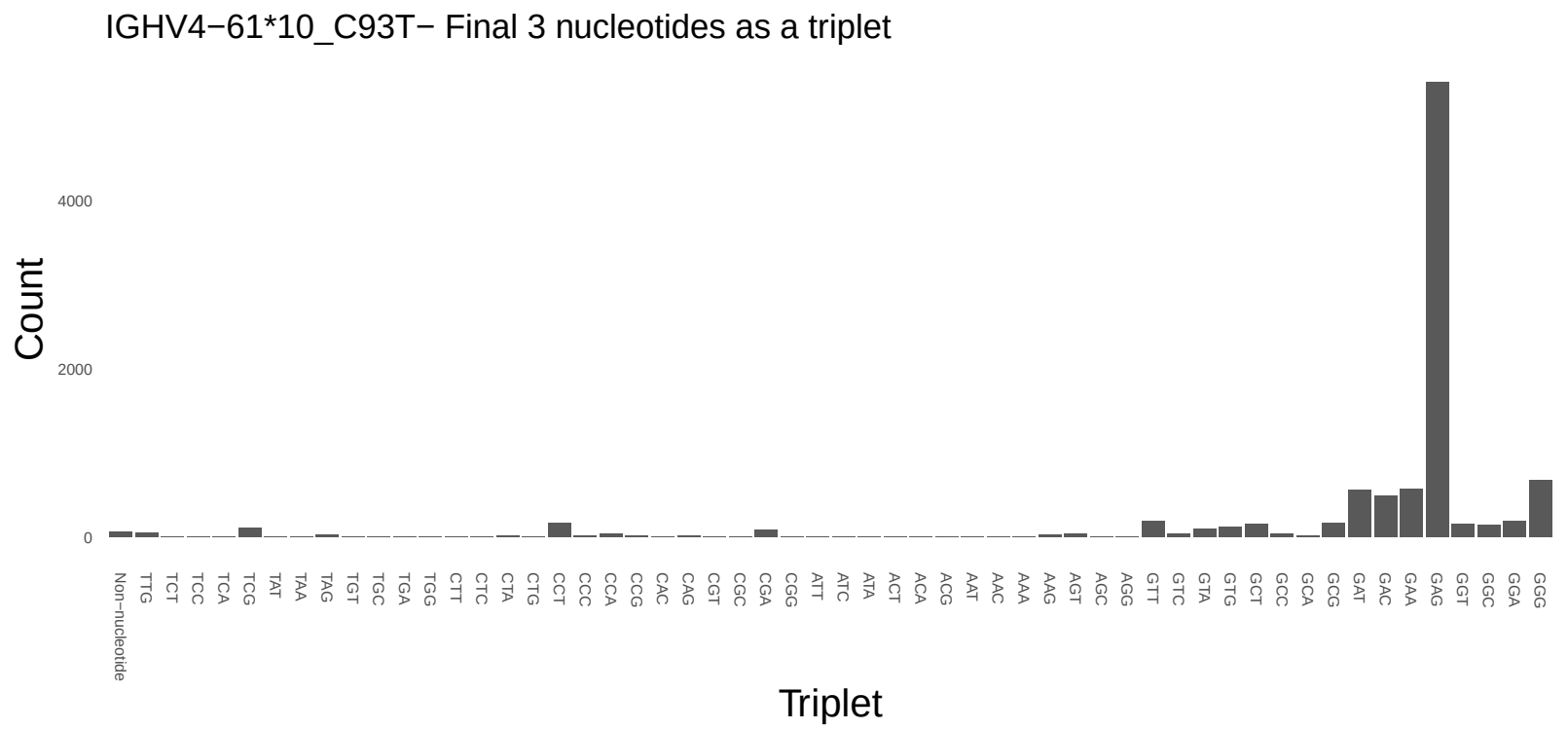

IGHV3−13*01_A315G− Final 3 nucleotides as a triplet
Count
60
40
20
0
Non−nucleotide
TTT TTC TCA TAT CTC CCT CCA CAC CGT CGA ATT ATC ATG ACT ACC ACA ACG AAT AAC AAA AAG AGT AGC AGA AGG GTC GCT GAA GGT GGA GGG
Triplet


IGHV3−53*02_A172G− Final 3 nucleotides as a triplet
Count
250
200
150
100
50
0
Non−nucleotide
TTT TTC TCT TCG TAT TAA TGC CTC CTG CCC CCA CCG CAT CAC CAG CGT CGC CGA CGG ATT ATC ATA ATG ACT ACC ACA ACG AAT AAC AAA AAG AGT AGC AGA AGG GTC GTA GTG GCC GCA GAT GAC GAA GAG GGT GGC GGA GGG
Triplet


IGHV3−66*03_T175G_T267G− Final 3 nucleotides as a triplet
Count
Triplet

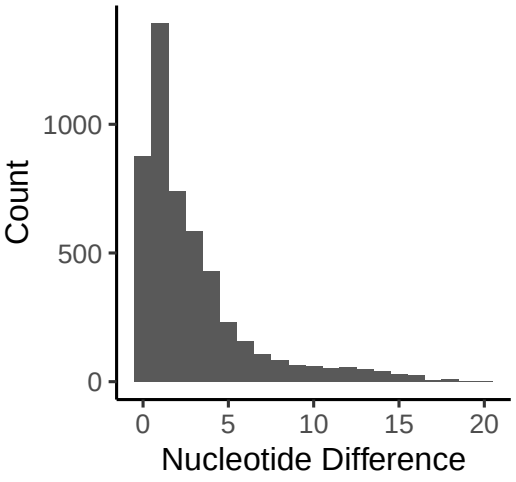

IGHV4−30−2*01_C315G− Final 3 nucleotides as a triplet
Count
Triplet


IGHV4−38−2*02_A70G− Final 3 nucleotides as a triplet
Count
Triplet


IGHV4−61*10_C93T− Final 3 nucleotides as a triplet
Count
4000
2000
0
Non−nucleotide
TTG
TCT
TCC
TCA
TCG
TAT
TAA
TAG
TGT
TGC
TGA
TGG
CTT
CTC
CTA
CTG
CCT
CCC
CCA
CCG
CAC
CAG
CGT
CGC
CGA
CGG
ATT
ATC
ATA
ACT
ACA
ACG
AAT
AAC
AAA
AAG
AGT
AGC
AGG
GTT
GTC
GTA
GTG
GCT
GCC
GCA
GCG
GAT
GAC
GAA
GAG
GGT
GGC
GGA
GGG
Triplet

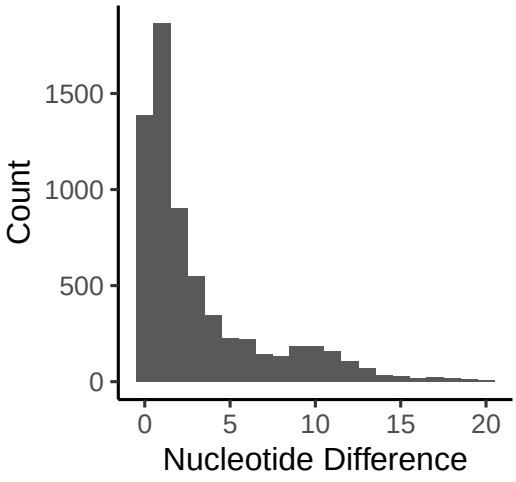
IGHV1−2*04

5042 sequences assigned
878 (17.4%) exact matches, in which:
639 unique CDR3
7 unique J



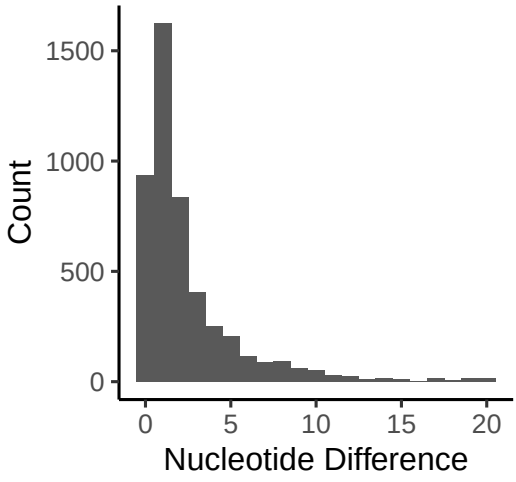
IGHV1−8*01

6721 sequences assigned
1386 (20.6%) exact matches, in which:
1058 unique CDR3
7 unique J



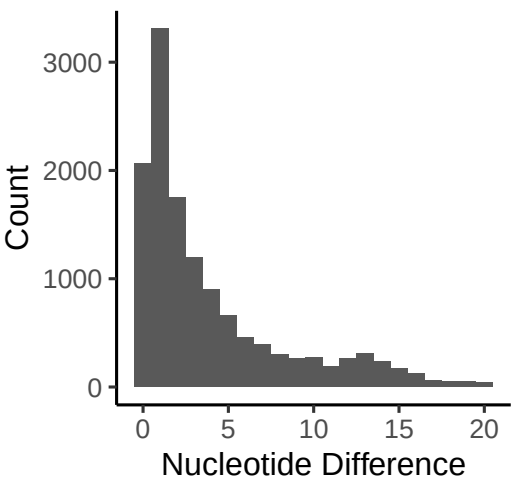
IGHV1−24*01

4926 sequences assigned
935 (19%) exact matches, in which:
596 unique CDR3
7 unique J



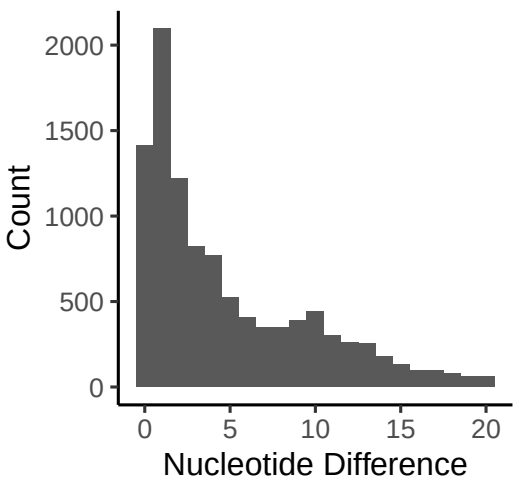
IGHV1−2*06

13250 sequences assigned
2063 (15.6%) exact matches, in which:
1469 unique CDR3
7 unique J



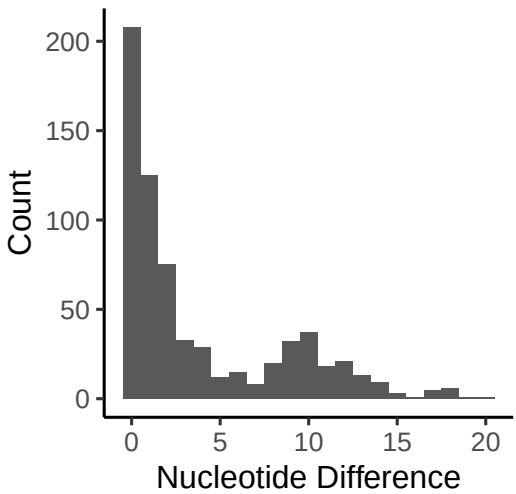
IGHV1−18*01

10427 sequences assigned
1411 (13.5%) exact matches, in which:
1046 unique CDR3
7 unique J



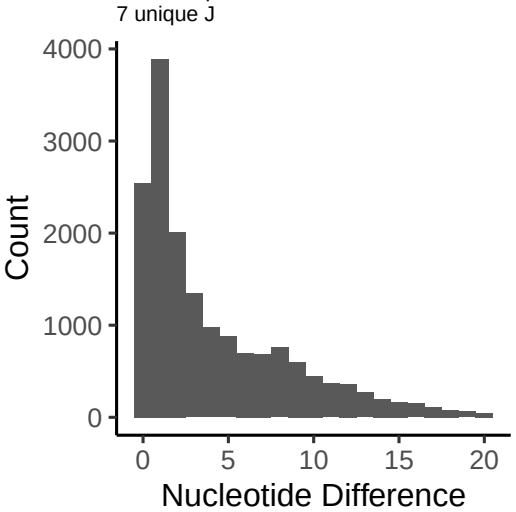
IGHV1−24*01_A315G_C3

682 sequences assigned
208 (30.5%) exact matches, in which:
205 unique CDR3
7 unique J



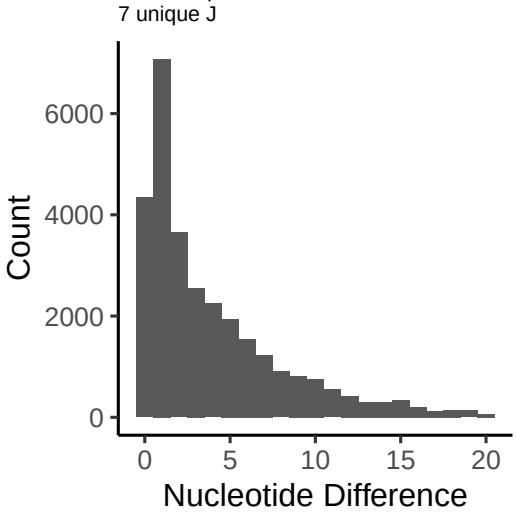
IGHV1−3*01

16948 sequences assigned
2546 (15%) exact matches, in which:
1823 unique CDR3
7 unique J



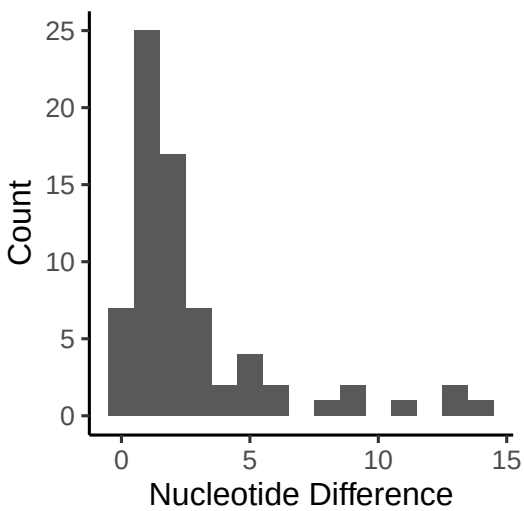
IGHV1−18*04

29902 sequences assigned
4341 (14.5%) exact matches, in which:
3097 unique CDR3
7 unique J



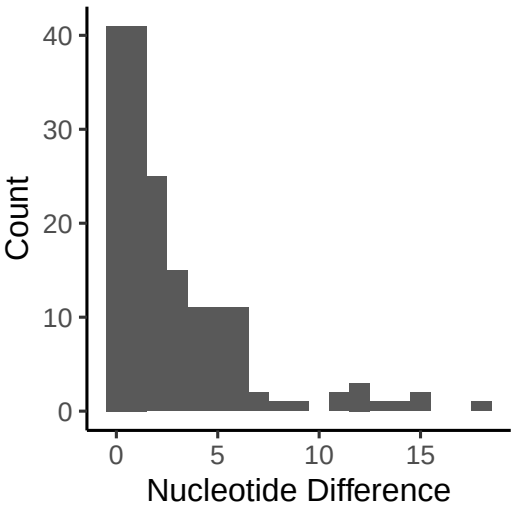
IGHV1−38−4*01

74 sequences assigned
7 (9.5%) exact matches, in which:
5 unique CDR3
2 unique J



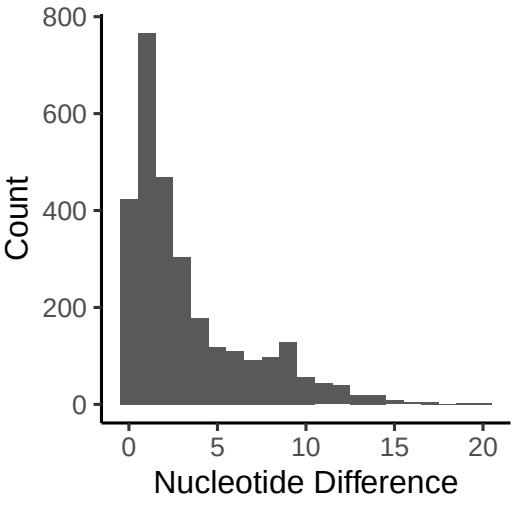
IGHV1−45*02

173 sequences assigned
41 (23.7%) exact matches, in which:
30 unique CDR3
5 unique J



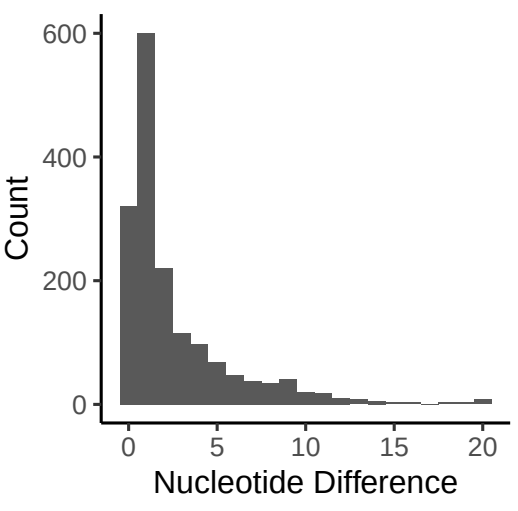
IGHV1−58*01

2902 sequences assigned
424 (14.6%) exact matches, in which:
284 unique CDR3
7 unique J



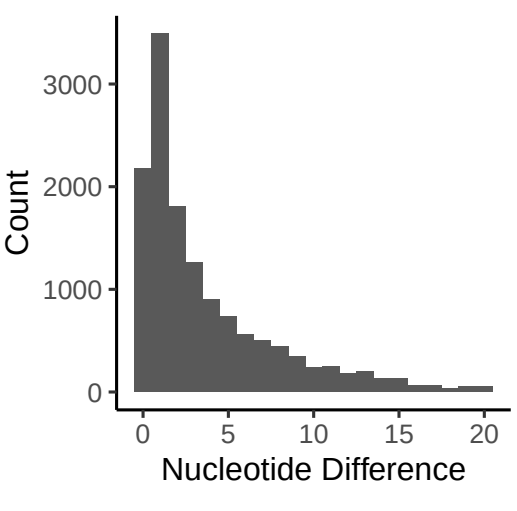
IGHV1−69−2*01

1704 sequences assigned
321 (18.8%) exact matches, in which:
198 unique CDR3
7 unique J



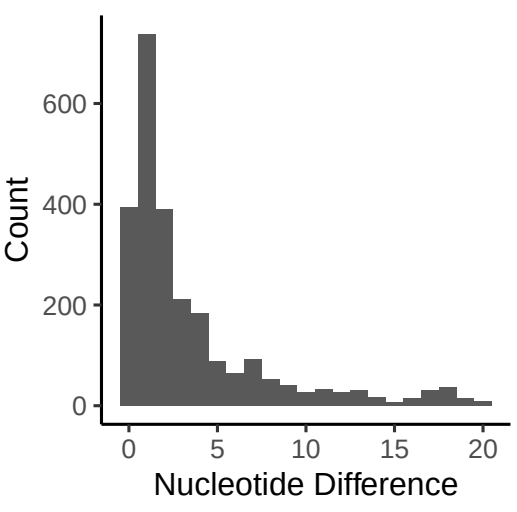
IGHV1−46*01

13832 sequences assigned
2179 (15.8%) exact matches, in which:
1535 unique CDR3
7 unique J



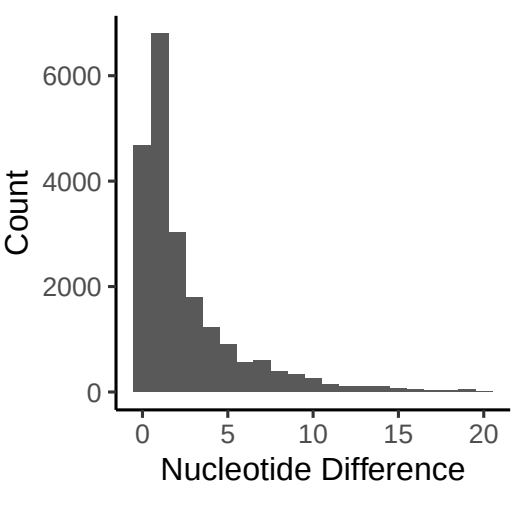
IGHV1−58*02

2524 sequences assigned
394 (15.6%) exact matches, in which:
272 unique CDR3
7 unique J



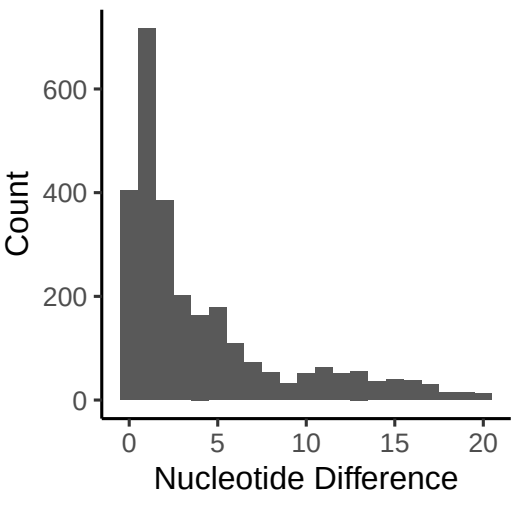
IGHV1−69*06

21550 sequences assigned
4682 (21.7%) exact matches, in which:
3414 unique CDR3
7 unique J



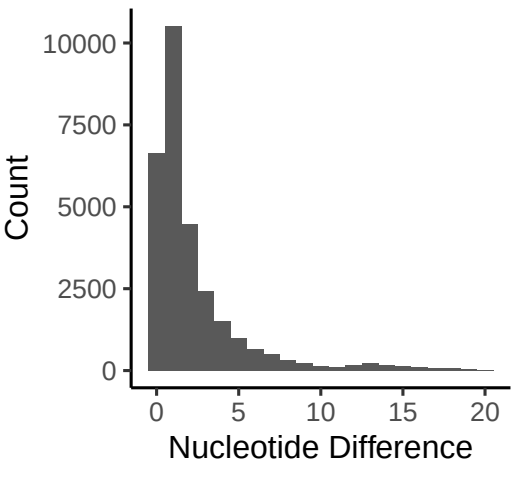
IGHV1−46*03

2775 sequences assigned
404 (14.6%) exact matches, in which:
271 unique CDR3
7 unique J



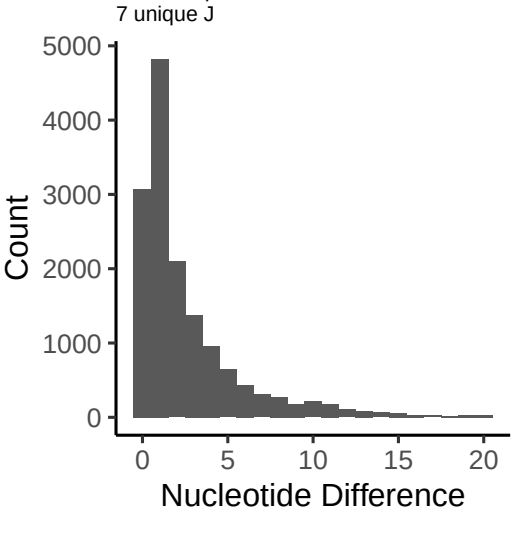
IGHV1−69*01

30188 sequences assigned
6645 (22%) exact matches, in which:
4894 unique CDR3
7 unique J



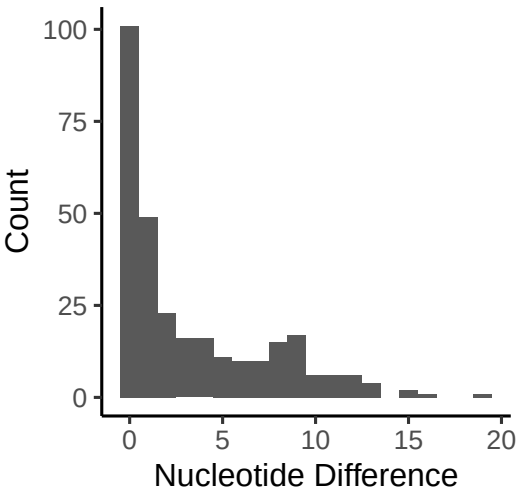
IGHV1−69*13

15138 sequences assigned
3069 (20.3%) exact matches, in which:
2254 unique CDR3
7 unique J



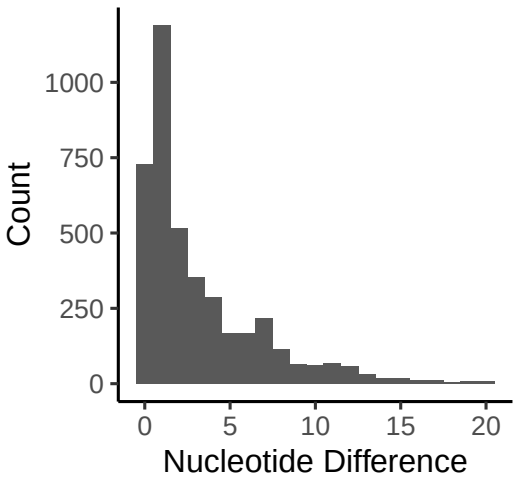
IGHV1−69−2*01_A315G_

297 sequences assigned
101 (34%) exact matches, in which:
101 unique CDR3
7 unique J



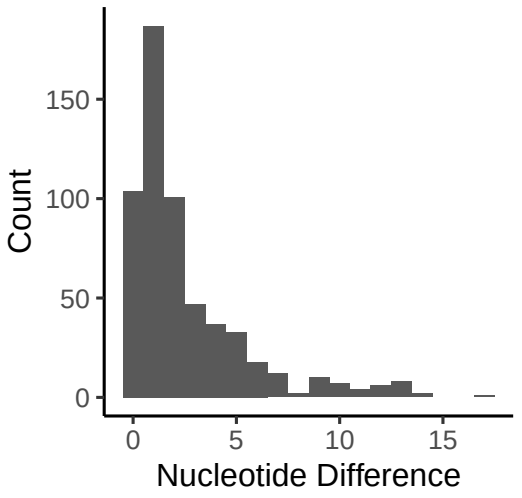
IGHV2−26*01

4148 sequences assigned
728 (17.6%) exact matches, in which:
515 unique CDR3
7 unique J



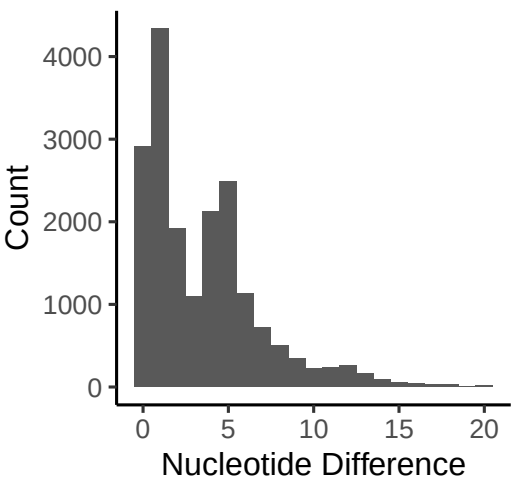
IGHV2−70*20

586 sequences assigned
104 (17.7%) exact matches, in which:
69 unique CDR3
5 unique J



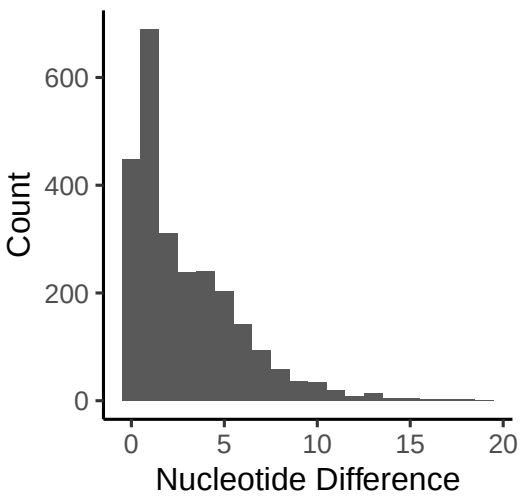
IGHV1−69*14_G163A

18863 sequences assigned
2917 (15.5%) exact matches, in which:
2153 unique CDR3
7 unique J



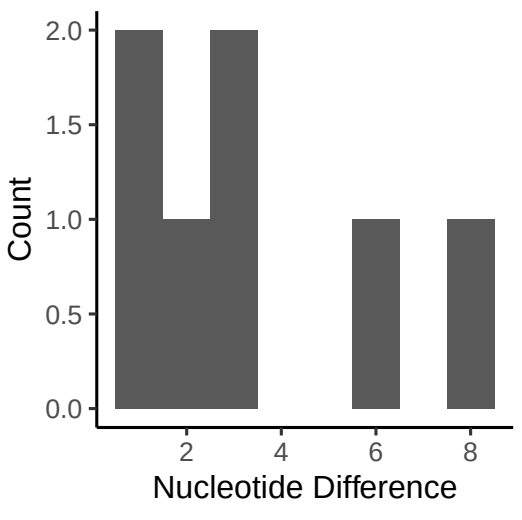
IGHV2−70*01

2581 sequences assigned
448 (17.4%) exact matches, in which:
306 unique CDR3
5 unique J



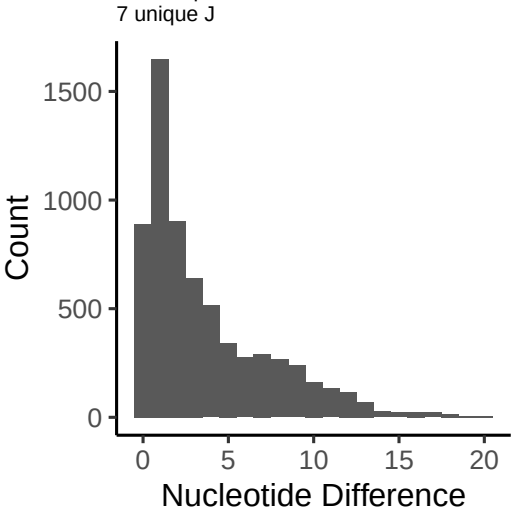
IGHV2−70D*14

10 sequences assigned
No exact matches.



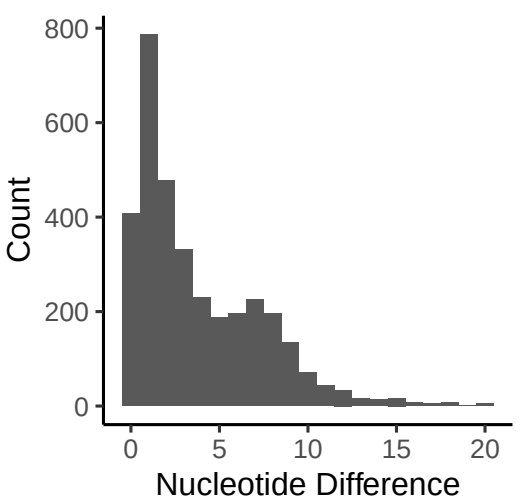
IGHV2−5*02

6702 sequences assigned
891 (13.3%) exact matches, in which:
627 unique CDR3
7 unique J



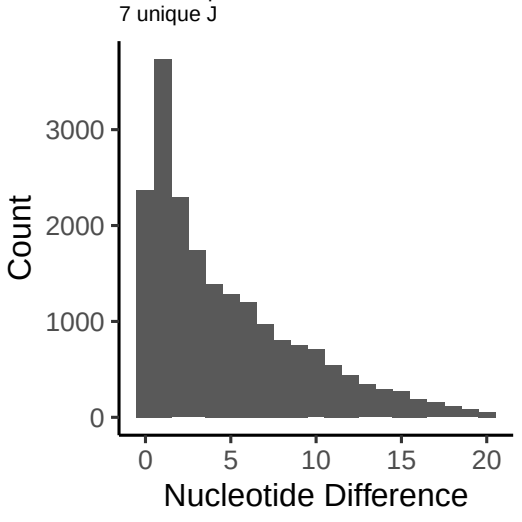
IGHV2−70*04

3434 sequences assigned
408 (11.9%) exact matches, in which:
268 unique CDR3
7 unique J



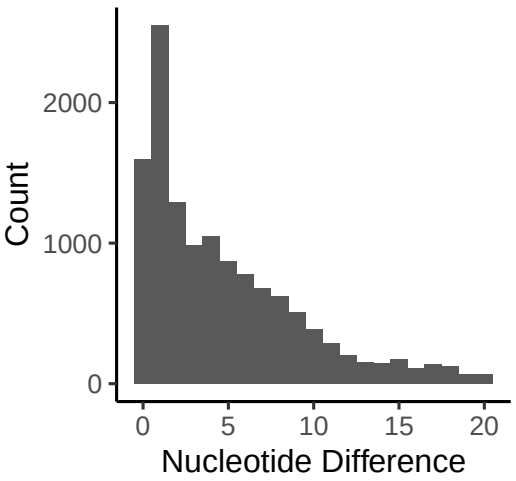
IGHV3−7*03

20368 sequences assigned
2369 (11.6%) exact matches, in which:
1775 unique CDR3
7 unique J



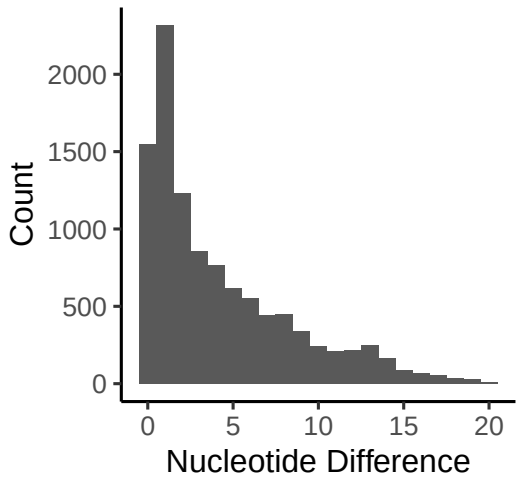
IGHV3−9*01_C246T

13020 sequences assigned
1599 (12.3%) exact matches, in which:
1134 unique CDR3
7 unique J



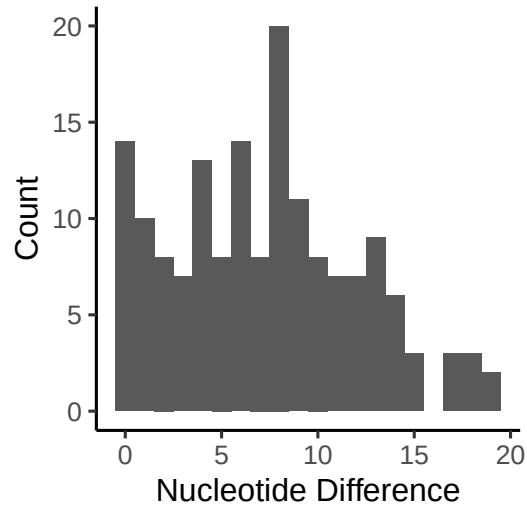
IGHV3−11*06

10574 sequences assigned
1549 (14.6%) exact matches, in which:
1092 unique CDR3
7 unique J



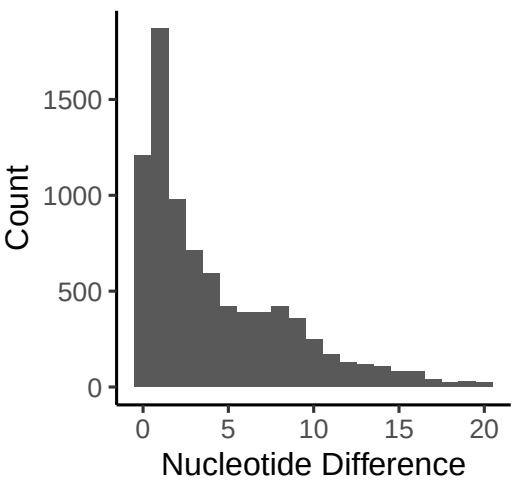
IGHV3−13*01_A315G

168 sequences assigned
14 (8.3%) exact matches, in which:
14 unique CDR3
4 unique J



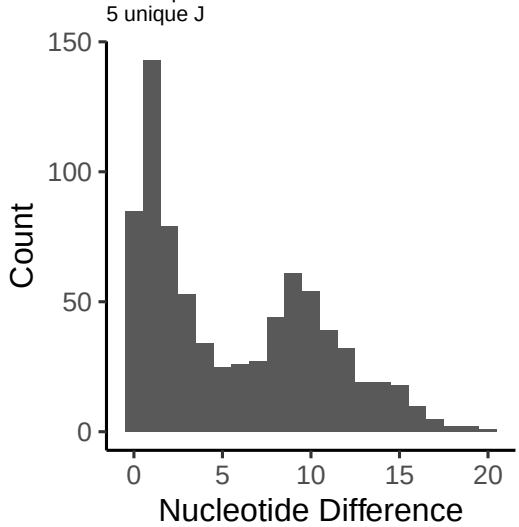
IGHV3−11*01

8457 sequences assigned
1209 (14.3%) exact matches, in which:
828 unique CDR3
7 unique J



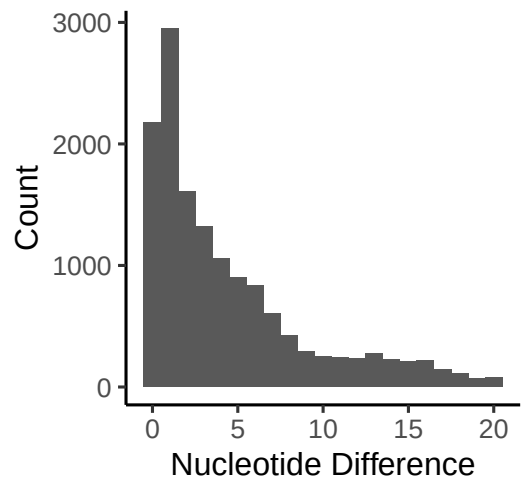
IGHV3−13*01

804 sequences assigned
85 (10.6%) exact matches, in which:
59 unique CDR3
5 unique J



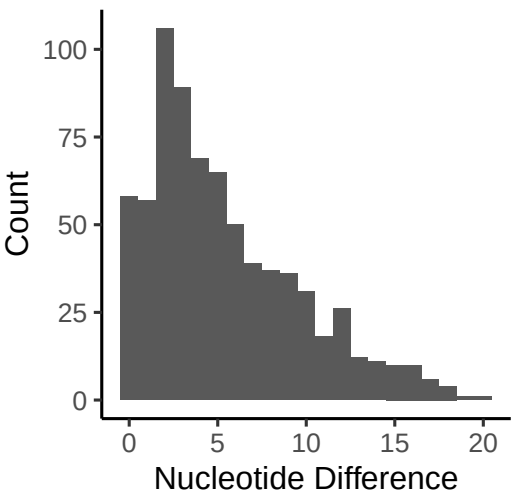
IGHV3−15*01

14602 sequences assigned
2174 (14.9%) exact matches, in which:
1512 unique CDR3
7 unique J



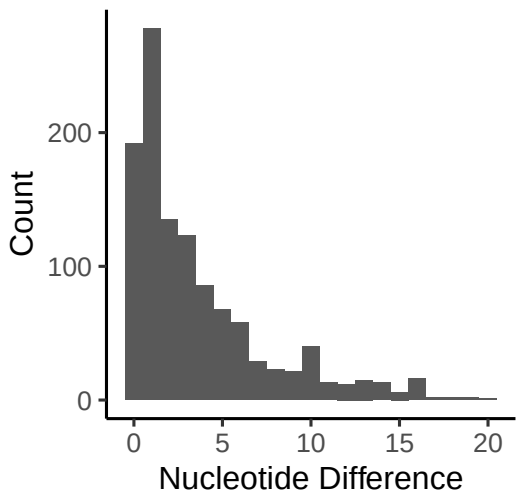
IGHV3−11*04

765 sequences assigned
58 (7.6%) exact matches, in which:
58 unique CDR3
6 unique J



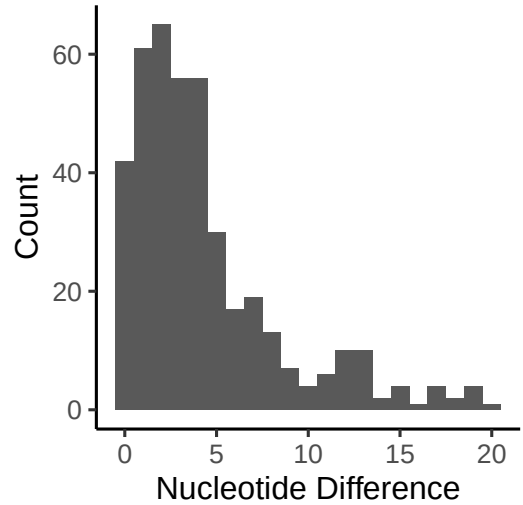
IGHV3−13*05

1145 sequences assigned
192 (16.8%) exact matches, in which:
129 unique CDR3
5 unique J



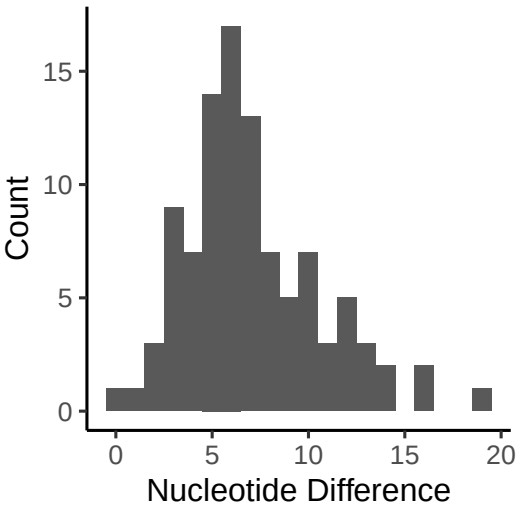
IGHV3−20*01

420 sequences assigned
42 (10%) exact matches, in which:
29 unique CDR3
5 unique J



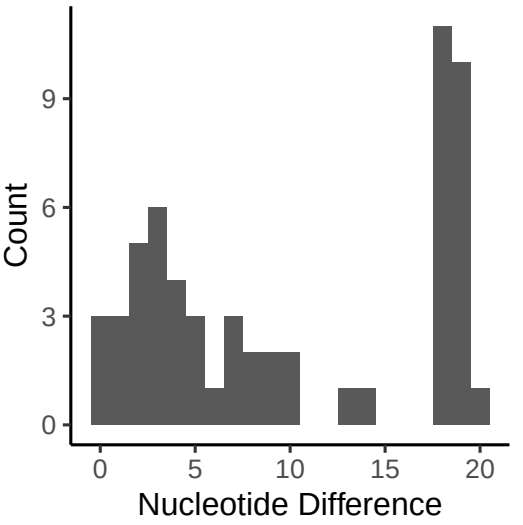
IGHV3−20*04

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



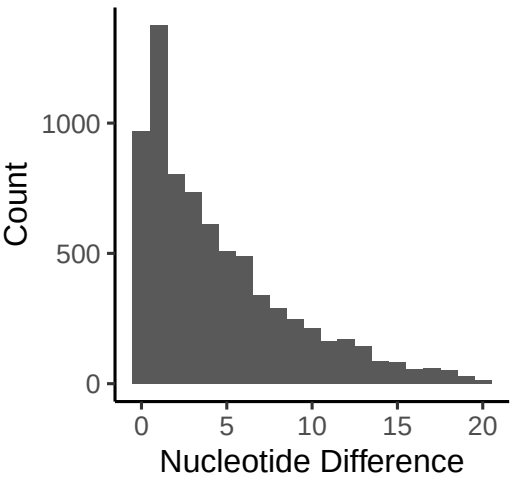
IGHV3−30−3*01

65 sequences assigned
3 (4.6%) exact matches, in which:
3 unique CDR3
2 unique J



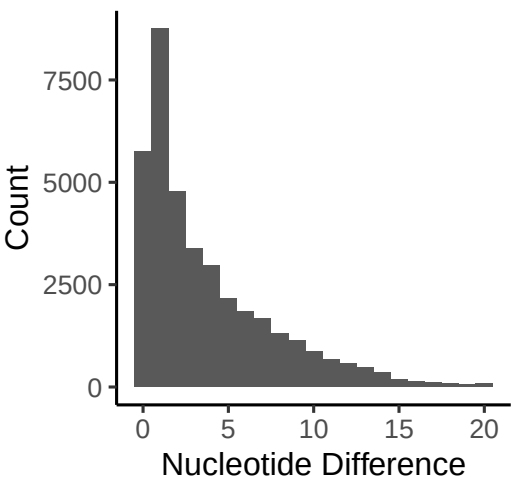
IGHV3−30*18

7510 sequences assigned
970 (12.9%) exact matches, in which:
653 unique CDR3
7 unique J



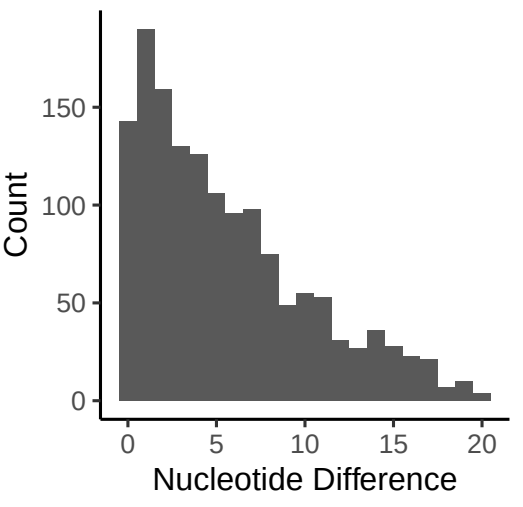
IGHV3−21*01

37795 sequences assigned
5765 (15.3%) exact matches, in which:
4131 unique CDR3
7 unique J



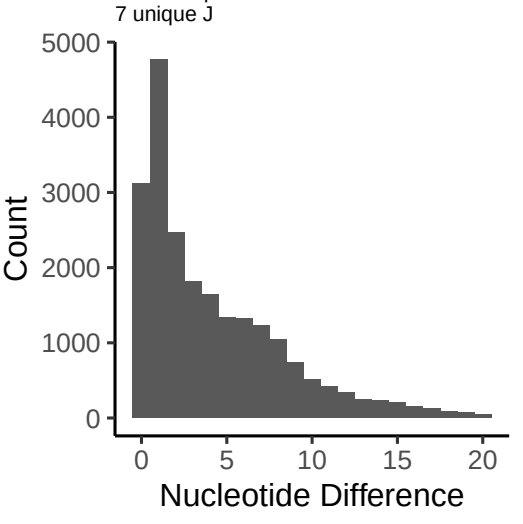
IGHV3−30*03

1483 sequences assigned
143 (9.6%) exact matches, in which:
137 unique CDR3
7 unique J



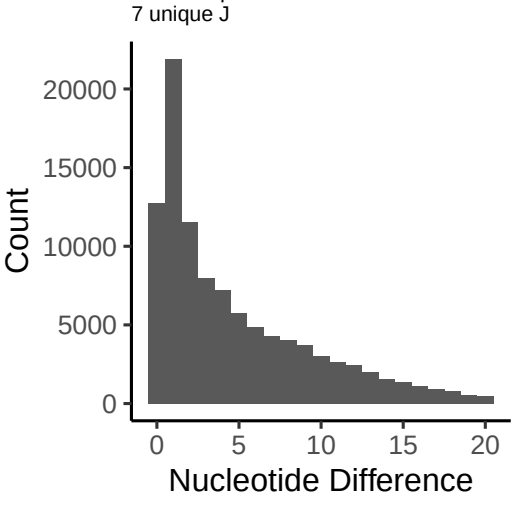
IGHV3−33*01

22217 sequences assigned
3118 (14%) exact matches, in which:
2105 unique CDR3
7 unique J



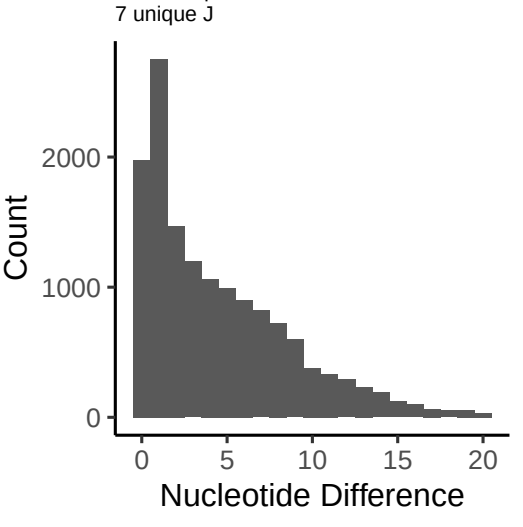
IGHV3−23*01

103141 sequences assigned
12732 (12.3%) exact matches, in which:
9027 unique CDR3
7 unique J



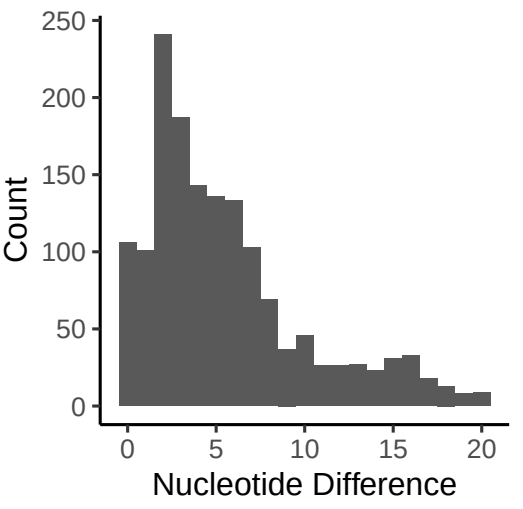
IGHV3−30*04

14588 sequences assigned
1977 (13.6%) exact matches, in which:
1413 unique CDR3
7 unique J



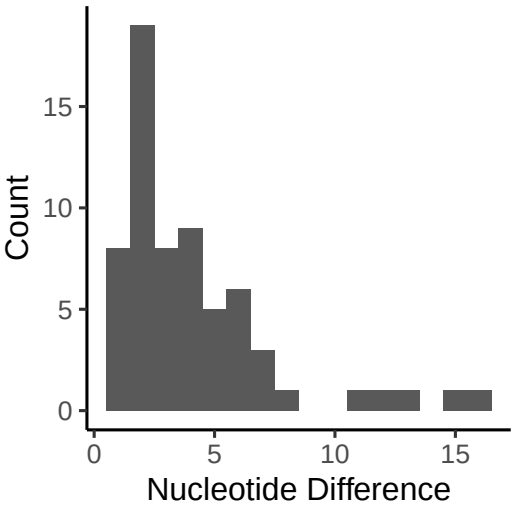
IGHV3−33*06

1524 sequences assigned
106 (7%) exact matches, in which:
105 unique CDR3
6 unique J



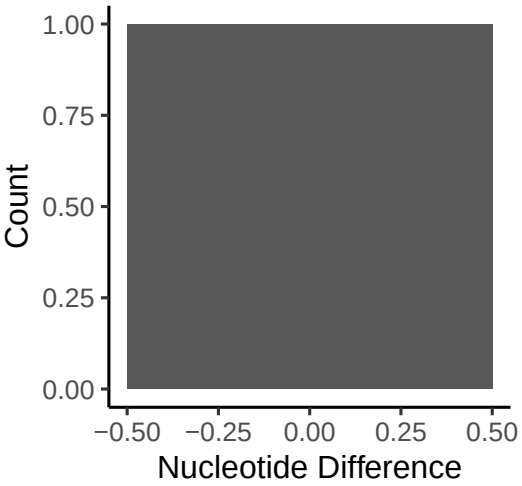
IGHV3−38−3*01

66 sequences assigned
No exact matches.



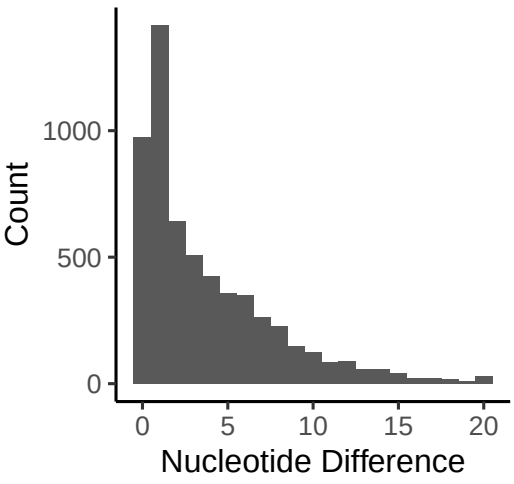
IGHV3−47*01

1 sequences assigned
1 (100%) exact matches, in which:
1 unique CDR3
1 unique J



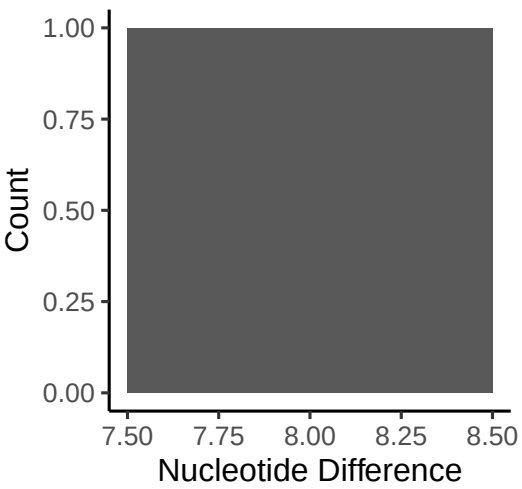
IGHV3−48*02

6012 sequences assigned
973 (16.2%) exact matches, in which:
680 unique CDR3
7 unique J



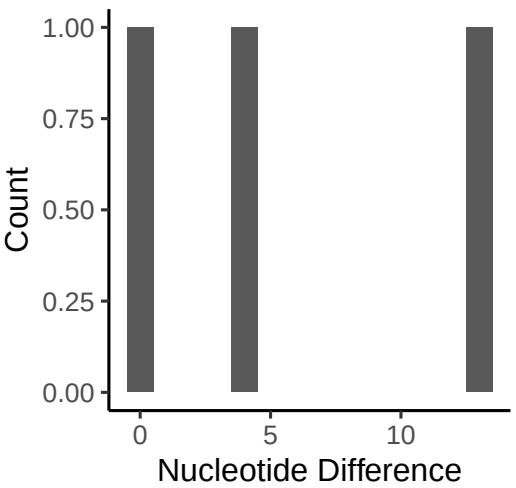
IGHV3−38*03

1 sequences assigned
No exact matches.



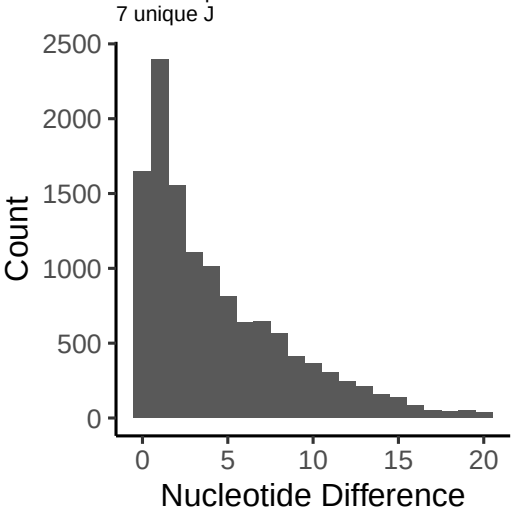
IGHV3−47*02

3 sequences assigned
1 (33.3%) exact matches, in which:
1 unique CDR3
1 unique J



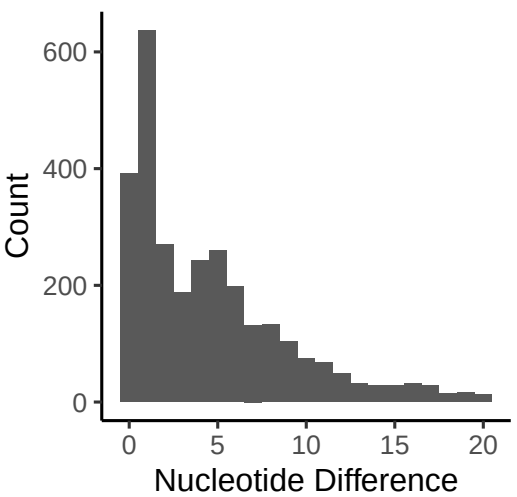
IGHV3−48*03

12628 sequences assigned
1645 (13%) exact matches, in which:
1183 unique CDR3
7 unique J



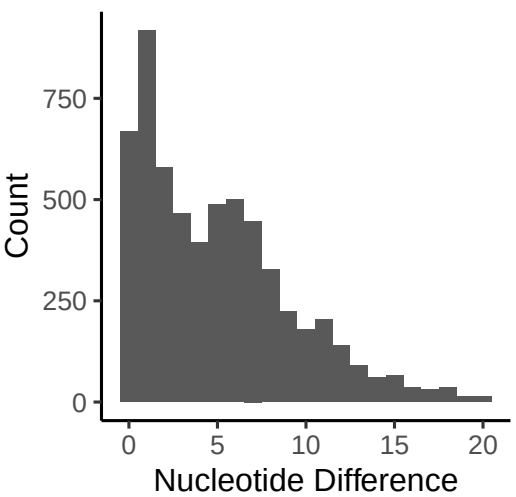
IGHV3−43*01

2984 sequences assigned
392 (13.1%) exact matches, in which:
285 unique CDR3
7 unique J



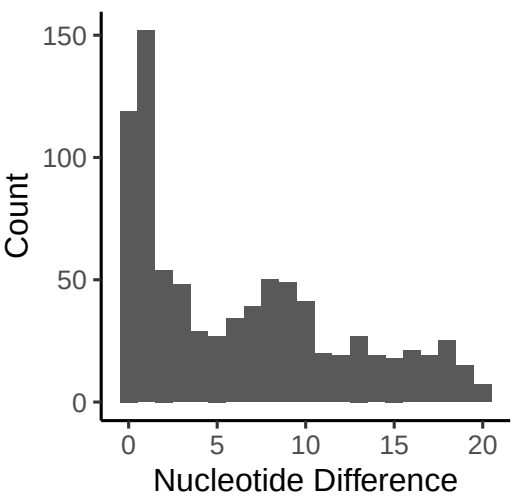
IGHV3−48*01

5940 sequences assigned
669 (11.3%) exact matches, in which:
496 unique CDR3
7 unique J



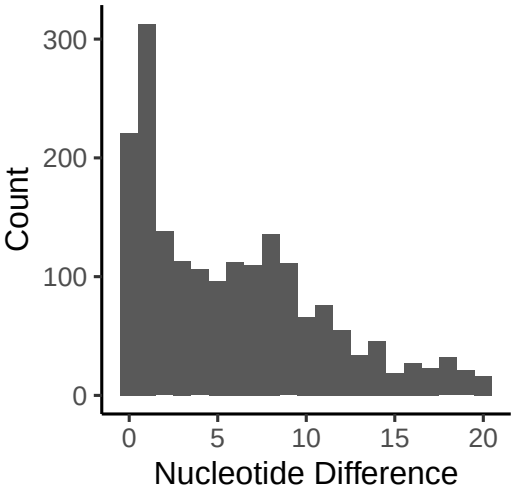
IGHV3−49*03

845 sequences assigned
119 (14.1%) exact matches, in which:
82 unique CDR3
7 unique J



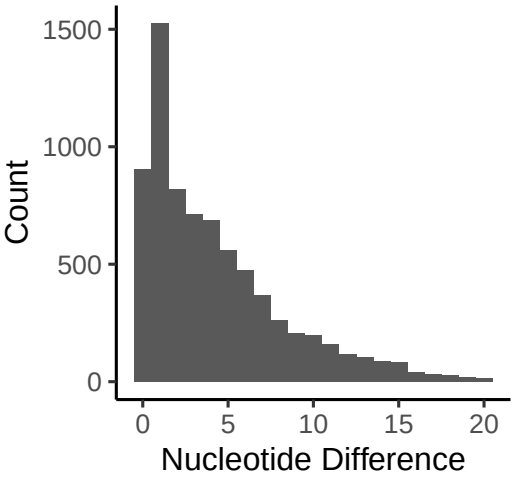
IGHV3−49*04

1954 sequences assigned
221 (11.3%) exact matches, in which:
160 unique CDR3
7 unique J



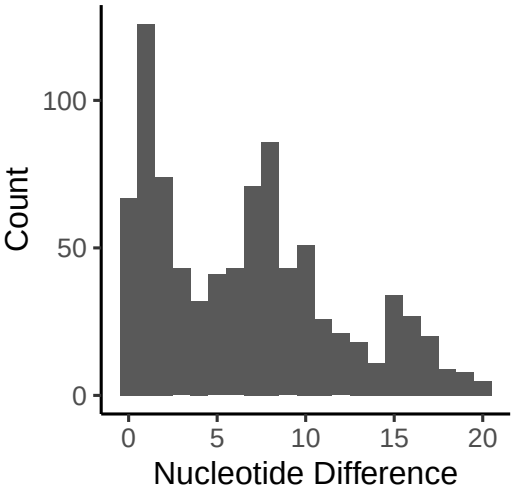
IGHV3−53*01

7492 sequences assigned
904 (12.1%) exact matches, in which:
632 unique CDR3
7 unique J



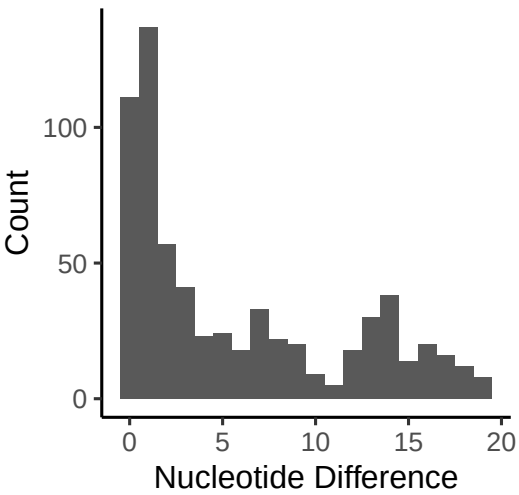
IGHV3−64*01

900 sequences assigned
67 (7.4%) exact matches, in which:
56 unique CDR3
4 unique J



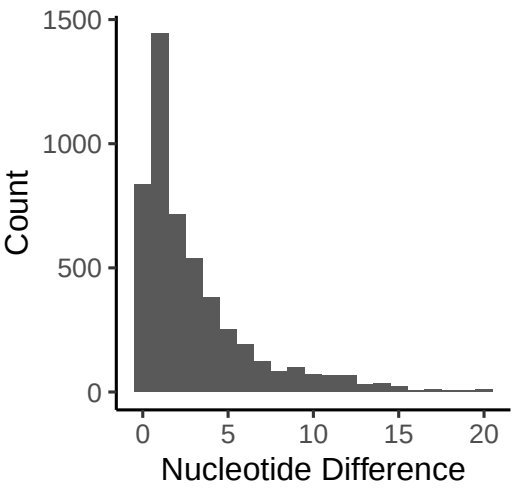
IGHV3−49*05

674 sequences assigned
111 (16.5%) exact matches, in which:
85 unique CDR3
6 unique J



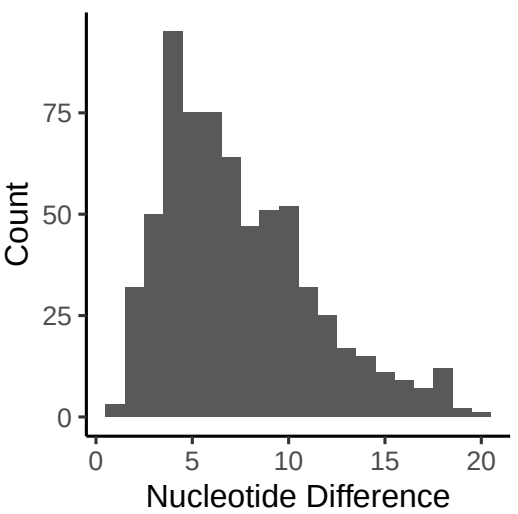
IGHV3−53*04

5026 sequences assigned
835 (16.6%) exact matches, in which:
619 unique CDR3
7 unique J



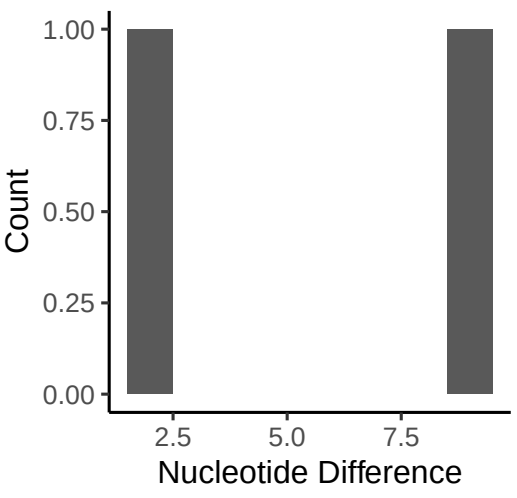
IGHV3−64*04

688 sequences assigned
No exact matches.



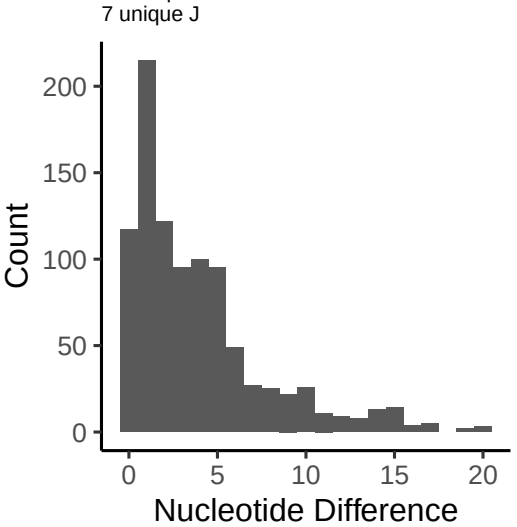
IGHV3−52*01

2 sequences assigned
No exact matches.



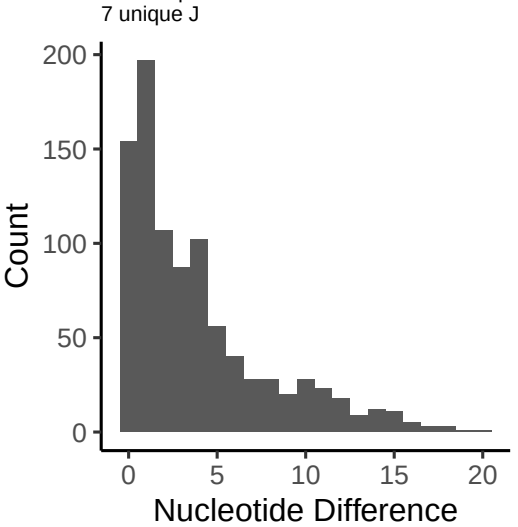
IGHV3−53*02_A172G

973 sequences assigned
117 (12%) exact matches, in which:
83 unique CDR3
7 unique J



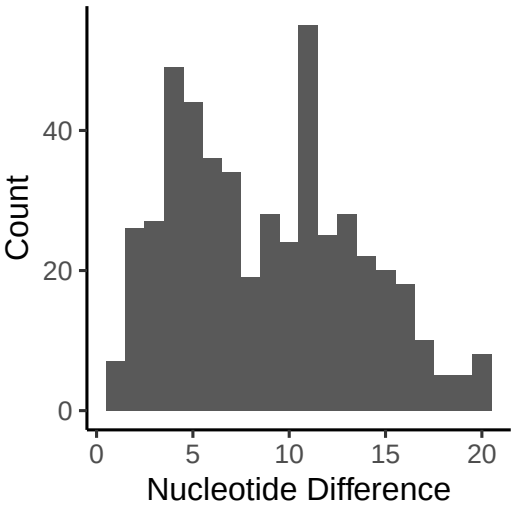
IGHV3−64*07

948 sequences assigned
154 (16.2%) exact matches, in which:
114 unique CDR3
7 unique J



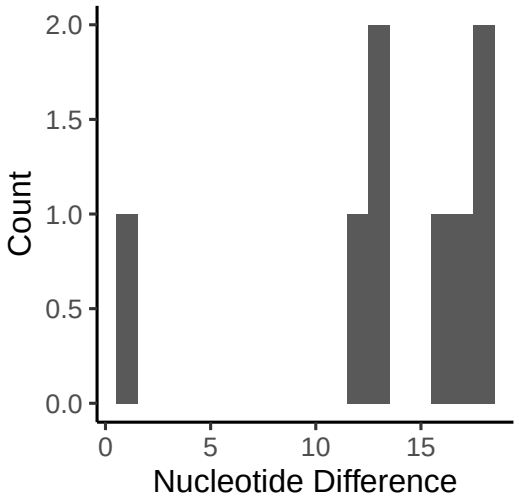
IGHV3−66*01

520 sequences assigned
No exact matches.



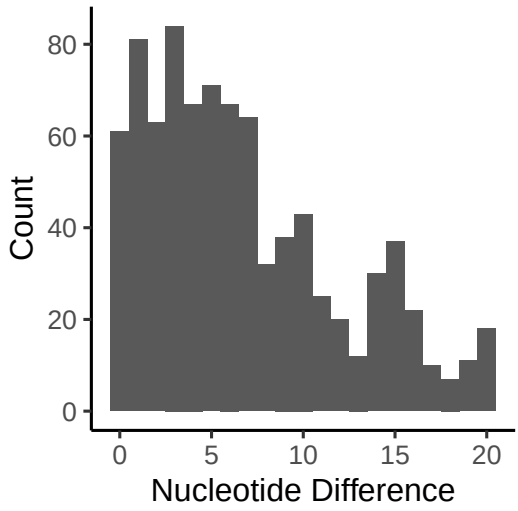
IGHV3−69−1*01

11 sequences assigned
No exact matches.



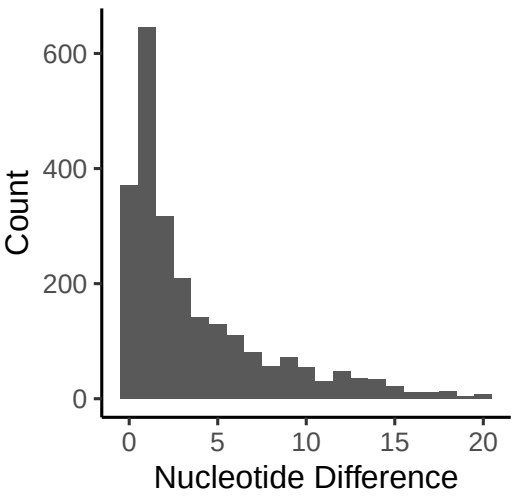
IGHV3−72*01

915 sequences assigned
61 (6.7%) exact matches, in which:
45 unique CDR3
5 unique J



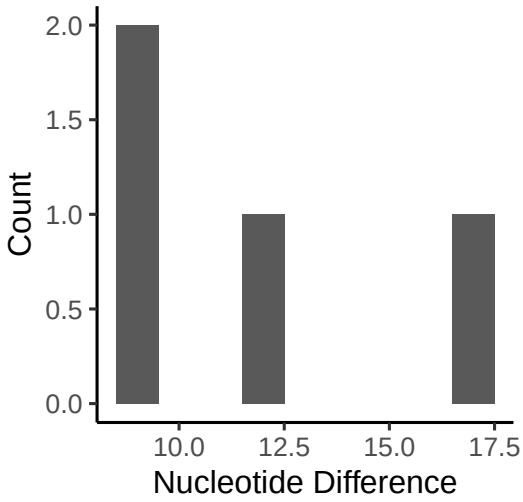
IGHV3−66*02

2444 sequences assigned
371 (15.2%) exact matches, in which:
269 unique CDR3
7 unique J



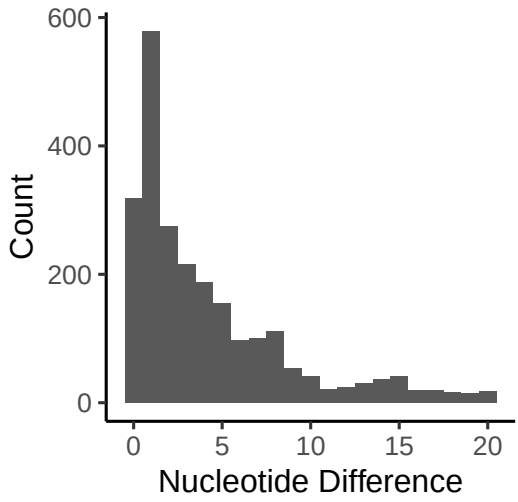
IGHV3−69−1*02

5 sequences assigned
No exact matches.



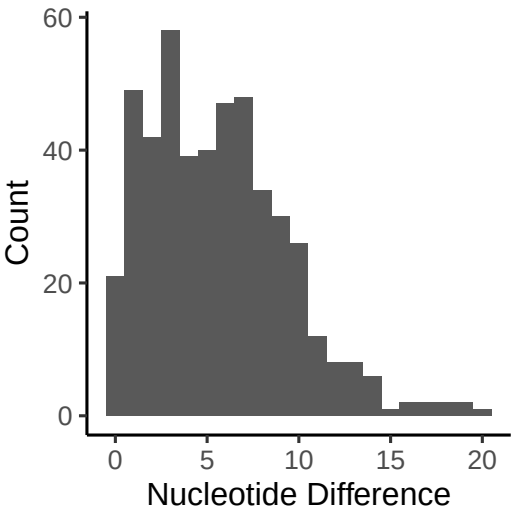
IGHV3−73*02

2451 sequences assigned
318 (13%) exact matches, in which:
233 unique CDR3
7 unique J



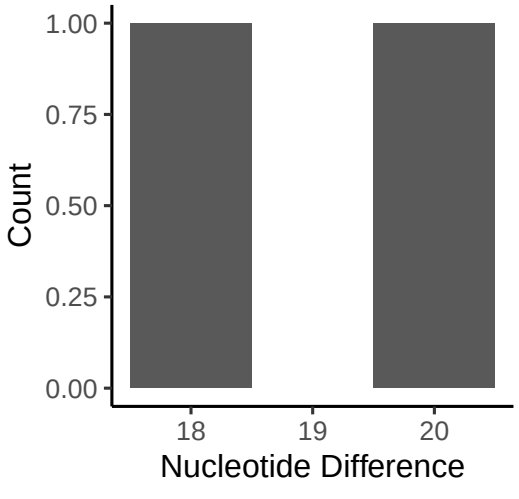
IGHV3−66*03_T175G_T2

487 sequences assigned
21 (4.3%) exact matches, in which:
20 unique CDR3
7 unique J



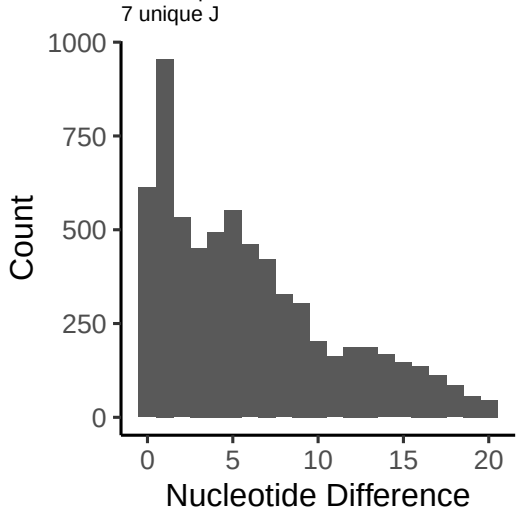
IGHV3−71*04

3 sequences assigned
No exact matches.



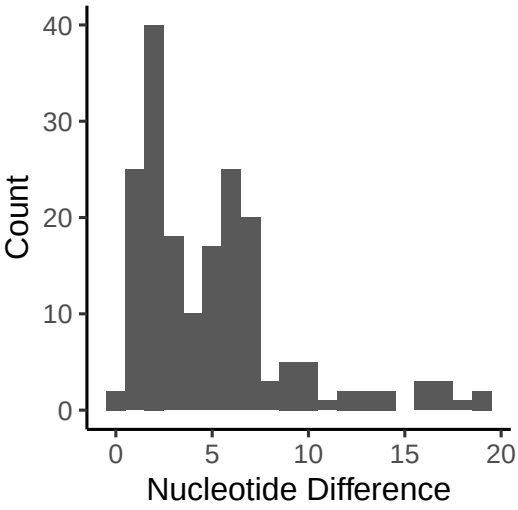
IGHV3−74*01

6787 sequences assigned
613 (9%) exact matches, in which:
475 unique CDR3
7 unique J



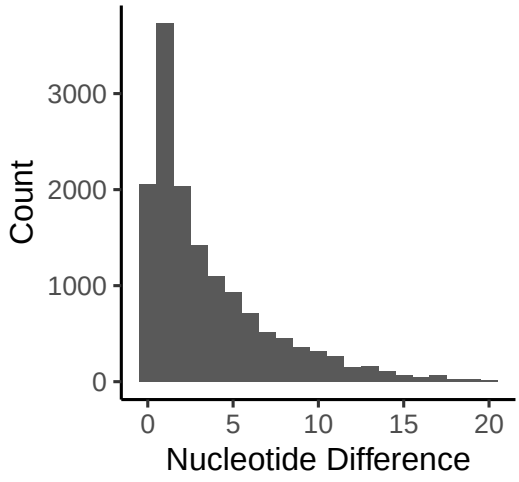
IGHV3−43D*04

190 sequences assigned
2 (1.1%) exact matches, in which:
2 unique CDR3
1 unique J



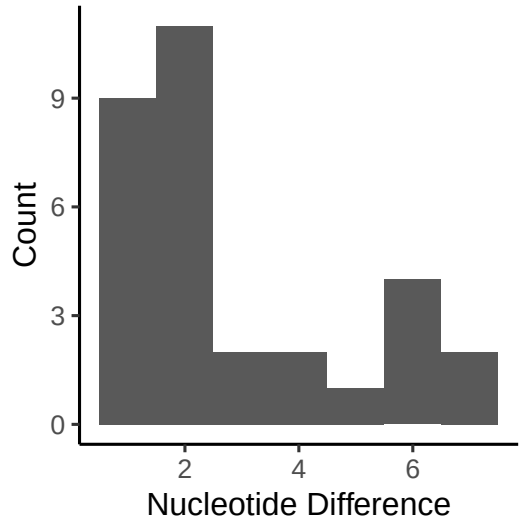
IGHV4−4*02

14803 sequences assigned
2062 (13.9%) exact matches, in which:
1493 unique CDR3
7 unique J



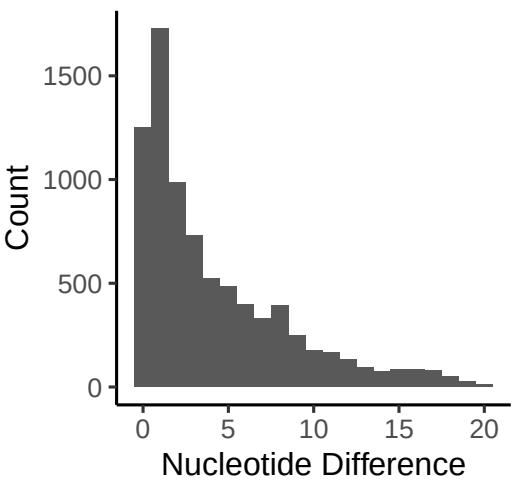
IGHV4−28*06

31 sequences assigned
No exact matches.



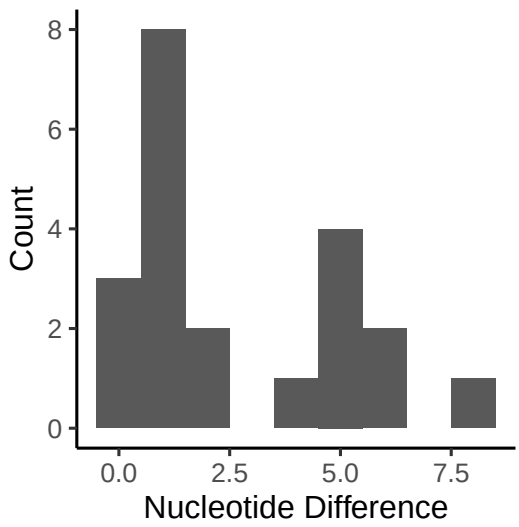
IGHV3−64D*06

8153 sequences assigned
1251 (15.3%) exact matches, in which:
911 unique CDR3
7 unique J



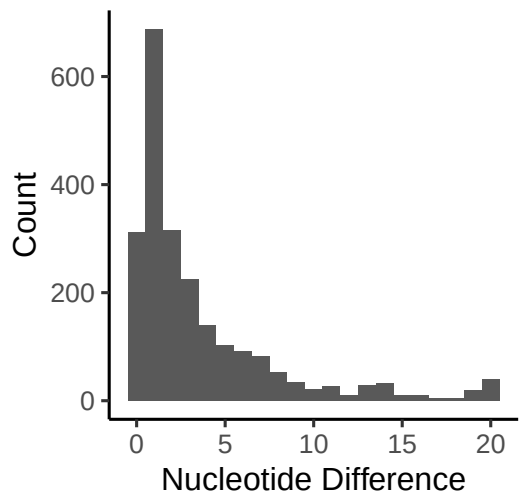
IGHV4−28*01

21 sequences assigned
3 (14.3%) exact matches, in which:
3 unique CDR3
1 unique J



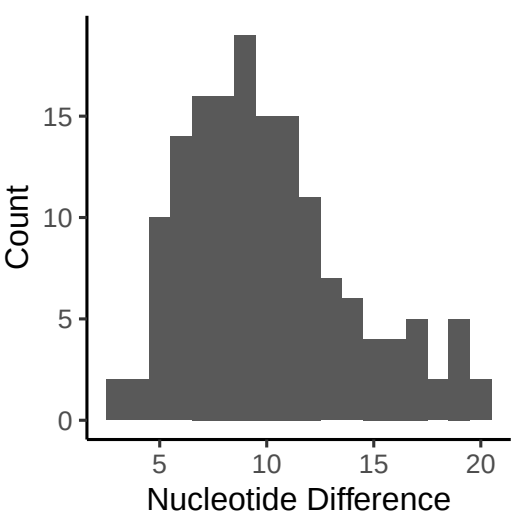
IGHV4−30−2*01

2371 sequences assigned
312 (13.2%) exact matches, in which:
188 unique CDR3
6 unique J



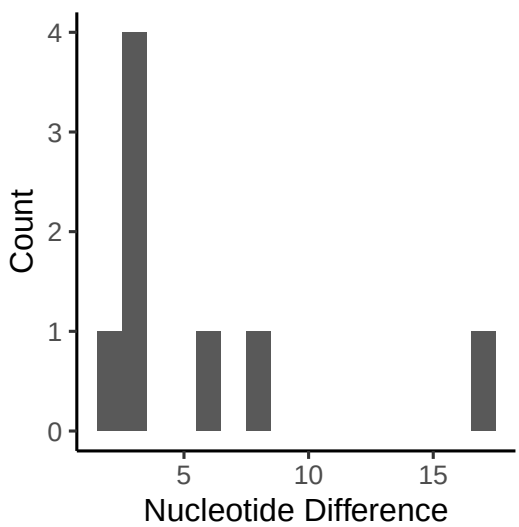
IGHV3−NL1*01

162 sequences assigned
No exact matches.



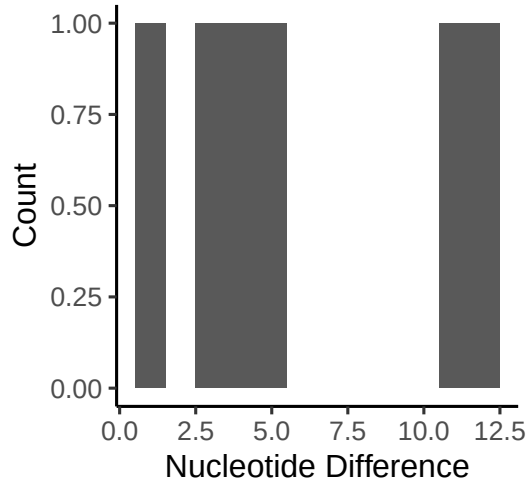
IGHV4−28*03

8 sequences assigned
No exact matches.



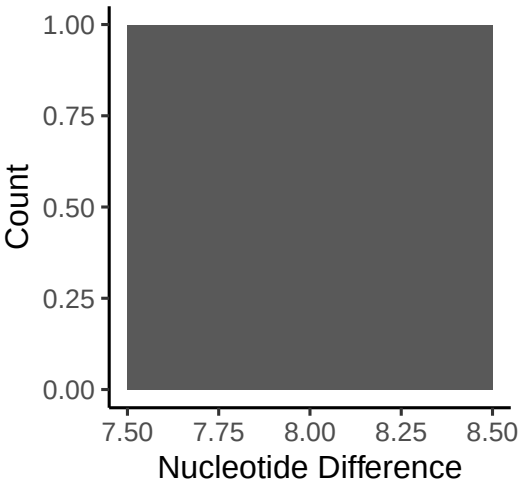
IGHV4−30−4*01

6 sequences assigned
No exact matches.



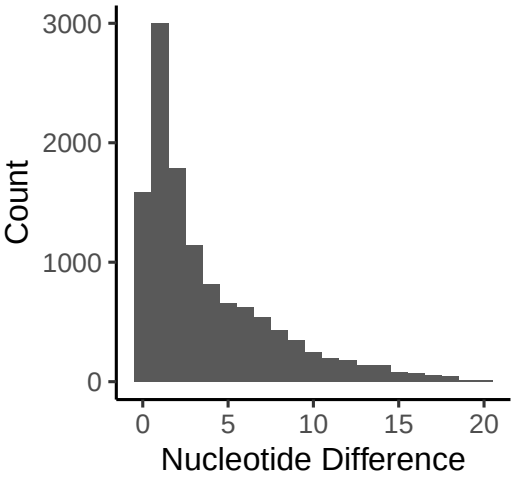
IGHV4−30−4*07

1 sequences assigned
No exact matches.



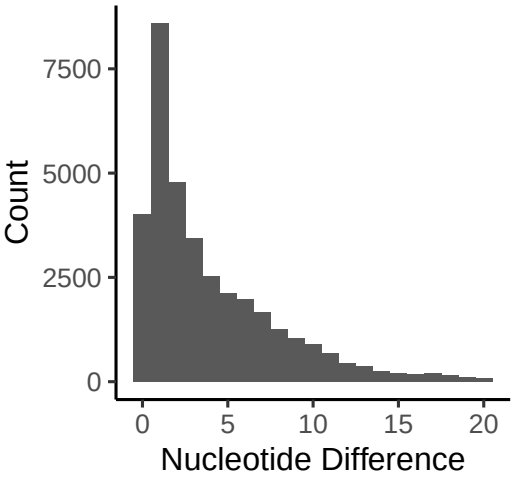
IGHV4−31*03

12387 sequences assigned
1586 (12.8%) exact matches, in which:
1120 unique CDR3
7 unique J



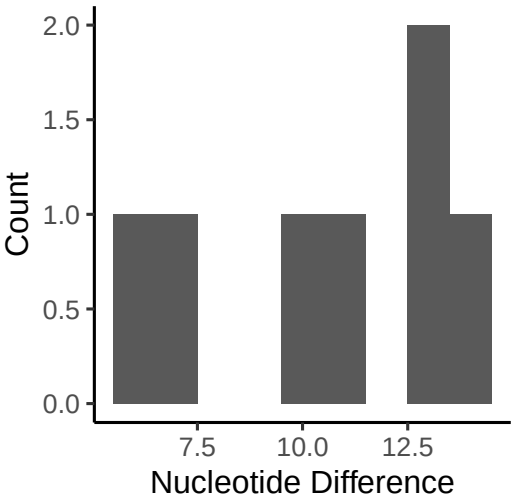
IGHV4−39*01

35546 sequences assigned
4022 (11.3%) exact matches, in which:
2880 unique CDR3
7 unique J



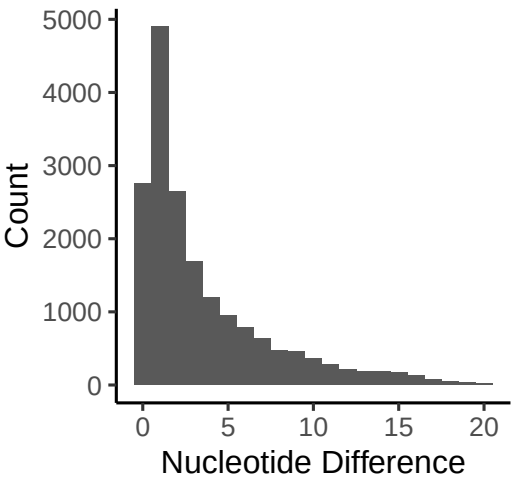
IGHV4−30−4*08

8 sequences assigned
No exact matches.



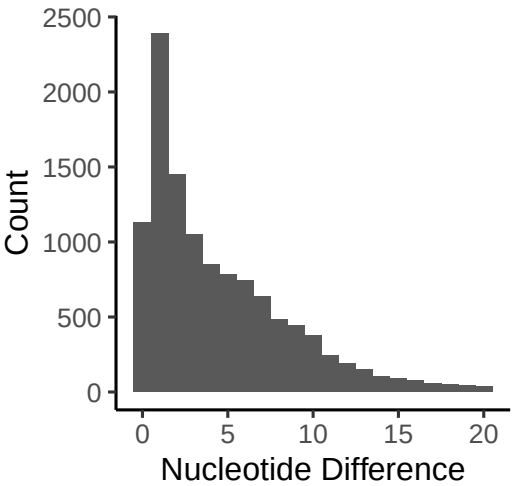
IGHV4−34*01

18438 sequences assigned
2754 (14.9%) exact matches, in which:
1942 unique CDR3
7 unique J



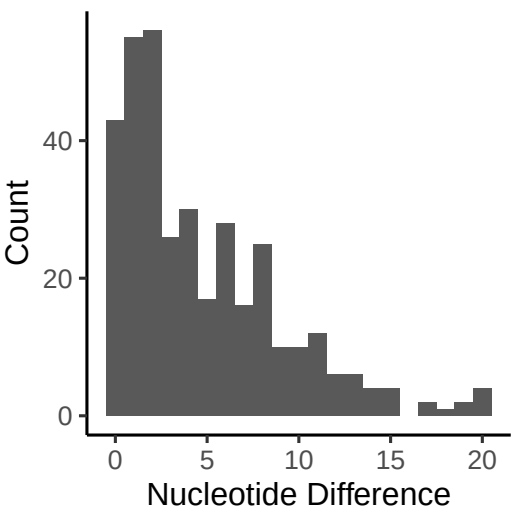
IGHV4−39*07

11576 sequences assigned
1130 (9.8%) exact matches, in which:
811 unique CDR3
7 unique J



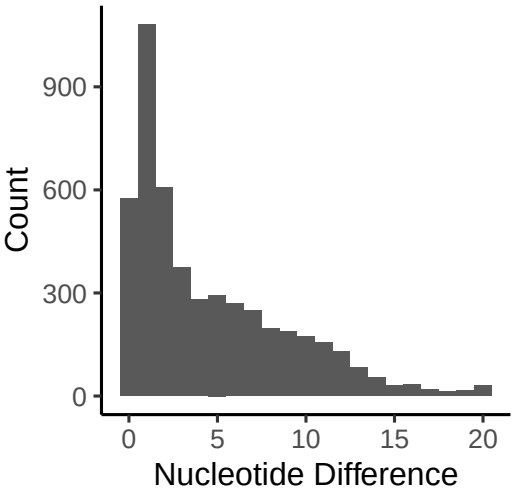
IGHV4−30−2*01_C315G

360 sequences assigned
43 (11.9%) exact matches, in which:
43 unique CDR3
6 unique J



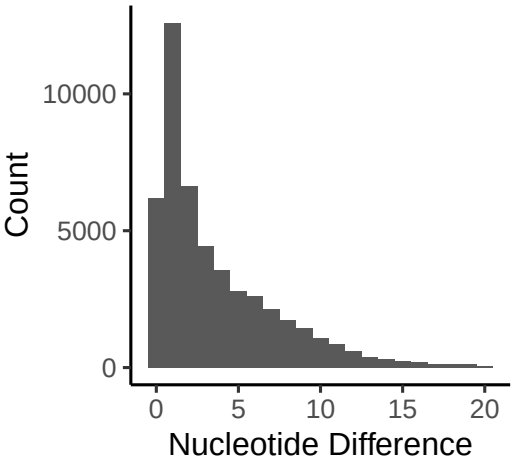
IGHV4−38−2*02_A70G

4971 sequences assigned
574 (11.5%) exact matches, in which:
405 unique CDR3
7 unique J



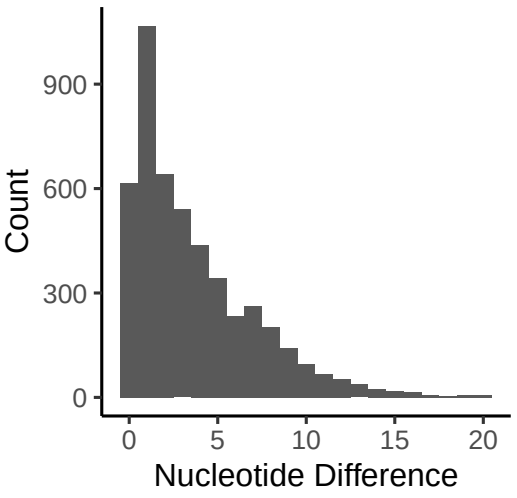
IGHV4−59*01

48778 sequences assigned
6184 (12.7%) exact matches, in which:
4262 unique CDR3
7 unique J



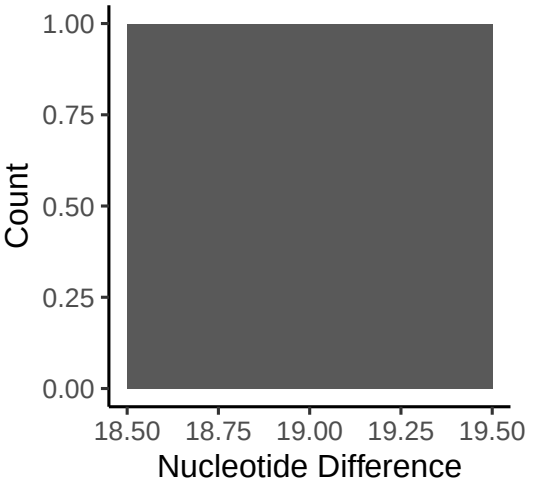
IGHV4−61*01

4923 sequences assigned
617 (12.5%) exact matches, in which:
452 unique CDR3
7 unique J



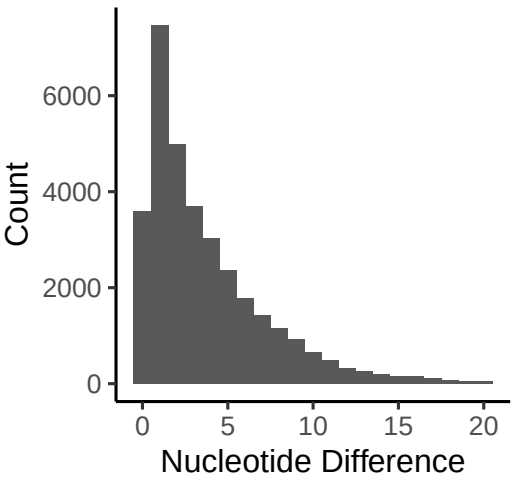
IGHV1/OR15−3*02

2 sequences assigned
No exact matches.



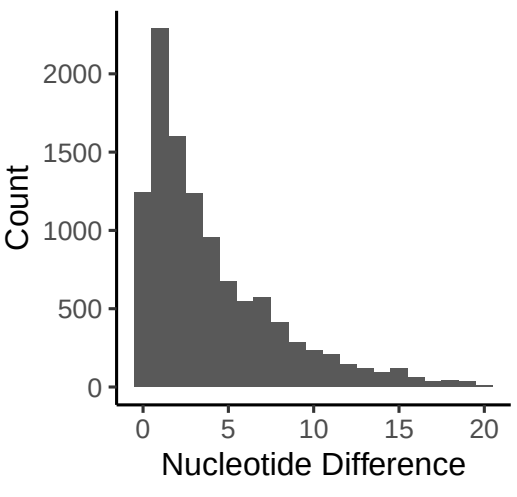
IGHV5−51*01

33213 sequences assigned
3598 (10.8%) exact matches, in which:
2578 unique CDR3
7 unique J



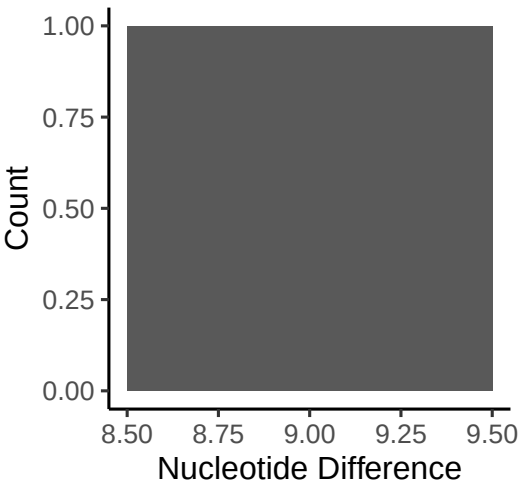
IGHV4−61*02

10993 sequences assigned
1244 (11.3%) exact matches, in which:
905 unique CDR3
7 unique J



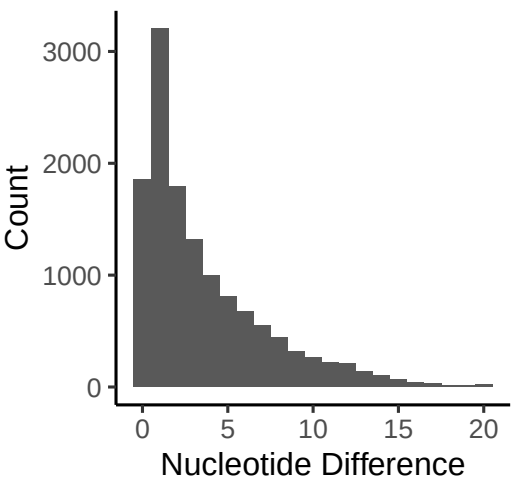
IGHV4/OR15−8*01

1 sequences assigned
No exact matches.



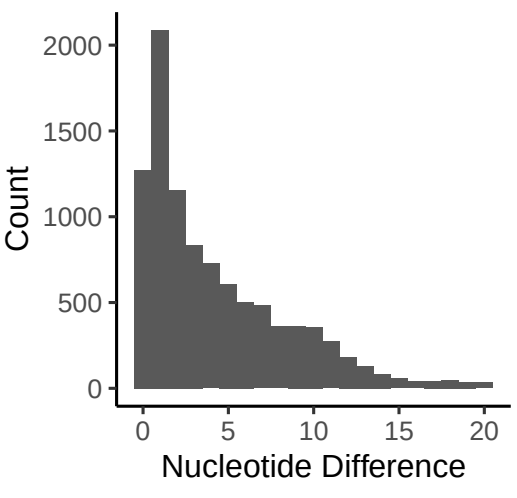
IGHV5−51*03

13211 sequences assigned
1854 (14%) exact matches, in which:
1374 unique CDR3
7 unique J



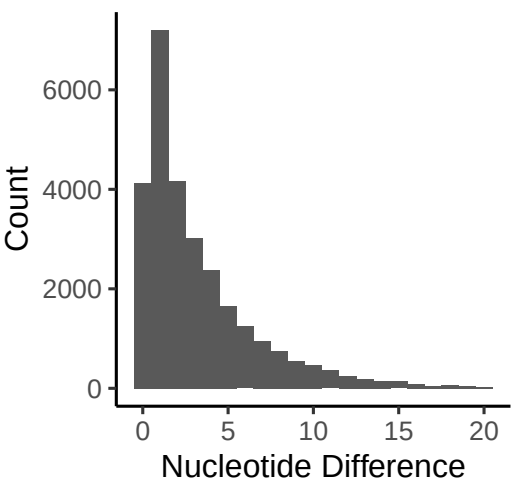
IGHV4−61*10_C93T

9806 sequences assigned
1271 (13%) exact matches, in which:
962 unique CDR3
7 unique J



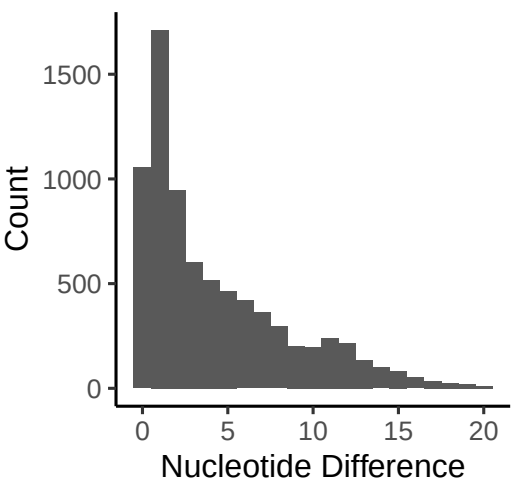
IGHV5−10−1*03

28060 sequences assigned
4127 (14.7%) exact matches, in which:
2888 unique CDR3
7 unique J



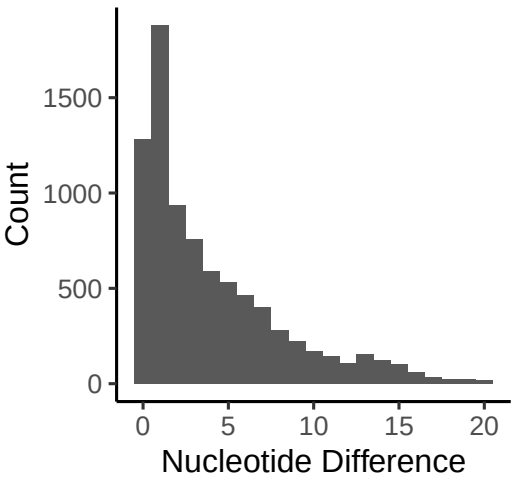
IGHV6−1*01

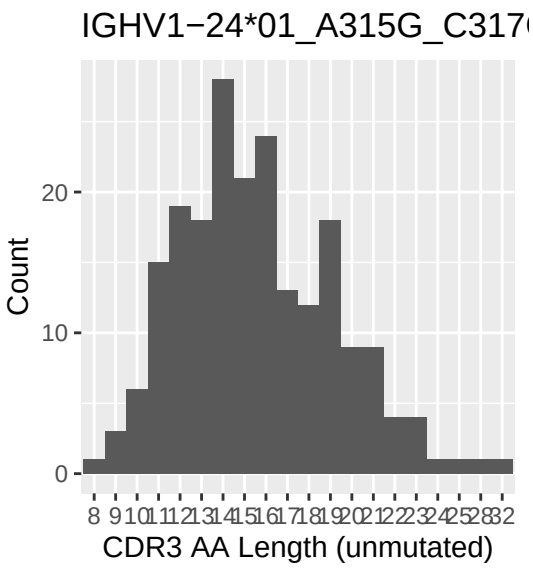
7748 sequences assigned
1055 (13.6%) exact matches, in which:
721 unique CDR3
7 unique J

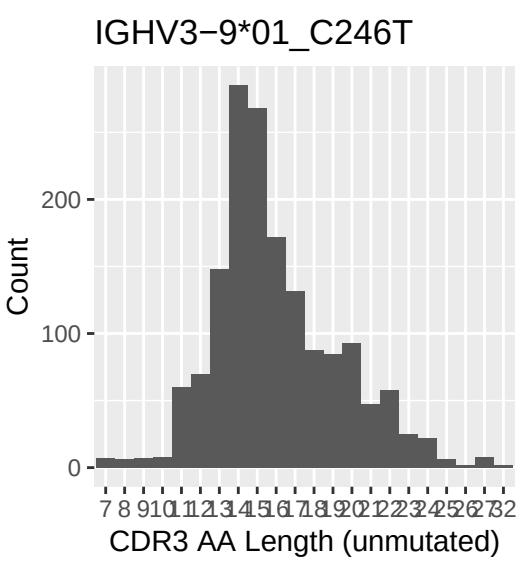


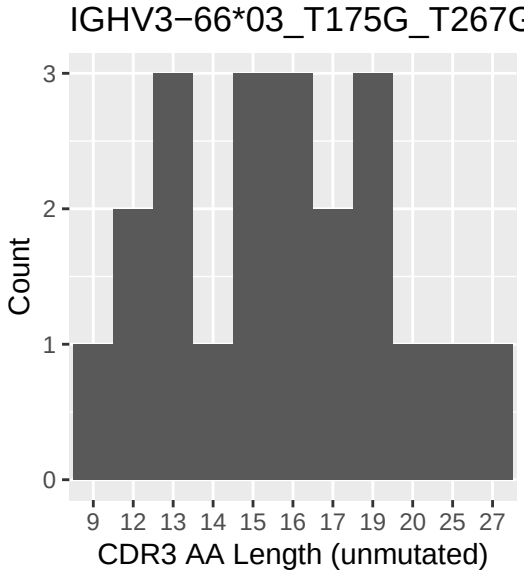
IGHV7−4−1*02

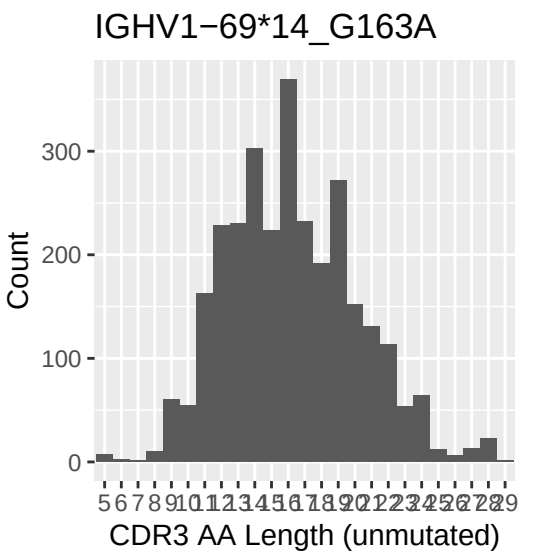
8386 sequences assigned
1281 (15.3%) exact matches, in which:
932 unique CDR3
7 unique J

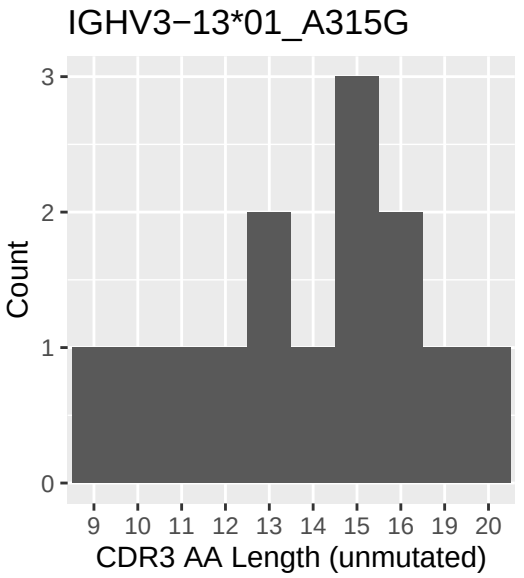


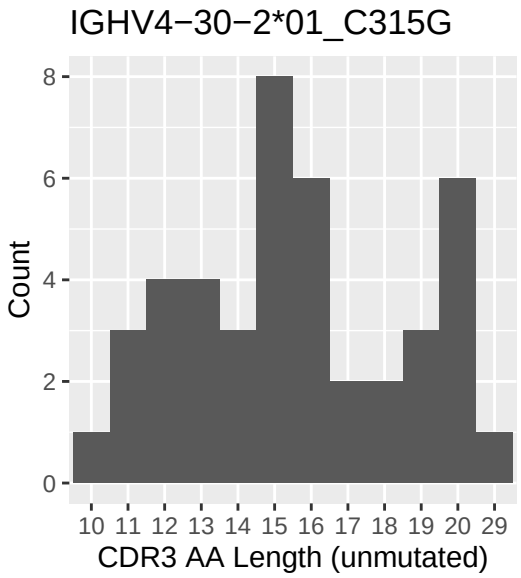

IGHV1−24*01_A315G_C317
Count
CDR3 AA Length (unmutated)

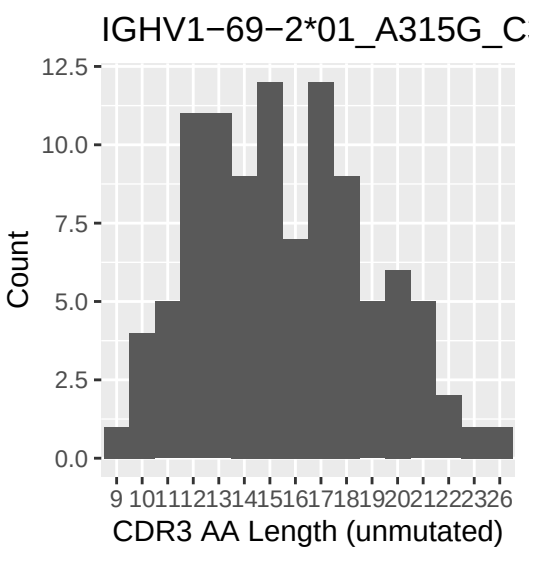

IGHV3−9*01_C246T
Count
CDR3 AA Length (unmutated)

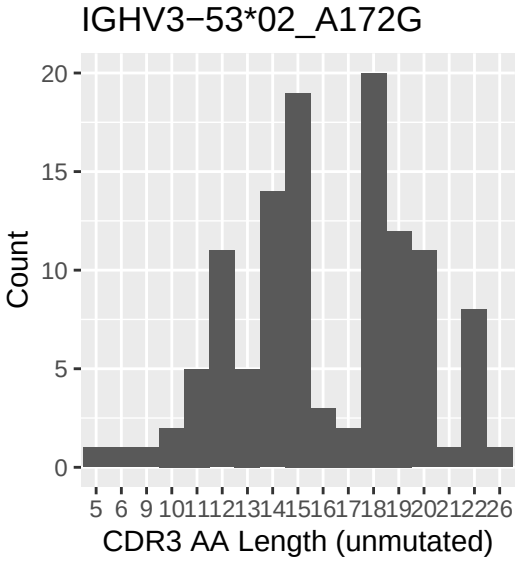

IGHV3−66*03_T175G_T267G
Count
CDR3 AA Length (unmutated)

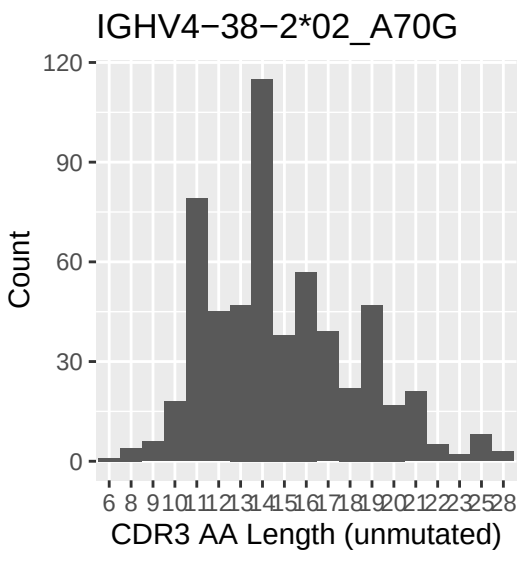

IGHV1−69*14_G163A
Count
CDR3 AA Length (unmutated)

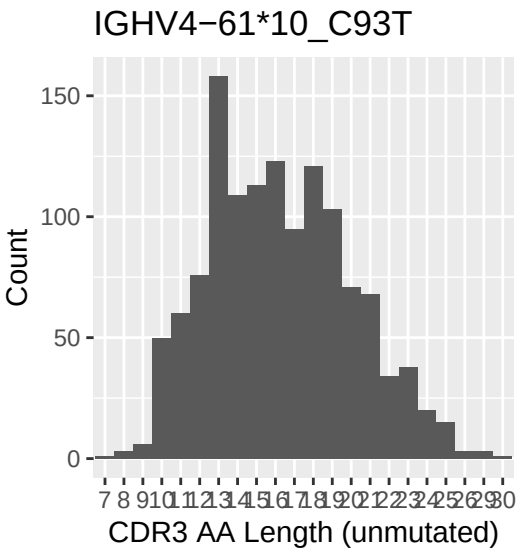

IGHV3−13*01_A315G
Count
CDR3 AA Length (unmutated)

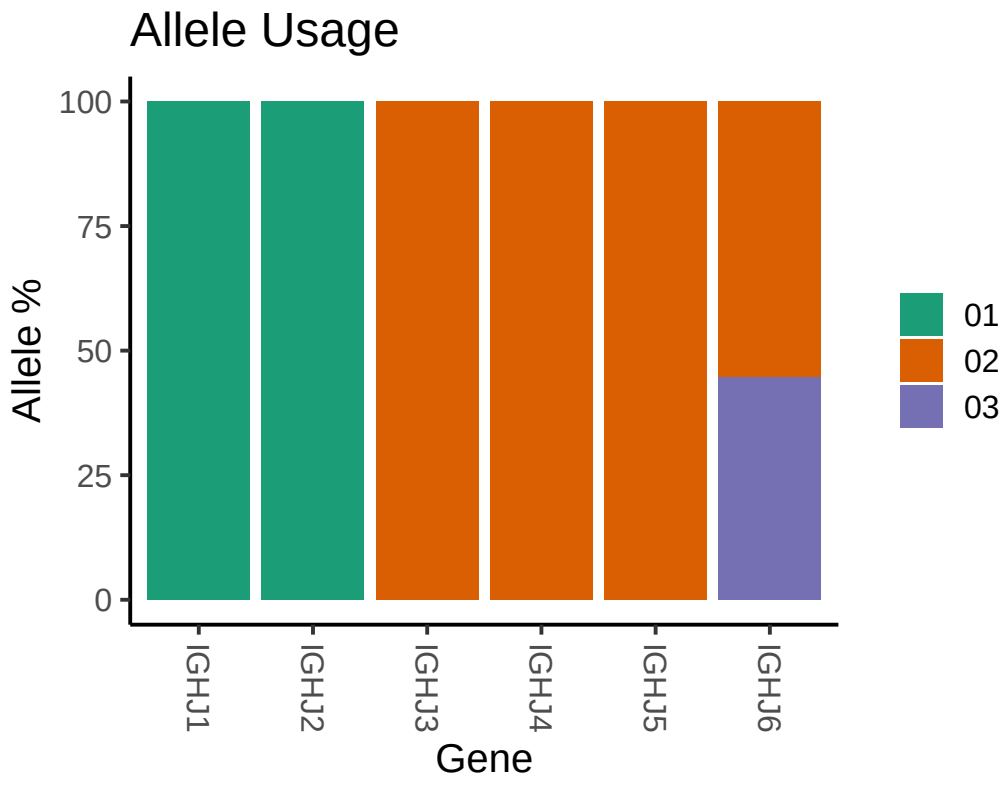
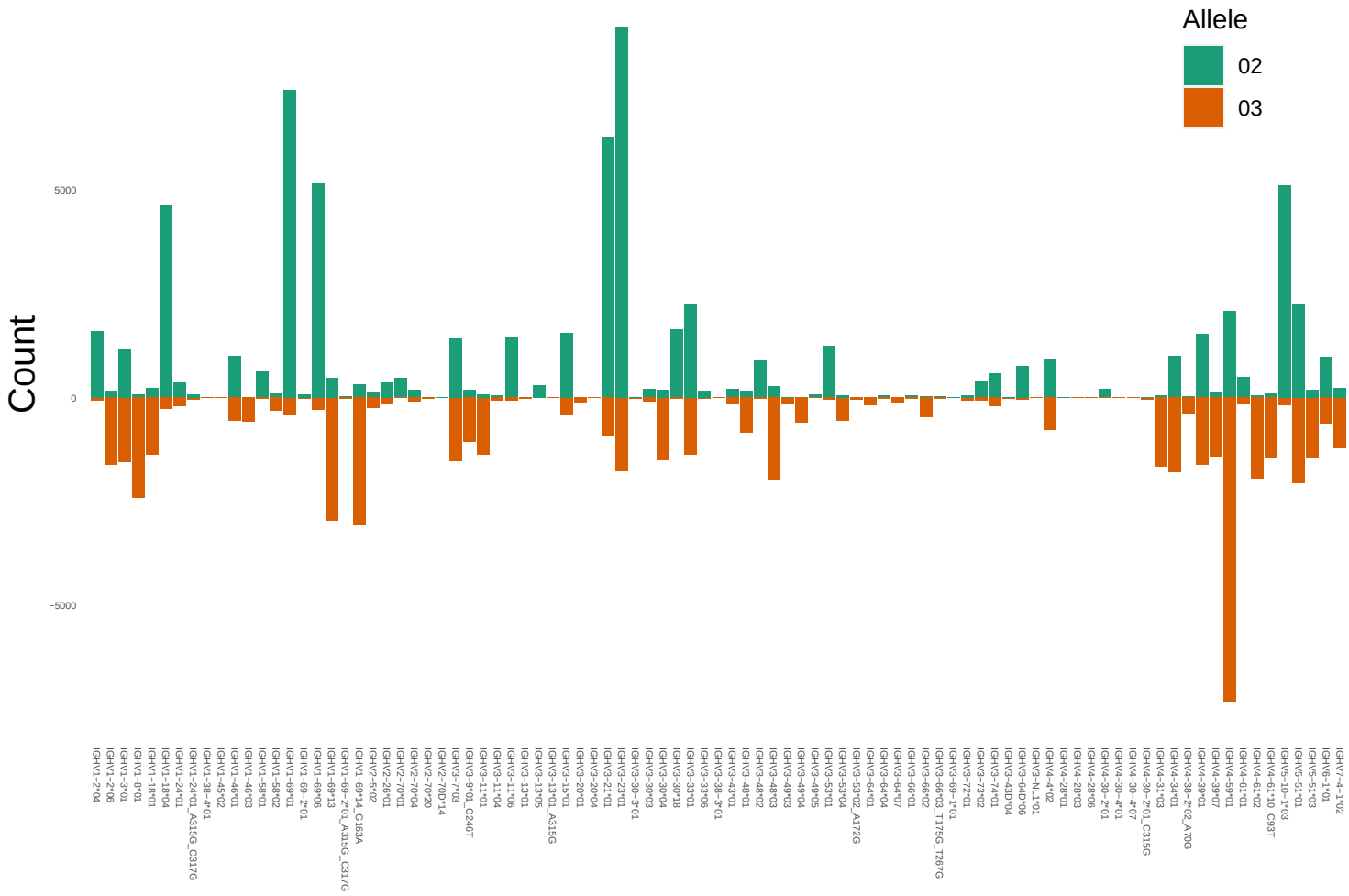

IGHV4−30−2*01_C315G
Count
CDR3 AA Length (unmutated)


IGHV1−69−2*01_A315G_C
Count
CDR3 AA Length (unmutated)


IGHV3−53*02_A172G
Count
CDR3 AA Length (unmutated)


IGHV4−38−2*02_A70G
Count
CDR3 AA Length (unmutated)


IGHV4−61*10_C93T
Count
150
100
50
0
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 29 30
CDR3 AA Length (unmutated)


Allele Usage
100
75
50
25
0
Allele %
IGHJ1
IGHJ2
IGHJ3
IGHJ4
IGHJ5
IGHJ6
Gene
01
02
03

Sequence Count by IGHJ6 allele usage