

V13-3_J2-4 Investigation

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Summary

In the most recent two batches (DNA160609LC and mammary_DNA160609LC) we observed a particular spike combination present in many of the clone count files that we looked at. This particular spike combination also appears to be the combination that corresponds to the clone present in the p14 monoclonal samples.

Hypotheses

This could either be an error in MiXCR that is consistently identifying random reads as this particular VJ combination, or it could be wet-bench contamination. One possible explanation for wet bench contamination is that the V13-3/J2-4 primer pair is particularly strong at amplifying, and any residual p14 DNA will be amplified at high rates relative to the more abundant DNA in the actual sample.

Procedure

Presence in Export Clone files

Through visual inspection of a few files, I noticed that the CDR3 amino acid sequence is the same for all of these clones, and is the same for the monoclonal p14 clone. Based on this, I decided to search each file for a clone with:

1. amino acid sequence == CASSDAGGRNTLYF (This is the p14 sequence)
2. V segment == V13-3
3. J segment == J2-4

```
DNA160609 <- weird.vj(clone.dir = "/Volumes/DNA160609LC/normalization/normalized_clones/",  
                      metadata = "~/Desktop/OHSU/tcr_spike/data/DNA160609LC/sample_identification.csv",  
                      treat.col = "Treatment_spike")  
DNA160609
```

##		Sample	Rank	Treatment	Clone.ID	Clone.count
##	[1,]	"S1"	"1"	"no.gdna_1"	"0"	"222"
##	[2,]	"S2"	"1"	"no.gdna_1"	"0"	"296"
##	[3,]	"S3"	"1"	"no.gdna_1"	"0"	"20"
##	[4,]	"S4"	"1"	"no.gdna_1"	"0"	"35"
##	[5,]	"S5"	"1"	"no.gdna_1"	"0"	"37"
##	[6,]	"S6"	"1"	"no.gdna_1"	"0"	"51"
##	[7,]	"S7"	"1"	"no.gdna_1"	"0"	"94"
##	[8,]	"S8"	"1"	"no.gdna_1"	"0"	"64"
##	[9,]	"S9"	"1"	"no.gdna_1"	"0"	"159"
##	[10,]	"S10"	"1"	"no.gdna_1"	"0"	"115"
##	[11,]	"S11"	"1"	"no.gdna_1"	"0"	"173"
##	[12,]	"S12"	"1"	"no.gdna_1"	"0"	"66"
##	[13,]	"S13"	"1"	"no.gdna_1"	"0"	"60"
##	[14,]	"S14"	"1"	"no.gdna_1"	"0"	"39"

##	[15,]	"S15"	"1"	"no.gdna_1"	"0"	"62"
##	[16,]	"S16"	"1"	"no.gdna_1"	"0"	"24"
##	[17,]	"S17"	"1"	"no.gdna_1"	"0"	"30"
##	[18,]	"S18"	"1"	"no.gdna_1"	"0"	"28"
##	[19,]	"S19"	"1"	"no.gdna_1"	"0"	"37"
##	[20,]	"S20"	"1"	"no.gdna_1"	"0"	"66"
##	[21,]	"S21"	"1"	"P14 spleen_0"	"0"	"427409"
##	[22,]	"S22"	"1"	"P14 spleen_0"	"0"	"516174"
##	[23,]	"S23"	"1"	"P14 spleen_0"	"0"	"510178"
##	[24,]	"S24"	"1"	"P14 spleen_0"	"0"	"589987"
##	[25,]	"S25"	"1"	"P14 spleen_0"	"0"	"239098"
##	[26,]	"S26"	"2"	"OT1 spleen_0"	"1"	"4616"
##	[27,]	"S27"	"2"	"OT1 spleen_0"	"1"	"2085"
##	[28,]	"S28"	"2"	"OT1 spleen_0"	"1"	"1480"
##	[29,]	"S29"	"2"	"OT1 spleen_0"	"1"	"2980"
##	[30,]	"S30"	"2"	"OT1 spleen_0"	"1"	"3224"
##	[31,]	"S31"	"2"	"El4_0"	"1"	"2049"
##	[32,]	"S32"	"2"	"El4_0"	"1"	"2533"
##	[33,]	"S33"	"2"	"El4_0"	"1"	"2317"
##	[34,]	"S34"	"2"	"El4_0"	"1"	"2171"
##	[35,]	"S35"	"2"	"El4_0"	"1"	"2270"
##	[36,]	"S36"	"1"	"EpH4_0"	"0"	"3651"
##	[37,]	"S37"	"1"	"EpH4_0"	"0"	"9462"
##	[38,]	"S38"	"1"	"EpH4_0"	"0"	"26894"
##	[39,]	"S39"	"1"	"EpH4_0"	"0"	"4697"
##	[40,]	"S40"	"1"	"EpH4_0"	"0"	"24288"
##	[41,]	"S41"	"1"	"D20R_0"	"0"	"7425"
##	[42,]	"S42"	"1"	"D20R_0"	"0"	"10053"
##	[43,]	"S43"	"1"	"D20R_0"	"0"	"14355"
##	[44,]	"S44"	"1"	"D20R_0"	"0"	"8672"
##	[45,]	"S45"	"1"	"D20R_0"	"0"	"6389"
##	[46,]	"S46"	"1"	"H2O_0"	"0"	"11177"
##	[47,]	"S47"	"1"	"H2O_0"	"0"	"6130"
##	[48,]	"S48"	"1"	"H2O_0"	"0"	"5053"
##	[49,]	"S49"	"1"	"H2O_0"	"0"	"2232"
##	[50,]	"S50"	"1"	"H2O_0"	"0"	"9177"
##	[51,]	"S51"	"1"	"WT spleen_0"	"0"	"4695"
##	[52,]	"S52"	"1"	"WT spleen_0"	"0"	"38122"
##	[53,]	"S53"	"1"	"WT spleen_0"	"0"	"27193"
##	[54,]	"S54"	"1"	"WT spleen_0"	"0"	"21477"
##	[55,]	"S55"	"1"	"WT spleen_0"	"0"	"26012"
##	[56,]	"S56"	"1"	"P14 spleen_1"	"0"	"195000"
##	[57,]	"S57"	"1"	"P14 spleen_1"	"0"	"228838"
##	[58,]	"S58"	"1"	"P14 spleen_1"	"0"	"262674"
##	[59,]	"S59"	"1"	"P14 spleen_1"	"0"	"421379"
##	[60,]	"S60"	"1"	"P14 spleen_1"	"0"	"258783"
##	[61,]	"S61"	"2"	"OT1 spleen_1"	"1"	"366"
##	[62,]	"S62"	"2"	"OT1 spleen_1"	"1"	"287"
##	[63,]	"S63"	"2"	"OT1 spleen_1"	"1"	"77"
##	[64,]	"S64"	"2"	"OT1 spleen_1"	"1"	"228"
##	[65,]	"S65"	"2"	"OT1 spleen_1"	"1"	"175"
##	[66,]	"S66"	"2"	"El4_1"	"1"	"1871"
##	[67,]	"S67"	"2"	"El4_1"	"1"	"464"
##	[68,]	"S68"	"2"	"El4_1"	"1"	"444"

##	[69,]	"S69"	"2"	"E14_1"	"1"	"531"
##	[70,]	"S70"	"2"	"E14_1"	"1"	"341"
##	[71,]	"S71"	"2"	"EpH4_1"	"1"	"176"
##	[72,]	"S72"	"1"	"EpH4_1"	"0"	"277"
##	[73,]	"S73"	"1"	"EpH4_1"	"0"	"231"
##	[74,]	"S74"	"1"	"EpH4_1"	"0"	"356"
##	[75,]	"S75"	"1"	"EpH4_1"	"0"	"229"
##	[76,]	"S76"	"1"	"D20R_1"	"0"	"330"
##	[77,]	"S77"	"1"	"D20R_1"	"0"	"199"
##	[78,]	"S78"	"1"	"D20R_1"	"0"	"279"
##	[79,]	"S79"	"1"	"D20R_1"	"0"	"363"
##	[80,]	"S80"	"1"	"D20R_1"	"0"	"304"
##	[81,]	"S81"	"1"	"H2O_1"	"0"	"41"
##	[82,]	"S82"	"1"	"H2O_1"	"0"	"288"
##	[83,]	"S83"	"1"	"H2O_1"	"0"	"78"
##	[84,]	"S84"	"1"	"H2O_1"	"0"	"77"
##	[85,]	"S85"	"1"	"H2O_1"	"0"	"45"
##	[86,]	"S86"	"1"	"WT spleen_1"	"0"	"61"
##	[87,]	"S87"	"1"	"WT spleen_1"	"0"	"119"
##	[88,]	"S88"	"1"	"WT spleen_1"	"0"	"62"
##	[89,]	"S89"	"1"	"WT spleen_1"	"0"	"94"
##	[90,]	"S90"	"1"	"WT spleen_1"	"0"	"181"
##	[91,]	"S91"	"1"	"Blood (600ng)_1.1"	"0"	"159"
##	[92,]	"S92"	"1"	"Blood (600ng)_1.1"	"0"	"74"
##	[93,]	"S93"	"1"	"Blood (600ng)_1.1"	"0"	"142"
##	[94,]	"S94"	"1"	"Blood (600ng)_1.2"	"0"	"228"
##	[95,]	"S95"	"1"	"Blood (600ng)_1.2"	"0"	"95"
##	[96,]	"S96"	"1"	"Blood (600ng)_1.2"	"0"	"218"
##	[97,]	"S97"	"1"	"Blood (600ng)_1.3"	"0"	"15706"
##	[98,]	"S98"	"1"	"Blood (600ng)_1.3"	"0"	"4605"
##	[99,]	"S99"	"1"	"Blood (600ng)_1.3"	"0"	"7811"
##	[100,]	"S100"	"1"	"Blood (600ng)_1.4"	"0"	"24540"
##	[101,]	"S101"	"1"	"Blood (600ng)_1.4"	"0"	"7482"
##	[102,]	"S102"	"1"	"Blood (600ng)_1.4"	"0"	"8232"
##	[103,]	"S103"	"1"	"Blood (600ng)_1.5"	"0"	"124642"
##	[104,]	"S104"	"1"	"Blood (600ng)_1.5"	"0"	"73315"
##	[105,]	"S105"	"1"	"Blood (600ng)_1.5"	"0"	"45156"
##	[106,]	"S106"	"1"	"Blood (600ng)_1.6"	"0"	"87318"
##	[107,]	"S107"	"1"	"Blood (600ng)_1.6"	"0"	"122622"
##	[108,]	"S108"	"1"	"Blood (600ng)_1.6"	"0"	"51371"
##	[109,]	"S109"	"1"	"Blood (600ng)_0"	"0"	"36695"
##	[110,]	"S110"	"1"	"Blood (600ng)_0"	"0"	"54791"
##	[111,]	"S111"	"1"	"Blood (600ng)_0"	"0"	"55597"
##	[112,]	"S112"	"1"	"Tumor (600ng)_1.1"	"0"	"302"
##	[113,]	"S113"	"1"	"Tumor (600ng)_1.1"	"0"	"243"
##	[114,]	"S114"	"2"	"Tumor (600ng)_1.1"	"1"	"60"
##	[115,]	"S115"	"2"	"Tumor (600ng)_1.2"	"1"	"101"
##	[116,]	"S116"	"1"	"Tumor (600ng)_1.2"	"0"	"190"
##	[117,]	"S117"	"1"	"Tumor (600ng)_1.2"	"0"	"81"
##	[118,]	"S118"	"1"	"Tumor (600ng)_1.3"	"0"	"1680"
##	[119,]	"S119"	"1"	"Tumor (600ng)_1.3"	"0"	"3065"
##	[120,]	"S120"	"1"	"Tumor (600ng)_1.3"	"0"	"1821"
##	[121,]	"S121"	"1"	"Tumor (600ng)_1.4"	"0"	"3883"
##	[122,]	"S122"	"1"	"Tumor (600ng)_1.4"	"0"	"5772"

##	[123,]	"S123"	"1"	"Tumor (600ng)_1.4"	"0"	"7682"
##	[124,]	"S124"	"1"	"Tumor (600ng)_1.5"	"0"	"87930"
##	[125,]	"S125"	"1"	"Tumor (600ng)_1.5"	"0"	"78269"
##	[126,]	"S126"	"1"	"Tumor (600ng)_1.5"	"0"	"57032"
##	[127,]	"S127"	"1"	"Tumor (600ng)_1.6"	"0"	"110077"
##	[128,]	"S128"	"1"	"Tumor (600ng)_1.6"	"0"	"97459"
##	[129,]	"S129"	"1"	"Tumor (600ng)_1.6"	"0"	"61390"
##	[130,]	"S130"	"1"	"Tumor (600ng)_0"	"0"	"1619"
##	[131,]	"S131"	"1"	"Tumor (600ng)_0"	"0"	"5258"
##	[132,]	"S132"	"1"	"Tumor (600ng)_0"	"0"	"3787"
##	[133,]	"S133"	"1"	"PCR control 1"	"0"	"309"
##	[134,]	"S134"	"1"	"PCR control 2"	"0"	"185"
##	[135,]	"S135"	"1"	"PCR control 3"	"0"	"149"
##	[136,]	"S136"	"1"	"2nd PCR_no template control"	"0"	"153"
##	[137,]	"S137"	"2"	"2nd PCR_no template control"	"1"	"9"
##	[138,]	"S138"	"1"	"2nd PCR_no template control"	"0"	"4"
##	[139,]	"S139"	"1"	"2nd PCR_no template control"	"0"	"7"
##		Clone.fraction		AA..Seq..CDR3	V.segments	J.segments
##	[1,]	"0.276119402985075"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[2,]	"0.269826800364631"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[3,]	"0.0506329113924051"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[4,]	"0.08274231678487"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[5,]	"0.0560606060606061"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[6,]	"0.0841584158415842"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[7,]	"0.124503311258278"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[8,]	"0.120300751879699"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[9,]	"0.204896907216495"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[10,]	"0.199652777777778"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[11,]	"0.197714285714286"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[12,]	"0.147321428571429"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[13,]	"0.147420147420147"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[14,]	"0.108938547486034"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[15,]	"0.1227722722722723"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[16,]	"0.0560747663551402"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[17,]	"0.0726392251815981"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[18,]	"0.0546875"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[19,]	"0.113149847094801"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[20,]	"0.170984455958549"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[21,]	"0.972726010655609"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[22,]	"0.970191698635235"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[23,]	"0.963279748350723"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[24,]	"0.962913939710467"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[25,]	"0.970420397262831"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[26,]	"0.00983844153629737"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[27,]	"0.00757124596926474"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[28,]	"0.00656916487272243"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[29,]	"0.00927213722763097"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[30,]	"0.00538216906087494"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[31,]	"0.004461311351196"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[32,]	"0.00361812174772564"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[33,]	"0.00362476416348828"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[34,]	"0.00429352609043894"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[35,]	"0.00344637546059214"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[36,]	"0.264853101196953"		"CASSDAGGRNTLYF"	"V133"	"J2-4"

##	[37,]	"0.299838387679437"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[38,]	"0.294712618486658"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[39,]	"0.274919520046825"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[40,]	"0.324679838515627"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[41,]	"0.202387766783874"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[42,]	"0.223033234237032"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[43,]	"0.204234068888984"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[44,]	"0.129124478856462"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[45,]	"0.130252186499766"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[46,]	"0.170173568818514"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[47,]	"0.124328161444073"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[48,]	"0.141311035292802"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[49,]	"0.136781468317196"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[50,]	"0.146207401978747"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[51,]	"0.00724389476217807"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[52,]	"0.0440030518878651"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[53,]	"0.0389549925364796"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[54,]	"0.0224463923462578"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[55,]	"0.0539841650323237"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[56,]	"0.995883680786084"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[57,]	"0.995480191580715"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[58,]	"0.995512737912059"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[59,]	"0.995619434212361"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[60,]	"0.995265639542486"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[61,]	"0.00520989025067259"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[62,]	"0.00254452926208651"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[63,]	"0.00335395069256904"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[64,]	"0.0027019660358129"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[65,]	"0.00237671632872024"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[66,]	"0.0126065424653842"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[67,]	"0.00356928568131817"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[68,]	"0.00256018451780308"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[69,]	"0.00262498331578401"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[70,]	"0.00207873593348045"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[71,]	"0.144736842105263"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[72,]	"0.204277286135693"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[73,]	"0.184947958366693"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[74,]	"0.206018518518519"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[75,]	"0.193575655114117"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[76,]	"0.196897374701671"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[77,]	"0.139355742296919"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[78,]	"0.157094594594595"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[79,]	"0.1562634524322"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[80,]	"0.159412690089145"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[81,]	"0.0971563981042654"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[82,]	"0.512455516014235"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[83,]	"0.20855614973262"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[84,]	"0.132758620689655"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[85,]	"0.16728624535316"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[86,]	"0.00572018004501125"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[87,]	"0.00923482849604222"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[88,]	"0.00907759882869692"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[89,]	"0.00878833208676141"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[90,]	"0.0104388949766423"	"CASSDAGGRNTLYF"	"V133"	"J2-4"

##	[91,]	"0.113247863247863"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[92,]	"0.0614107883817427"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[93,]	"0.120543293718166"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[94,]	"0.122121049812533"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[95,]	"0.0963488843813387"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[96,]	"0.175523349436393"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[97,]	"0.335705888639521"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[98,]	"0.222420788253478"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[99,]	"0.262598756093461"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[100,]	"0.3032437442076"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[101,]	"0.121658536585366"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[102,]	"0.193157820639167"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[103,]	"0.347622128760919"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[104,]	"0.117143185834486"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[105,]	"0.0961352996404187"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[106,]	"0.203047644737546"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[107,]	"0.296843037907269"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[108,]	"0.130083462477336"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[109,]	"0.0557917271032698"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[110,]	"0.0602151837524178"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[111,]	"0.0534873518676367"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[112,]	"0.105483758295494"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[113,]	"0.121076233183857"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[114,]	"0.0352941176470588"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[115,]	"0.0185457216305545"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[116,]	"0.120253164556962"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[117,]	"0.0475352112676056"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[118,]	"0.251723104584957"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[119,]	"0.265620937689575"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[120,]	"0.287405303030303"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[121,]	"0.343780433820274"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[122,]	"0.304703584437523"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[123,]	"0.312314509899581"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[124,]	"0.335935082350514"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[125,]	"0.33876817867036"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[126,]	"0.357477748527015"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[127,]	"0.36293348455974"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[128,]	"0.35420058731174"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[129,]	"0.375168822914693"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[130,]	"0.0896208137282037"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[131,]	"0.121569443481076"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[132,]	"0.105708304256804"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[133,]	"0.145002346316283"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[134,]	"0.134545454545455"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[135,]	"0.162132752992383"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[136,]	"0.14868804664723"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[137,]	"0.204545454545455"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[138,]	"0.285714285714286"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[139,]	"0.4375"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##		Normalized.clone.count	Normalized.clone.fraction		
##	[1,]	"291"	"0.327334083239595"		
##	[2,]	"388"	"0.318293683347006"		
##	[3,]	"26"	"0.0654911838790932"		
##	[4,]	"46"	"0.107728337236534"		

##	[5,]	"49"	"0.0736842105263158"
##	[6,]	"67"	"0.112227805695142"
##	[7,]	"123"	"0.149817295980512"
##	[8,]	"84"	"0.144082332761578"
##	[9,]	"209"	"0.243306169965076"
##	[10,]	"151"	"0.255499153976311"
##	[11,]	"227"	"0.233539094650206"
##	[12,]	"87"	"0.171936758893281"
##	[13,]	"79"	"0.188095238095238"
##	[14,]	"51"	"0.130434782608696"
##	[15,]	"81"	"0.156976744186047"
##	[16,]	"31"	"0.0702947845804989"
##	[17,]	"39"	"0.0874439461883408"
##	[18,]	"37"	"0.0625"
##	[19,]	"49"	"0.144542772861357"
##	[20,]	"87"	"0.218045112781955"
##	[21,]	"560680"	"0.981881735682788"
##	[22,]	"677123"	"0.979002264164038"
##	[23,]	"669257"	"0.972976469989605"
##	[24,]	"773952"	"0.972730437667866"
##	[25,]	"313651"	"0.97755663047137"
##	[26,]	"6055"	"0.00570238718596845"
##	[27,]	"2735"	"0.00438335702643317"
##	[28,]	"1941"	"0.00381291755965419"
##	[29,]	"3909"	"0.00538863960629433"
##	[30,]	"4229"	"0.0031196011867615"
##	[31,]	"2688"	"0.00309216088899626"
##	[32,]	"3323"	"0.0025090531288036"
##	[33,]	"3039"	"0.00251401569956892"
##	[34,]	"2848"	"0.00298056666349214"
##	[35,]	"2978"	"0.0023888230674638"
##	[36,]	"4789"	"0.358189977561705"
##	[37,]	"12412"	"0.386365758754864"
##	[38,]	"35280"	"0.389644813571302"
##	[39,]	"6162"	"0.360350877192982"
##	[40,]	"31861"	"0.404050523752758"
##	[41,]	"9740"	"0.277405941158042"
##	[42,]	"13188"	"0.313790806129247"
##	[43,]	"18831"	"0.285067667807079"
##	[44,]	"11376"	"0.181844338944037"
##	[45,]	"8381"	"0.179934733135815"
##	[46,]	"14662"	"0.229718296618933"
##	[47,]	"8041"	"0.169038659631272"
##	[48,]	"6629"	"0.189313456705506"
##	[49,]	"2928"	"0.188453369376327"
##	[50,]	"12038"	"0.196394485683987"
##	[51,]	"6159"	"0.00887913051125281"
##	[52,]	"50009"	"0.0530645637073995"
##	[53,]	"35672"	"0.0463192721257237"
##	[54,]	"28174"	"0.0254776724472365"
##	[55,]	"34123"	"0.0680680700648505"
##	[56,]	"255803"	"0.996517294709327"
##	[57,]	"300192"	"0.99629614879127"
##	[58,]	"344579"	"0.996353805227851"

##	[59,]	"552770"	"0.996342819651802"
##	[60,]	"339475"	"0.995831573265747"
##	[61,]	"480"	"0.00294283542192903"
##	[62,]	"376"	"0.00143185184903102"
##	[63,]	"101"	"0.0018908192301932"
##	[64,]	"299"	"0.0015248722473251"
##	[65,]	"230"	"0.00134279909390252"
##	[66,]	"2454"	"0.00873636056177575"
##	[67,]	"609"	"0.00246730516797122"
##	[68,]	"582"	"0.00176848092957678"
##	[69,]	"697"	"0.00181544456252214"
##	[70,]	"447"	"0.00143491827065062"
##	[71,]	"231"	"0.145465994962217"
##	[72,]	"363"	"0.220668693009119"
##	[73,]	"303"	"0.206122448979592"
##	[74,]	"467"	"0.253666485605649"
##	[75,]	"300"	"0.233281493001555"
##	[76,]	"433"	"0.245048104131296"
##	[77,]	"261"	"0.177671885636487"
##	[78,]	"366"	"0.200109349371241"
##	[79,]	"476"	"0.201268498942918"
##	[80,]	"399"	"0.203260315843097"
##	[81,]	"54"	"0.126760563380282"
##	[82,]	"378"	"0.517808219178082"
##	[83,]	"102"	"0.217021276595745"
##	[84,]	"101"	"0.149187592319055"
##	[85,]	"59"	"0.198653198653199"
##	[86,]	"80"	"0.00679925208227095"
##	[87,]	"156"	"0.0111892124515851"
##	[88,]	"81"	"0.0103171570500573"
##	[89,]	"123"	"0.0110254571531015"
##	[90,]	"237"	"0.0132261844969027"
##	[91,]	"209"	"0.135626216742375"
##	[92,]	"97"	"0.070854638422206"
##	[93,]	"186"	"0.134199134199134"
##	[94,]	"299"	"0.137093076570381"
##	[95,]	"125"	"0.103135313531353"
##	[96,]	"286"	"0.195221843003413"
##	[97,]	"20603"	"0.383725694703122"
##	[98,]	"6041"	"0.248723649538867"
##	[99,]	"10247"	"0.290159988673368"
##	[100,]	"32192"	"0.339979722879351"
##	[101,]	"9815"	"0.134612483370592"
##	[102,]	"10799"	"0.218020673503997"
##	[103,]	"163507"	"0.387991523875288"
##	[104,]	"96175"	"0.117018726646445"
##	[105,]	"59236"	"0.100131173256883"
##	[106,]	"114545"	"0.215158892057088"
##	[107,]	"160857"	"0.327981062135281"
##	[108,]	"67389"	"0.137933363626316"
##	[109,]	"48137"	"0.0550944985618913"
##	[110,]	"71875"	"0.0599469380980619"
##	[111,]	"72933"	"0.051684074689026"
##	[112,]	"396"	"0.121546961325967"


```
## [113,] "319" "0.14927468413664"
## [114,] "79" "0.0366079703429101"
## [115,] "132" "0.0139225820061175"
## [116,] "249" "0.149729404690319"
## [117,] "106" "0.0568364611260054"
## [118,] "2204" "0.317350611951044"
## [119,] "4021" "0.334692858331946"
## [120,] "2389" "0.363180297962907"
## [121,] "5094" "0.430163823678433"
## [122,] "7572" "0.380254105358309"
## [123,] "10077" "0.380939779987147"
## [124,] "115348" "0.419011500766476"
## [125,] "102674" "0.429634279019165"
## [126,] "74815" "0.449768848329636"
## [127,] "144400" "0.45212882540438"
## [128,] "127848" "0.443374764177117"
## [129,] "80532" "0.462110518161474"
## [130,] "2124" "0.135234942060359"
## [131,] "6898" "0.168215182773673"
## [132,] "4968" "0.146160635481024"
## [133,] "405" "0.175857577073383"
## [134,] "243" "0.147005444646098"
## [135,] "195" "0.189320388349515"
## [136,] "201" "0.156298600311042"
## [137,] "12" "0.17910447761194"
## [138,] "5" "0.238095238095238"
## [139,] "9" "0.375"
```

```
mammary_DNA160609 <- weird.vj(clone.dir = "/Volumes/mammary_DNA160609LC/normalization/normalized_clones",
                               metadata = "~/Desktop/OHSU/tcr_spike/data/mammary_DNA160609LC/mammary_treatments",
                               treat.col = "Treatment")

mammary_DNA160609
```

```
##      Sample Rank Treatment      Clone.ID Clone.count
## [1,] "S1"    "1"  "Vehicle "      "0"      "43721"
## [2,] "S2"    "1"  "Vehicle "      "0"      "39164"
## [3,] "S3"    "1"  "Vehicle "      "0"      "196689"
## [4,] "S4"    "1"  "Vehicle "      "0"      "39800"
## [5,] "S5"    "1"  "PLX+ IgG2b"      "0"      "108959"
## [6,] "S6"    "1"  "PLX+ IgG2b"      "0"      "47864"
## [7,] "S7"    "1"  "PLX+ IgG2b"      "0"      "61117"
## [8,] "S8"    "1"  "PLX+ IgG2b"      "0"      "24881"
## [9,] "S9"    "1"  "PLX+ IgG2b"      "0"      "34982"
## [10,] "S10"  "1"  "PLX+ aPD-L1"      "0"      "32165"
## [11,] "S11"  "1"  "PLX+ aPD-L1"      "0"      "31346"
## [12,] "S12"  "1"  "PLX+ aPD-L1"      "0"      "56171"
## [13,] "S13"  "1"  "PLX+ aPD-L1"      "0"      "38439"
## [14,] "S14"  "1"  "PLX+ aPD-L1"      "0"      "48957"
## [15,] "S15"  "1"  "PLX+ aPD-L1"      "0"      "59368"
## [16,] "S16"  "1"  "PTX+ IgG2b"      "0"      "46129"
## [17,] "S17"  "1"  "PTX+ IgG2b"      "0"      "63918"
## [18,] "S18"  "1"  "PTX+ IgG2b"      "0"      "11098"
## [19,] "S19"  "1"  "PTX+ IgG2b"      "0"      "117463"
## [20,] "S20"  "1"  "PTX+ IgG2b"      "0"      "120767"
```

##	[21,]	"S21"	"1"	"PTX+ IgG2b"	"0"	"76697"
##	[22,]	"S22"	"1"	"PTX+ aPD-L1"	"0"	"86579"
##	[23,]	"S23"	"1"	"PTX+ aPD-L1"	"0"	"60056"
##	[24,]	"S24"	"1"	"PTX+ aPD-L1"	"0"	"48932"
##	[25,]	"S25"	"1"	"PTX+ aPD-L1"	"0"	"67982"
##	[26,]	"S26"	"1"	"PTX+ aPD-L1"	"0"	"41602"
##	[27,]	"S27"	"1"	"PTX+ aPD-L1"	"0"	"57193"
##	[28,]	"S28"	"1"	"Vehicle + IgG2b"	"0"	"69564"
##	[29,]	"S29"	"2"	"Vehicle + IgG2b"	"1"	"47417"
##	[30,]	"S30"	"1"	"Vehicle + IgG2b"	"0"	"113688"
##	[31,]	"S31"	"1"	"Vehicle + IgG2b"	"0"	"158466"
##	[32,]	"S32"	"1"	"Vehicle + IgG2b"	"0"	"59072"
##	[33,]	"S33"	"1"	"Vehicle + aPD-L1"	"0"	"107301"
##	[34,]	"S34"	"1"	"Vehicle + aPD-L1"	"0"	"75160"
##	[35,]	"S35"	"1"	"Vehicle + aPD-L1"	"0"	"22568"
##	[36,]	"S36"	"1"	"Vehicle + aPD-L1"	"0"	"77253"
##	[37,]	"S37"	"1"	"Vehicle + aPD-L1"	"0"	"46240"
##	[38,]	"S38"	"1"	"Vehicle + aPD-L1"	"0"	"82106"
##	[39,]	"S39"	"1"	"Vehicle + aPD-L1"	"0"	"63958"
##	[40,]	"S40"	"1"	"PLX+ PTX+ IgG2b"	"0"	"56572"
##	[41,]	"S41"	"1"	"PLX+ PTX+ IgG2b"	"0"	"26972"
##	[42,]	"S42"	"1"	"PLX+ PTX+ IgG2b"	"0"	"63235"
##	[43,]	"S43"	"1"	"PLX+ PTX+ IgG2b"	"0"	"42998"
##	[44,]	"S44"	"1"	"PLX+ PTX+ IgG2b"	"0"	"59120"
##	[45,]	"S45"	"1"	"PLX+ PTX+ IgG2b"	"0"	"85470"
##	[46,]	"S46"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"107205"
##	[47,]	"S47"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"75158"
##	[48,]	"S48"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"68730"
##	[49,]	"S49"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"29865"
##	[50,]	"S50"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"112395"
##	[51,]	"S51"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"52682"
##	[52,]	"S52"	"1"	"Vehicle"	"0"	"5728"
##	[53,]	"S53"	"1"	"Vehicle"	"0"	"5033"
##	[54,]	"S54"	"1"	"Vehicle"	"0"	"139"
##	[55,]	"S55"	"1"	"Vehicle"	"0"	"4435"
##	[56,]	"S56"	"1"	"PLX+ IgG2b"	"0"	"24762"
##	[57,]	"S57"	"1"	"PLX+ IgG2b"	"0"	"2434"
##	[58,]	"S58"	"1"	"PLX+ IgG2b"	"0"	"3774"
##	[59,]	"S59"	"1"	"PLX+ IgG2b"	"0"	"6452"
##	[60,]	"S60"	"1"	"PLX+ IgG2b"	"0"	"2751"
##	[61,]	"S61"	"1"	"PLX+ aPD-L1"	"0"	"24234"
##	[62,]	"S62"	"1"	"PLX+ aPD-L1"	"0"	"6592"
##	[63,]	"S63"	"1"	"PLX+ aPD-L1"	"0"	"3067"
##	[64,]	"S64"	"1"	"PLX+ aPD-L1"	"0"	"7188"
##	[65,]	"S65"	"1"	"PLX+ aPD-L1"	"0"	"7080"
##	[66,]	"S66"	"1"	"PTX+ IgG2b"	"0"	"7168"
##	[67,]	"S67"	"1"	"PTX+ IgG2b"	"0"	"15787"
##	[68,]	"S68"	"1"	"PTX+ IgG2b"	"0"	"2326"
##	[69,]	"S69"	"1"	"PTX+ IgG2b"	"0"	"20700"
##	[70,]	"S70"	"1"	"PTX+ IgG2b"	"0"	"6527"
##	[71,]	"S71"	"1"	"PTX+ aPD-L1"	"0"	"16957"
##	[72,]	"S72"	"1"	"PTX+ aPD-L1"	"0"	"2962"
##	[73,]	"S73"	"1"	"PTX+ aPD-L1"	"0"	"3727"
##	[74,]	"S74"	"1"	"PTX+ aPD-L1"	"0"	"31610"

##	[75,]	"S75"	"1"	"PTX+ aPD-L1"	"0"	"21312"
##	[76,]	"S76"	"1"	"Vehicle+ IgG2b"	"0"	"4635"
##	[77,]	"S77"	"2"	"Vehicle+ IgG2b"	"1"	"23942"
##	[78,]	"S78"	"1"	"Vehicle+ IgG2b"	"0"	"3520"
##	[79,]	"S79"	"1"	"Vehicle+ IgG2b"	"0"	"3201"
##	[80,]	"S80"	"1"	"Vehicle+ IgG2b"	"0"	"4568"
##	[81,]	"S81"	"1"	"Vehicle + aPD-L1"	"0"	"4098"
##	[82,]	"S82"	"1"	"Vehicle + aPD-L1"	"0"	"4265"
##	[83,]	"S83"	"1"	"Vehicle + aPD-L1"	"0"	"2827"
##	[84,]	"S84"	"1"	"Vehicle + aPD-L1"	"0"	"3252"
##	[85,]	"S85"	"1"	"Vehicle + aPD-L1"	"0"	"15697"
##	[86,]	"S86"	"1"	"Vehicle + aPD-L1"	"0"	"4594"
##	[87,]	"S87"	"1"	"Vehicle + aPD-L1"	"0"	"6781"
##	[88,]	"S88"	"1"	"PLX+ PTX+ IgG2b"	"0"	"2252"
##	[89,]	"S89"	"1"	"PLX+ PTX+ IgG2b"	"0"	"56495"
##	[90,]	"S90"	"1"	"PLX+ PTX+ IgG2b"	"0"	"5064"
##	[91,]	"S91"	"1"	"PLX+ PTX+ IgG2b"	"0"	"3193"
##	[92,]	"S92"	"1"	"PLX+ PTX+ IgG2b"	"0"	"5775"
##	[93,]	"S93"	"1"	"PLX+ PTX+ IgG2b"	"0"	"6517"
##	[94,]	"S94"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"2963"
##	[95,]	"S95"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"6638"
##	[96,]	"S96"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"3435"
##	[97,]	"S97"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"9824"
##	[98,]	"S98"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"6010"
##	[99,]	"S99"	"1"	"PLX+ PTX+ aPD-L1"	"0"	"3900"
##	[100,]	"S100"	"1"	"untreated"	"0"	"3906"
##	[101,]	"S101"	"1"	"untreated"	"0"	"32906"
##	[102,]	"S102"	"1"	"untreated"	"0"	"18353"
##	[103,]	"S103"	"1"	"untreated"	"0"	"20173"
##	[104,]	"S104"	"1"	"untreated"	"0"	"13352"
##	[105,]	"S105"	"1"	"untreated"	"0"	"12609"
##	[106,]	"S106"	"1"	"untreated"	"0"	"117453"
##	[107,]	"S107"	"1"	"wild-type mammary tissue"	"0"	"126361"
##	[108,]	"S108"	"1"	"wild-type mammary tissue"	"0"	"122609"
##	[109,]	"S109"	"1"	"wild-type mammary tissue"	"0"	"117954"
##	[110,]	"S110"	"1"	"wild-type mammary tissue"	"0"	"151190"
##	[111,]	"S111"	"1"	"wild-type mammary tissue"	"0"	"120183"
##	[112,]	"S112"	"1"	"untreated"	"0"	"25541"
##	[113,]	"S113"	"1"	"untreated"	"0"	"16601"
##	[114,]	"S114"	"1"	"untreated"	"0"	"44856"
##	[115,]	"S115"	"1"	"untreated"	"0"	"10204"
##	[116,]	"S116"	"1"	"untreated"	"0"	"17872"
##	[117,]	"S117"	"1"	"wild-type"	"0"	"14459"
##	[118,]	"S118"	"1"	"wild-type"	"0"	"61929"
##	[119,]	"S119"	"1"	"wild-type"	"0"	"44572"
##	[120,]	"S120"	"1"	"wild-type"	"0"	"55379"
##	[121,]	"S121"	"1"	"wild-type"	"0"	"84391"
##	[122,]	"S122"	"1"	"PCR control 2 "	"0"	"26806"
##	[123,]	"S123"	"1"	"ST control 1"	"0"	"2356"
##	[124,]	"S124"	"1"	"ST control 2"	"0"	"2050"
##	[125,]	"S125"	"1"	"ST control 3"	"0"	"3685"
##	[126,]	"S126"	"1"	"1st PCR negative control 1"	"0"	"27739"
##	[127,]	"S127"	"1"	"1st PCR negative control 2"	"0"	"67004"
##	[128,]	"S128"	"1"	"1st PCR negative control 3"	"0"	"51115"

##	[129,]	"S129"	"1"	"1stPCR negative control 4"	"0"	"50419"
##	[130,]	"S130"	"1"	"1st PCR negative control 5"	"0"	"120973"
##	[131,]	"S131"	"1"	"1st PCR negative control 6"	"0"	"44898"
##	[132,]	"S132"	"1"	"PCR control1"	"0"	"74031"
##	[133,]	"S133"	"1"	"2nd PCR negative control 1"	"0"	"60"
##	[134,]	"S134"	"1"	"2nd PCR negative control 2"	"0"	"20"
##	[135,]	"S135"	"1"	"2nd PCR negative control 3"	"0"	"62"
##		Clone.fraction		AA..Seq..CDR3	V.segments	J.segments
##	[1,]	"0.128902817989374"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[2,]	"0.227368518830298"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[3,]	"0.345190145998852"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[4,]	"0.125736093208987"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[5,]	"0.27909150986409"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[6,]	"0.198883916513964"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[7,]	"0.223923469518607"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[8,]	"0.127908411387915"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[9,]	"0.10591971998583"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[10,]	"0.358156936541695"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[11,]	"0.192434250914716"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[12,]	"0.409418573292419"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[13,]	"0.151206060987507"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[14,]	"0.132130162662845"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[15,]	"0.118930093913266"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[16,]	"0.15838174501806"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[17,]	"0.276641419606146"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[18,]	"0.142790972954891"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[19,]	"0.277567600138946"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[20,]	"0.279541593174358"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[21,]	"0.255189669571351"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[22,]	"0.370567413830739"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[23,]	"0.299414691541445"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[24,]	"0.260029014927277"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[25,]	"0.175831281425231"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[26,]	"0.179331333195393"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[27,]	"0.295142454626615"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[28,]	"0.138116161004481"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[29,]	"0.115527520532893"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[30,]	"0.230132061569355"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[31,]	"0.261561950663949"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[32,]	"0.146222888911992"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[33,]	"0.285940797748737"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[34,]	"0.207905153646777"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[35,]	"0.185196126702774"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[36,]	"0.27336808246372"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[37,]	"0.144223271597622"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[38,]	"0.56083716418828"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[39,]	"0.174707582371355"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[40,]	"0.242897318649235"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[41,]	"0.137605926258488"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[42,]	"0.229628150192461"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[43,]	"0.137414631184346"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[44,]	"0.58349206975849"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[45,]	"0.221859393008068"		"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[46,]	"0.320948069910725"		"CASSDAGGRNTLYF"	"V133"	"J2-4"

##	[47,]	"0.245685033604435"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[48,]	"0.315227511431756"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[49,]	"0.215364312911042"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[50,]	"0.611546999804122"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[51,]	"0.187479759858506"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[52,]	"0.256401074306177"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[53,]	"0.292956926658906"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[54,]	"0.306167400881057"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[55,]	"0.313095658312743"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[56,]	"0.486378189389326"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[57,]	"0.246906066139176"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[58,]	"0.374107850911975"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[59,]	"0.214416270645708"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[60,]	"0.31000676132522"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[61,]	"0.481358625484159"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[62,]	"0.32329573320255"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[63,]	"0.297305157037611"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[64,]	"0.318109399893787"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[65,]	"0.187723717353838"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[66,]	"0.326575242607864"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[67,]	"0.286183017910231"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[68,]	"0.348203592814371"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[69,]	"0.405326023105541"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[70,]	"0.282444069410187"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[71,]	"0.26978823604283"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[72,]	"0.234799841458581"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[73,]	"0.278591717745552"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[74,]	"0.380238656594332"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[75,]	"0.396938034307426"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[76,]	"0.395410339532503"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[77,]	"0.304613348940177"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[78,]	"0.297674418604651"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[79,]	"0.223175067977411"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[80,]	"0.176370656370656"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[81,]	"0.186824709368589"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[82,]	"0.205334360406336"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[83,]	"0.268165433504079"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[84,]	"0.29679656840376"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[85,]	"0.554821150855365"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[86,]	"0.282290770554258"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[87,]	"0.480444948278305"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[88,]	"0.255473624503687"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[89,]	"0.742222397393452"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[90,]	"0.355867884750527"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[91,]	"0.341570389388104"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[92,]	"0.330661322645291"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[93,]	"0.352346453287197"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[94,]	"0.32621380601123"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[95,]	"0.446882994479601"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[96,]	"0.338957963291889"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[97,]	"0.280677694923002"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[98,]	"0.26891583516041"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[99,]	"0.34805890227577"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[100,]	"0.457162921348315"	"CASSDAGGRNTLYF"	"V133"	"J2-4"

##	[101,]	"0.320702493031597"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[102,]	"0.533905454545455"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[103,]	"0.434005292485101"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[104,]	"0.45705678978537"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[105,]	"0.481075925219382"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[106,]	"0.586992048697356"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[107,]	"0.608956935769913"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[108,]	"0.602575254945325"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[109,]	"0.621418862676093"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[110,]	"0.459689385094376"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[111,]	"0.517361170899699"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[112,]	"0.122465908437062"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[113,]	"0.22441061966043"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[114,]	"0.239591067145963"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[115,]	"0.0644057740495983"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[116,]	"0.113159044429108"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[117,]	"0.109014279898065"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[118,]	"0.213157976257267"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[119,]	"0.373031150092898"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[120,]	"0.308739985839405"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[121,]	"0.461761117099568"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[122,]	"0.600654297750291"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[123,]	"0.363524147508101"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[124,]	"0.369902562251895"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[125,]	"0.46398891966759"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[126,]	"0.418531315539327"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[127,]	"0.434244977316915"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[128,]	"0.403532040199259"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[129,]	"0.409381368799682"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[130,]	"0.657772968740654"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[131,]	"0.41699637782112"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[132,]	"0.523017252341995"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[133,]	"0.495867768595041"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[134,]	"0.253164556962025"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##	[135,]	"0.449275362318841"	"CASSDAGGRNTLYF"	"V133"	"J2-4"
##		Normalized.clone.count	Normalized.clone.fraction		
##	[1,]	"52462"	"0.118031916449368"		
##	[2,]	"46994"	"0.223061843485525"		
##	[3,]	"236013"	"0.275045857874386"		
##	[4,]	"47757"	"0.116700225791002"		
##	[5,]	"130743"	"0.26114337988559"		
##	[6,]	"57434"	"0.199399378547746"		
##	[7,]	"73336"	"0.211602716880089"		
##	[8,]	"29855"	"0.123884808498278"		
##	[9,]	"41976"	"0.0954974508077561"		
##	[10,]	"38596"	"0.360831681687297"		
##	[11,]	"37613"	"0.187812392332313"		
##	[12,]	"67401"	"0.393100431587542"		
##	[13,]	"46124"	"0.137073095348478"		
##	[14,]	"58745"	"0.117208231411686"		
##	[15,]	"71238"	"0.103780580365923"		
##	[16,]	"55352"	"0.162319248578475"		
##	[17,]	"76697"	"0.258099144907979"		
##	[18,]	"13317"	"0.132909497385125"		

##	[19,]	"140948"	"0.261749652728772"
##	[20,]	"144912"	"0.258673963917167"
##	[21,]	"92031"	"0.23668698402901"
##	[22,]	"103889"	"0.360600485942381"
##	[23,]	"72063"	"0.291916131279824"
##	[24,]	"58715"	"0.259104970278941"
##	[25,]	"81574"	"0.161895575825415"
##	[26,]	"49920"	"0.215495657279022"
##	[27,]	"68628"	"0.255338147805025"
##	[28,]	"83472"	"0.128576511742896"
##	[29,]	"56897"	"0.0997680139857933"
##	[30,]	"136418"	"0.217479956701054"
##	[31,]	"190148"	"0.240290044444332"
##	[32,]	"70882"	"0.136703245839039"
##	[33,]	"128754"	"0.272214669747794"
##	[34,]	"90187"	"0.20122627385444"
##	[35,]	"27080"	"0.22757832459325"
##	[36,]	"92698"	"0.262738262262092"
##	[37,]	"55485"	"0.133247679542753"
##	[38,]	"98522"	"0.56441485826898"
##	[39,]	"76745"	"0.161777880835187"
##	[40,]	"67883"	"0.220502442700483"
##	[41,]	"32365"	"0.128951415616807"
##	[42,]	"75878"	"0.228756967955695"
##	[43,]	"51595"	"0.129338330220724"
##	[44,]	"70940"	"0.579954218443427"
##	[45,]	"102558"	"0.210215405301811"
##	[46,]	"128639"	"0.309998891475446"
##	[47,]	"90184"	"0.225376610654058"
##	[48,]	"82471"	"0.306743286468794"
##	[49,]	"35836"	"0.218328479693916"
##	[50,]	"134866"	"0.662826643600317"
##	[51,]	"63215"	"0.17263603468287"
##	[52,]	"6873"	"0.285435441671166"
##	[53,]	"6039"	"0.327565632458234"
##	[54,]	"167"	"0.359913793103448"
##	[55,]	"5322"	"0.327105101413645"
##	[56,]	"29713"	"0.526929010977318"
##	[57,]	"2921"	"0.274969406005836"
##	[58,]	"4529"	"0.386697404371585"
##	[59,]	"7742"	"0.254353111242526"
##	[60,]	"3301"	"0.284421850766845"
##	[61,]	"29079"	"0.50779708373352"
##	[62,]	"7910"	"0.343957907553159"
##	[63,]	"3680"	"0.263534803781152"
##	[64,]	"8625"	"0.344931013797241"
##	[65,]	"8496"	"0.168008068184065"
##	[66,]	"8601"	"0.359228166896379"
##	[67,]	"18943"	"0.296002875179699"
##	[68,]	"2791"	"0.383221200054922"
##	[69,]	"24839"	"0.423180455226932"
##	[70,]	"7832"	"0.28511103021478"
##	[71,]	"20347"	"0.291495945674909"
##	[72,]	"3554"	"0.253766511960014"

## [73,]	"4472"	"0.303227556278817"
## [74,]	"37930"	"0.404431365022498"
## [75,]	"25573"	"0.376455521043412"
## [76,]	"5562"	"0.361685524775654"
## [77,]	"28729"	"0.201352677319877"
## [78,]	"4224"	"0.298473713962691"
## [79,]	"3841"	"0.25719833935985"
## [80,]	"5481"	"0.207590046585615"
## [81,]	"4917"	"0.205088633993743"
## [82,]	"5118"	"0.241096664782363"
## [83,]	"3392"	"0.277850589777195"
## [84,]	"3902"	"0.308336625839589"
## [85,]	"18835"	"0.530982183130356"
## [86,]	"5512"	"0.269364218345306"
## [87,]	"8137"	"0.476656317731826"
## [88,]	"2702"	"0.254066760695816"
## [89,]	"67790"	"0.750611761318968"
## [90,]	"6076"	"0.32837918175431"
## [91,]	"3831"	"0.359279752414893"
## [92,]	"6930"	"0.306732173682114"
## [93,]	"7820"	"0.351476470852623"
## [94,]	"3555"	"0.30554361839278"
## [95,]	"7965"	"0.464756681059634"
## [96,]	"4122"	"0.331377120347295"
## [97,]	"11788"	"0.284301666546077"
## [98,]	"7212"	"0.270517629407352"
## [99,]	"4680"	"0.36144578313253"
## [100,]	"4687"	"0.506538419971901"
## [101,]	"39485"	"0.356784646106859"
## [102,]	"22022"	"0.536493860845839"
## [103,]	"24206"	"0.444971414915715"
## [104,]	"16021"	"0.469961865649751"
## [105,]	"15130"	"0.499966955257419"
## [106,]	"140936"	"0.574939216422172"
## [107,]	"151625"	"0.610610630766319"
## [108,]	"147122"	"0.573874850799248"
## [109,]	"141537"	"0.60819364292252"
## [110,]	"181418"	"0.44602282505544"
## [111,]	"144211"	"0.495434244881132"
## [112,]	"30647"	"0.11274077017025"
## [113,]	"19920"	"0.233775378476705"
## [114,]	"53824"	"0.221434154770231"
## [115,]	"12244"	"0.057839020081156"
## [116,]	"21445"	"0.101877452517364"
## [117,]	"17350"	"0.0953218141361976"
## [118,]	"74311"	"0.195523361977783"
## [119,]	"53483"	"0.335419658703928"
## [120,]	"66451"	"0.295304966114876"
## [121,]	"101263"	"0.437930035332633"
## [122,]	"32165"	"0.59837407448748"
## [123,]	"2827"	"0.396326931165008"
## [124,]	"2460"	"0.385157350868953"
## [125,]	"4422"	"0.489159292035398"
## [126,]	"33285"	"0.504999165541412"


```
## [127,] "80400" "0.477134345364557"
## [128,] "61335" "0.43273504635313"
## [129,] "60499" "0.427391666784407"
## [130,] "145159" "0.687289600151512"
## [131,] "53875" "0.449625277494951"
## [132,] "88832" "0.534099722825139"
## [133,] "72" "0.507042253521127"
## [134,] "24" "0.289156626506024"
## [135,] "74" "0.493333333333333"
```

It's presence in all of the samples, with a high clone fraction, suggests that it is a contamination. The fact that they all have identical CDR3 regions is further evidence. I did not include it in this report, but this clone did not show up in any samples when I ran the same analysis on `equivol_DNA160107LC` and `equivol_DNA151124LC`.

Spike Count Analysis

This particular primer combination may be in high numbers due to the fact that V13-3/J2-4 is a vigorous primer combination compared to other primer pairs. We can look at the 20 samples from DNA160609LC to see how it stacks up against other pairs. Note, even if this sequence is a contamination, the spike counts should not be affected. Thee presence of p14 DNA could potentially reduce V13-3/J2-4 spike counts because the DNA would be taking up more of the primers, but we generally assume an excess of primers. I will run the analysis on data from a previous batch as well in order to compare.

```
DNA160609.spikes.only <- spike.analysis(count.dir = "/Volumes/DNA160609LC/spike_counts/25bp/counts/",
                                         subset = c(1, 20))
DNA160609.spikes.only
```

##	Sample	median	mean	V133_J24
## S1	S1	2224	2431.365	2162
## S2	S2	3990	4361.608	3681
## S3	S3	2874	3036.365	2496
## S4	S4	3680	3881.842	3226
## S5	S5	4820	5128.027	4212
## S6	S6	3628	3910.404	3284
## S7	S7	4810	5182.392	4374
## S8	S8	6256	6677.658	5473
## S9	S9	4136	4675.504	4040
## S10	S10	3552	3821.085	3388
## S11	S11	6362	6866.881	5826
## S12	S12	3316	3630.658	3212
## S13	S13	2530	2748.881	2318
## S14	S14	1653	1772.677	1475
## S15	S15	3136	3315.385	2565
## S16	S16	2486	2540.615	1967
## S17	S17	1900	2053.712	1655
## S18	S18	3042	3248.654	2640
## S19	S19	2328	2534.865	2018
## S20	S20	3887	4187.092	3378

```
DNA160609.all.samples <- spike.analysis(count.dir = "/Volumes/DNA160609LC/spike_counts/25bp/counts/")
DNA160609.all.samples
```

##	Sample	median	mean	V133_J24
## S1	S1	2224.0	2431.3653846	2162
## S2	S2	3990.0	4361.6076923	3681
## S3	S3	2874.0	3036.3653846	2496
## S4	S4	3680.0	3881.8423077	3226
## S5	S5	4820.0	5128.0269231	4212
## S6	S6	3628.0	3910.4038462	3284
## S7	S7	4810.0	5182.3923077	4374
## S8	S8	6256.0	6677.6576923	5473
## S9	S9	4136.0	4675.5038462	4040
## S10	S10	3552.0	3821.0846154	3388
## S11	S11	6362.0	6866.8807692	5826
## S12	S12	3316.0	3630.6576923	3212
## S13	S13	2530.0	2748.8807692	2318
## S14	S14	1653.0	1772.6769231	1475
## S15	S15	3136.0	3315.3846154	2565
## S16	S16	2486.0	2540.6153846	1967
## S17	S17	1900.0	2053.7115385	1655
## S18	S18	3042.0	3248.6538462	2640
## S19	S19	2328.0	2534.8653846	2018
## S20	S20	3887.0	4187.0923077	3378
## S21	S21	3.0	3.8307692	2
## S22	S22	2.0	3.3423077	1
## S23	S23	3.0	5.8000000	1
## S24	S24	7.0	11.1500000	6
## S25	S25	1.0	3.1269231	2
## S26	S26	4.0	9.7269231	5
## S27	S27	4.0	8.7576923	5
## S28	S28	3.0	6.5692308	7
## S29	S29	7.0	13.9961538	8
## S30	S30	11.0	29.1346154	33
## S31	S31	0.0	1.1269231	11
## S32	S32	3.0	5.4538462	3
## S33	S33	7.0	9.2807692	7
## S34	S34	1.0	3.2115385	1
## S35	S35	1.0	4.3115385	0
## S36	S36	1.0	2.6384615	0
## S37	S37	6.0	15.9961538	2
## S38	S38	5.0	17.0346154	19
## S39	S39	2.0	4.4346154	8
## S40	S40	4.0	15.6423077	1
## S41	S41	3.0	7.4961538	9
## S42	S42	7.0	10.4807692	8
## S43	S43	33.0	102.6461538	123
## S44	S44	25.5	112.4615385	2
## S45	S45	6.5	77.5115385	6
## S46	S46	26.5	138.0576923	0
## S47	S47	30.0	99.4500000	1
## S48	S48	16.5	72.4961538	100
## S49	S49	10.5	30.7384615	0
## S50	S50	33.0	113.6884615	2
## S51	S51	3.0	11.2076923	11
## S52	S52	109.5	160.0807692	80
## S53	S53	121.0	162.9153846	78

## S54	S54	255.5	346.8346154	220
## S55	S55	68.5	95.8500000	35
## S56	S56	1384.0	1523.4307692	699
## S57	S57	1693.0	1853.2038462	712
## S58	S58	1831.0	1999.6307692	798
## S59	S59	2324.0	2533.1730769	1068
## S60	S60	1830.0	1990.6307692	888
## S61	S61	3208.0	3481.5269231	3138
## S62	S62	4524.0	5070.9769231	4470
## S63	S63	1062.0	1167.6384615	1018
## S64	S64	3331.0	3449.4846154	3002
## S65	S65	3641.0	4061.2384615	3530
## S66	S66	1209.0	2027.5269231	1377
## S67	S67	708.5	1569.3192308	904
## S68	S68	994.5	2031.6461538	1211
## S69	S69	1668.0	2801.4038462	2002
## S70	S70	1409.0	2254.5615385	1460
## S71	S71	2854.0	3007.2846154	2251
## S72	S72	4374.0	4825.6115385	3720
## S73	S73	4066.0	4453.0461538	3643
## S74	S74	5570.0	6007.8846154	4675
## S75	S75	4388.0	4741.1346154	4057
## S76	S76	5024.0	5427.4192308	4123
## S77	S77	4344.0	4661.9230769	3989
## S78	S78	4316.0	4611.2038462	3668
## S79	S79	6708.0	7561.8192308	6038
## S80	S80	5780.0	6285.3653846	5161
## S81	S81	3312.0	3538.6384615	2914
## S82	S82	2777.0	2888.0076923	2424
## S83	S83	2508.0	2700.9500000	2505
## S84	S84	4197.0	4458.2384615	3982
## S85	S85	3014.0	3323.9076923	2978
## S86	S86	2860.0	3199.3076923	2767
## S87	S87	3011.0	3338.8615385	2967
## S88	S88	3194.0	3566.1615385	2930
## S89	S89	2268.0	2517.3115385	2198
## S90	S90	2536.0	2790.2000000	2258
## S91	S91	2358.0	2618.6384615	1781
## S92	S92	2539.0	2869.6769231	1926
## S93	S93	2129.0	2360.2346154	1685
## S94	S94	2242.0	2510.8153846	1820
## S95	S95	1734.0	1970.0500000	1321
## S96	S96	710.0	814.2038462	591
## S97	S97	1939.0	2182.6846154	1689
## S98	S98	1533.0	1707.0076923	1304
## S99	S99	1731.0	1937.1307692	1519
## S100	S100	2314.0	2650.4884615	2045
## S101	S101	4012.0	4489.7846154	3777
## S102	S102	2426.0	2686.5961538	2427
## S103	S103	835.0	1244.3038462	723
## S104	S104	320.0	457.7115385	340
## S105	S105	257.5	346.6307692	250
## S106	S106	387.0	547.5961538	323
## S107	S107	641.0	921.0538462	490

## S108	S108	170.0	229.5576923	135
## S109	S109	95.0	144.6961538	81
## S110	S110	91.5	137.1576923	75
## S111	S111	119.0	179.9153846	112
## S112	S112	3458.0	4075.7961538	2707
## S113	S113	4479.0	5187.1153846	3477
## S114	S114	4724.0	5540.4500000	3610
## S115	S115	2595.0	3035.4076923	2253
## S116	S116	3402.0	3931.6961538	2661
## S117	S117	4990.0	5633.9730769	3681
## S118	S118	2952.0	3575.2692308	2747
## S119	S119	3538.0	4236.0115385	3200
## S120	S120	2286.0	2797.2153846	2142
## S121	S121	1542.0	1895.6769231	1524
## S122	S122	5340.0	6385.9461538	5034
## S123	S123	6392.0	7466.6000000	5735
## S124	S124	2016.0	3619.7115385	1861
## S125	S125	1922.0	3485.1846154	2101
## S126	S126	1128.0	2139.0807692	1310
## S127	S127	1926.0	3366.8615385	1851
## S128	S128	1668.0	3024.5269231	1443
## S129	S129	937.5	1655.5307692	939
## S130	S130	939.0	2458.7615385	1304
## S131	S131	1972.0	3583.5884615	2114
## S132	S132	3064.0	5385.5461538	3098
## S133	S133	7970.0	8365.0846154	7082
## S134	S134	6126.0	6629.6846154	5332
## S135	S135	5358.0	5476.8384615	4339
## S136	S136	4.0	4.4576923	8
## S137	S137	1.0	0.9807692	2
## S138	S138	0.0	0.2346154	0
## S139	S139	0.0	0.2846154	0

```
DNA151124 <- spike.analysis(count.dir = "/Volumes/DNA151124LC/spike_counts/25bp/counts/")
DNA151124
```

##	Sample	median	mean	V133_J24
## 1	1	159.0	366.9692308	412
## 2	2	126.0	222.3692308	84
## 3	3	95.0	363.7653846	120
## 4	4	91.0	184.4961538	338
## 5	5	216.5	504.4115385	52
## 6	6	84.0	129.7500000	139
## 7	7	181.5	282.3307692	382
## 8	8	251.5	521.1807692	360
## 9	9	177.0	271.8384615	134
## 10	10	228.0	394.7423077	260
## 11	11	100.5	190.0461538	274
## 12	12	157.0	279.6500000	116
## 13	13	308.5	695.6269231	301
## 14	14	315.5	515.7769231	1193
## 15	15	269.0	588.6961538	535
## 16	16	52.5	87.0461538	126
## 17	17	41.0	71.0500000	36

## 18	18	89.5	162.4500000	11
## 19	19	69.5	134.6000000	35
## 20	20	88.0	139.6076923	194
## 21	21	117.5	200.5538462	149
## 22	22	87.0	159.2038462	166
## 23	23	146.5	246.8153846	380
## 24	24	513.0	1042.5730769	1254
## 25	25	622.0	840.9615385	438
## 26	26	157.5	256.1500000	251
## 27	27	288.5	533.5384615	394
## 28	28	230.0	510.6692308	320
## 29	29	218.0	364.8384615	404
## 30	30	167.5	342.1269231	218
## 31	31	72.0	141.5038462	43
## 32	32	198.5	376.4923077	356
## 33	33	652.5	1221.3461538	1020
## 34	34	135.5	288.8038462	131
## 35	35	67.0	113.3423077	57
## 36	36	176.5	312.2461538	258
## 37	37	518.0	892.4961538	713
## 38	38	632.0	1101.8615385	605
## 39	39	159.0	286.0230769	270
## 40	40	334.0	547.2153846	261
## 41	41	247.5	466.1730769	273
## 42	42	134.5	210.9846154	202
## 43	43	23.0	42.9846154	12
## 44	44	24.5	54.6884615	28
## 45	45	58.0	108.1961538	40
## 46	46	36.0	66.5000000	21
## 47	47	34.0	63.7692308	73
## 48	48	68.0	108.5076923	94
## 49	49	142.5	226.2807692	229
## 50	50	75.0	144.3961538	162
## 51	51	78.0	178.7769231	55
## 52	52	25.0	43.1115385	2
## 53	53	176.0	369.5692308	134
## 54	54	285.5	550.5653846	455
## 55	55	64.0	120.9423077	144
## 56	56	138.0	231.8461538	195
## 57	57	93.5	152.5384615	168
## 58	58	21.0	42.4038462	23
## 59	59	49.5	2217.3423077	35
## 60	60	426.0	695.4076923	399
## 61	61	257.5	406.2653846	509
## 62	62	96.5	182.8846154	198
## 63	63	19.0	34.3769231	2
## 64	64	14.0	24.1769231	57
## 65	65	126.0	224.6961538	14
## 66	66	22.0	35.7076923	26
## 67	67	23.0	39.4807692	9
## 68	68	31.5	50.4115385	23
## 69	69	191.0	323.5230769	243
## 70	70	11.0	23.4961538	9
## 71	71	41.0	75.7576923	41

## 72	72	7.0	13.6153846	7
## 73	73	22.5	40.2730769	56
## 74	74	41.5	60.3269231	102
## 75	75	25.5	41.2076923	30
## 76	76	2.0	5.0346154	0
## 77	77	5.0	10.9615385	3
## 78	78	0.0	0.7576923	2
## 79	79	0.0	1.5192308	4
## 80	80	1.0	3.3115385	1
## 81	81	26.5	41.4461538	32
## 82	82	16.0	28.8115385	4
## 83	83	1.0	2.7423077	0
## 84	84	63.5	153.1538462	96
## 85	85	0.0	0.1000000	0
## 86	86	7.0	23.7000000	10
## 87	87	17.0	35.9115385	59
## 88	88	2.5	21.1692308	1
## 89	89	39.0	88.7730769	0
## 90	90	26.5	67.8192308	84
## 91	91	24.0	52.6192308	40
## 92	92	48.0	91.8500000	132
## 93	93	23.0	40.4346154	64
## 94	94	10.0	51.1461538	0
## 95	95	53.5	244.5807692	72
## 96	96	7.0	20.4538462	17
## 97	97	16.0	35.3076923	24
## 98	98	21.0	68.2576923	68
## 99	99	10.0	25.3807692	11
## 100	100	32.5	65.9461538	8
## 101	101	5.0	13.7115385	2
## 102	102	11.0	20.1576923	6
## 103	103	5.5	20.8500000	0
## 104	104	5.0	11.6192308	0
## 105	105	7.0	18.4692308	3
## 106	106	9.5	30.8000000	0
## 107	107	3.0	9.8846154	2
## 108	108	21.5	42.8807692	0
## 109	109	48.5	108.0192308	116
## 110	110	29.0	58.8807692	4
## 111	111	7.0	15.9346154	15
## 112	112	40.0	73.9076923	78
## 113	113	18.5	36.6423077	33
## 114	114	156.5	278.0500000	234
## 115	115	74.0	204.6730769	166
## 116	116	16.0	29.7076923	16
## 117	117	43.5	103.5307692	69
## 118	118	89.0	202.6961538	162
## 119	119	18.0	43.0307692	27
## 120	120	8.0	15.1769231	12
## 121	121	73.0	132.5615385	73
## 122	122	120.0	253.1115385	210
## 123	123	268.5	438.8384615	220
## 124	124	45.5	98.8115385	80
## 125	125	66.0	150.9961538	81

## 126	126	76.0	147.7961538	93
## 127	127	111.5	170.6730769	141
## 128	128	37.0	93.4538462	53
## 129	129	17.0	32.1461538	0
## 130	130	53.0	73.5115385	19
## 131	131	18.0	46.0769231	19
## 132	132	59.0	138.7615385	82
## 133	133	85.0	169.1230769	178
## 134	134	24.5	89.7769231	1
## 135	135	7.0	19.6576923	0
## 136	136	20.0	59.5230769	21
## 137	137	36.0	73.1730769	21
## 138	138	20.0	64.5692308	10
## 139	139	64.0	133.0807692	116
## 140	140	23.0	50.8692308	23
## 141	141	50.0	126.6346154	39
## 142	142	0.0	0.0000000	0
## 143	143	20.0	42.4115385	53
## 144	144	25.5	1991.2692308	51
## 145	145	174.0	331.2307692	355
## 146	146	24.0	52.6846154	13
## 147	147	8.0	39.0000000	0
## 148	148	8.0	32.6576923	29
## 149	149	2.0	8.7076923	9
## 150	150	60.0	115.5730769	151
## 151	151	1.0	3.1000000	3
## 152	152	10.0	18.0961538	1
## 153	153	6.0	14.0576923	14
## 154	154	14.5	54.7923077	1
## 155	155	32.0	49.6038462	117
## 156	156	47.5	107.6000000	25
## 157	157	3.0	22.5923077	50
## 158	158	17.5	35.0769231	1
## 159	159	5.5	15.6807692	14
## 160	160	34.0	64.8384615	55
## 161	161	1.5	2.8769231	0
## 162	162	3.0	6.6846154	7
## 163	163	0.0	0.3307692	0
## 164	164	0.0	0.8730769	0
## 165	165	0.0	0.5269231	0
## 166	166	3.0	14.2153846	0
## 167	167	2.0	5.0000000	4
## 168	168	1.0	1.9692308	1
## 169	169	45.0	68.8461538	46
## 170	170	91.0	164.5769231	108

From these tables, we see that the V13-3/J2-4 primer pair does not produce spike counts significantly higher than other combinations.

Conclusions

The batch summaries suggest that the samples were contaminated by p14 DNA at some point. The spike counts suggest that V13-3/J2-4 is not a particularly efficient primer pair. Based on these two observations, it

seems that this is just a one-off fluke from using monoclonal samples. I think we should delete these entries from the `export_clones` and `export_alignments` data before running other analyses.