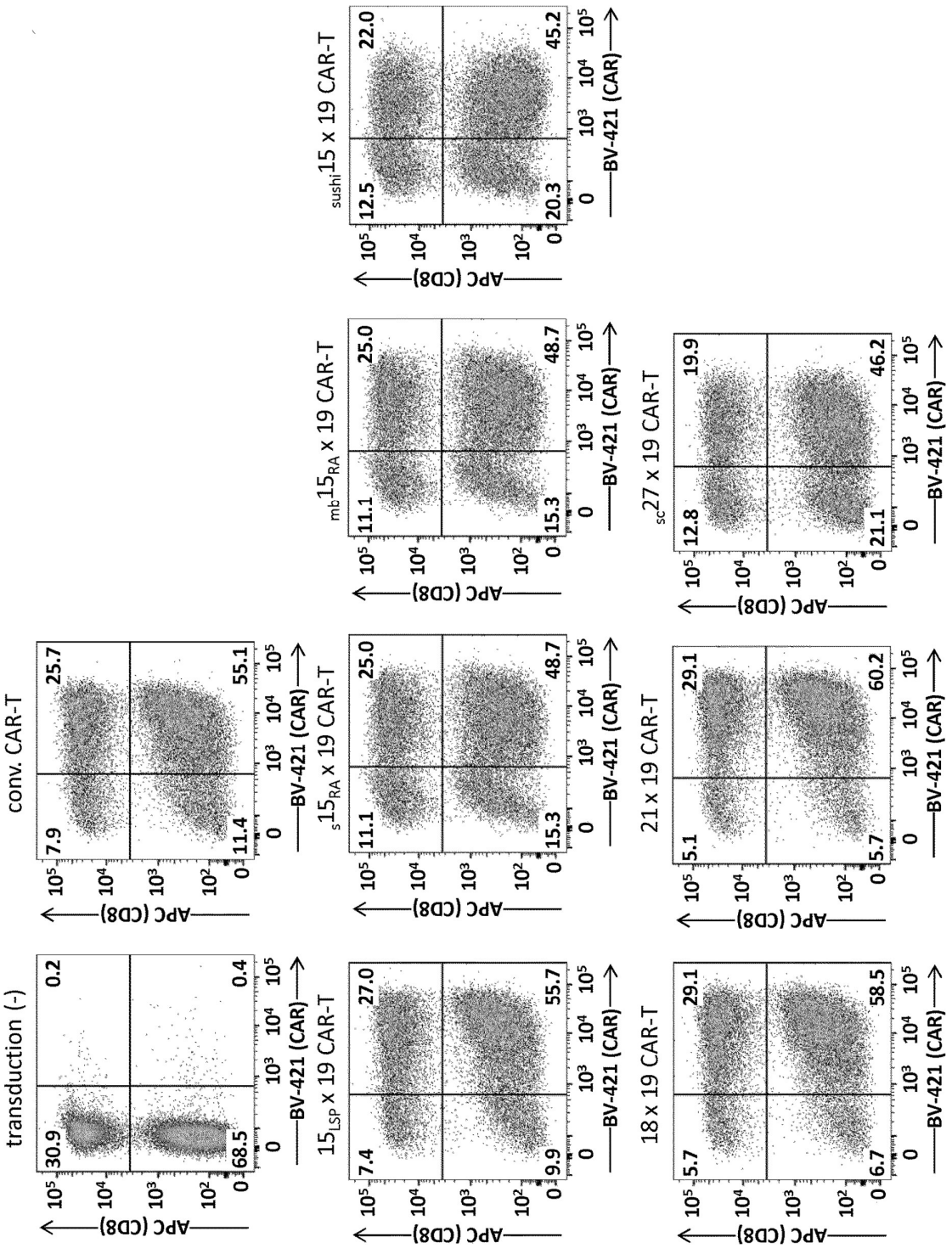
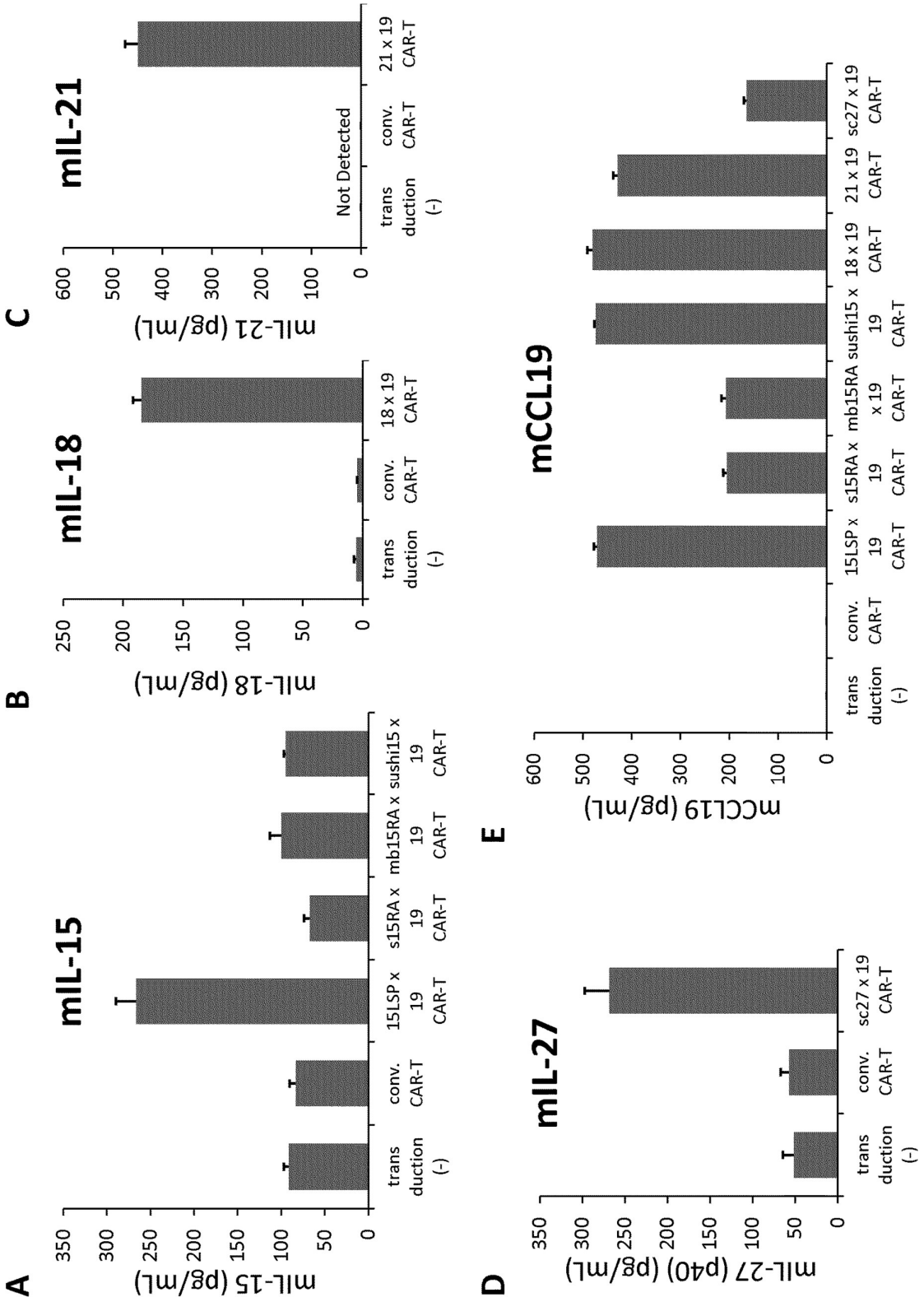
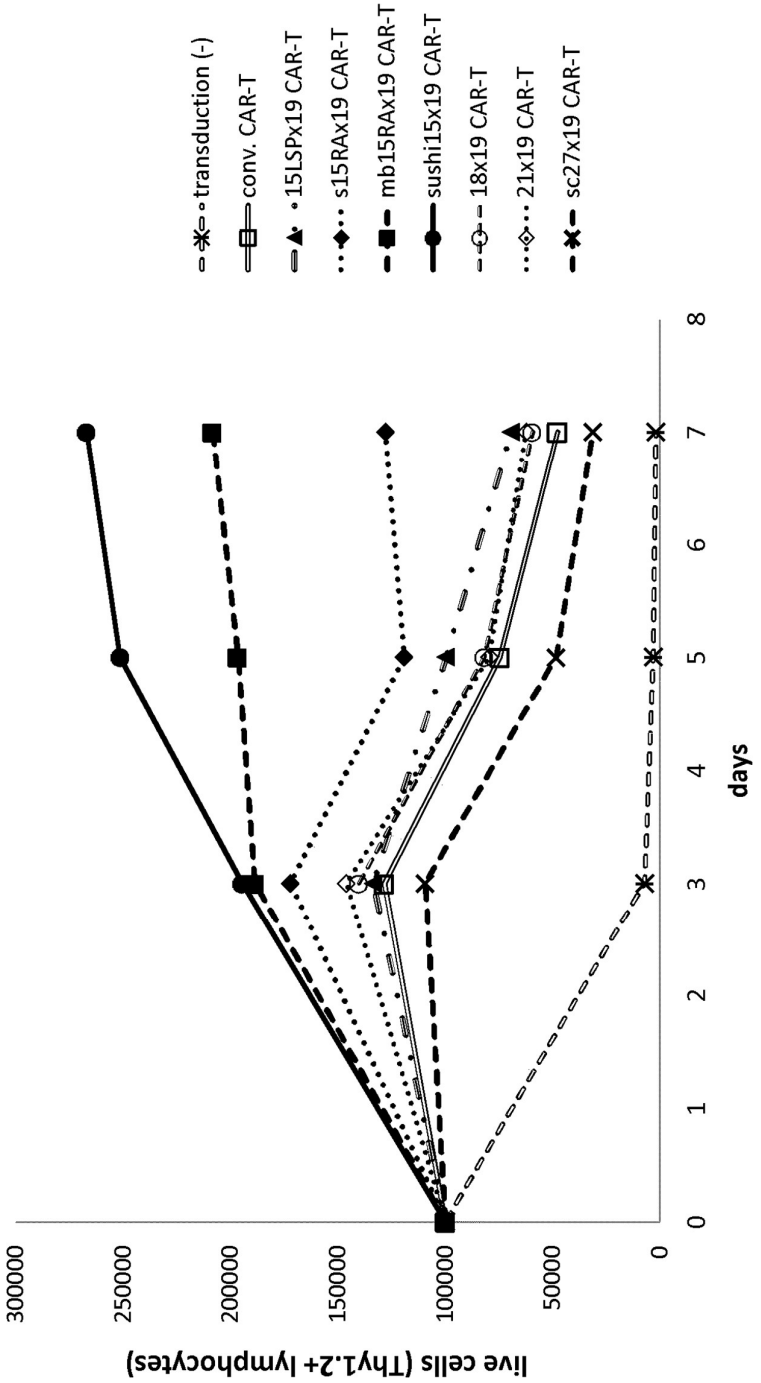
[Figure 1]


transduction (-)
conv. CAR-T
15LSP x 19 CAR-T
sushi15 x 19 CAR-T
sRA15 x 19 CAR-T
mbRA15 x 19 CAR-T
18 x 19 CAR-T
21 x 19 CAR-T
scFv27 x 19 CAR-T
APC (CD8)
BV-421 (CAR)
30.9
0.2
68.5
0.4
7.9
25.7
11.4
55.1
7.4
27.0
9.9
55.7
12.5
22.0
20.3
45.2
11.1
25.0
15.3
48.7
5.7
29.1
6.7
58.5
5.1
29.1
5.7
60.2
12.8
19.9
21.1
46.2

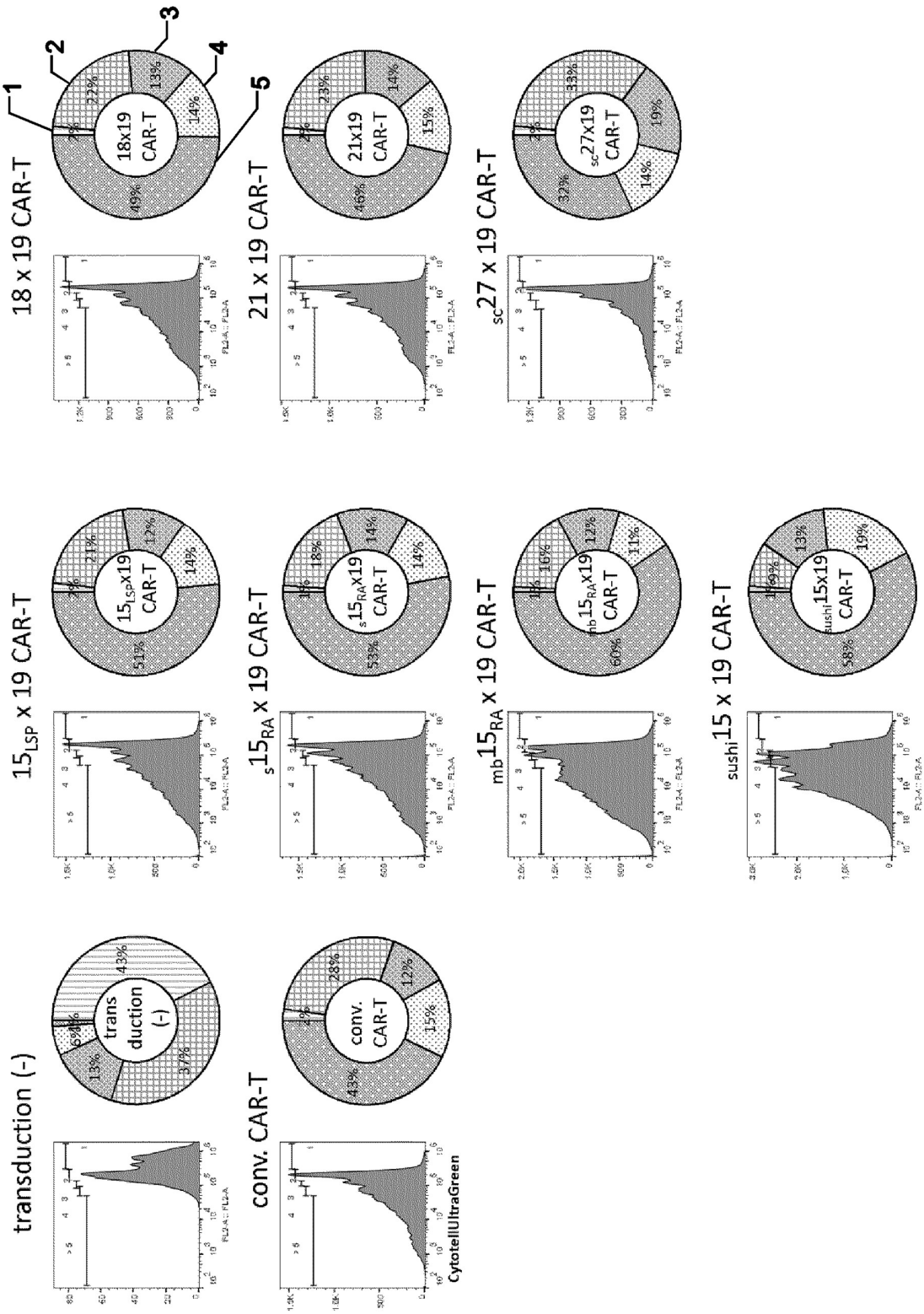
[Figure 2]


A
mIL-15
mIL-15 (pg/mL)
0
50
100
150
200
250
300
350
trans duction (-)
conv. CAR-T
15LSP x 19 CAR-T
s15RA x 19 CAR-T
mb15RA x 19 CAR-T
sushi15 x 19 CAR-T
B
mIL-18
mIL-18 (pg/mL)
0
50
100
150
200
250
trans duction (-)
conv. CAR-T
18 x 19 CAR-T
C
mIL-21
mIL-21 (pg/mL)
0
100
200
300
400
500
600
Not Detected
trans duction (-)
conv. CAR-T
21 x 19 CAR-T
D
mIL-27
mIL-27 (p40) (pg/mL)
0
50
100
150
200
250
300
350
trans duction (-)
conv. CAR-T
sc27 x 19 CAR-T
E
mCCL19
mCCL19 (pg/mL)
0
100
200
300
400
500
600
trans duction (-)
conv. CAR-T
15LSP x 19 CAR-T
s15RA x 19 CAR-T
mb15RA x 19 CAR-T
sushi15 x 19 CAR-T
18 x 19 CAR-T
21 x 19 CAR-T
sc27 x 19 CAR-T

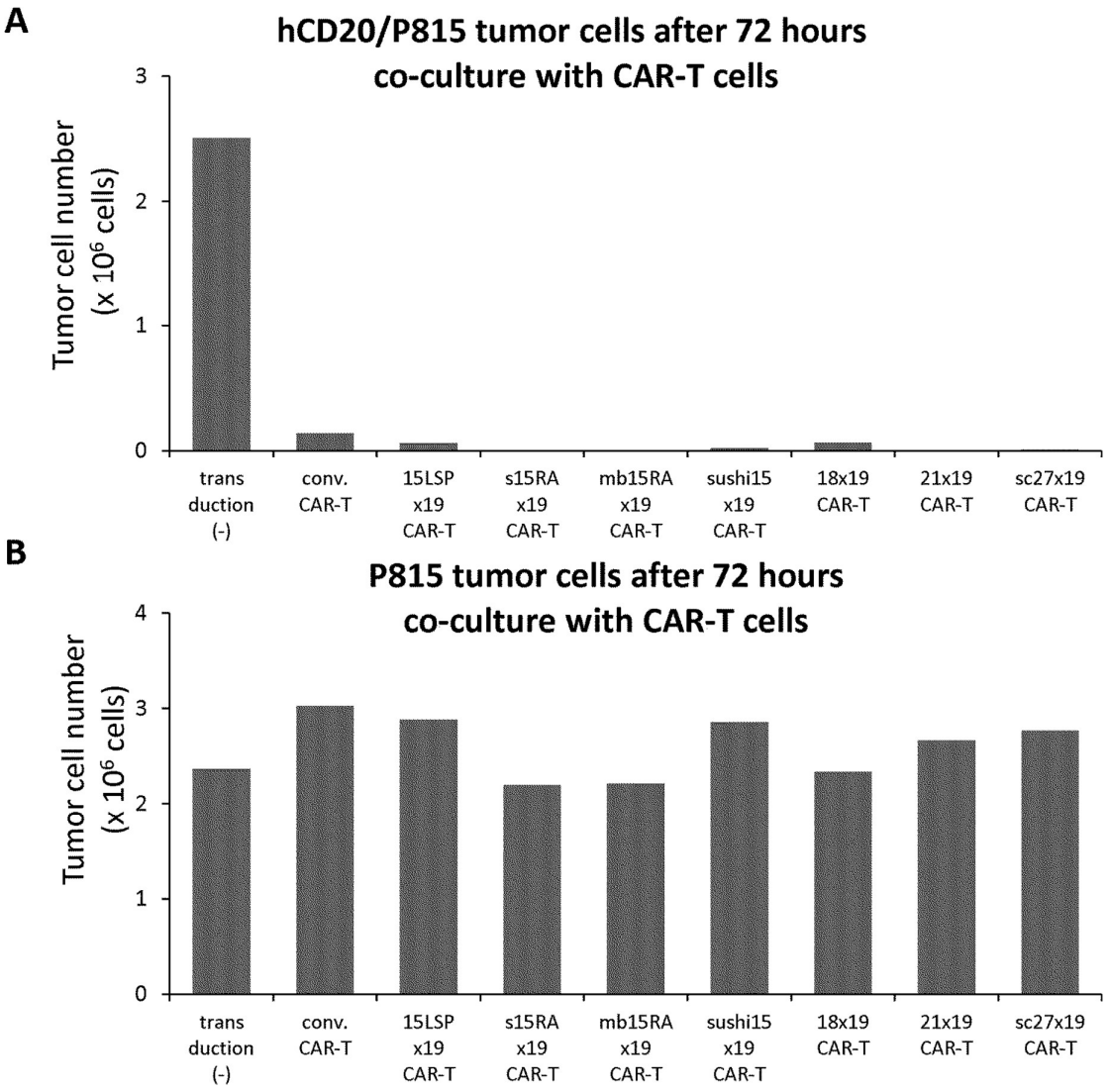
[Figure 3]


transduction (-)
conv. CAR-T
15LSPx19 CAR-T
s15RAx19 CAR-T
mb15RAx19 CAR-T
sushi15x19 CAR-T
18x19 CAR-T
21x19 CAR-T
sc27x19 CAR-T
live cells (Thy1.2+ lymphocytes)
300000
250000
200000
150000
100000
50000
0
0
1
2
3
4
5
6
7
8
days

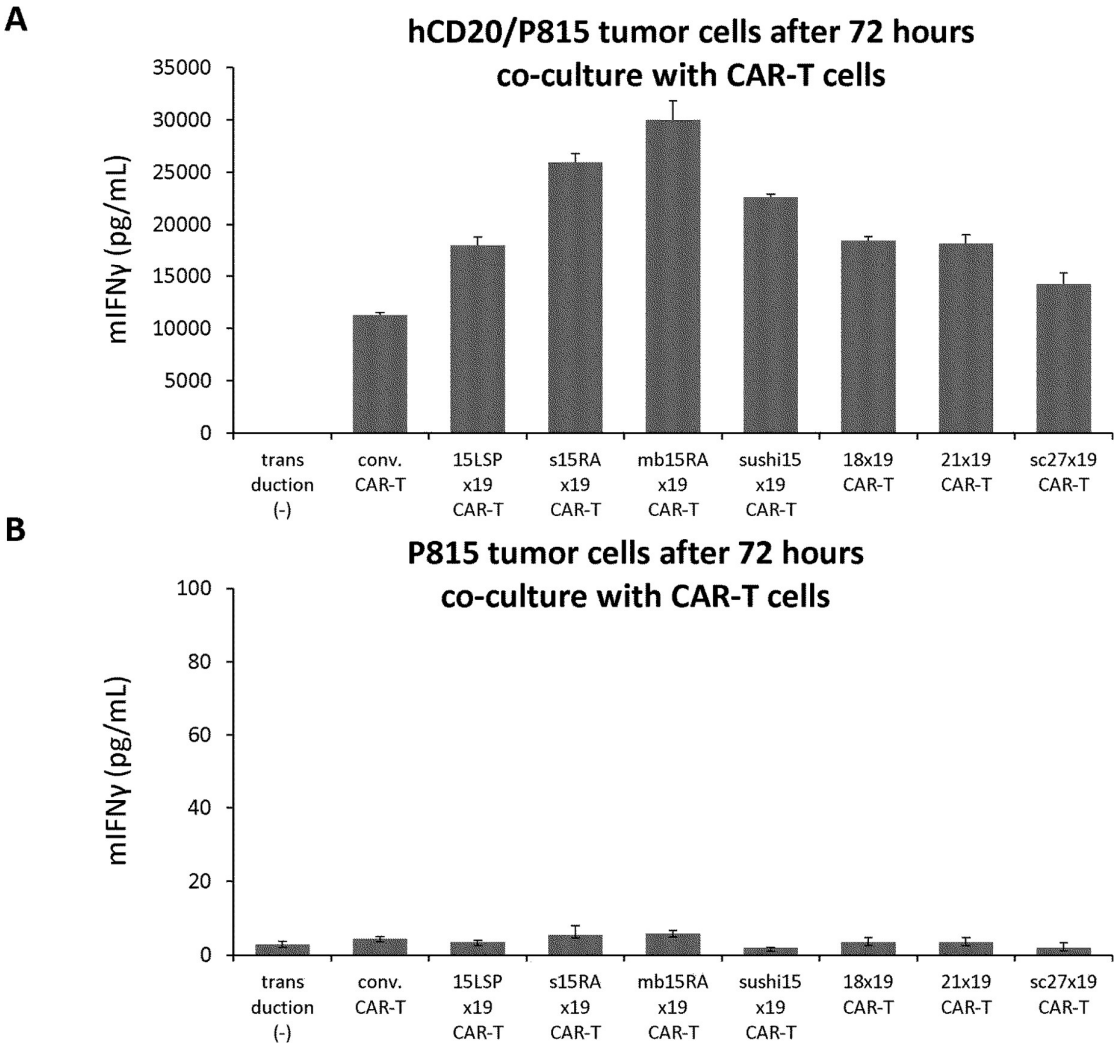
[Figure 4]


transduction (-)
trans duction (-)
6%
13%
37%
43%
CytotellUltraGreen
conv. CAR-T
conv. CAR-T
2%
43%
28%
12%
15%
15LSP x 19 CAR-T
15LSPx19 CAR-T
3%
51%
21%
12%
14%
sc15RA x 19 CAR-T
sc15RAx19 CAR-T
1%
53%
18%
14%
14%
mb15RA x 19 CAR-T
mb15RAx19 CAR-T
1%
60%
16%
12%
11%
sushi15 x 19 CAR-T
sushi15x19 CAR-T
1%
58%
9%
13%
19%
18 x 19 CAR-T
18x19 CAR-T
2%
49%
22%
13%
14%
1
2
3
4
5
21 x 19 CAR-T
21x19 CAR-T
2%
46%
23%
14%
15%
sc27 x 19 CAR-T
sc27x19 CAR-T
2%
32%
33%
19%
14%

[Figure 5]


A
hCD20/P815 tumor cells after 72 hours co-culture with CAR-T cells
Tumor cell number (x 10⁶ cells)
0
1
2
3
trans duction (-)
conv. CAR-T
15LSP x19 CAR-T
s15RA x19 CAR-T
mb15RA x19 CAR-T
sushi15 x19 CAR-T
18x19 CAR-T
21x19 CAR-T
sc27x19 CAR-T
B
P815 tumor cells after 72 hours co-culture with CAR-T cells
Tumor cell number (x 10⁶ cells)
0
1
2
3
4
trans duction (-)
conv. CAR-T
15LSP x19 CAR-T
s15RA x19 CAR-T
mb15RA x19 CAR-T
sushi15 x19 CAR-T
18x19 CAR-T
21x19 CAR-T
sc27x19 CAR-T

[Figure 6]


A
hCD20/P815 tumor cells after 72 hours co-culture with CAR-T cells
mIFNγ (pg/mL)
35000
30000
25000
20000
15000
10000
5000
0
transduction (-)
conv. CAR-T
15LSP x19 CAR-T
s15RA x19 CAR-T
mb15RA x19 CAR-T
sushi15 x19 CAR-T
18x19 CAR-T
21x19 CAR-T
sc27x19 CAR-T
B
P815 tumor cells after 72 hours co-culture with CAR-T cells
mIFNγ (pg/mL)
100
80
60
40
20
0
transduction (-)
conv. CAR-T
15LSP x19 CAR-T
s15RA x19 CAR-T
mb15RA x19 CAR-T
sushi15 x19 CAR-T
18x19 CAR-T
21x19 CAR-T
sc27x19 CAR-T

[Figure 7]

SEQ ID NO: 1: Anti-human CD20 CAR DNA fragment (DNA fragment #1)

anti-human CD20 scFv

CCATGGACTGGACCTGGCGGATCCTGTTCCTGGTGGCTGCTGCTACAGGCGCCCACAGCC

Nco I

AGATCGTGCTGTCTCAGTCTCCCGCCATCCTGTCTGCTAGCCCTGGCGAGAAAGTGACCA

TGACCTGCAGAGCCAGCAGCAGCGTGTCCTACATCCACTGGTTCCAGCAGAAGCCCGGCA

GCAGCCCCAAGCCTTGGATCTACGCCACAAGCAACCTGGCCTCTGGCGTGCCAGTGCGGT

TTAGCGGCTCTGGCTCTGGCACCAGCTACAGCCTGACCATCAGCAGAGTGGAAGCCGAGG

ACGCCGCCACCTACTACTGTCAGCAGTGGACCAGCAACCCCCCCACATTCGGCGGAGGCA

CCAAGCTGGAAATCAAGGGCGGAGGCGGATCTGGCGGCGGAGGATCTGGGGGAGGCGGCT

CTCAGGTGCAGCTGCAGCAGCCTGGCGCTGAGCTCGTGAAACCTGGCGCCTCCGTGAAGA

TGAGCTGCAAGGCCAGCGGCTACACCTTCACAAGCTACAACATGCACTGGGTCAAGCAGA

CCCCTGGCAGAGGCCTGGAATGGATCGGCGCTATCTACCCCGGCAACGGCGACACCTCCT

ACAACCAGAAGTTCAAGGGCAAGGCCACCCTGACCGCCGACAAGAGCAGCAGCACAGCCT

ACATGCAGCTGTCCTCCCTGACCAGCGAGGACAGCGCCGTGTACTACTGCGCCAGATCTA

CCTACTACGGCGGCGACTGGTACTTCAACGTGTGGGGCGCTGGCACCACCGTGACCGTGT

3rd TM domain (CD8)

CTGCTGCGGCCGCAGTCGTGCCAGTCCTTCAGAAAGTGAACTCTACTACTACCAAGCCAG

TGCTGCGAACTCCCTCACCTGTGCACCCTACCGGGACATCTCAGCCCCAGAGACCAGAAG

ATTGTCGGCCCCGTGGCTCAGTGAAGGGGACCGGATTGGACTTCGCCTGTGATATTTACA

TCTGGGCACCCTTGGCCGGAATCTGCGTGGCCCCTCTGCTGTCCTTGATCATCACTCTCA

CP domain (CD28_4-1BB_CD3z)

TCTGCTACCACAGGAGCCGAAATAGTAGAAGGAACAGACTCCTTCAAAGTGACTACATGA

ACATGACTCCCCGGAGGCCTGGGCTCACTCGAAAGCCTTACCAGCCCTACGCCCCTGCCA

GAGACTTTGCAGCGTACCGCCCCAAATGGATCAGGAAAAAATTCCCCCACATATTCAAGC

AACCATTTAAGAAGACCACTGGAGCAGCTCAAGAGGAAGATGCTTGTAGCTGCCGATGTC

CACAGGAAGAAGAAGGAGGAGGAGGAGGCTATGAGCTGAGAGCAAAATTCAGCAGGAGTG

CAGAGACTGCTGCCAACCTGCAGGACCCCAACCAGCTCTACAATGAGCTCAATCTAGGGC

Sbf I

GAAGAGAGGAATATGACGTCTTGGAGAAGAAGCGGGCTCGGGATCCAGAGATGGGAGGCA

AACAGCAGAGGAGGAGGAACCCCCAGGAAGGCGTATACAATGCACTGCAGAAAGACAAGA

TGGCAGAAGCCTACAGTGAGATCGGCACAAAAGGCGAGAGGCGGAGAGGCAAGGGGCACG

ATGGCCTTTACCAGGGTCTCAGCACTGCCACCAAGGACACCTATGATGCCCTGCATATGC

AGACCCTGGCCCCTCGC

[Figure 8]

SEQ ID NO: 3: MCS DNA fragment encoding stop codons and restriction enzyme sites (DNA fragment #2)

TGAAAGCTTAAACCAGTTAACTGGAAAACGCGTAAAGTCGAC
Stop codon
Sal I

[Figure 9]

SEQ ID NO: 4: $IL15_{LSP}$_F2A_CCL19 DNA fragment (DNA fragment #3)

F2A
GAATTCGGCAGCGGCGTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGAC
Mouse IL-15 long signal peptide
GTGGAGAGCAACCCTGGCCCTATGAAGATCCTGAAGCCCTACATGAGGAACACCAGCATC
Mouse IL-15
TCCTGTTACCTCTGTTTCCTGCTGAACAGCCACTTCCTGACCGAGGCCGGCATCCACGTG
TTCATCCTGGGCTGCGTGTCCGTGGGCCTGCCTAAGACCGAGGCCAACTGGATCGACGTG
AGATACGACCTGGAGAAGATCGAGAGCCTGATCCAGAGCATCCACATCGACACCACACTG
TACACCGACAGCGACTTCCACCCCAGCTGCAAGGTGACCGCCATGAACTGCTTTCTGCTG
GAGCTGCAGGTGATCCTGCACGAGTACAGCAACATGACCCTGAACGAGACCGTGAGAAAC
GTGCTGTACCTGGCCAACTCCACCCTGAGCAGCAACAAGAACGTGGCCGAGAGCGGCTGC
AAGGAGTGCGAGGAGCTCGAGGAGAAAACCTTCACCGAGTTCCTGCAGAGCTTCATCAGG
F2A
ATCGTCCAGATGTTCATCAACACCAGCGGCAGCGGCGTGAAGCAGACCCTGAACTTCGAC
Mouse CCL19
CTGCTGAAGCTGGCCGGAGACGTGGAGAGCAACCCTGGCCCATGCATGGCCCCCAGGGTG
ACCCCTCTGCTGGCCTTCAGCCTGCTGGTGCTGTGGACCTTCCCTGCCCCTACCCTGGGA
GGAGCCAATGACGCCGAGGACTGCTGCCTGAGCGTGACCCAGAGACCCATCCCCGGCAAC
ATCGTGAAGGCCTTCAGGTACCTGCTGAACGAGGACGGCTGCAGAGTGCCTGCCGTGGTG
TTCACCACCCTGAGGGGCTACCAGCTGTGTGCTCCCCCTGACCAGCCTTGGGTGGACAGG
ATCATCAGGAGGCTGAAGAAGAGCAGCGCCAAGAACAAGGGCAACAGCACCAGGAGGAGC
CCCGTGAGCTGAAAGCTTAAACCAGTTAACTGGAAAACGCGTAAAGTCGAC
Stop codon
Sal I

[Figure 10]

SEQ ID NO: 6: $_{s}$IL15$_{RA}$_F2A_CCL19 DNA fragment (DNA fragment #4)

F2A
GAATTCGGCAGCGGCGTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGAC
Mouse IL-2 signal peptide
GTGGAGAGCAACCCTGGCCCTATGTATTCCATGCAGCTGGCCAGCTGTGTGACCCTGACA
Mouse IL-15
CTGGTGCTGCTGGTGAACAGCGGCATCCACGTGTTCATTCTGGGATGCGTCTCCGTGGGC
CTCCCCAAGACCGAGGCTAACTGGATCGACGTCAGGTACGACCTGGAGAAGATCGAAAGC
CTGATCCAGTCCATCCACATCGATACAACCCTGTACACAGATTCCGACTTCCACCCCTCC
TGTAAGGTCACCGCCATGAACTGCTTCCTCCTGGAACTCCAGGTCATCCTGCACGAGTAC
TCCAACATGACCCTGAACGAAACCGTGAGGAATGTGCTGTACCTCGCCAACTCCACACTG
AGCTCCAATAAGAACGTGGCTGAGAGCGGCTGCAAGGAGTGTGAGGAGCTGGAAGAGAAG
ACCTTCACCGAGTTCCTGCAGAGCTTCATCAGGATCGTGCAGATGTTCATCAACACAAGC
26aa linker
TCCGGCGGAGGATCCGGAGGAGGAGGAAGCGGAGGCGGCGGCTCCGGAGGCGGAGGAAGC
Mouse IL-15RA Extracellular domain
GGAGGAGGAAGCCTGCAAGGAACCACCTGTCCCCCTCCCGTGTCCATCGAGCACGCCGAC
ATCAGGGTGAAGAACTACTCCGTCAACAGCAGGGAAAGGTACGTGTGCAACTCCGGCTTT
AAGAGGAAGGCCGGCACCAGCACCCTCATCGAGTGCGTGATCAACAAGAACACAAACGTG
GCCCACTGGACCACCCCCAGCCTGAAGTGTATTAGAGACCCCAGCCTGGCTCATTACAGC
CCCGTGCCCACAGTGGTGACACCCAAGGTGACAAGCCAGCCTGAGAGCCCTAGCCCTAGC
GCCAAAGAGCCCGAGGCCTTTTCCCCCAAGTCCGACACCGCCATGACCACCGAGACAGCC
ATCATGCCTGGCAGCAGACTGACCCCTAGCCAGACCACATCCGCTGGCACCACAGGCACC
GGCTCCCACAAGAGCTCCAGAGCCCCTAGCCTGGCTGCCACAATGACACTGGAACCTACC
F2A
GCCTCCACCAGCCTCAGAATCACAGAGATCTCCCCCCACAGCAGCAAGATGACCAAGGGC
AGCGGCGTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGACGTGGAGAGC
Mouse CCL19
AACCCTGGCCCATGCATGGCCCCCAGGGTGACCCCTCTGCTGGCCTTCAGCCTGCTGGTG
CTGTGGACCTTCCCTGCCCCTACCCTGGGAGGAGCCAATGACGCCGAGGACTGCTGCCTG
AGCGTGACCCAGAGACCCATCCCCGGCAACATCGTGAAGGCCTTCAGGTACCTGCTGAAC
GAGGACGGCTGCAGAGTGCCTGCCGTGGTGTTCACCACCCTGAGGGGCTACCAGCTGTGT
GCTCCCCCTGACCAGCCTTGGGTGGACAGGATCATCAGGAGGCTGAAGAAGAGCAGCGCC
AAGAACAAGGGCAACAGCACCAGGAGGAGCCCCGTGAGCTGAAAGCTTAAACCAGTTAAC
Stop codon
TGGAAAACGCGTAAAGTCGAC
Sal I

[Figure 11]

SEQ ID NO: 8: $_{mb}$IL15$_{RA}$_F2A_CCL19 DNA fragment (DNA fragment #5)

F2A
GAATTCGGCAGCGGCGTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGAC
Mouse IL-2 signal peptide
GTGGAGAGCAACCCTGGCCCTATGTATTCCATGCAGCTGGCCAGCTGTGTGACCCTGACA
Mouse IL-15
CTGGTGCTGCTGGTGAACAGCGGCATCCACGTGTTCATTCTGGGATGCGTCTCCGTGGGC
CTCCCCAAGACCGAGGCTAACTGGATCGACGTCAGGTACGACCTGGAGAAGATCGAAAGC
CTGATCCAGTCCATCCACATCGATACAACCCTGTACACAGATTCCGACTTCCACCCCTCC
TGTAAGGTCACCGCCATGAACTGCTTCCTCCTGGAACTCCAGGTCATCCTGCACGAGTAC
TCCAACATGACCCTGAACGAAACCGTGAGGAATGTGCTGTACCTCGCCAACTCCACACTG
AGCTCCAATAAGAACGTGGCTGAGAGCGGCTGCAAGGAGTGTGAGGAGCTGGAAGAGAAG
ACCTTCACCGAGTTCCTGCAGAGCTTCATCAGGATCGTGCAGATGTTCATCAACACAAGC
26aa linker
TCCGGCGGAGGATCCGGAGGAGGAGGAAGCGGAGGCGGCGGCTCCGGAGGCGGAGGAAGC
Mouse IL-15RA
GGAGGAGGAAGCCTGCAAGGAACCACCTGTCCCCCTCCCGTGTCCATCGAGCACGCCGAC
ATCAGGGTGAAGAACTACTCCGTCAACAGCAGGGAAAGGTACGTGTGCAACTCCGGCTTT
AAGAGGAAGGCCGGCACCAGCACCCTCATCGAGTGCGTGATCAACAAGAACACAAACGTG
GCCCACTGGACCACCCCCAGCCTGAAGTGTATTAGAGACCCCAGCCTGGCTCATTACAGC
CCCGTGCCCACAGTGGTGACACCCAAGGTGACAAGCCAGCCTGAGAGCCCTAGCCCTAGC
GCCAAAGAGCCCGAGGCCTTTTCCCCCAAGTCCGACACCGCCATGACCACCGAGACAGCC
ATCATGCCTGGCAGCAGACTGACCCCTAGCCAGACCACATCCGCTGGCACCACAGGCACC
GGCTCCCACAAGAGCTCCAGAGCCCCTAGCCTGGCTGCCACAATGACACTGGAACCTACC
GCCTCCACCAGCCTCAGAATCACAGAGATCTCCCCCCACAGCAGCAAGATGACCAAGGTG
GCCATCTCCACCTCCGTGCTGCTGGTGGGAGCCGGCGTGGTCATGGCCTTTCTGGCCTGG
TACATCAAGTCCAGGCAGCCTAGCCAACCTTGCAGGGTGGAGGTGGAAACTATGGAAACC
F2A
GTGCCCATGACCGTGAGGGCCAGCTCCAAGGAGGATGAAGACACCGGCGCCGGCAGCGGC
GTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGACGTGGAGAGCAACCCT
Mouse CCL19
GGCCCATGCATGGCCCCCAGGGTGACCCCTCTGCTGGCCTTCAGCCTGCTGGTGCTGTGG
ACCTTCCCTGCCCCTACCCTGGGAGGAGCCAATGACGCCGAGGACTGCTGCCTGAGCGTG
ACCCAGAGACCCATCCCCGGCAACATCGTGAAGGCCTTCAGGTACCTGCTGAACGAGGAC
GGCTGCAGAGTGCCTGCCGTGGTGTTCACCACCCTGAGGGGCTACCAGCTGTGTGCTCCC
CCTGACCAGCCTTGGGTGGACAGGATCATCAGGAGGCTGAAGAAGAGCAGCGCCAAGAAC
AAGGGCAACAGCACCAGGAGGAGCCCCGTGAGCTGAAAGCTTAAACCAGTTAACTGGAAA
Stop codon
ACGCGTAAAGTCGAC
Sal I

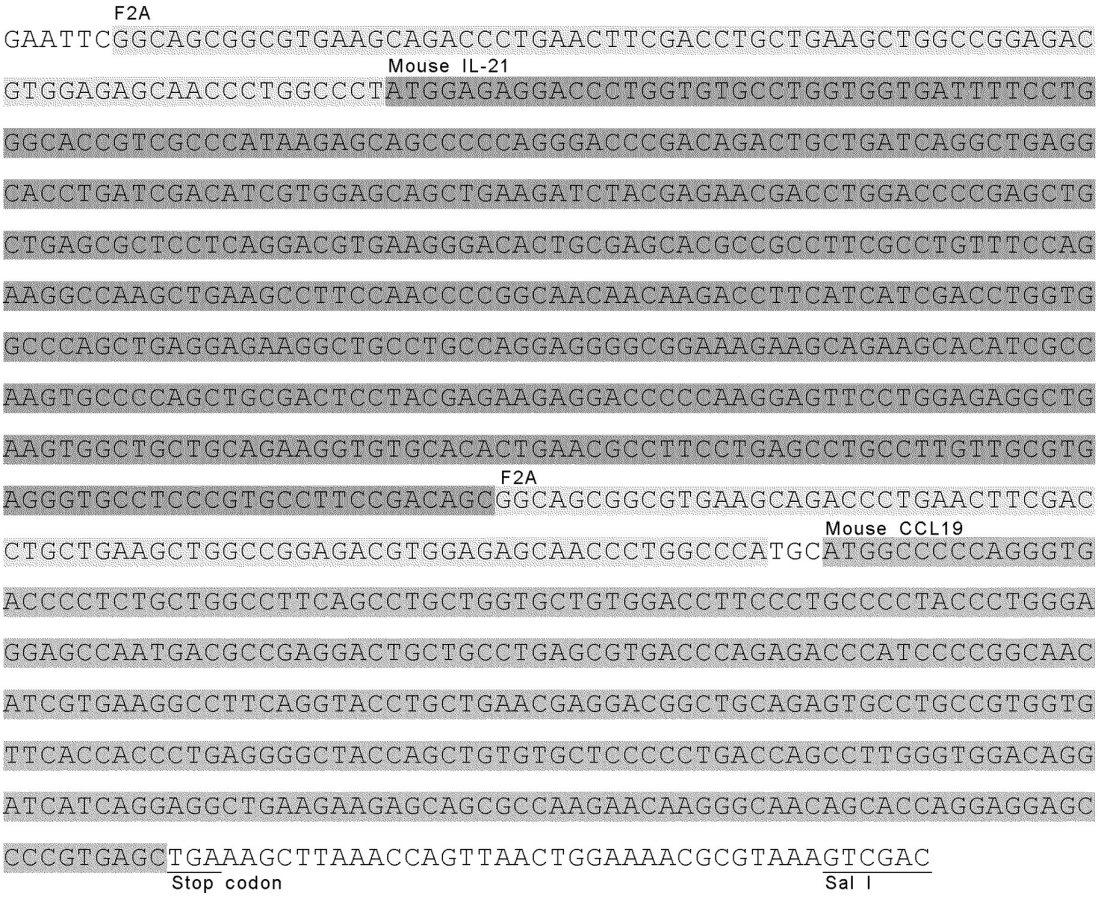
[Figure 12]

SEQ ID NO: 10: $_{sushi}$IL15_F2A_CCL19 DNA fragment (DNA fragment #6)

F2A
GAATTCGGCAGCGGCGTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGAC
Mouse IL-15RAsushi
GTGGAGAGCAACCCTGGCCCTATGGCCTCCCCTCAGCTGAGAGGCTACGGCGTGCAGGCT
ATCCCCGTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCCTCTGAGAGTGACCCCTGGC
ACAACCTGCCCTCCTCCCGTGAGCATCGAGCACGCCGACATCAGGGTGAAGAACTACTCC
GTGAACAGCAGGGAGAGGTACGTGTGCAACAGCGGCTTCAAGAGGAAGGCCGGCACCAGC
ACCCTGATCGAGTGCGTGATCAACAAGAACACCAACGTGGCCCACTGGACCACCCCCAGC
26aa linker
CTGAAGTGCATCAGGAGCGGCGGCAGCGGCGGCGGCGGCAGCGGCGGCGGCAGCGGCGGC
Mouse IL-15
GGCGGCAGCCTGCAGAACTGGATCGACGTCAGGTACGACCTGGAGAAGATCGAAAGCCTG
ATCCAGTCCATCCACATCGATACAACCCTGTACACAGATTCCGACTTCCACCCCTCCTGT
AAGGTCACCGCCATGAACTGCTTCCTCCTGGAACTCCAGGTCATCCTGCACGAGTACTCC
AACATGACCCTGAACGAAACCGTGAGGAATGTGCTGTACCTCGCCAACTCCACACTGAGC
TCCAATAAGAACGTGGCTGAGAGCGGCTGCAAGGAGTGTGAGGAGCTGGAAGAGAAGACC
F2A
TTCACCGAGTTCCTGCAGAGCTTCATCAGGATCGTGCAGATGTTCATCAACACAAGCGGC
AGCGGCGTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGACGTGGAGAGC
Mouse CCL19
AACCCTGGCCCATGCATGGCCCCCAGGGTGACCCCTCTGCTGGCCTTCAGCCTGCTGGTG
CTGTGGACCTTCCCTGCCCCTACCCTGGGAGGAGCCAATGACGCCGAGGACTGCTGCCTG
AGCGTGACCCAGAGACCCATCCCCGGCAACATCGTGAAGGCCTTCAGGTACCTGCTGAAC
GAGGACGGCTGCAGAGTGCCTGCCGTGGTGTTCACCACCCTGAGGGGCTACCAGCTGTGT
GCTCCCCCTGACCAGCCTTGGGTGGACAGGATCATCAGGAGGCTGAAGAAGAGCAGCGCC
AAGAACAAGGGCAACAGCACCAGGAGGAGCCCCGTGAGCTGAAAGCTTAAACCAGTTAAC
Stop codon
TGGAAAACGCGTAAAGTCGAC
Sal I

[Figure 13]

SEQ ID NO: 12: IL-18_F2A_CCL19 DNA fragment (DNA fragment #7)



[Figure 14]

SEQ ID NO: 14: IL-21_F2A_CCL19 DNA fragment (DNA fragment #8)

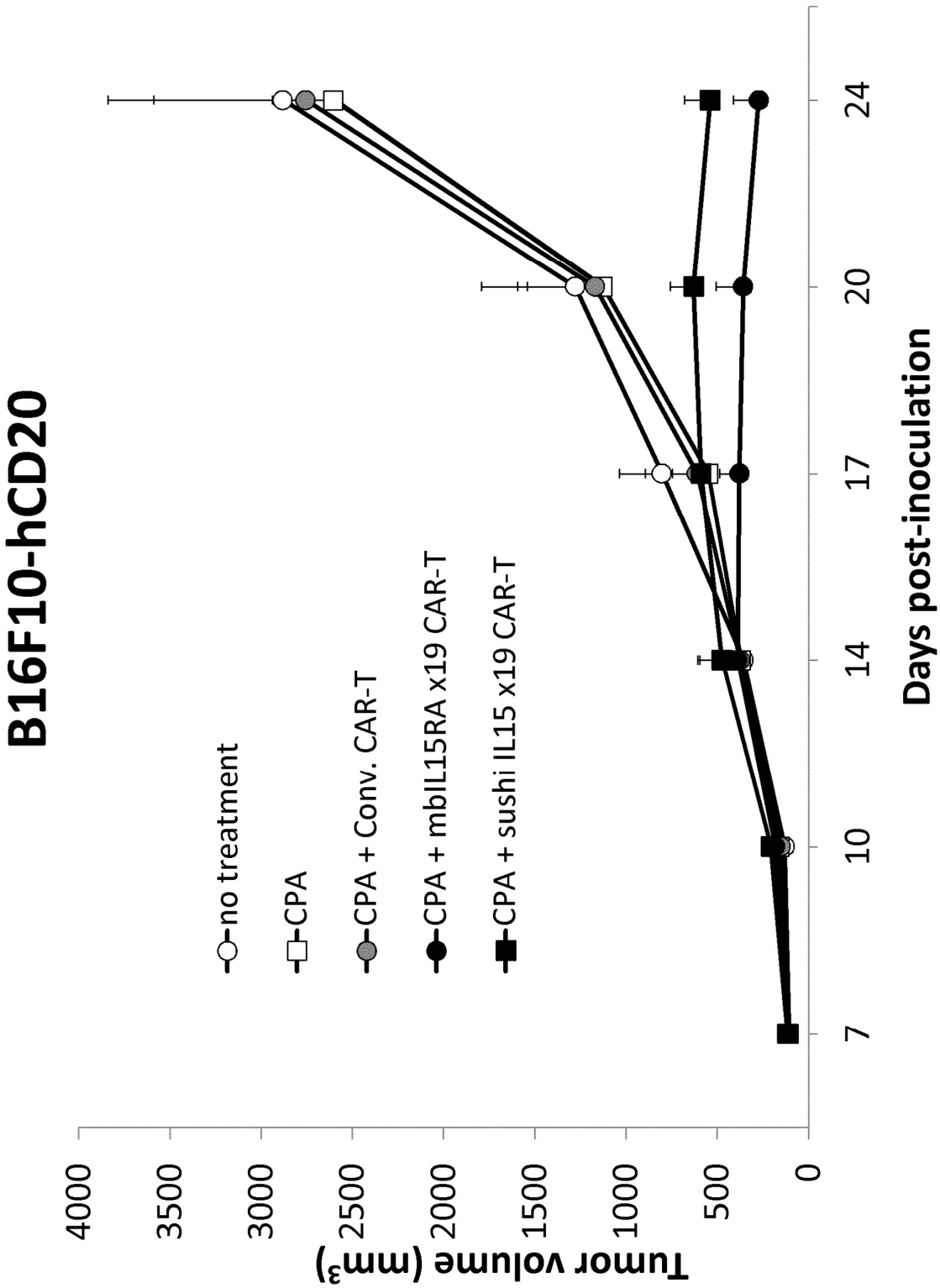
F2A
GAATTCGGCAGCGGCGTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGAC
Mouse IL-21
GTGGAGAGCAACCCTGGCCCTATGGAGAGGACCCTGGTGTGCCTGGTGGTGATTTTCCTG
GGCACCGTCGCCCATAAGAGCAGCCCCCAGGGACCCGACAGACTGCTGATCAGGCTGAGG
CACCTGATCGACATCGTGGAGCAGCTGAAGATCTACGAGAACGACCTGGACCCCGAGCTG
CTGAGCGCTCCTCAGGACGTGAAGGGACACTGCGAGCACGCCGCCTTCGCCTGTTTCCAG
AAGGCCAAGCTGAAGCCTTCCAACCCCGGCAACAACAAGACCTTCATCATCGACCTGGTG
GCCCAGCTGAGGAGAAGGCTGCCTGCCAGGAGGGGCGGAAAGAAGCAGAAGCACATCGCC
AAGTGCCCCAGCTGCGACTCCTACGAGAAGAGGACCCCCAAGGAGTTCCTGGAGAGGCTG
AAGTGGCTGCTGCAGAAGGTGTGCACACTGAACGCCTTCCTGAGCCTGCCTTGTTGCGTG
F2A
AGGGTGCCTCCCGTGCCTTCCGACAGCGGCAGCGGCGTGAAGCAGACCCTGAACTTCGAC
Mouse CCL19
CTGCTGAAGCTGGCCGGAGACGTGGAGAGCAACCCTGGCCCATGCATGGCCCCCAGGGTG
ACCCCTCTGCTGGCCTTCAGCCTGCTGGTGCTGTGGACCTTCCCTGCCCCTACCCTGGGA
GGAGCCAATGACGCCGAGGACTGCTGCCTGAGCGTGACCCAGAGACCCATCCCCGGCAAC
ATCGTGAAGGCCTTCAGGTACCTGCTGAACGAGGACGGCTGCAGAGTGCCTGCCGTGGTG
TTCACCACCCTGAGGGGCTACCAGCTGTGTGCTCCCCCTGACCAGCCTTGGGTGGACAGG
ATCATCAGGAGGCTGAAGAAGAGCAGCGCCAAGAACAAGGGCAACAGCACCAGGAGGAGC
CCCGTGAGCTGAAAGCTTAAACCAGTTAACTGGAAAACGCGTAAAGTCGAC
Stop codon
Sal I

[Figure 15]

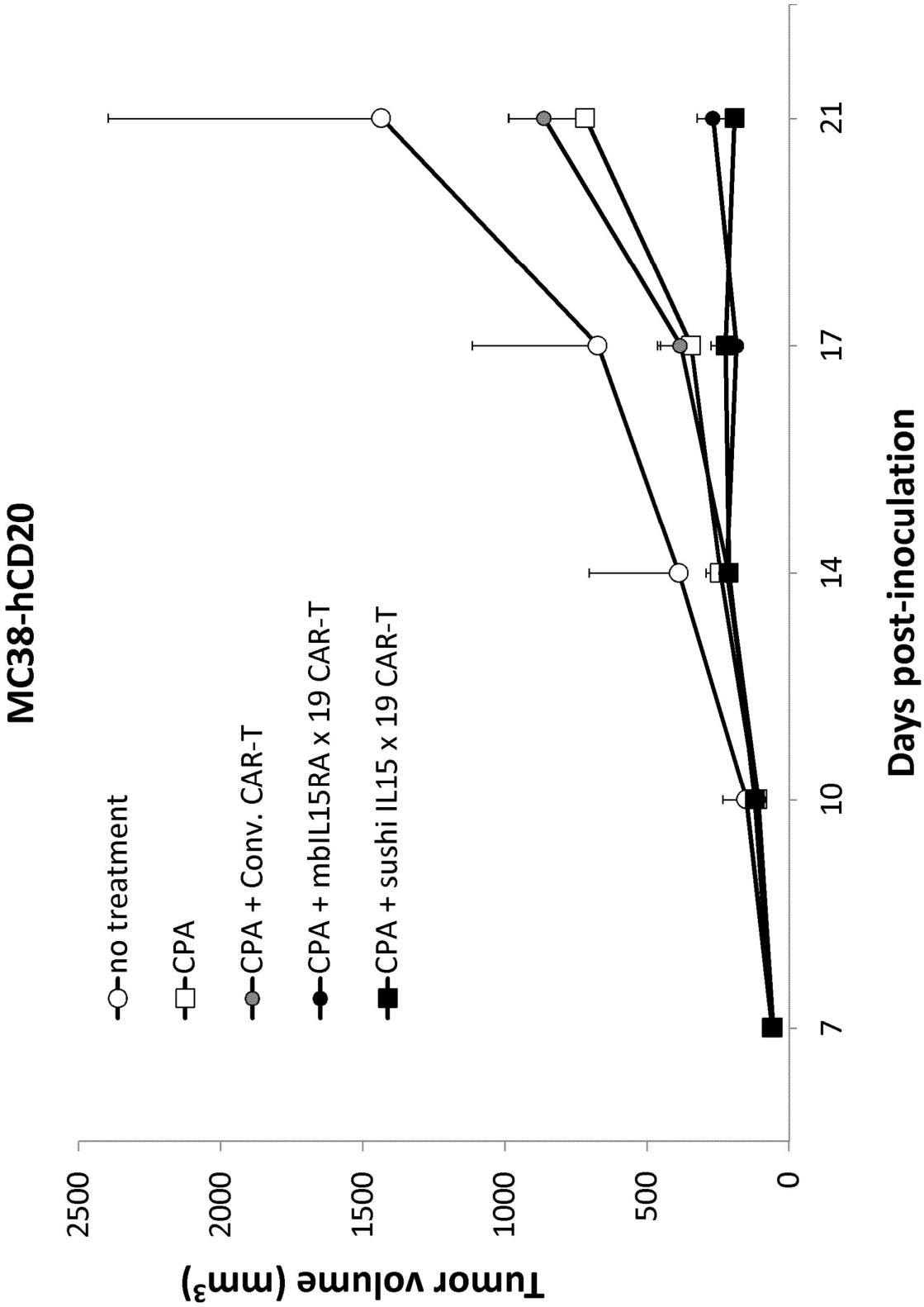
SEQ ID NO: 16: $_{sc}$IL27_F2A_CCL19 DNA fragment (DNA fragment #9)

F2A
GAATTCGGCAGCGGCGTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGAC
Mouse EBI3
GTGGAGAGCAACCCTGGCCCTATGAGCAAGCTCCTCTTTCTGTCCCTGGCCCTGTGGGCC
AGCAGATCCCCTGGCTACACAGAAACAGCCCTGGTGGCCCTGTCCCAACCCAGAGTGCAG
TGTCACGCTTCCAGGTACCCCGTGGCTGTGGACTGCAGCTGGACCCCTCTGCAAGCCCCT
AATAGCACCAGGAGCACCTCCTTCATCGCCACCTACAGACTGGGAGTGGCCACCCAGCAG
CAGAGCCAGCCTTGCCTGCAGAGGTCCCCTCAGGCCTCCAGATGCACAATCCCTGATGTG
CACCTGTTTAGCACCGTGCCCTACATGCTGAACGTGACAGCCGTGCACCCTGGAGGAGCC
AGCAGCTCCCTCCTGGCCTTCGTCGCCGAGAGAATCATCAAGCCTGACCCCCCTGAGGGC
GTGAGACTGAGAACAGCTGGCCAGAGACTGCAGGTGCTGTGGCACCCTCCCGCCTCCTGG
CCTTTCCCCGATATCTTCTCCCTGAAGTACAGACTGAGGTACAGGAGAAGAGGCGCTAGC
CACTTCAGACAGGTGGGCCCCATTGAGGCTACCACCTTTACCCTCAGGAATAGCAAGCCC
CATGCTAAGTACTGTATCCAGGTGTCCGCCCAGGATCTGACAGACTACGGCAAGCCCTCC
18aa linker
GACTGGAGCCTGCCTGGACAAGTGGAAAGCGCTCCCCACAAGCCTGGAAGCACATCCGGA
p28
AGCGGCAAACCCGGCAGCGGAGAGGGATCCACCAAAGGCTTCCCTACCGACCCCCTGTCT
TTACAAGAACTGAGAAGGGAGTTCACCGTGAGCCTGTATCTGGCCAGGAAGCTCCTCAGC
GAGGTGCAGGGCTATGTGCACAGCTTCGCCGAAAGCAGGCTGCCCGGCGTGAACCTGGAT
CTGCTGCCCCTGGGCTACCACCTGCCTAACGTGTCCCTGACCTTCCAGGCTTGGCATCAC
CTGTCCGACTCCGAGAGGCTCTGCTTTCTGGCCACCACCCTGAGGCCCTTCCCTGCCATG
CTGGGAGGACTGGGCACCCAGGGAACCTGGACCAGCAGCGAGAGGGAACAGCTGTGGGCC
ATGAGACTGGACCTGAGGGATCTGCACAGACACCTGAGGTTCCAGGTGCTGGCCGCCGGC
TTCAAGTGTAGCAAAGAGGAGGAGGACAAAGAAGAAGAAGAAGAGGAAGAAGAGGAAGAG
AAGAAACTCCCCCTGGGAGCCCTGGGAGGCCCTAATCAGGTGTCCTCCCAGGTGTCCTGG
CCTCAGCTGCTGTATACCTACCAGCTGCTGCACAGCCTGGAGCTGGTGCTGTCCAGGGCT
F2A
GTGAGGGACCTGCTCCTGCTGAGCCTGCCTAGAAGGCCTGGCAGCGCTTGGGACTCCGGC
AGCGGCGTGAAGCAGACCCTGAACTTCGACCTGCTGAAGCTGGCCGGAGACGTGGAGAGC
Mouse CCL19
AACCCTGGCCCATGCATGGCCCCCAGGGTGACCCCTCTGCTGGCCTTCAGCCTGCTGGTG
CTGTGGACCTTCCCTGCCCCTACCCTGGGAGGAGCCAATGACGCCGAGGACTGCTGCCTG
AGCGTGACCCAGAGACCCATCCCCGGCAACATCGTGAAGGCCTTCAGGTACCTGCTGAAC
GAGGACGGCTGCAGAGTGCCTGCCGTGGTGTTCACCACCCTGAGGGGCTACCAGCTGTGT
GCTCCCCCTGACCAGCCTTGGGTGGACAGGATCATCAGGAGGCTGAAGAAGAGCAGCGCC
AAGAACAAGGGCAACAGCACCAGGAGGAGCCCCGTGAGCTGAAAGCTTAAACCAGTTAAC
Stop codon
TGGAAAACGCGTAAAGTCGAC
Sal I

[Figure 16]


B16F10-hCD20
no treatment
CPA
CPA + Conv. CAR-T
CPA + mbIL15RA x19 CAR-T
CPA + sushi IL15 x19 CAR-T
Tumor volume (mm3)
0
500
1000
1500
2000
2500
3000
3500
4000
7
10
14
17
20
24
Days post-inoculation

[Figure 17]


MC38-hCD20
no treatment
CPA
CPA + Conv. CAR-T
CPA + mbIL15RA x 19 CAR-T
CPA + sushi IL15 x 19 CAR-T
Tumor volume (mm3)
2500
2000
1500
1000
500
0
7
10
14
17
21
Days post-inoculation