

Figure 1

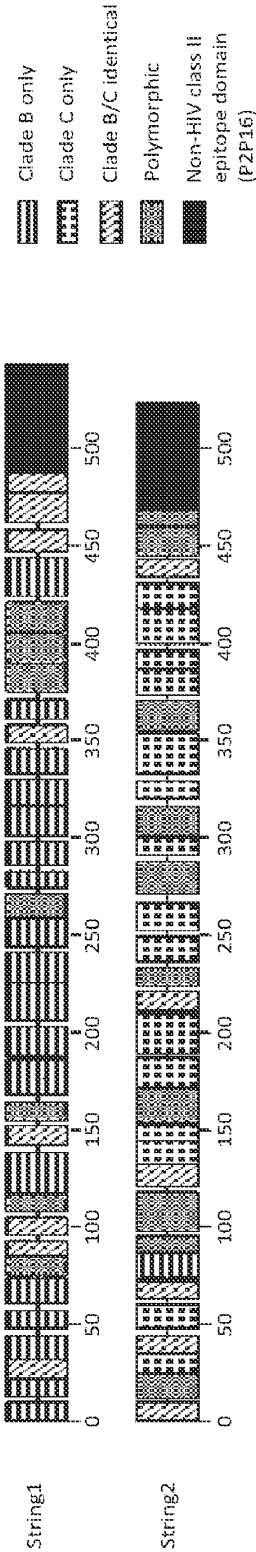


Figure 2

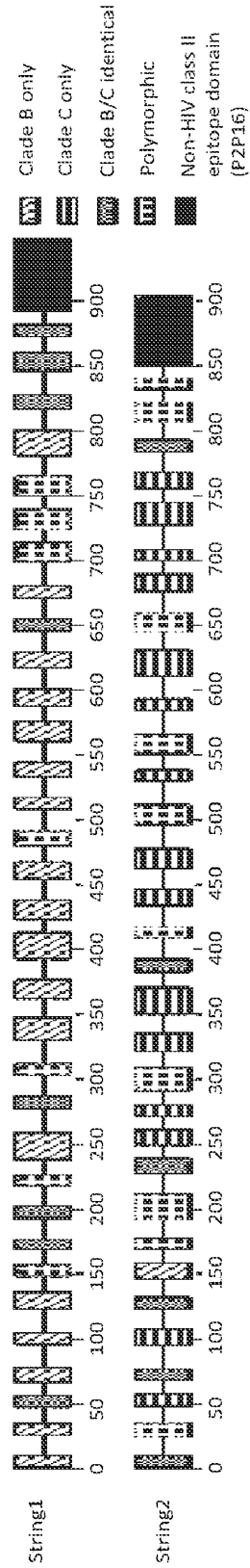


Figure 3

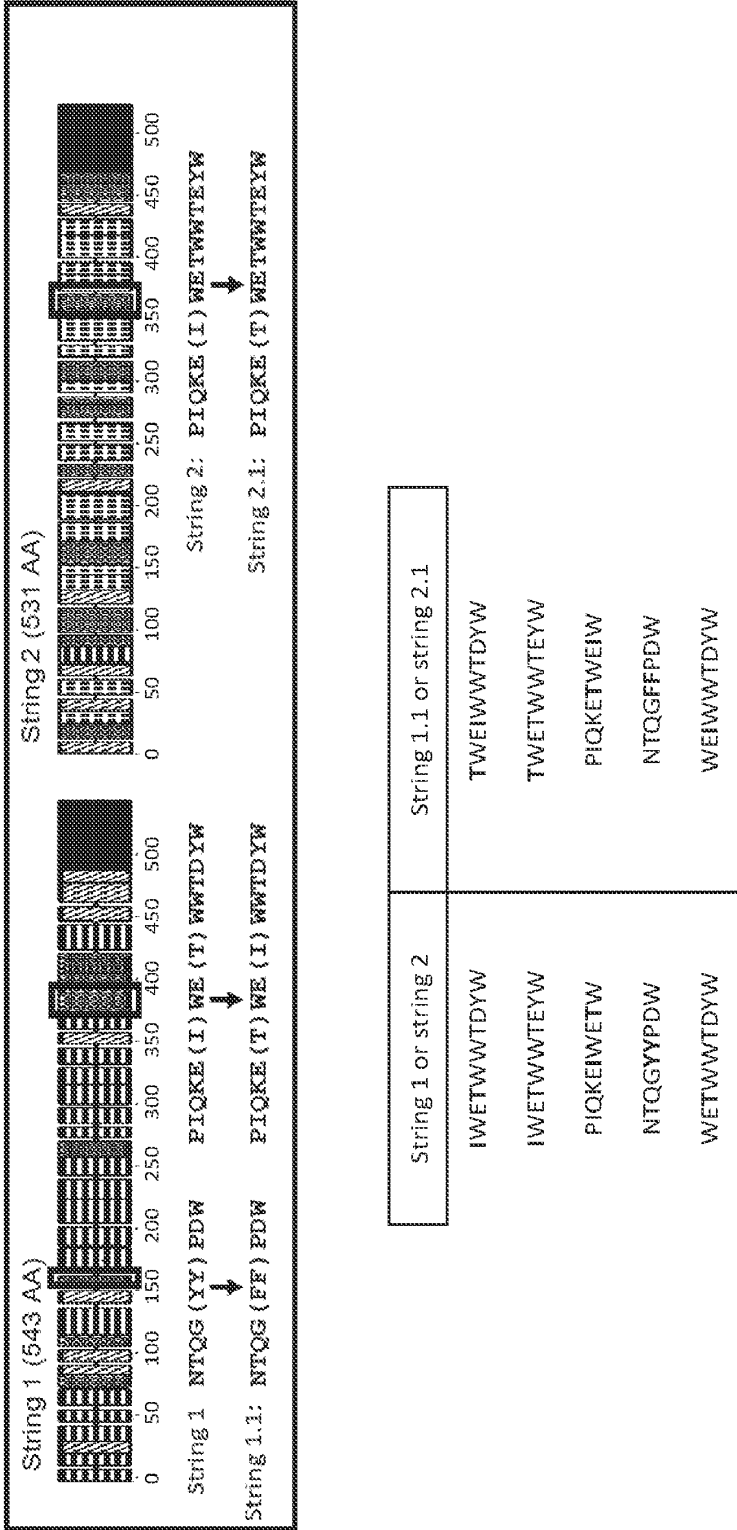


Figure 4

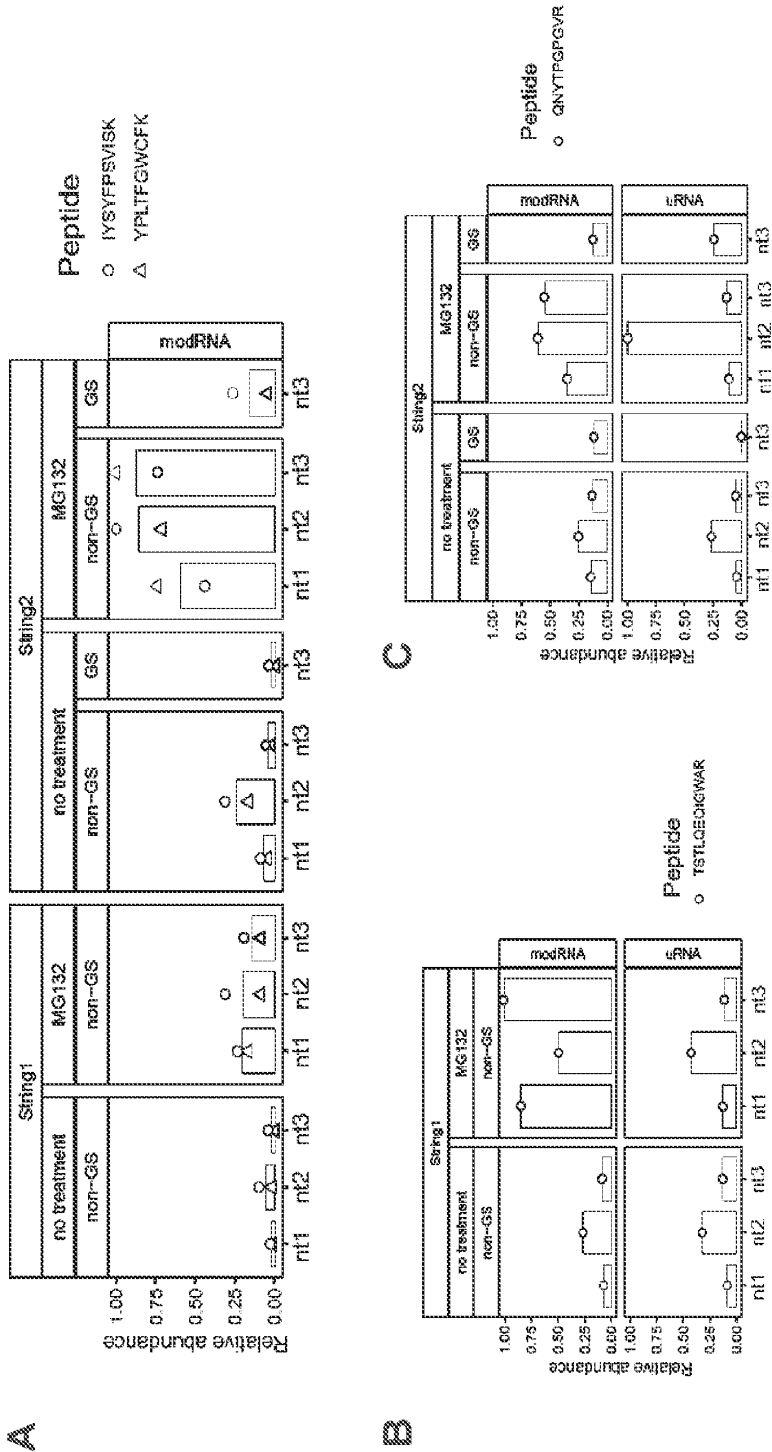


Figure 4

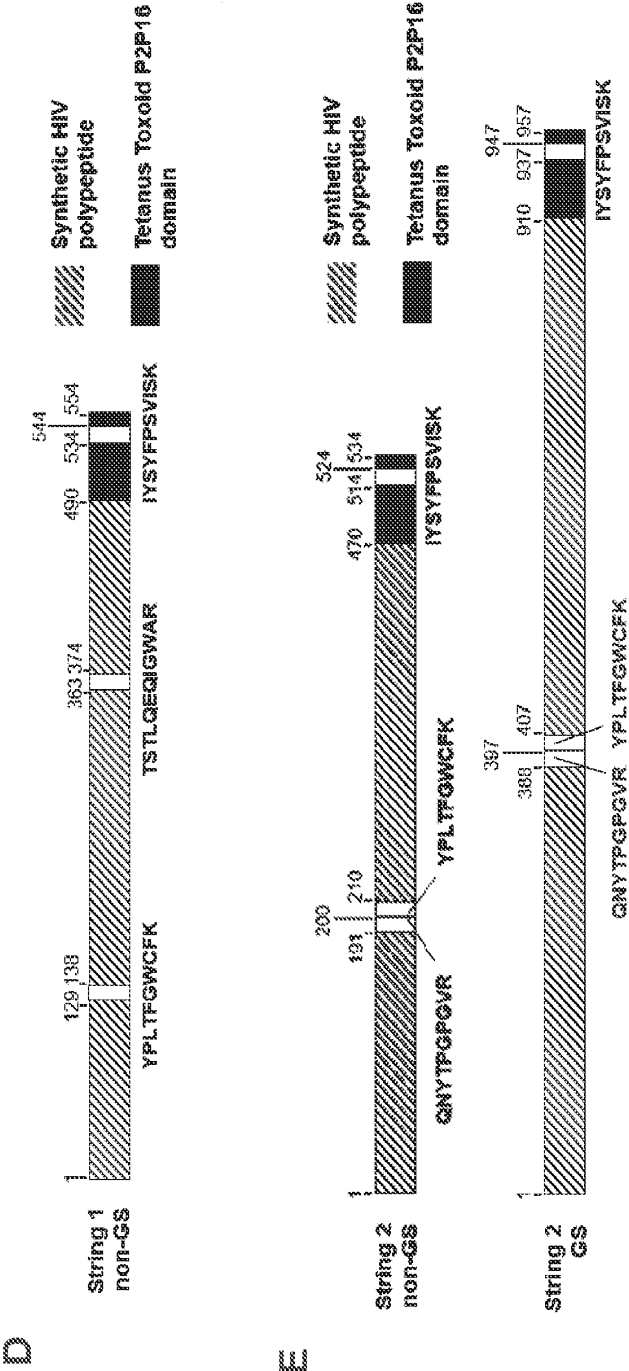


Figure 5

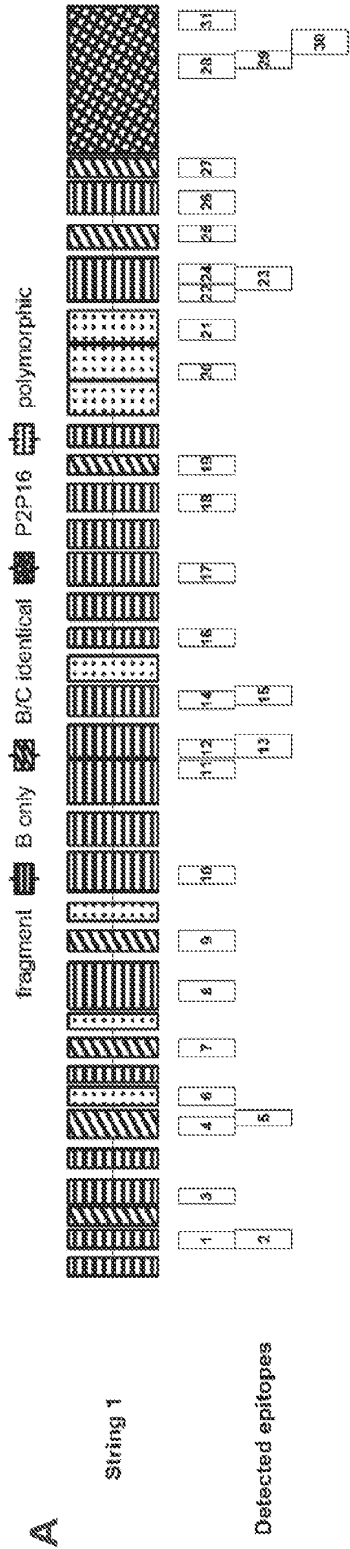


Figure 5

| order | epitope      | B/C polymorphism | allele           | edge |
|-------|--------------|------------------|------------------|------|
| 1     | GERVDII      | ConB             | B*40:02          | yes  |
| 2     | GERVIDIA     | ConB             | B*40:02          | yes  |
| 3     | AEQASQEV     | ConB             | B*40:02          | yes  |
| 4     | HQAAMQMIK    | ConB/C           | A*03:01          | no   |
| 5     | MQMLKETI     | ConB/C           | B*08:01          | yes  |
| 6     | KONPEIVY     | Polymorphic      | B*15:03, B*15:01 | yes  |
| 7     | KLTPLCVTL    | ConB/C           | B*15:01, A*02:01 | yes  |
| 8     | TPGPGIRYPL   | ConB             | B*07:02          | no   |
| 9     | FKRKGIGGY    | ConB/C           | B*15:03          | yes  |
| 10    | SEGATPQDL    | ConB/C           | B*40:02          | no   |
| 11    | EVIPMFSAI    | ConB             | A*25:01          | yes  |
| 12    | KONPDIVY     | ConB             | B*15:03, B*15:01 | yes  |
| 13    | KQNPDIVIVQV  | ConB             | B*15:01          | yes  |
| 14    | YVDRFYKTL    | ConB             | C*03:04          | no   |
| 15    | DRFYKTLRA    | ConB             | B*14:02          | yes  |
| 16    | RAIEAQQHL    | ConB             | B*15:03, C*03:04 | yes  |
| 17    | IQKETWEAW    | ConB             | B*15:01          | no   |
| 18    | EYKRWII      | ConB             | B*08:01          | yes  |
| 19    | GLNKVRMY     | ConB/C           | B*15:01          | yes  |
| 20    | GQMVHQPL     | Polymorphic      | B*14:02          | yes  |
| 21    | TPGPGTRYPL   | Polymorphic      | B*07:02          | no   |
| 22    | GQMVHQAI     | ConB/C           | B*14:02          | yes  |
| 23    | QAISRTLNAW   | ConB/C           | A*25:01          | no   |
| 24    | SPRTLNAWV    | ConB/C           | B*07:02          | no   |
| 25    | IRYQYNVL     | ConB/C           | B*14:02          | yes  |
| 26    | ACQGVGGPGHK  | ConB/C           | A*11:01          | yes  |
| 27    | GIPHPAGLK    | ConB/C           | A*03:01          | yes  |
| 28    | SVDDALINSTK  | P2P16            | A*11:01          | no   |
| 29    | ALINSTKIY    | P2P16            | B*15:01          | no   |
| 30    | KIYSYFSPVISK | P2P16            | A*03:01          | no   |
| 31    | KVNQGAQGK    | P2P16            | A*03:01, A*11:01 | no   |

B

Figure 5

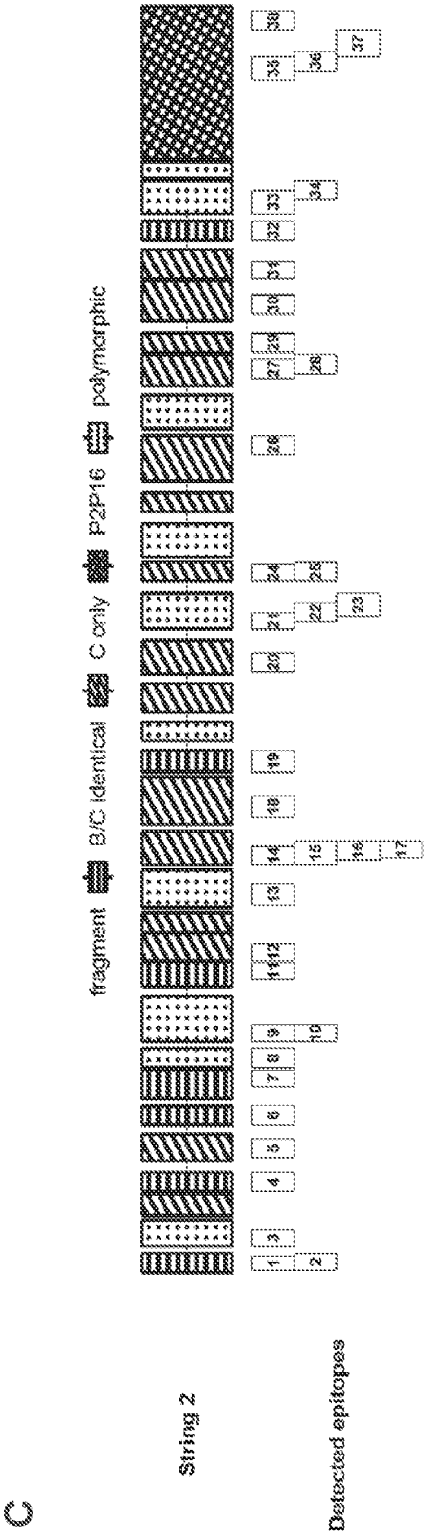


Figure 5

| order | epitope     | B/C polymorphism | allele                    | edge |
|-------|-------------|------------------|---------------------------|------|
| 1     | VTDSQYA     | ConB/C           | B*40:02                   | no   |
| 2     | VTDSQAL     | ConB/C           | A*01:01                   | yes  |
| 3     | AEQATQEV    | Polymorphic      | B*40:02                   | yes  |
| 4     | GIPHPAGLK   | ConB/C           | A*03:01                   | yes  |
| 5     | RMYSVPSIL   | ConC             | B*15:01                   | no   |
| 6     | GLNKIVRMY   | ConB/C           | B*15:01                   | yes  |
| 7     | MQMLKETI    | ConB/C           | B*08:01                   | yes  |
| 8     | AKNPEVIY    | Polymorphic      | B*15:03, B*15:01          | yes  |
| 9     | GGMVHQAL    | ConC             | B*15:03, B*14:02, B*15:01 | yes  |
| 10    | GGMVHQAL    | Polymorphic      | B*15:03, B*14:02, B*15:01 | yes  |
| 11    | IRYQYNVL    | ConB/C           | B*14:02                   | yes  |
| 12    | AEQATQDV    | ConC             | B*40:02                   | yes  |
| 13    | TPGPGVREPL  | Polymorphic      | B*07:02                   | no   |
| 14    | AQNPEVIY    | ConC             | B*15:03, A*11:01, B*15:01 | yes  |
| 15    | AQNPEVIYQY  | ConC             | A*11:01, B*15:01          | yes  |
| 16    | NPEIVYQY    | ConC             | B*18:01                   | no   |
| 17    | PEIVYQY     | ConC             | B*18:01                   | no   |
| 18    | TPGPGVRYPL  | ConC             | B*07:02                   | no   |
| 19    | FKRKGGIGY   | ConB/C           | B*15:03                   | yes  |
| 20    | IQKETWETW   | ConC             | B*15:01                   | no   |
| 21    | GGMVHQPI    | Polymorphic      | B*14:02                   | yes  |
| 22    | VHQIPSPRT   | Polymorphic      | B*15:10                   | no   |
| 23    | QPISPRTLNAW | Polymorphic      | A*25:01                   | yes  |
| 24    | GERIDII     | ConC             | B*40:02                   | yes  |
| 25    | GERIDIIA    | ConC             | B*40:02                   | yes  |
| 26    | EVIPMFETAL  | ConC             | A*25:01                   | yes  |
| 27    | YVDRFFETL   | ConC             | C*03:04                   | no   |
| 28    | DRFKTLRA    | ConC             | B*14:02                   | yes  |
| 29    | RAIEAQQHM   | ConC             | C*03:04                   | yes  |
| 30    | SEGATPQDL   | ConB/C           | B*40:02                   | no   |
| 31    | DIYKRWII    | ConC             | B*08:01                   | yes  |
| 32    | KLTPLCVTL   | ConB/C           | B*15:01, A*02:01          | yes  |
| 33    | ACQGVGGPSHK | Polymorphic      | A*11:01                   | yes  |
| 34    | GPSHKARVL   | Polymorphic      | B*07:02                   | yes  |
| 35    | SVDDALINSTK | P2P16            | A*11:01                   | no   |
| 36    | ALINSTKIY   | P2P16            | B*15:01                   | no   |
| 37    | KIYSFFPSVSK | P2P16            | A*03:01, A*11:01          | no   |
| 38    | KVNQGAQ GK  | P2P16            | A*03:01, A*11:01          | no   |

Figure 6

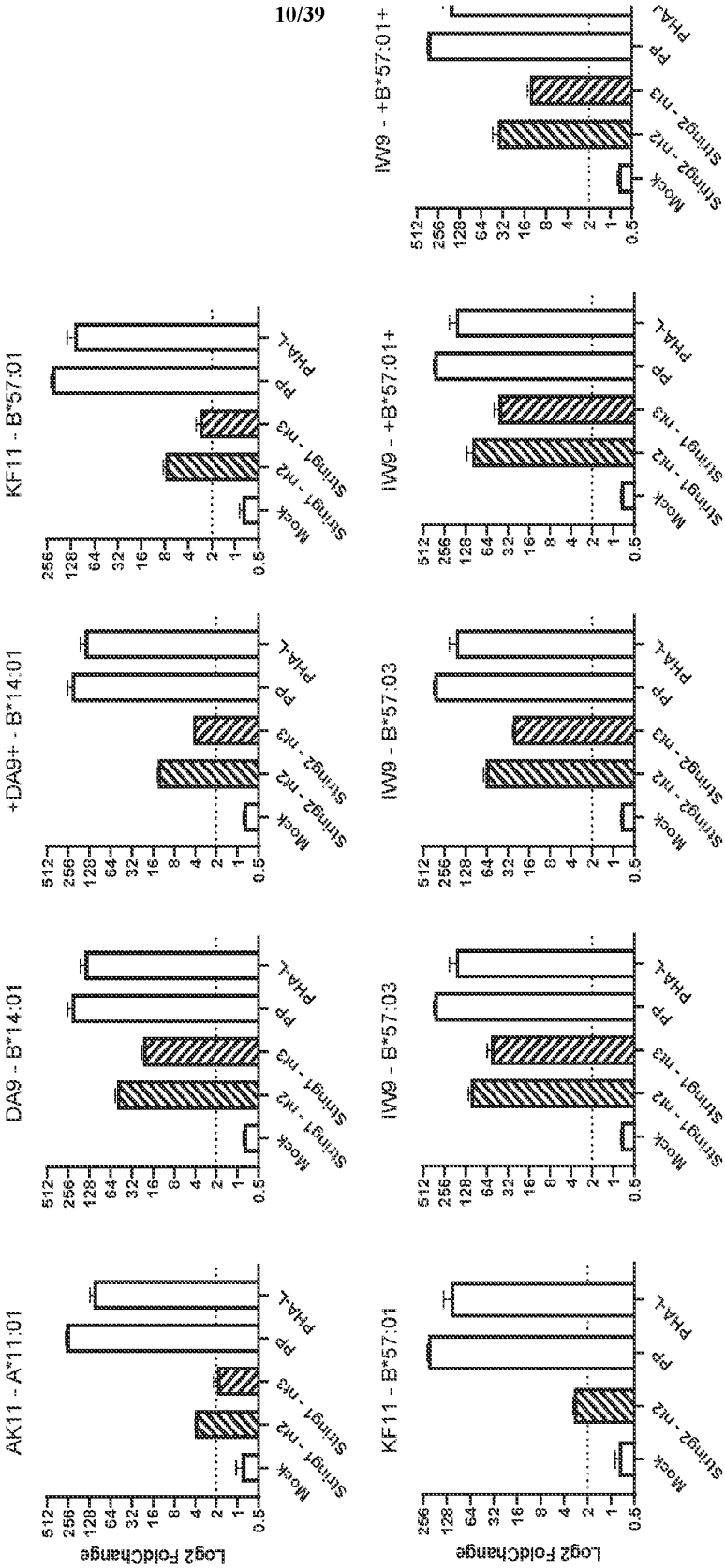


Figure 7

A

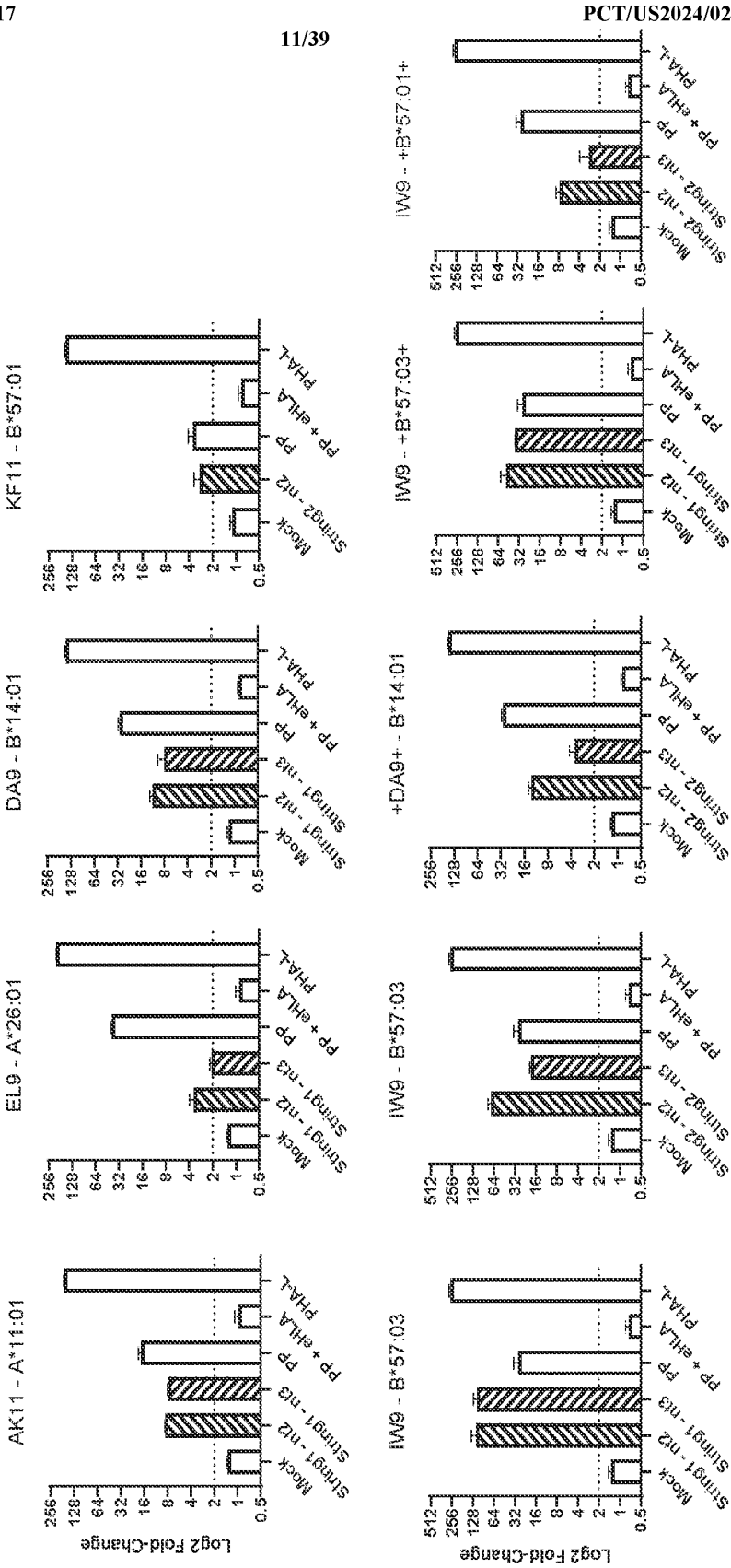


Figure 7

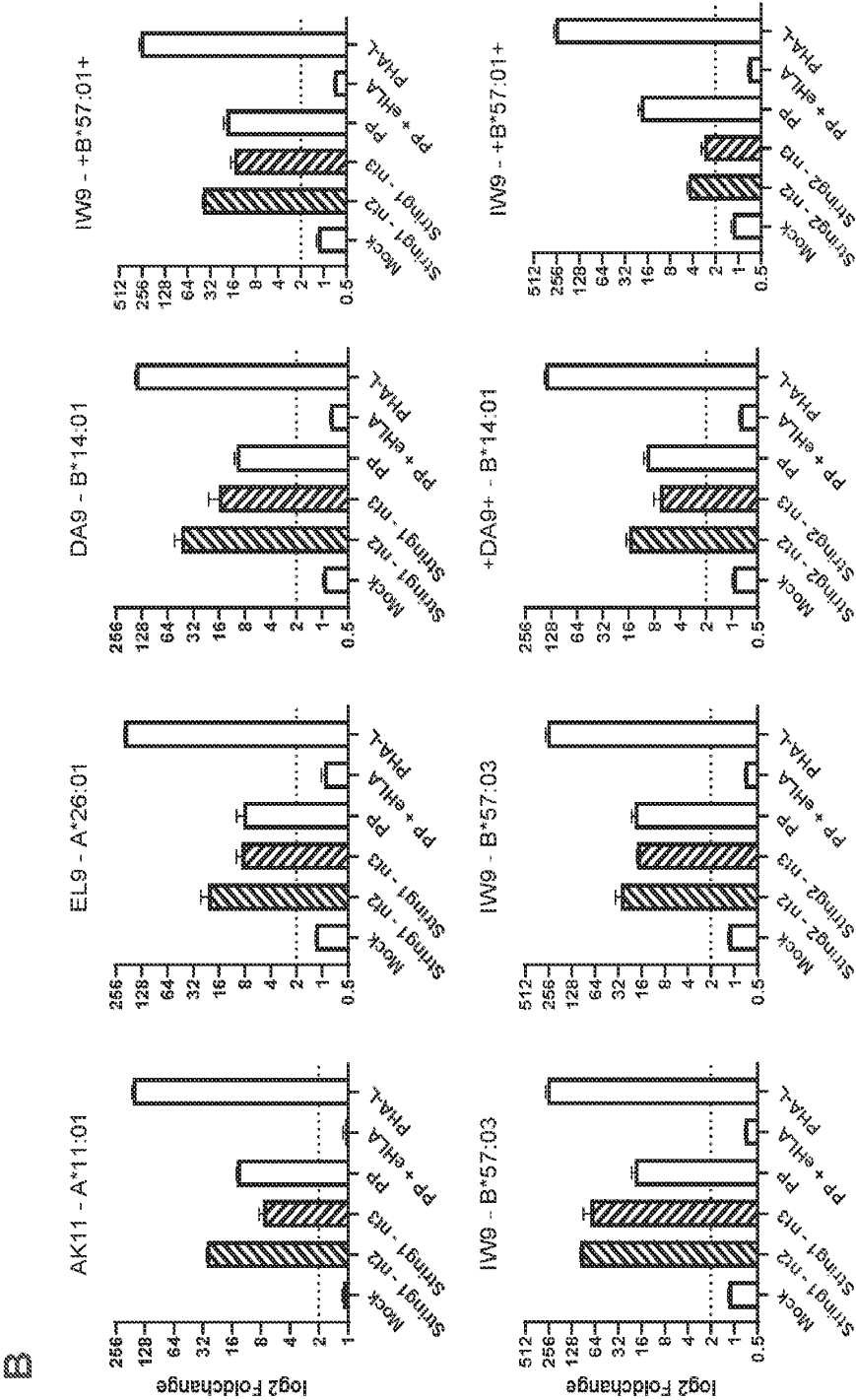


Figure 8

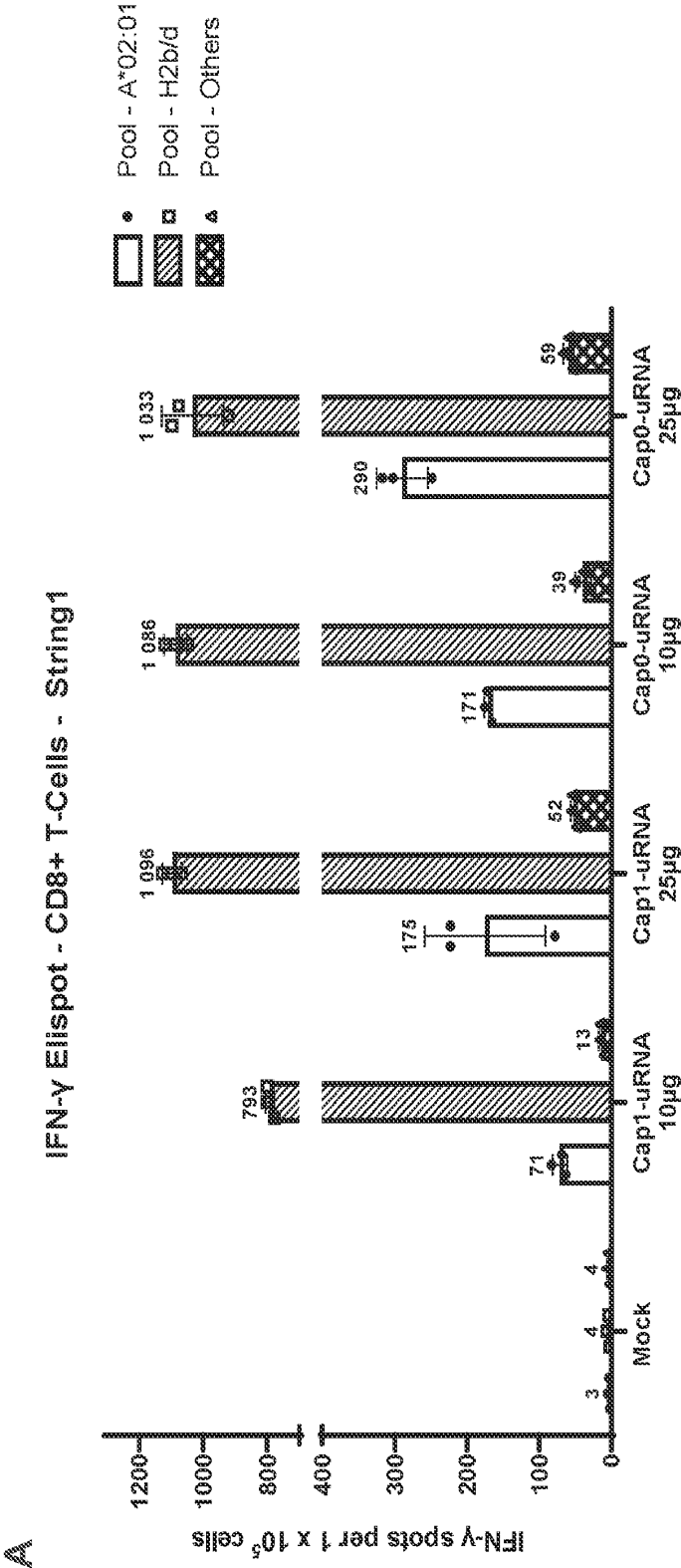


Figure 8

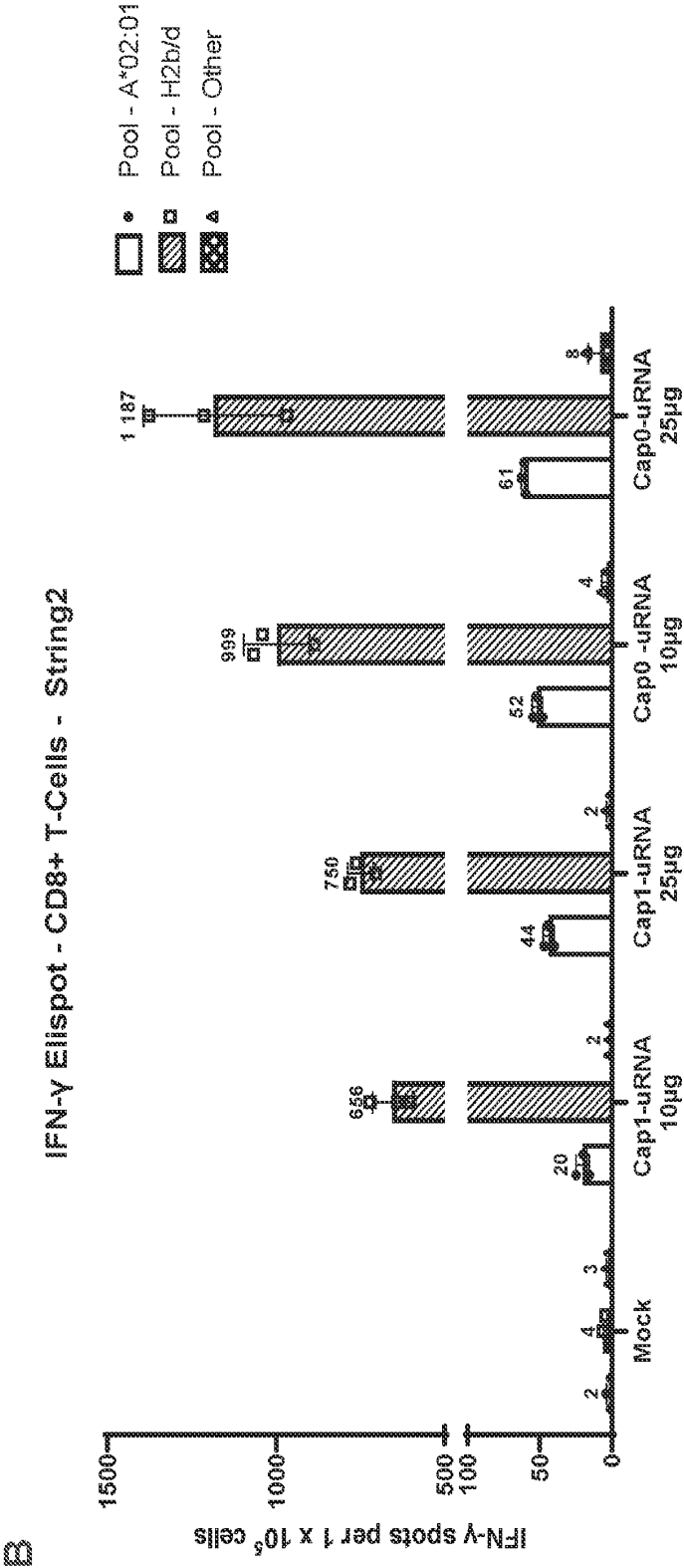


Figure 8  
IFN- $\gamma$  Elispot - CD8+ T-Cells - String1  
cross-reactivity testing

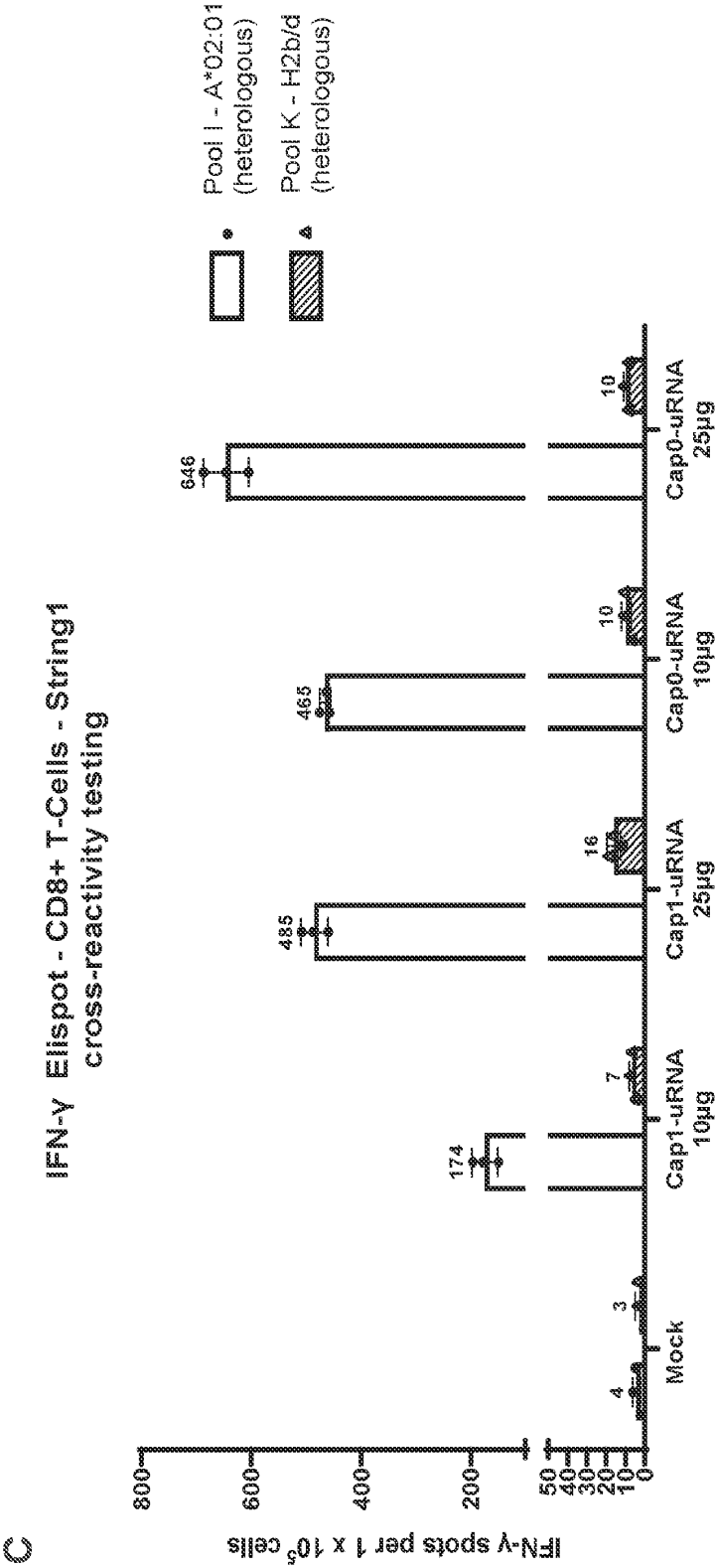


Figure 8

IFN- $\gamma$  Elispot - CD8+ T-Cells - String2  
cross-reactivity testing

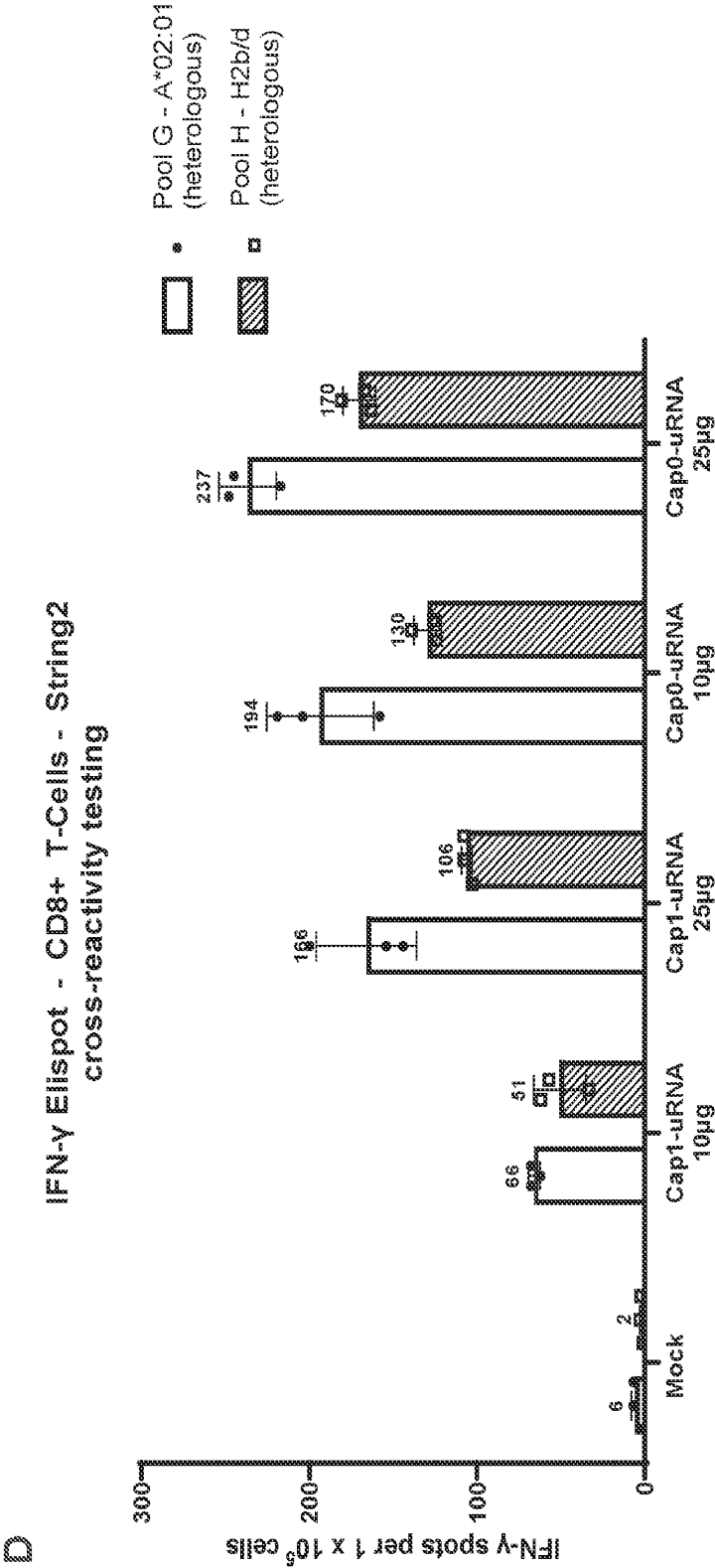
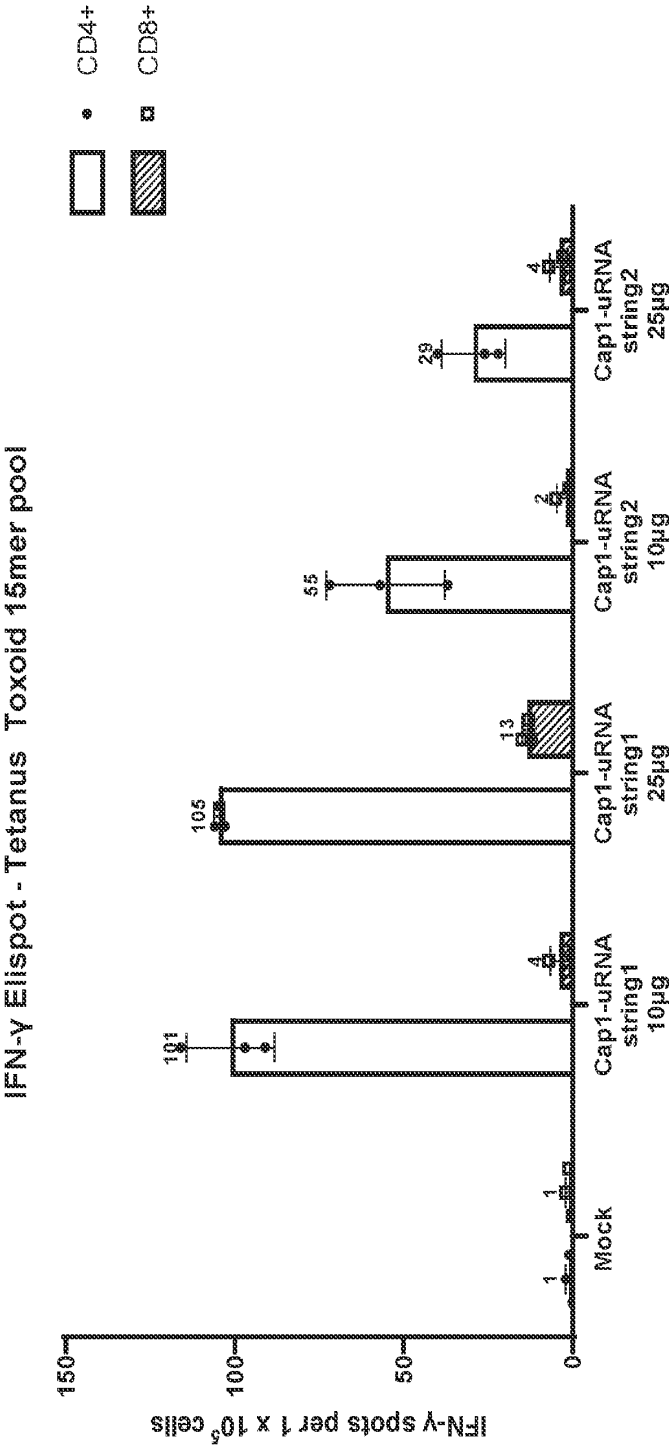


Figure 8



E

Figure 8  
IFN-γ Elispot - AH-1 irrelevant MuLV peptide

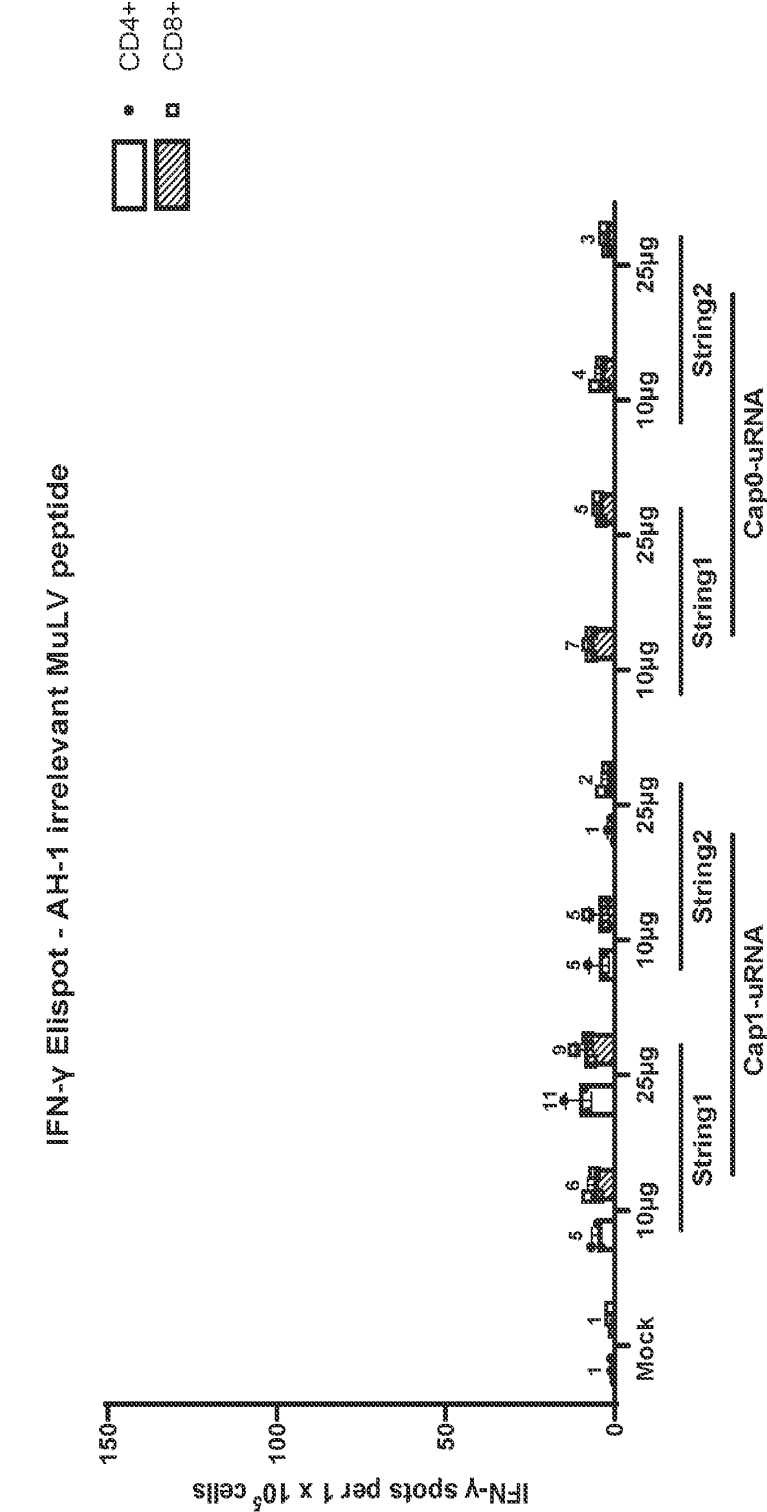


Figure 8  
IFN-γ Elispot - Concanavalin A

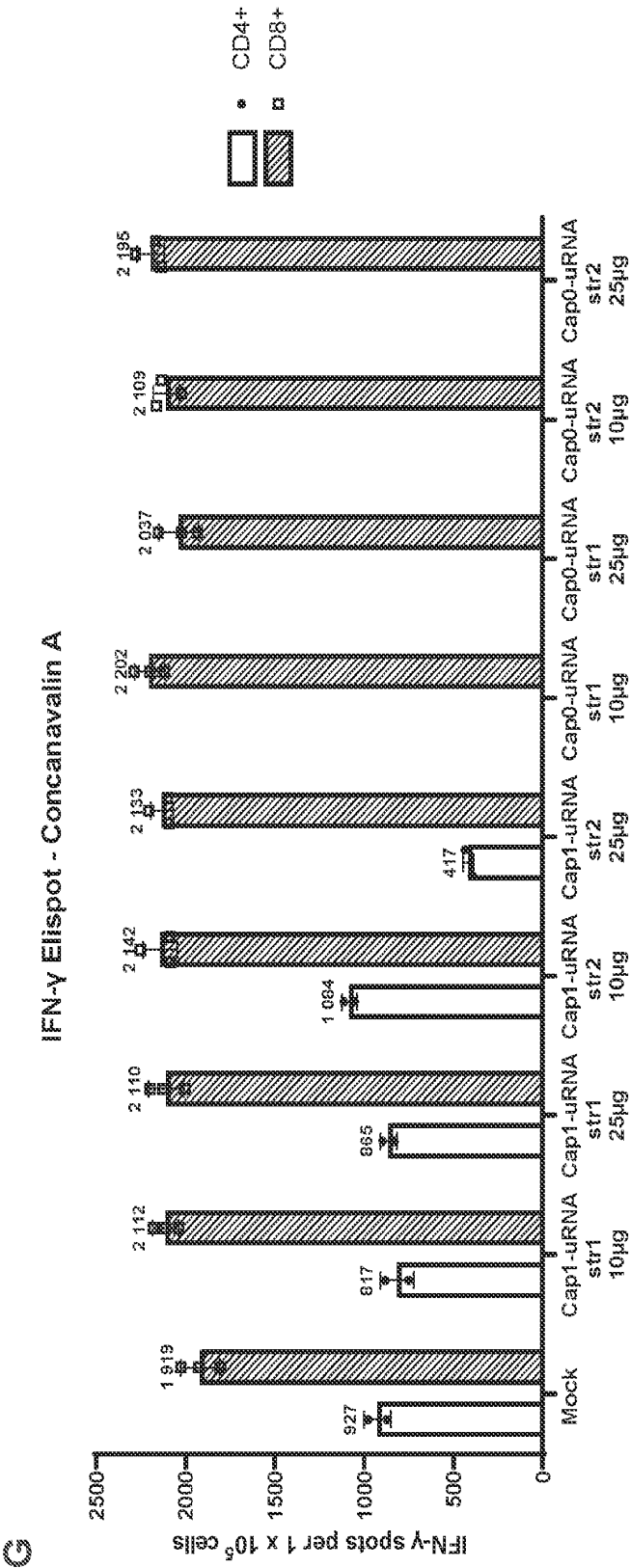


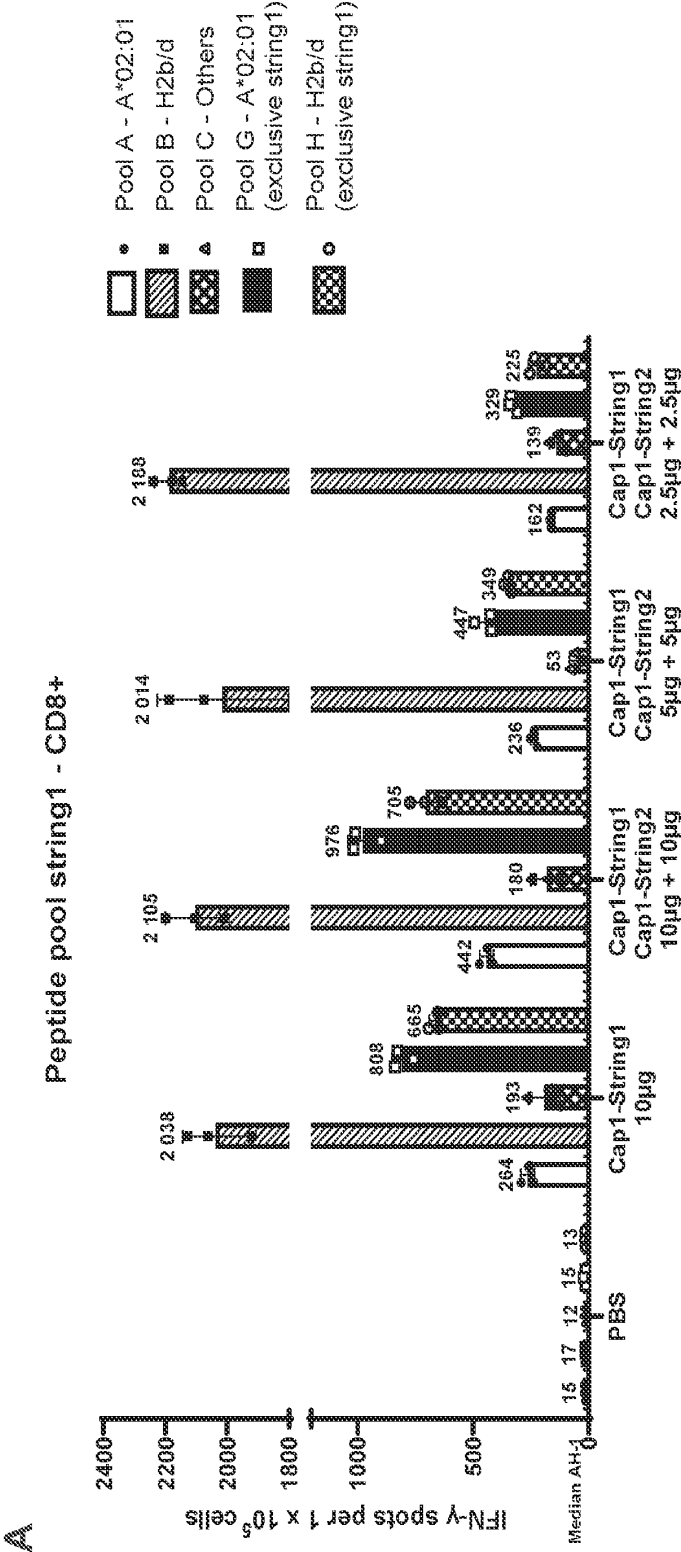
Figure 8

H

| Mouse strain<br>(n=X) | mRNA vaccine<br>tested | Nanolipid Carrier<br>Formulation | Formulated<br>mRNA<br>Dose/100µL | Prime d0 | boost d7 | boost d14 | d21       |
|-----------------------|------------------------|----------------------------------|----------------------------------|----------|----------|-----------|-----------|
| CB6F1<br>(n=5)        | PBS                    | N/A                              | -                                | 100µL    | 100µL    | 100µL     | Sacrifice |
| CB6F1<br>(n=5)        | Cap1-String1           | Lipoplex                         | 10µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap1-String1           |                                  | 25µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap1-String2           |                                  | 10µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap1-String2           |                                  | 25µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap0-String1           |                                  | 10µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap0-String1           |                                  | 25µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap0-String2           |                                  | 10µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap0-String2           |                                  | 25µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap0-String2           |                                  | 25µg                             | 100µL    | 100µL    | 100µL     |           |

CB6F1 = CB6F1-Tg(HLA-A\*0201/H2-Kb)A\*0201

Figure 9



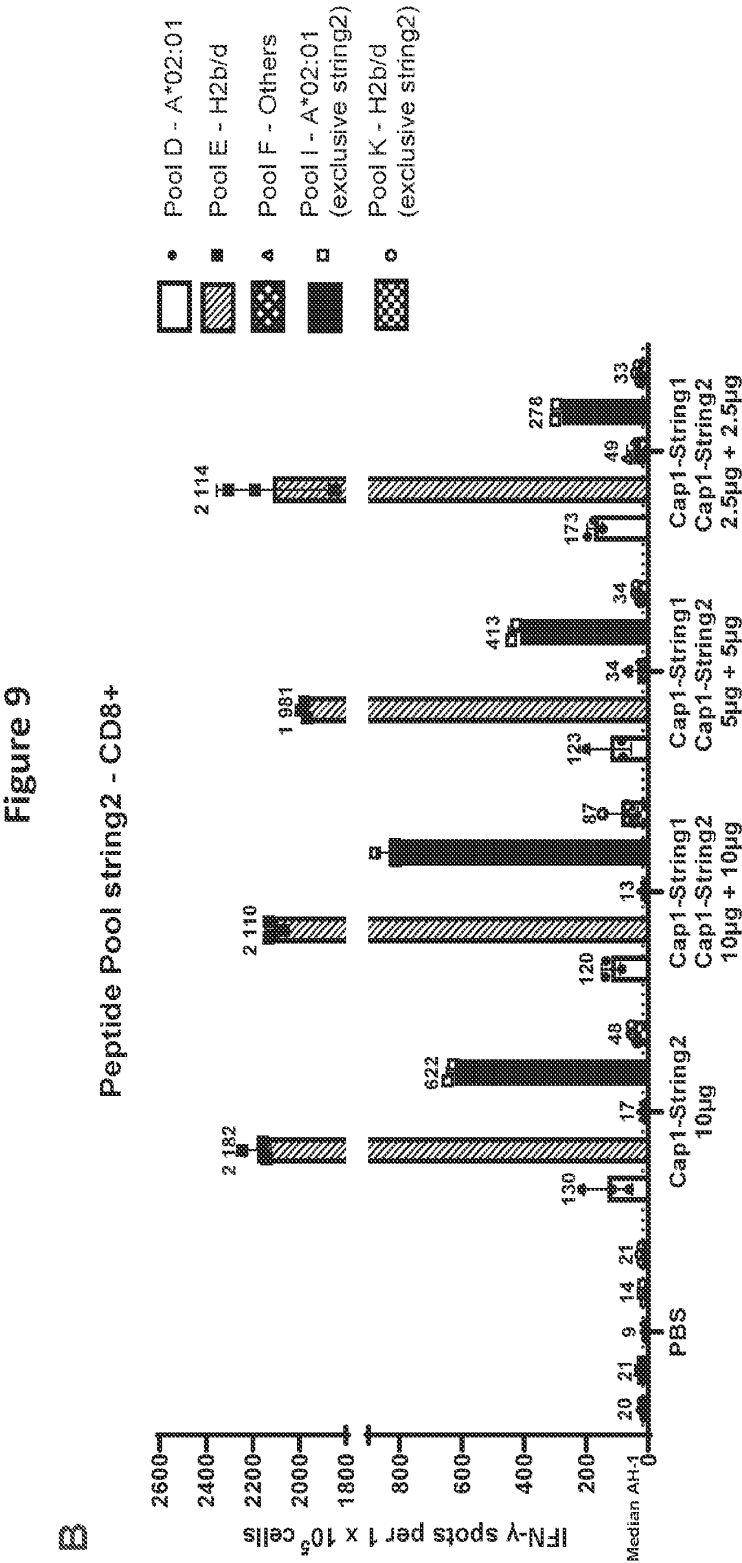


Figure 9

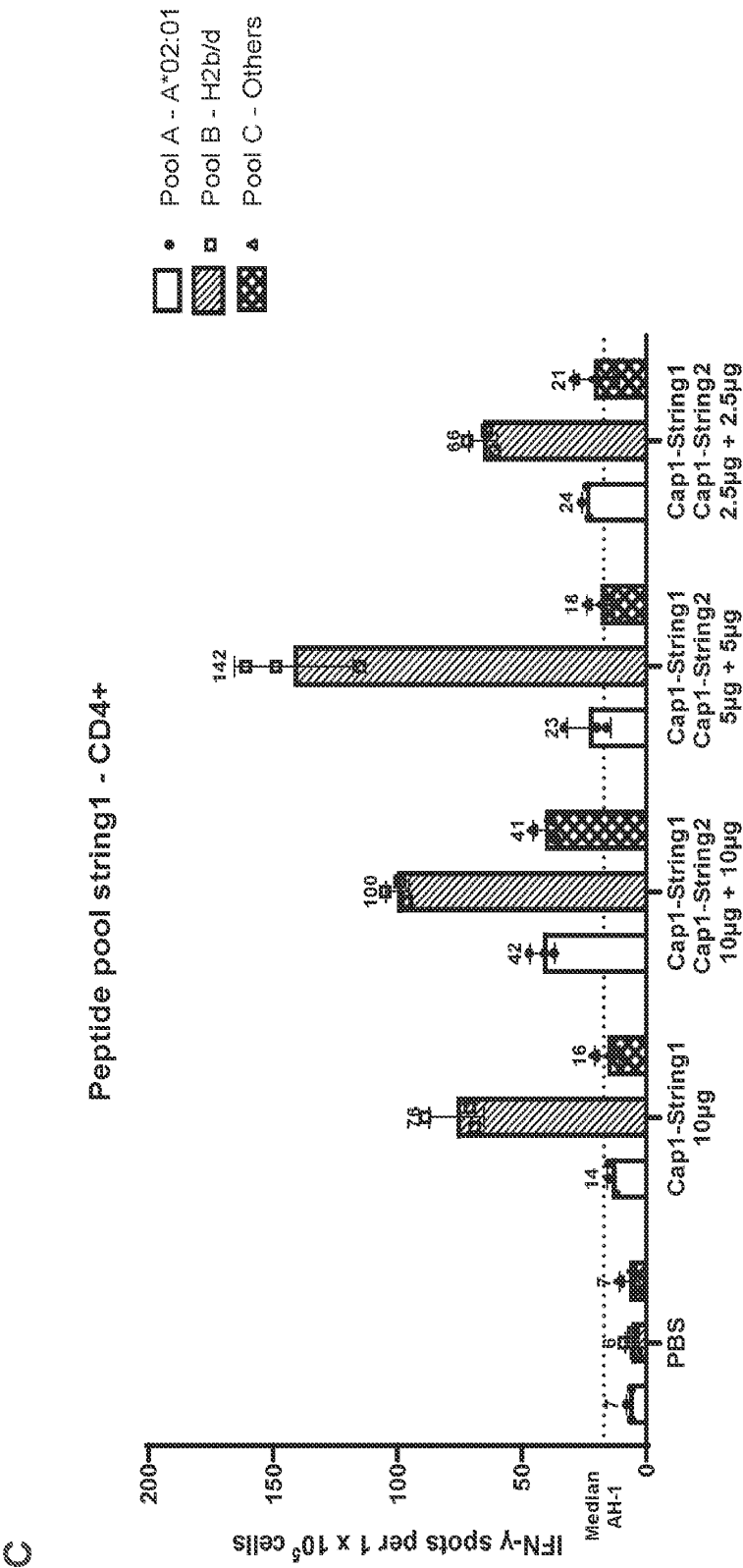


Figure 9

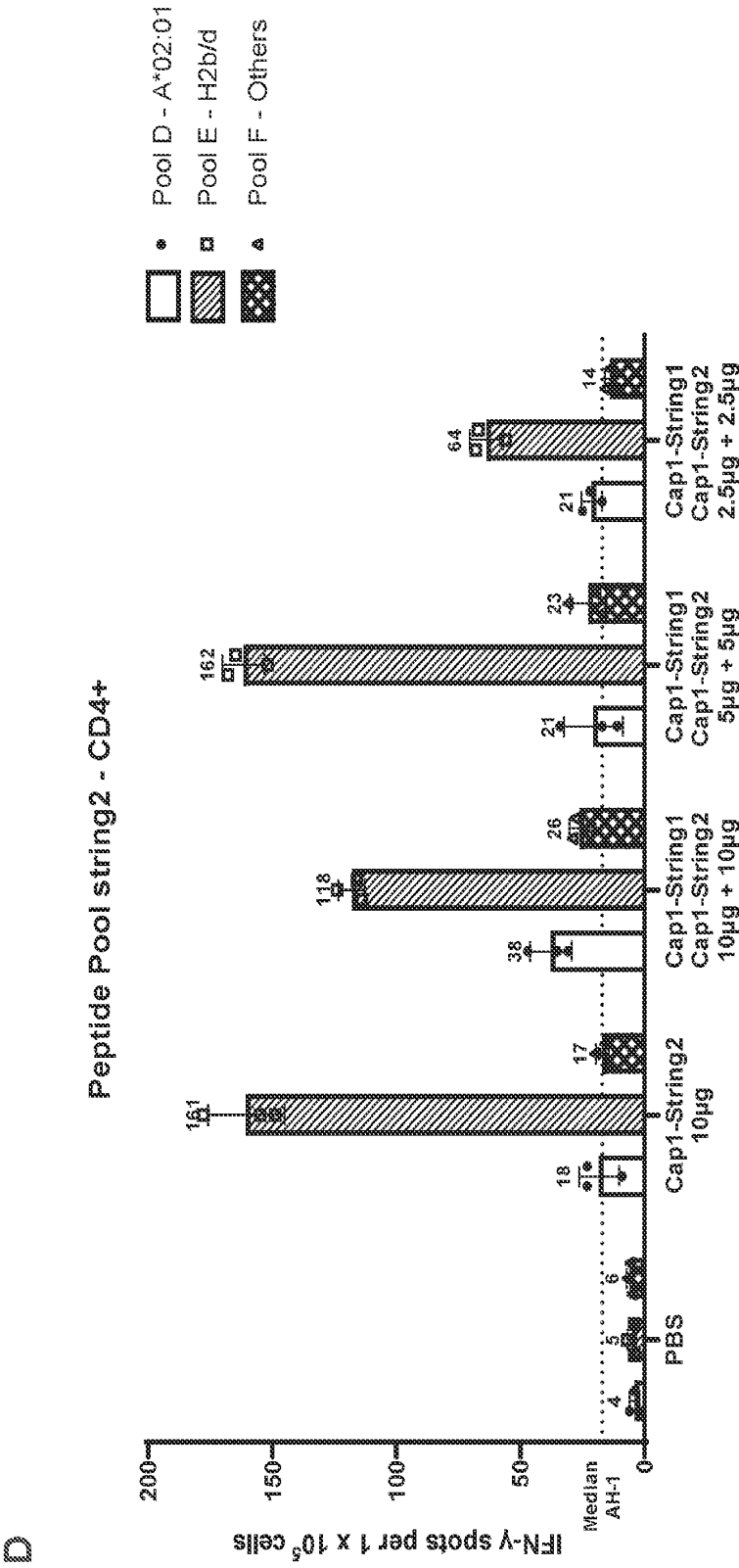


Figure 9

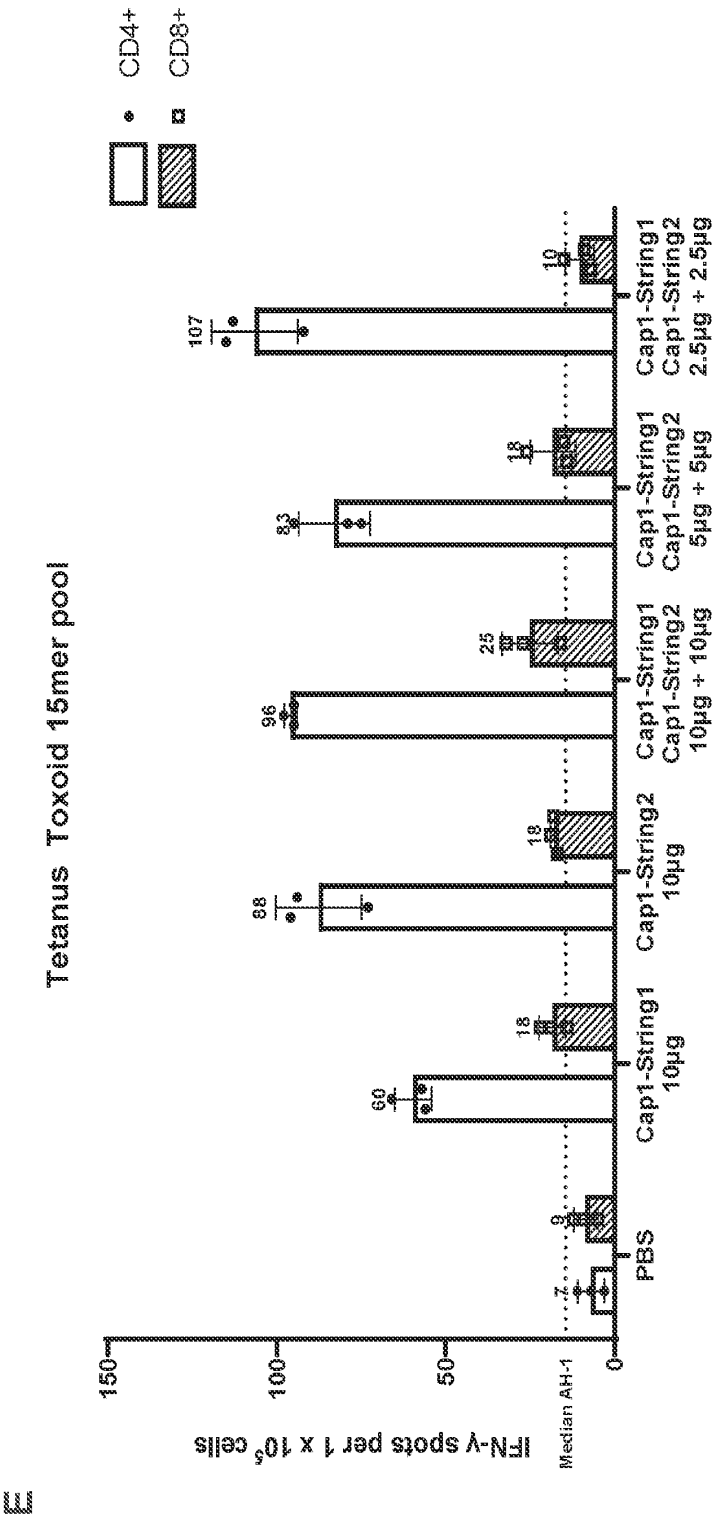


Figure 9  
AH-1 irrelevant MuLV peptide

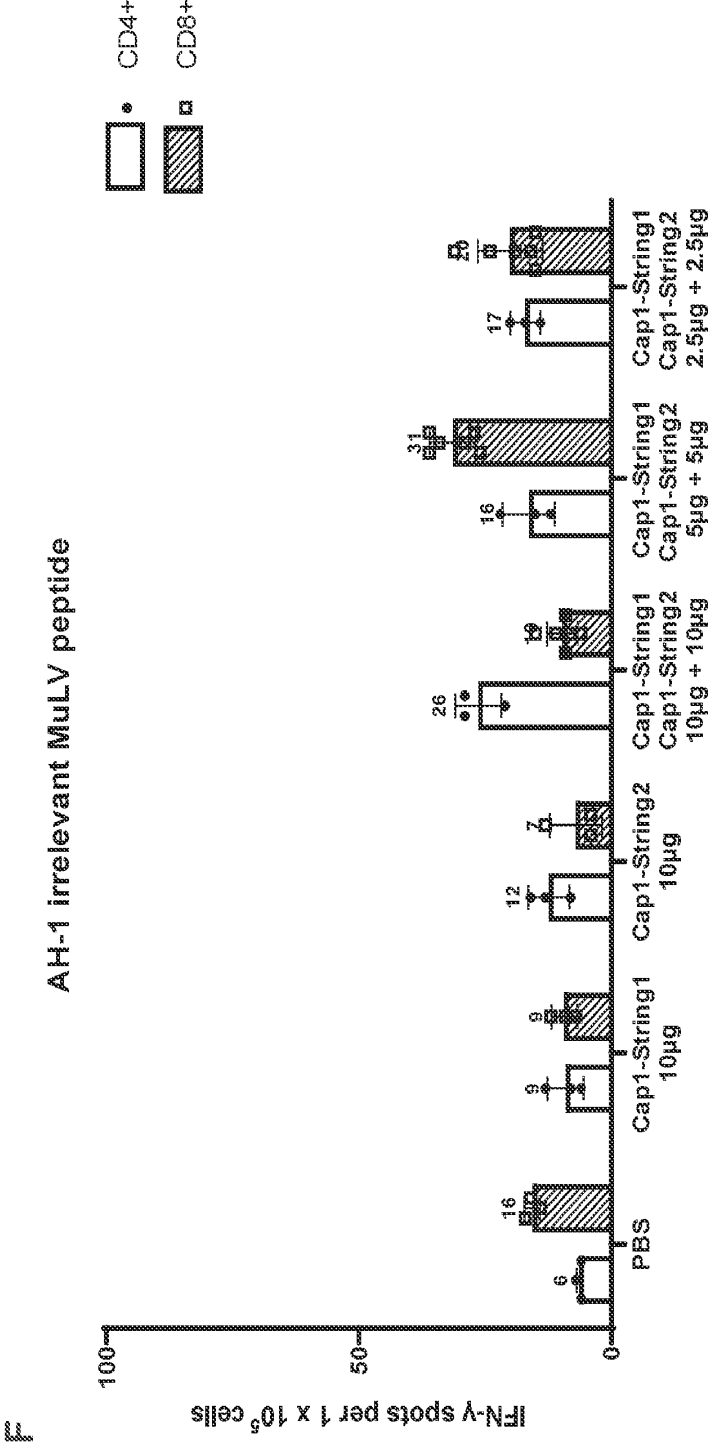


Figure 9

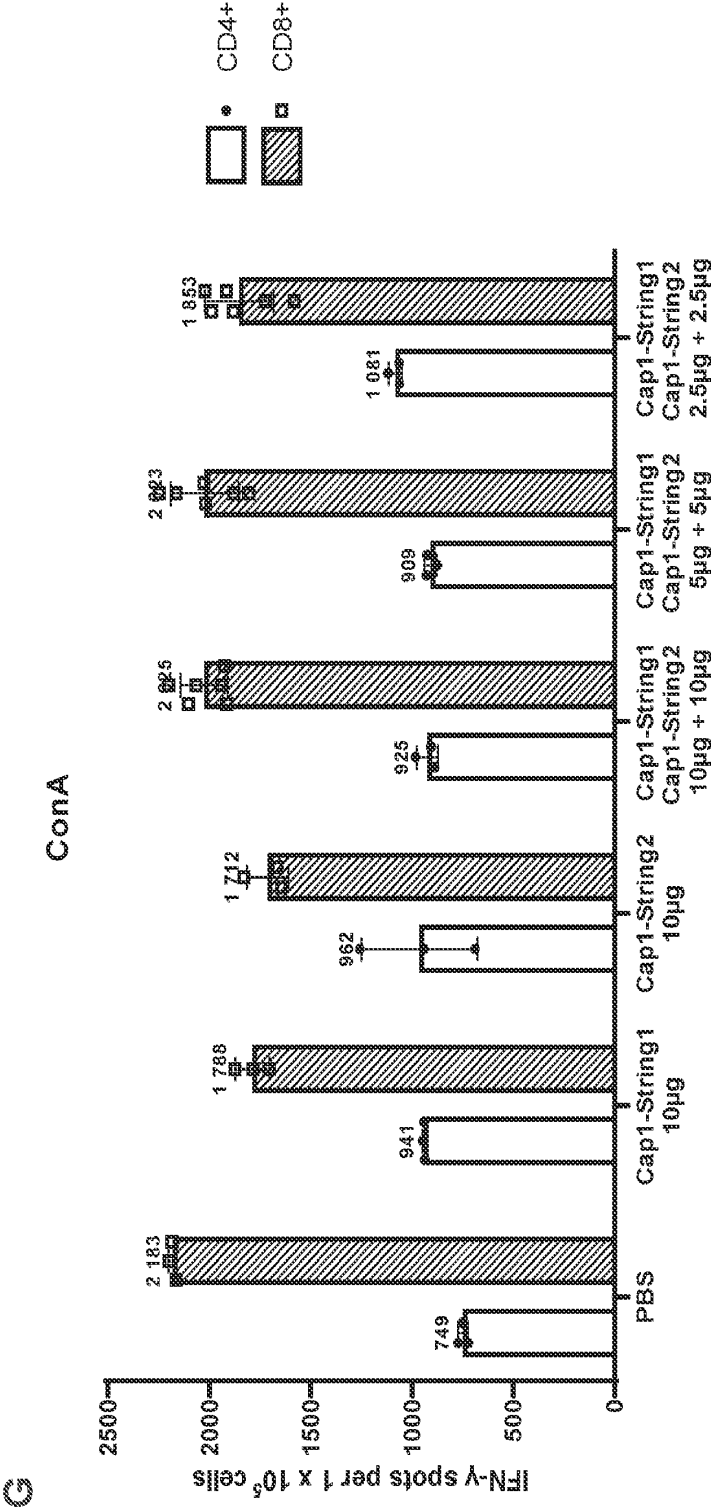


Figure 9

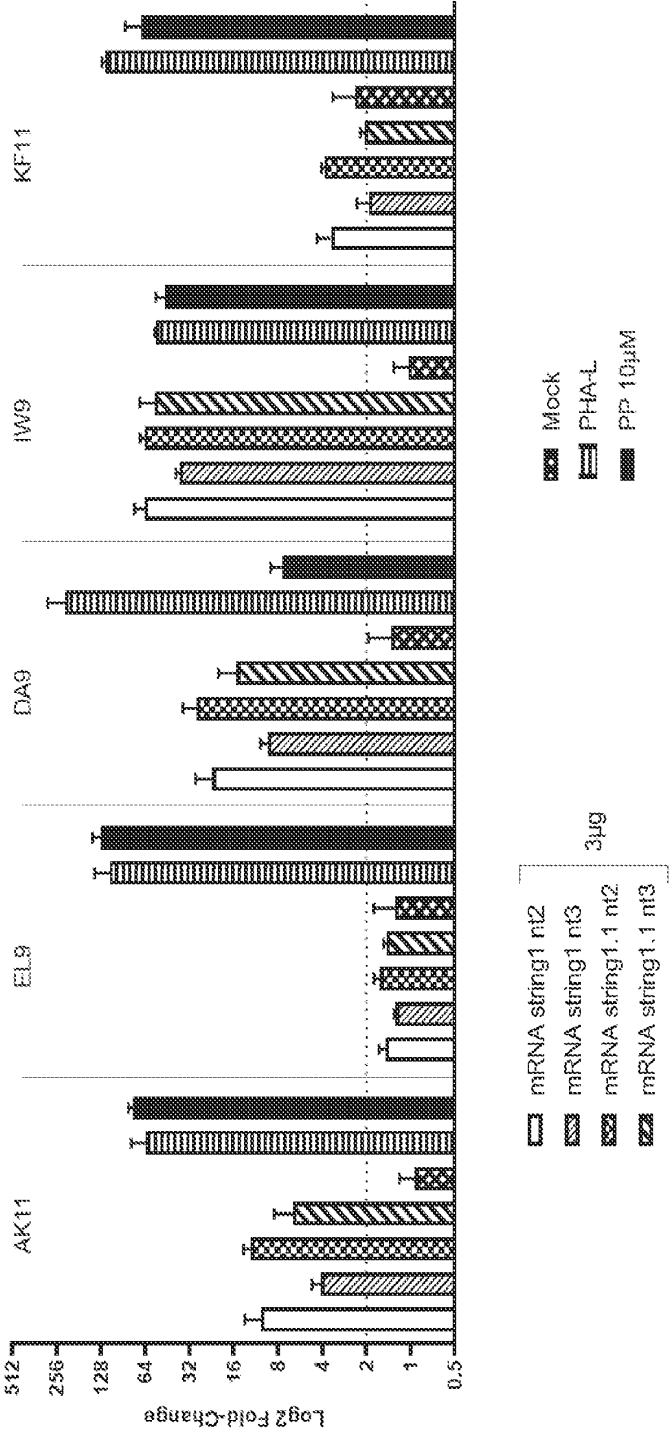
H

| Mouse strain<br>(n=X) | mRNA vaccine<br>tested            | Nanolipid<br>Carrier<br>Formulation | Formulated<br>mRNA<br>Dose/100µL | Prime d0 | boost d7 | boost d14 | d21       |
|-----------------------|-----------------------------------|-------------------------------------|----------------------------------|----------|----------|-----------|-----------|
| CB6F1<br>(n=5)        | PBS                               | N/A                                 | -                                | 100µL    | 100µL    | 100µL     | Sacrifice |
| CB6F1<br>(n=5)        | Cap1-String1<br>+<br>Cap1-String2 | Lipoplex                            | 10µg<br>+<br>10µg                | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap1-String1<br>+<br>Cap1-String2 |                                     | 5µg<br>+<br>5µg                  | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap1-String1<br>+<br>Cap1-String2 |                                     | 2.5µg<br>+<br>2.5µg              | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap1-String1                      |                                     | 10µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap1-String2                      |                                     | 10µg                             | 100µL    | 100µL    | 100µL     |           |
| CB6F1<br>(n=5)        | Cap1-String2                      |                                     |                                  | 100µL    | 100µL    | 100µL     |           |

CB6F1 = CB6F1-Tg(HLA-A\*0201/H2-Kb)A\*0201

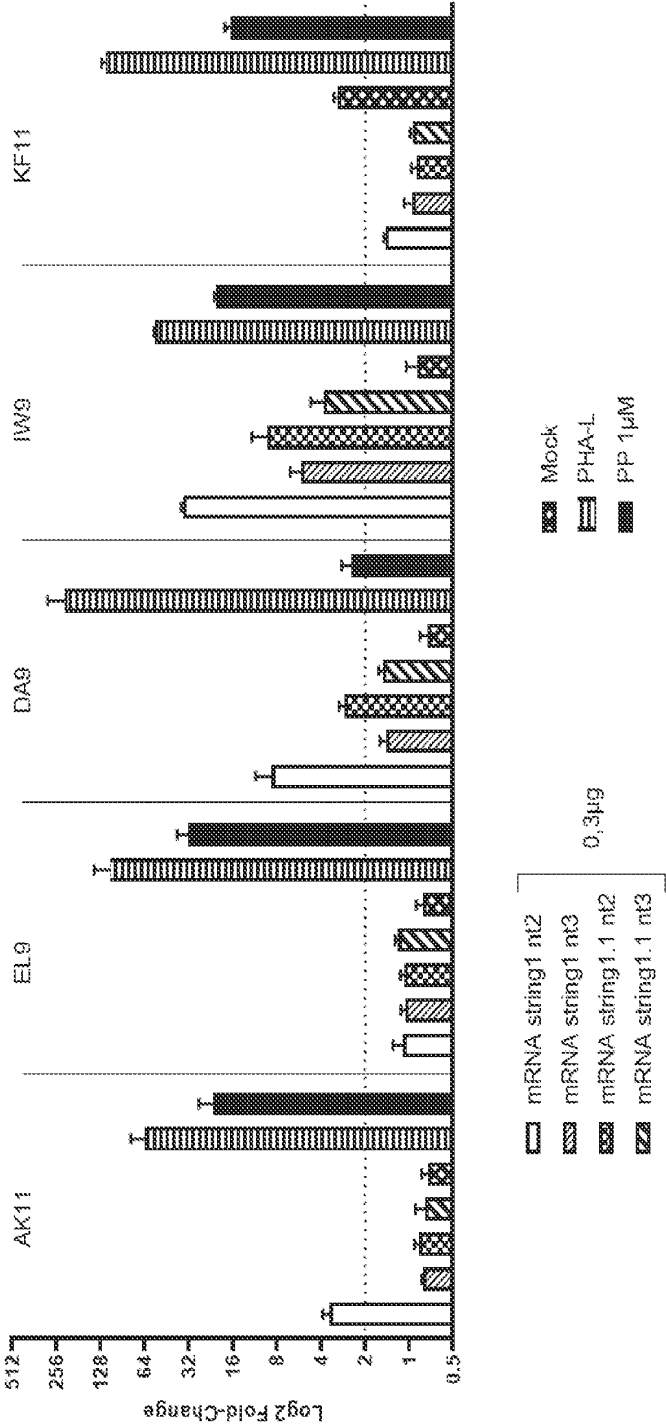
A

Figure 10



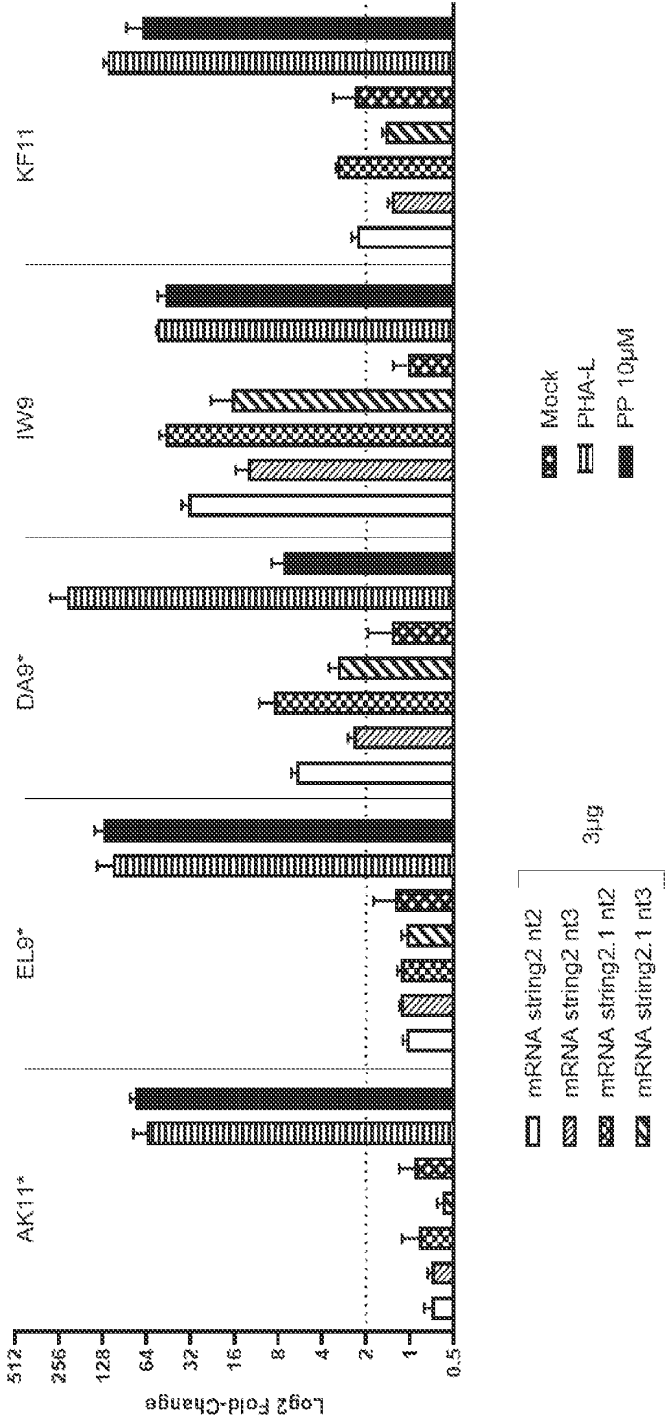
B

Figure 10



C

Figure 10



D

Figure 10

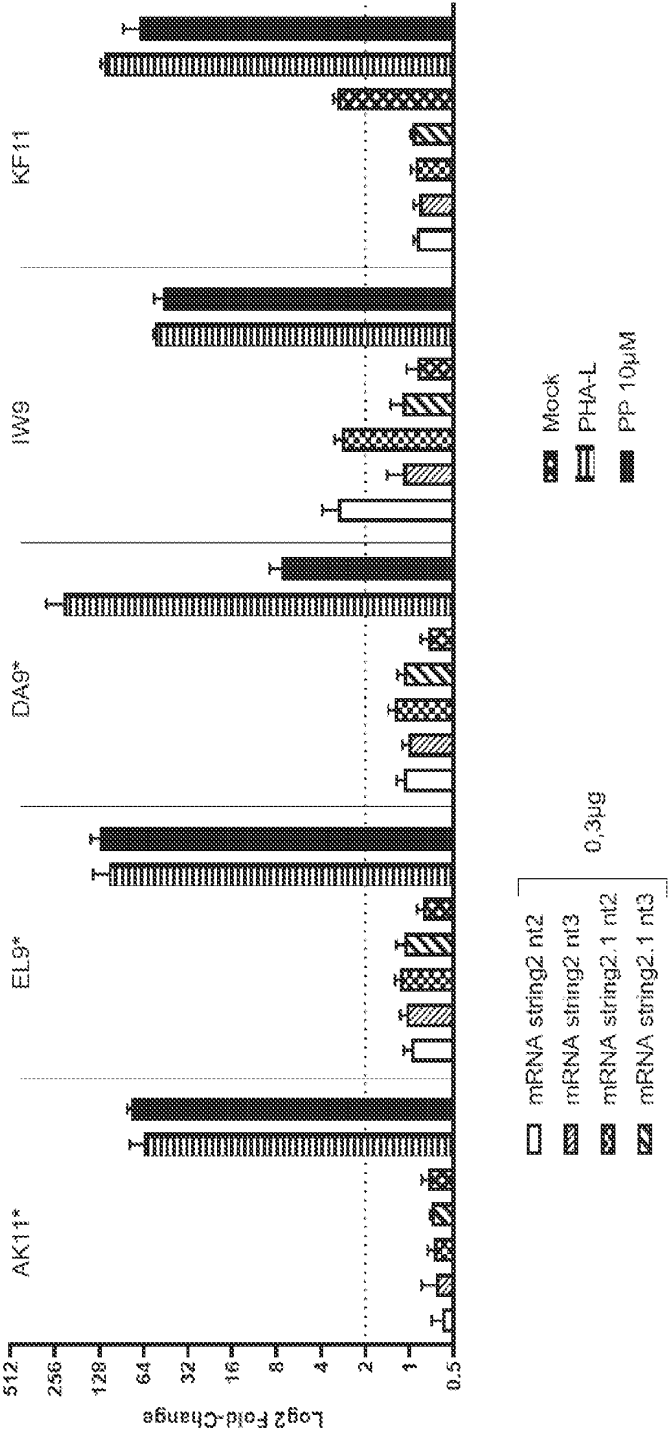


Figure 11

A

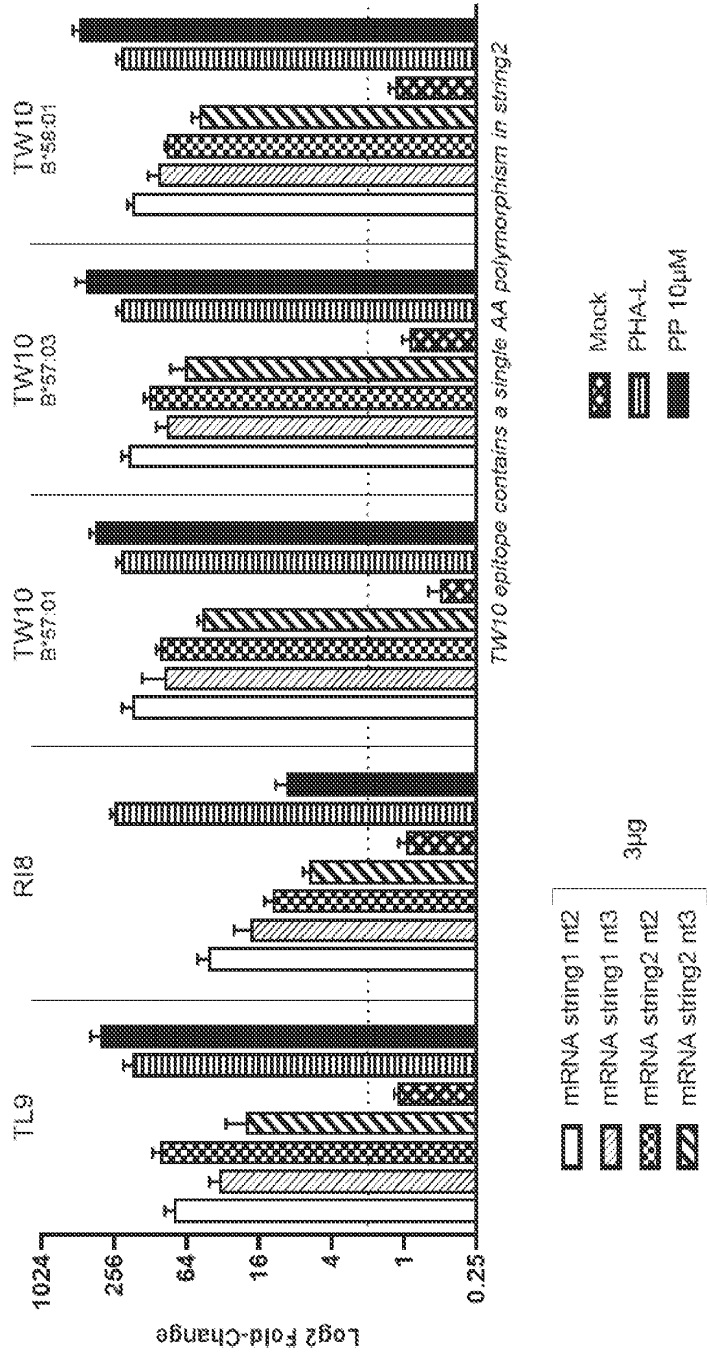


Figure 11

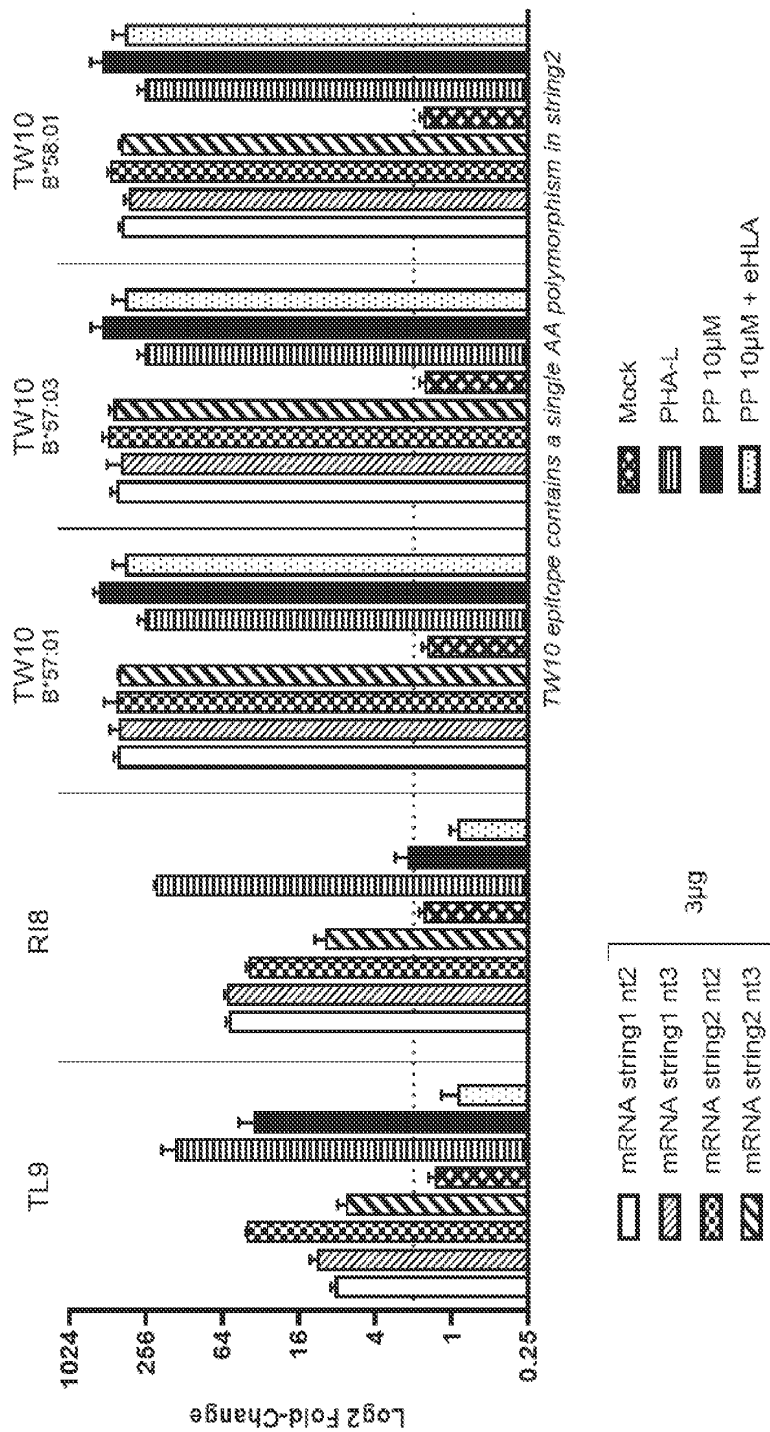


Figure 11

C

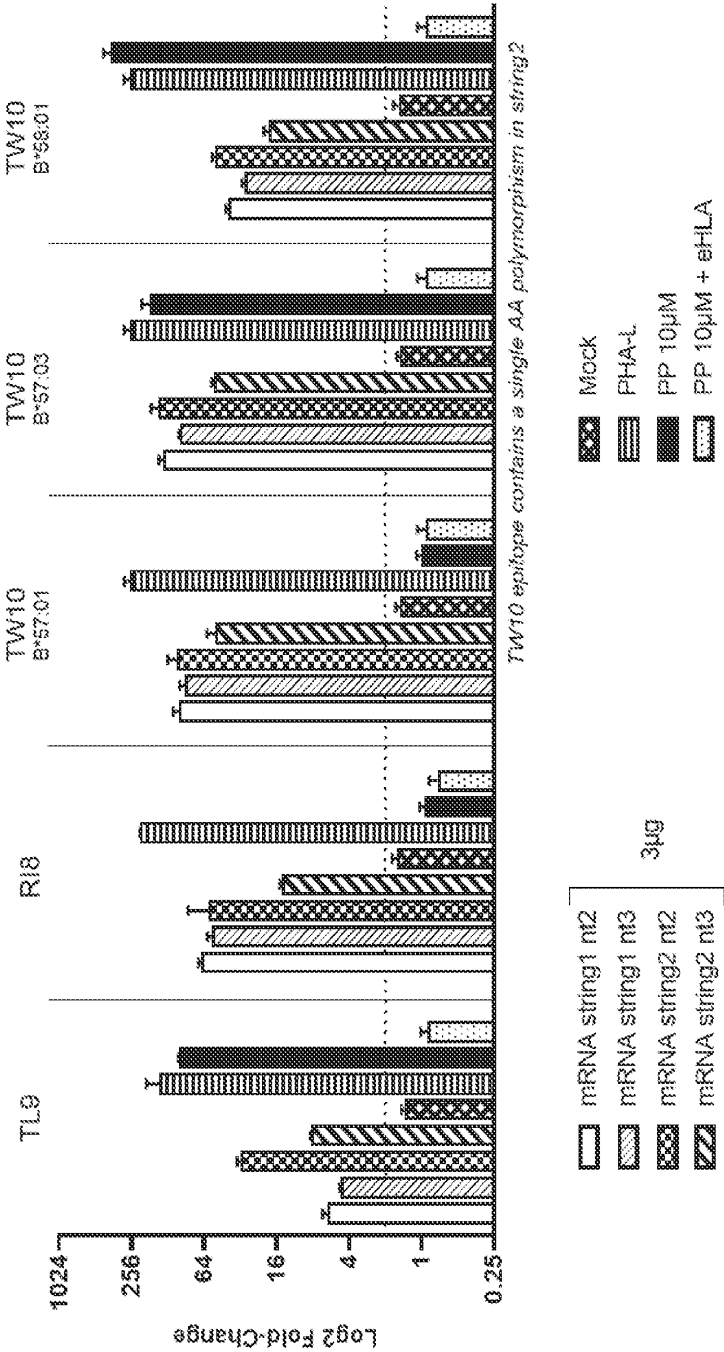
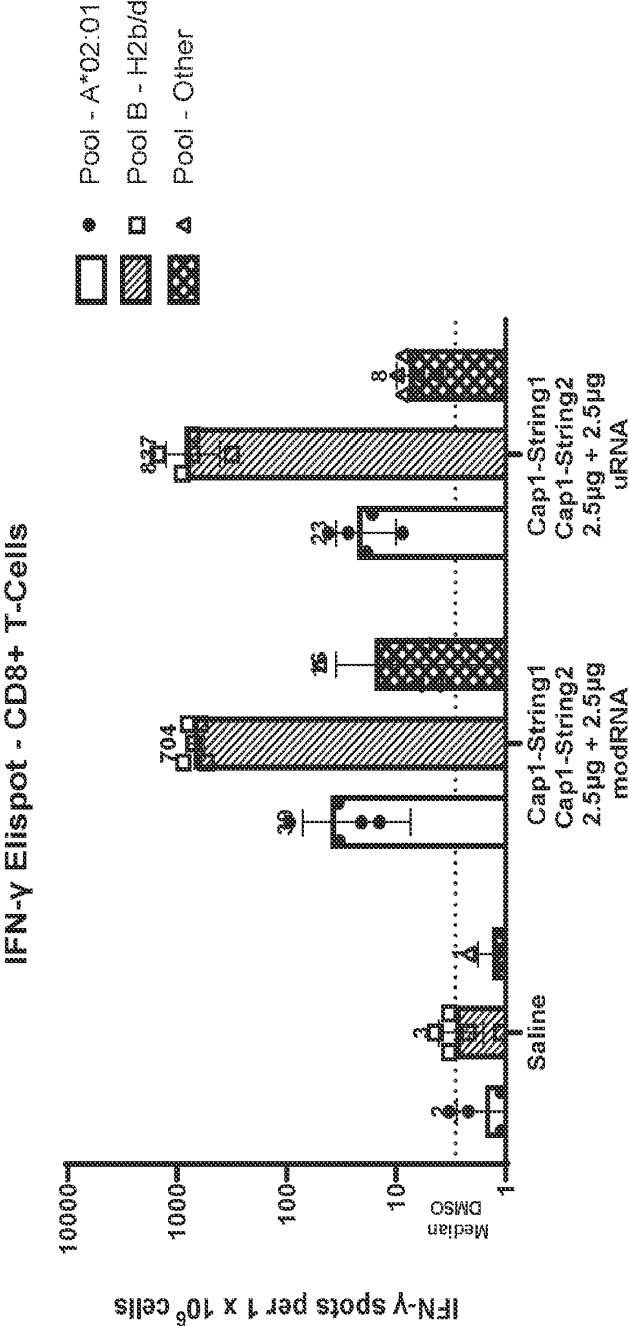


Figure 12

A



B

Figure 12

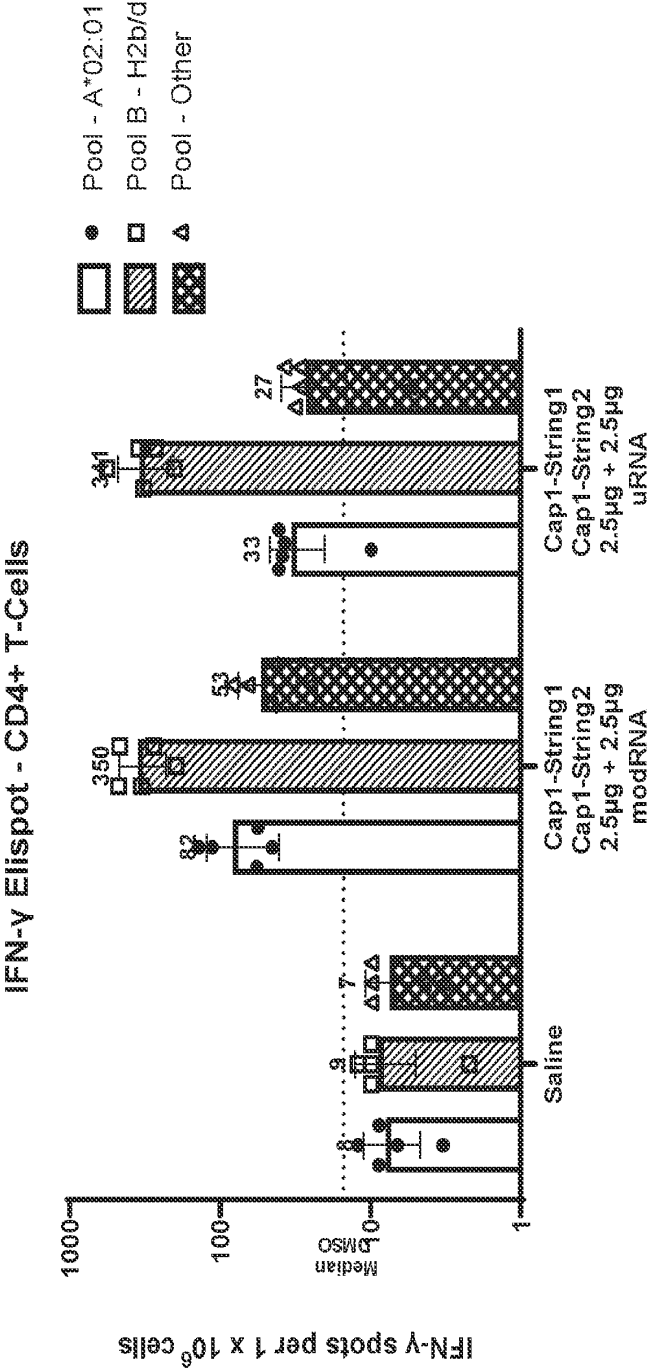


Figure 12

C

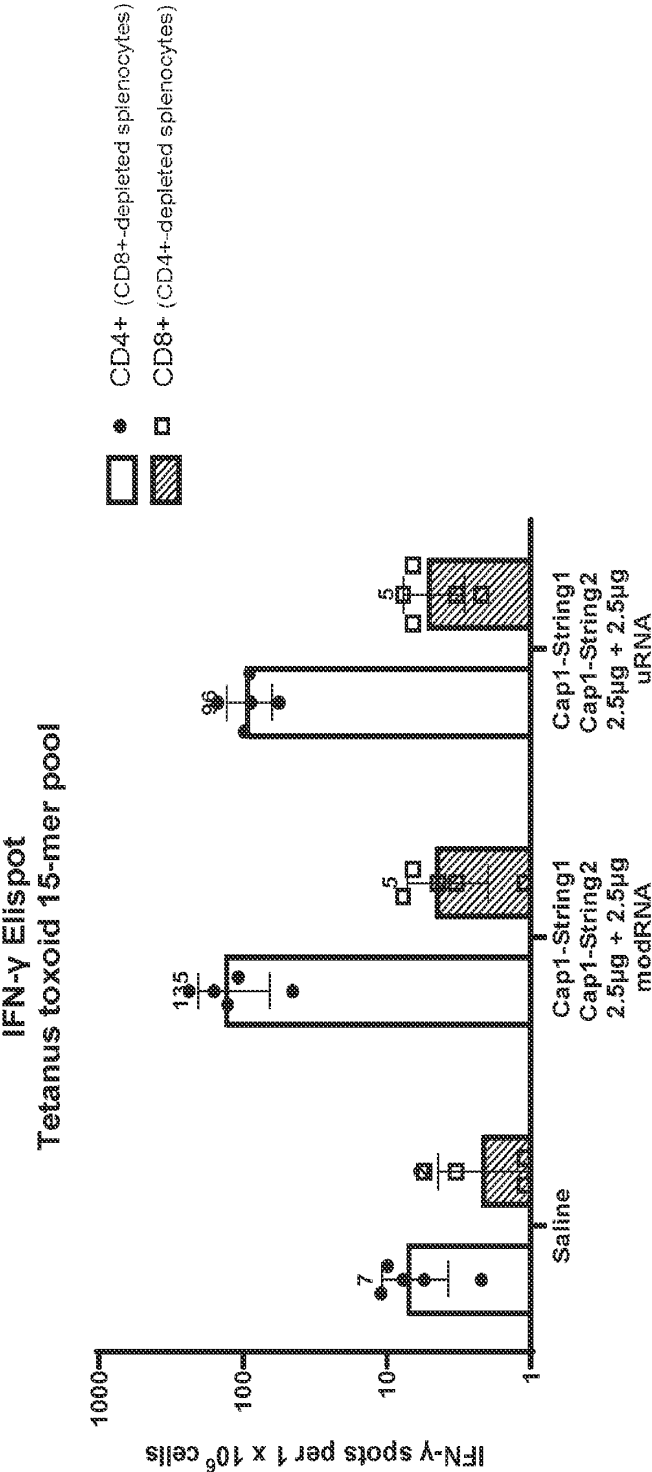


Figure 12

|                       |                                   |                                  |             |                              |                                   | Prime d0             | d7 |
|-----------------------|-----------------------------------|----------------------------------|-------------|------------------------------|-----------------------------------|----------------------|----|
| Mouse strain<br>(n=X) | mRNA vaccine<br>tested            | Nanolipid Carrier<br>Formulation | mRNA format | Formulated<br>mRNA Dose/20µL | Intramuscular<br>Injection volume | End of<br>experiment |    |
| CB6F1<br>(n=5)        | PBS                               | N/A                              | N/A         | -                            | 20µL                              | Sacrifice            |    |
| CB6F1<br>(n=5)        | Cap1-String1<br>+<br>Cap1-String2 | Lipid Nanoparticle               | modRNA      | 2.5µg<br>+<br>2.5µg          | 20µL                              |                      |    |
| CB6F1<br>(n=5)        | Cap1-String1<br>+<br>Cap1-String2 |                                  | uRNA        | 2.5µg<br>+<br>2.5µg          | 20µL                              |                      |    |

CB6F1 = CB6F1-Tg(HLA-A\*0201/H2-Kb)A\*0201

D