

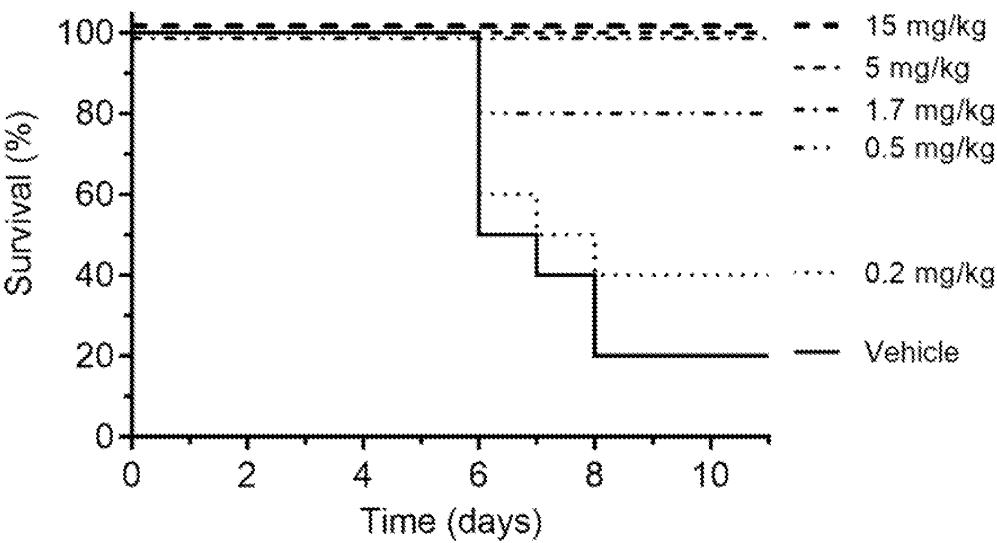


Figure 1

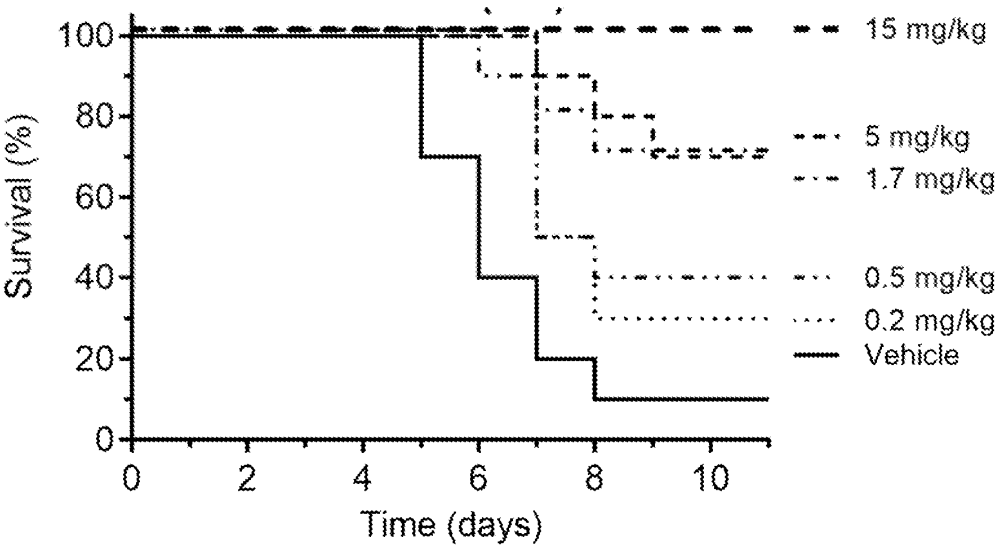


Figure 2

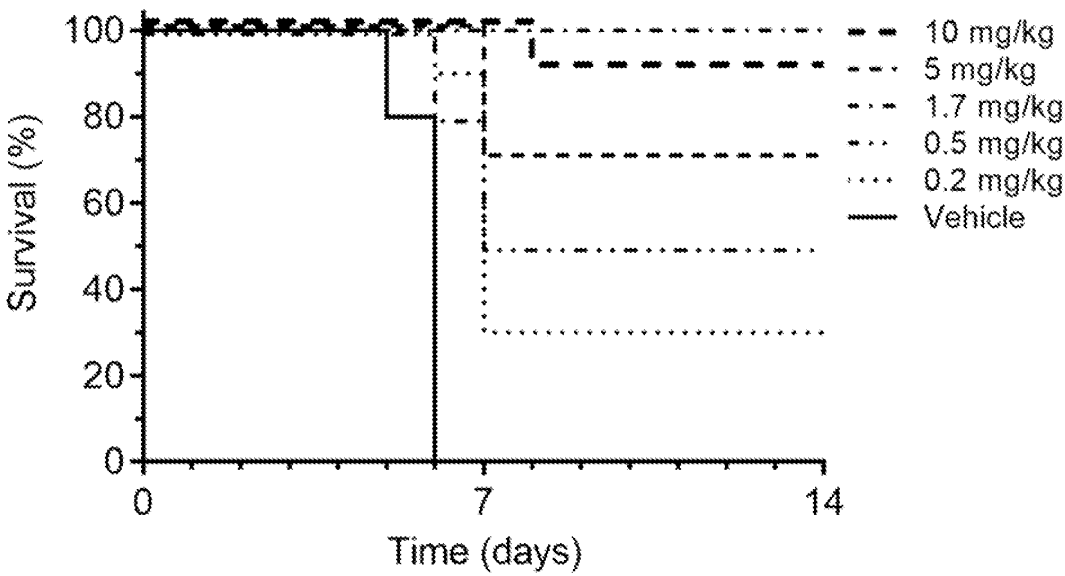


Figure 3

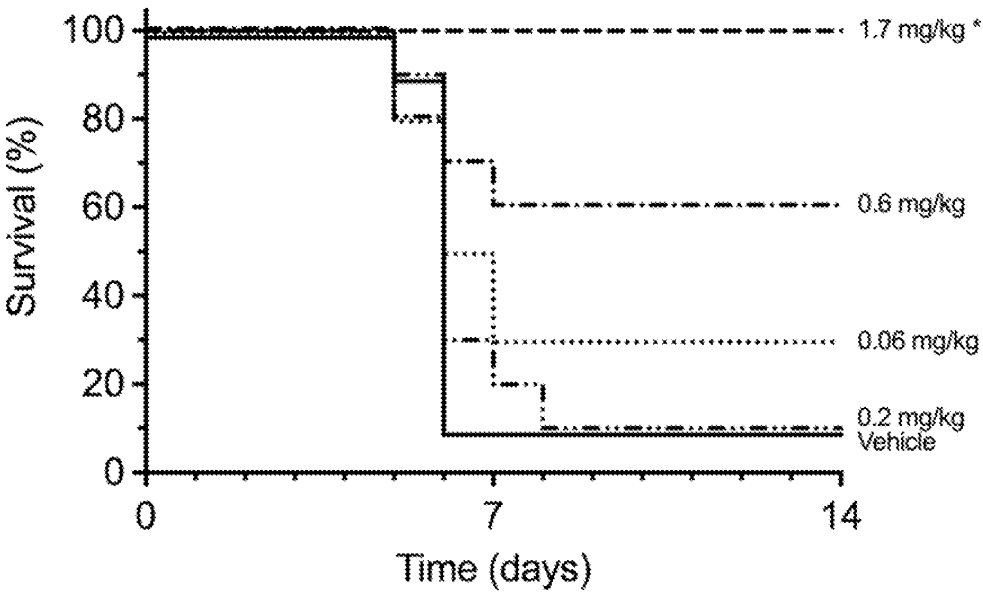


Figure 4A

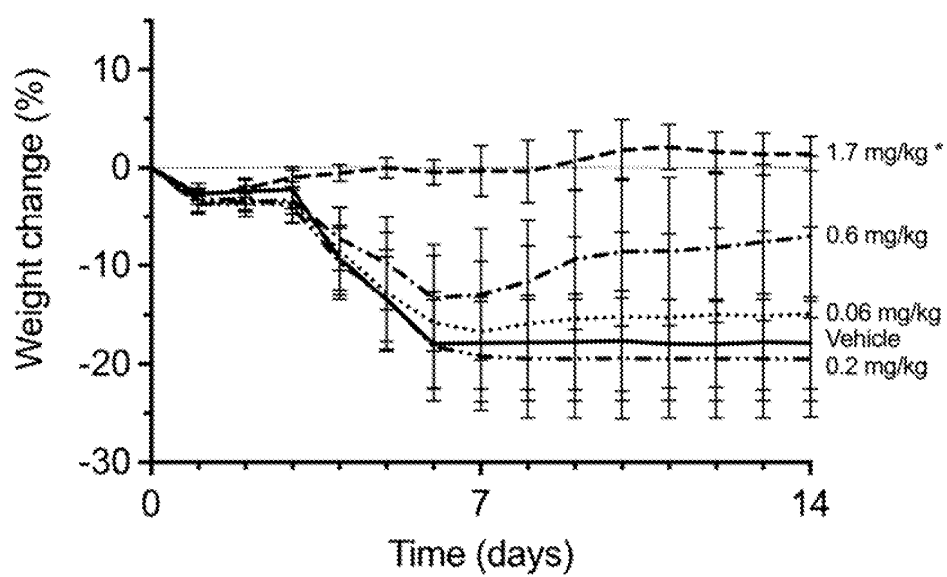


Figure 4B

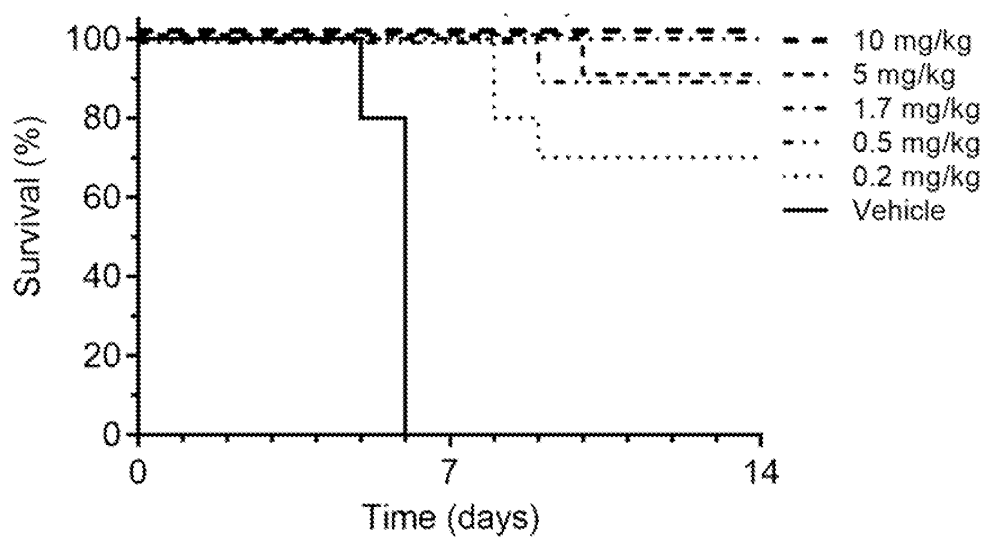


Figure 5

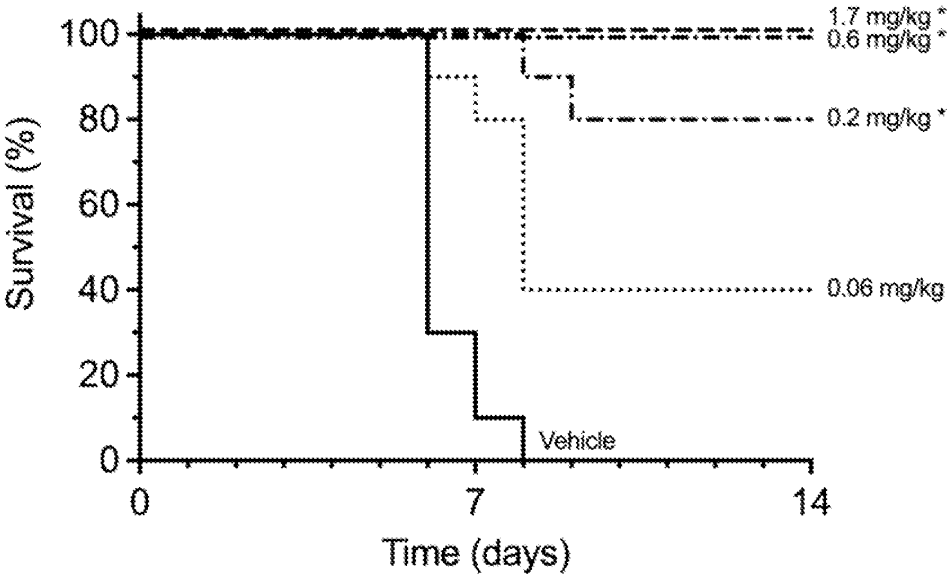


Figure 6A

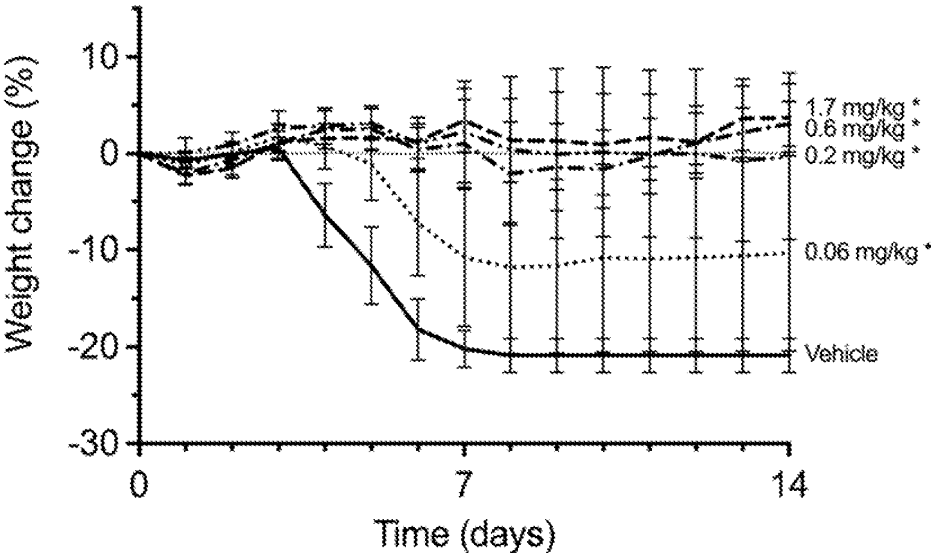


Figure 6B

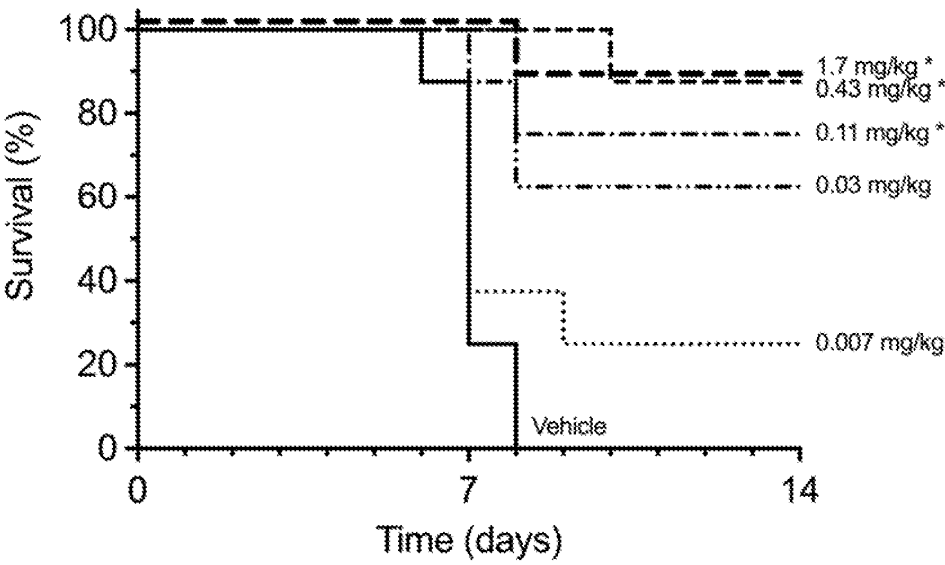


Figure 7A

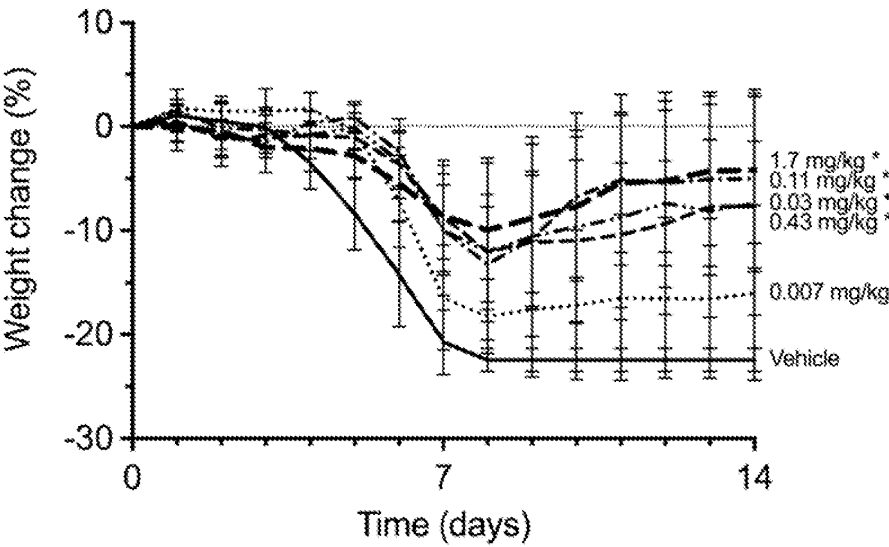


Figure 7B

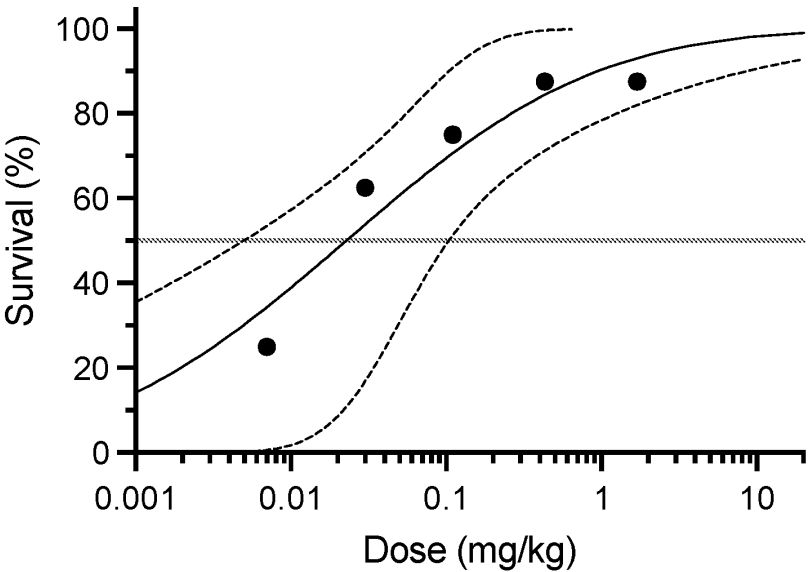


Figure 7C

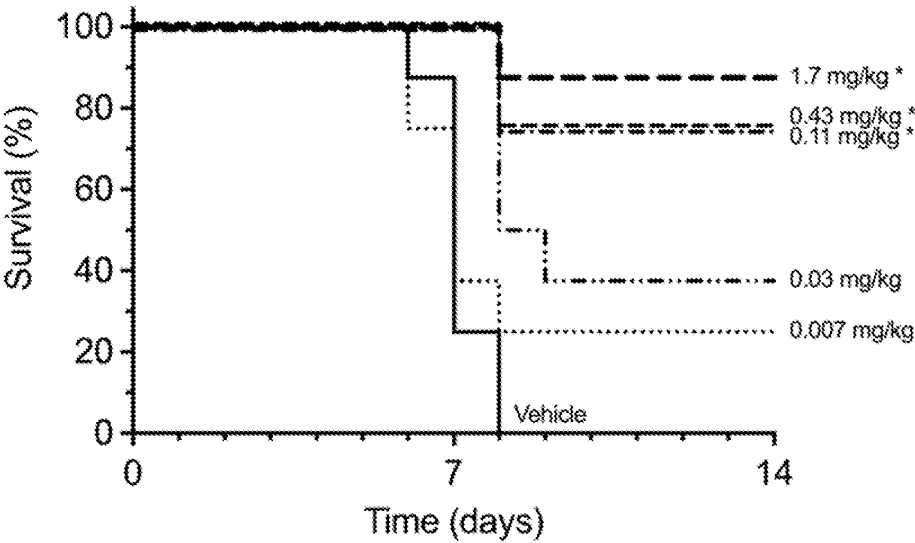


Figure 7D

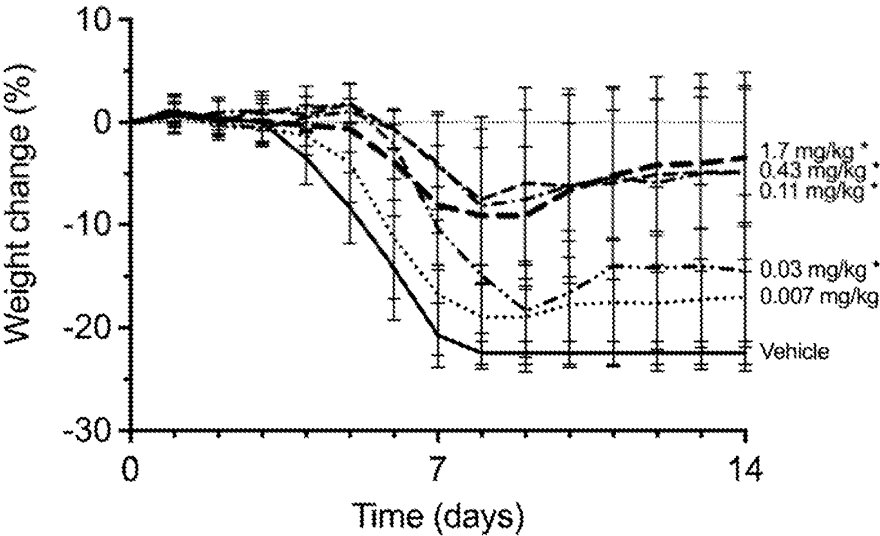


Figure 7E

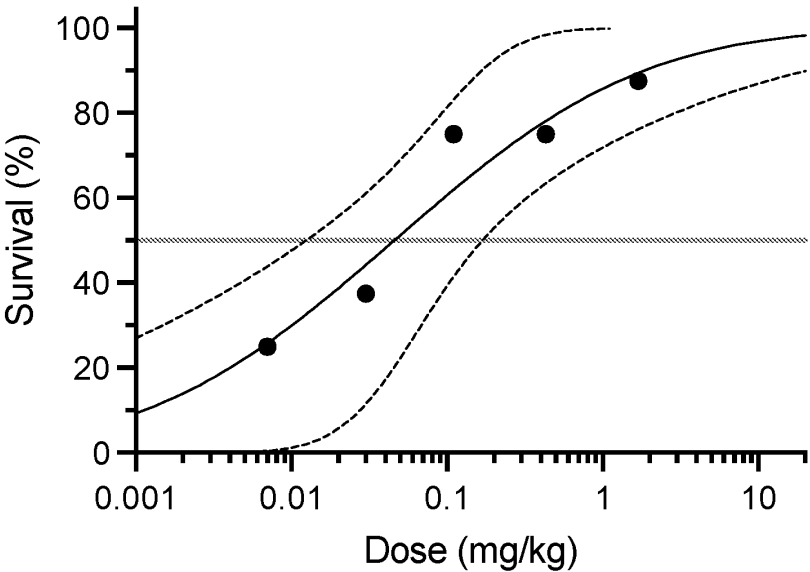


Figure 7F

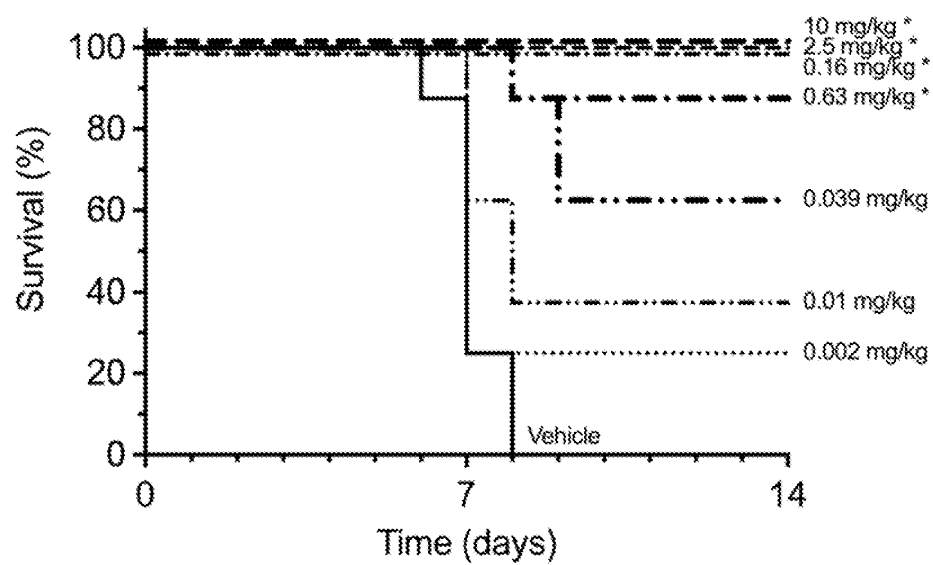


Figure 7G

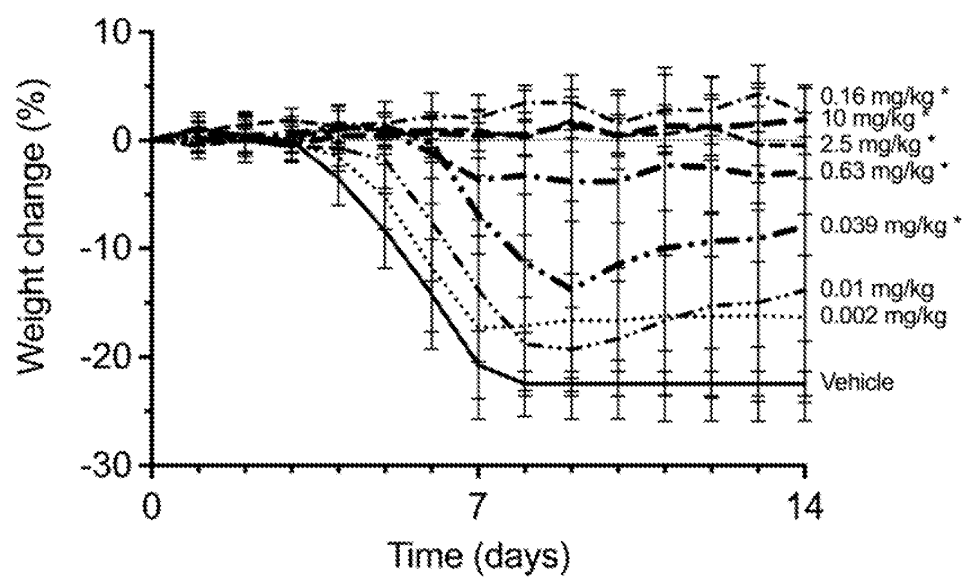


Figure 7H

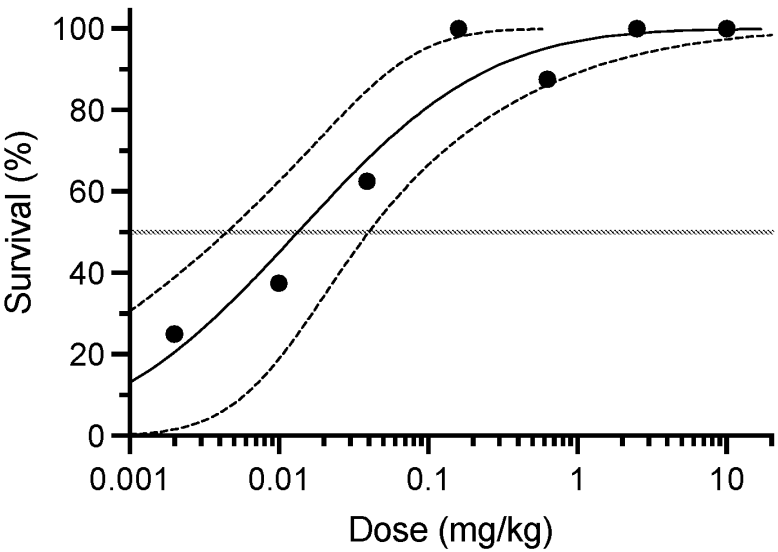


Figure 7I

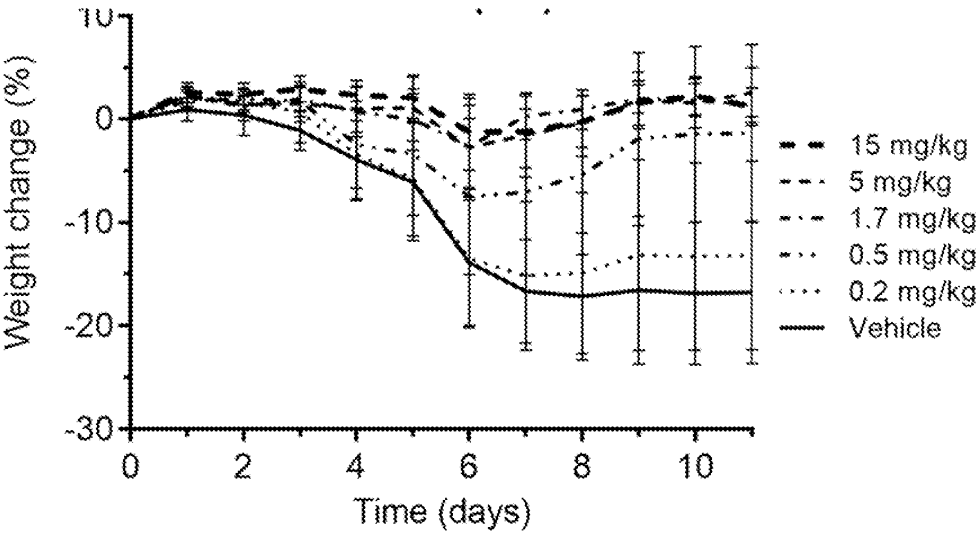


Figure 8

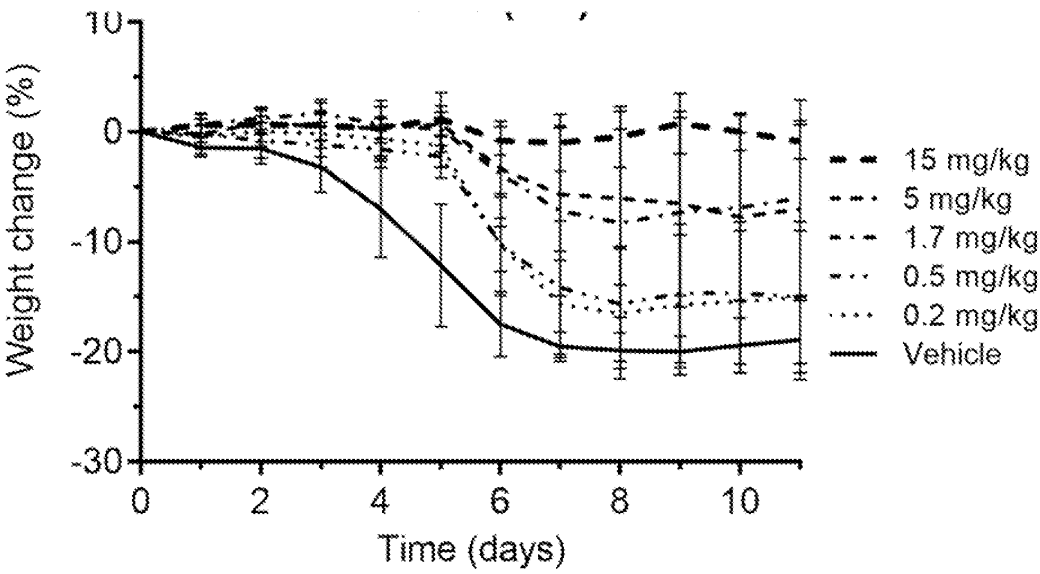


Figure 9

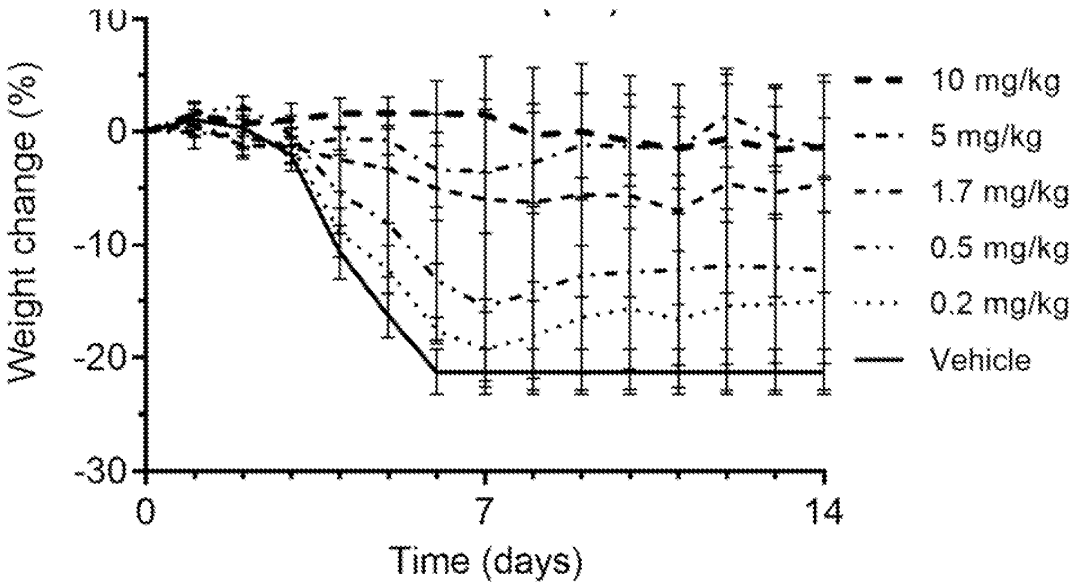
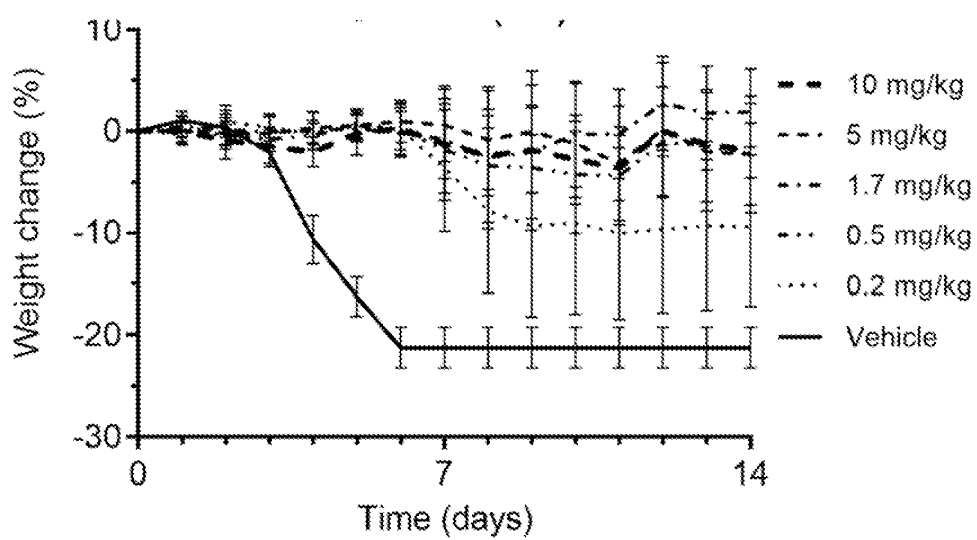


Figure 10

**Figure 11**

| Stem helix domain (SH) |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1142                   |   |   |   |   |   |   |   |   |   |   | 1162 |   |   |   |   |   |   |   |   |   |   |   |   |   |
| HCoV-229E              | V | P | E | Y | - | - | I | D | V | N | K    | T | L | Q | E | L | S | Y | K | L | P | N | Y |   |
| HCoV-NL63              | I | P | D | Y | - | - | V | D | V | N | K    | T | L | Q | E | F | A | Q | N | L | P | K | Y |   |
| HCoV-HKU1              | I | - | P | N | L | - | S | D | F | E | A    | E | L | S | L | W | F | K | N | H | T | S | I |   |
| HCoV-OC43              | I | - | P | N | L | - | P | D | F | K | E    | E | L | D | Q | W | F | K | N | Q | T | S | V | * |
| SARS-CoV-1             | Q | - | P | E | L | - | D | S | F | K | E    | E | L | D | K | Y | F | K | N | H | T | S | P |   |
| SARS-CoV-2             | Q | - | P | E | L | - | D | S | F | K | E    | E | L | D | K | Y | F | K | N | H | T | S | P |   |
| MERS-CoV               | L | G | N | S | T | G | I | D | F | Q | D    | E | L | D | E | F | F | K | N | V | S | T | S | * |

Figure 12A

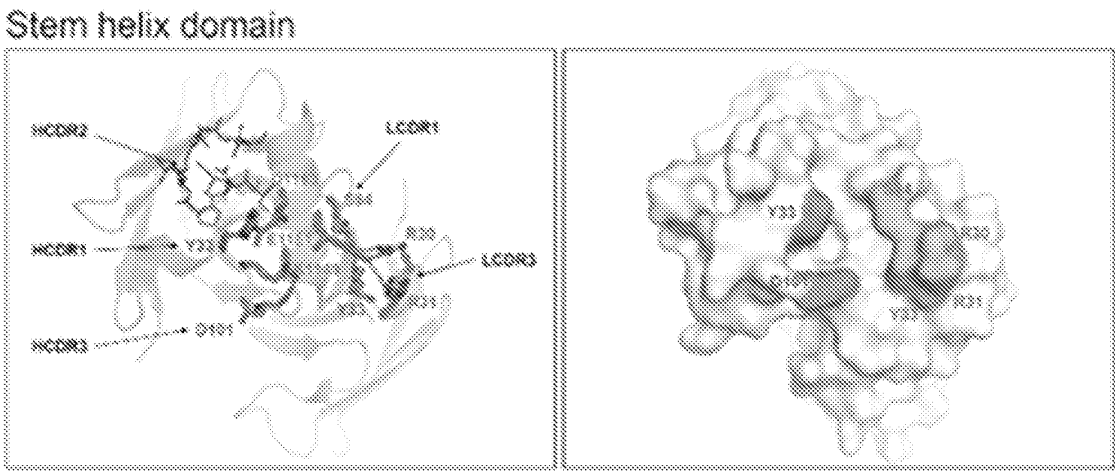


Figure 12B

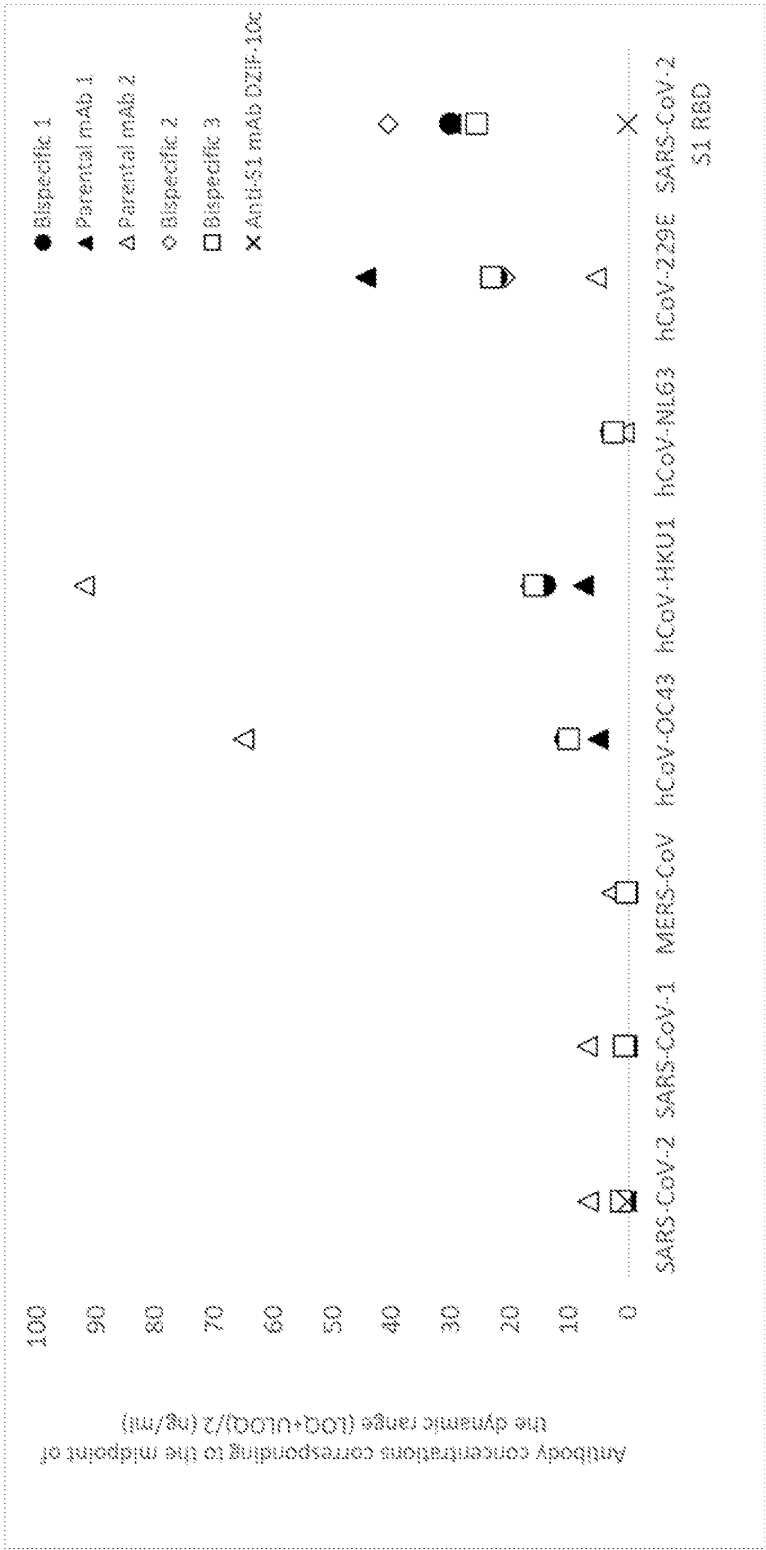


Figure 13A

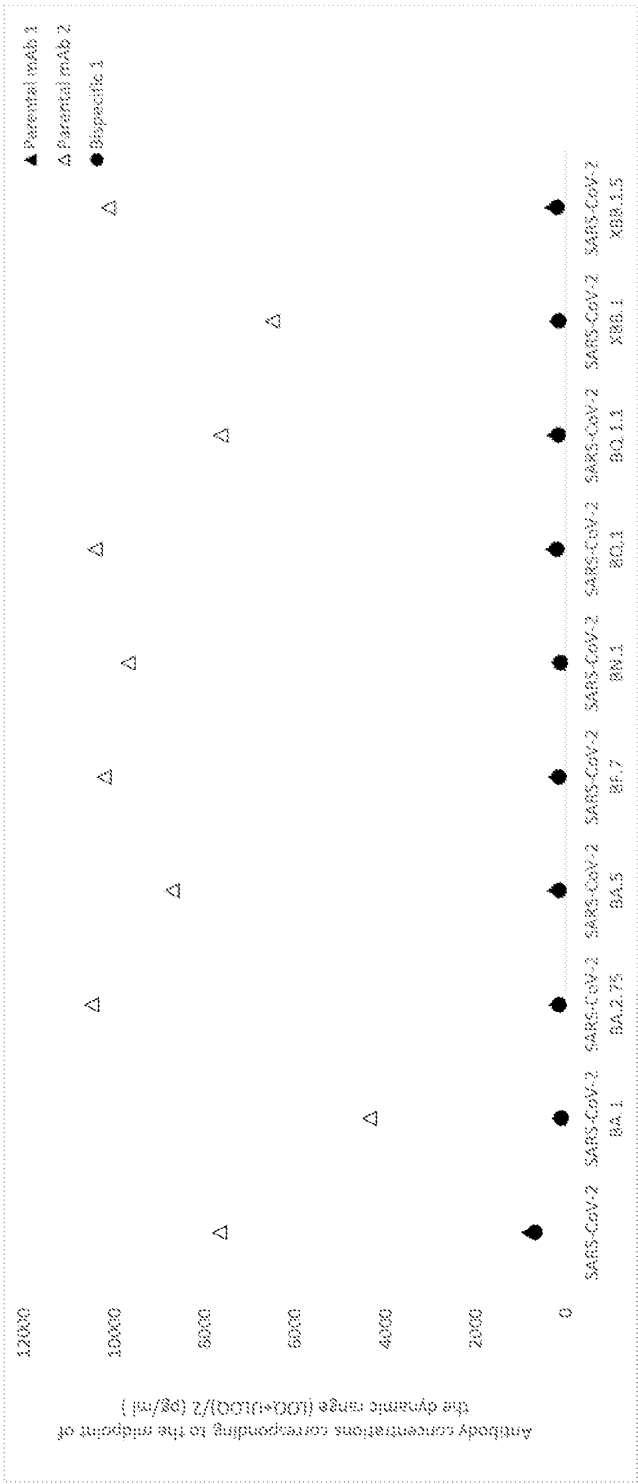


Figure 13B

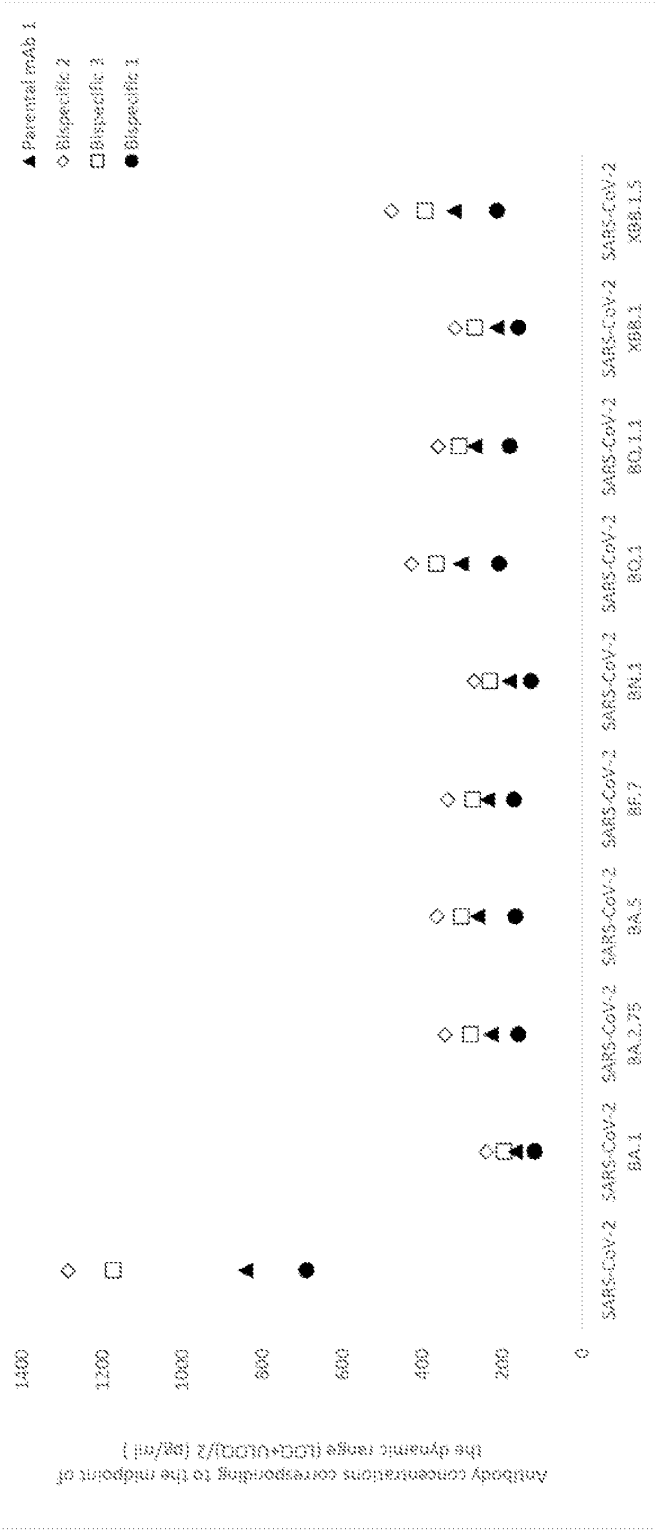


Figure 13C