FIG 1A

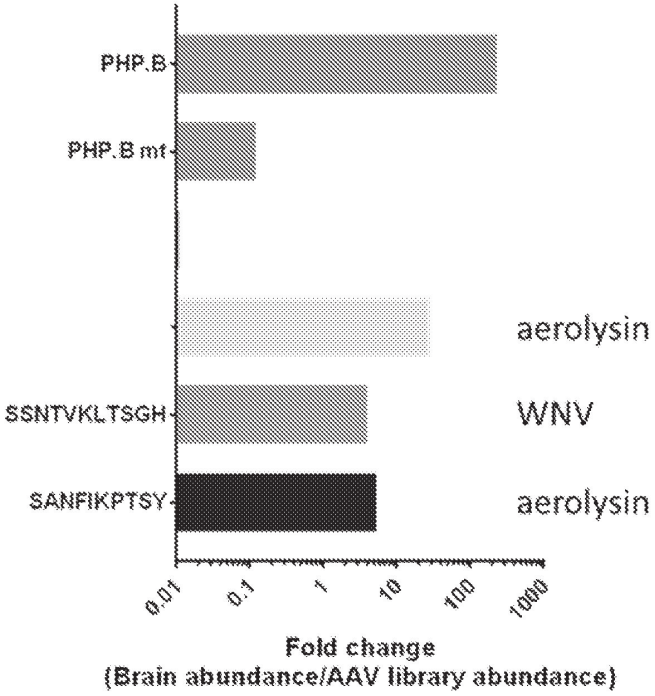

PHP.B
PHP.B mt
aerolysin
SSNTVKLTSGH
WNV
SANFIKPTSY
aerolysin
0.01
0.1
1
10
100
1000
Fold change
(Brain abundance/AAV library abundance)

FIG 1B

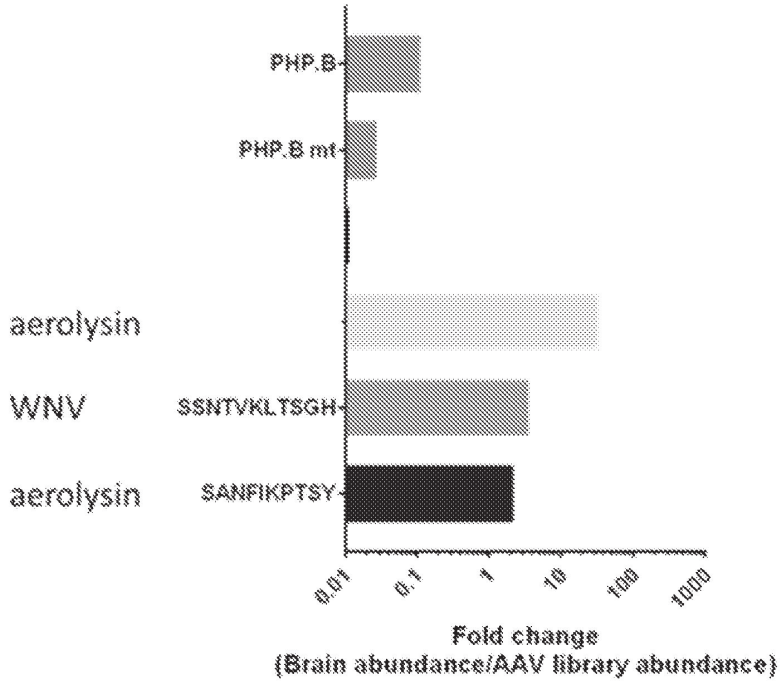

PHP.B
PHP.B mt
aerolysin
WNV
SSNTVKLTSGH
aerolysin
SANFIKPTSY
0.01
0.1
1
10
100
1000
Fold change
(Brain abundance/AAV library abundance)

FIG 2A

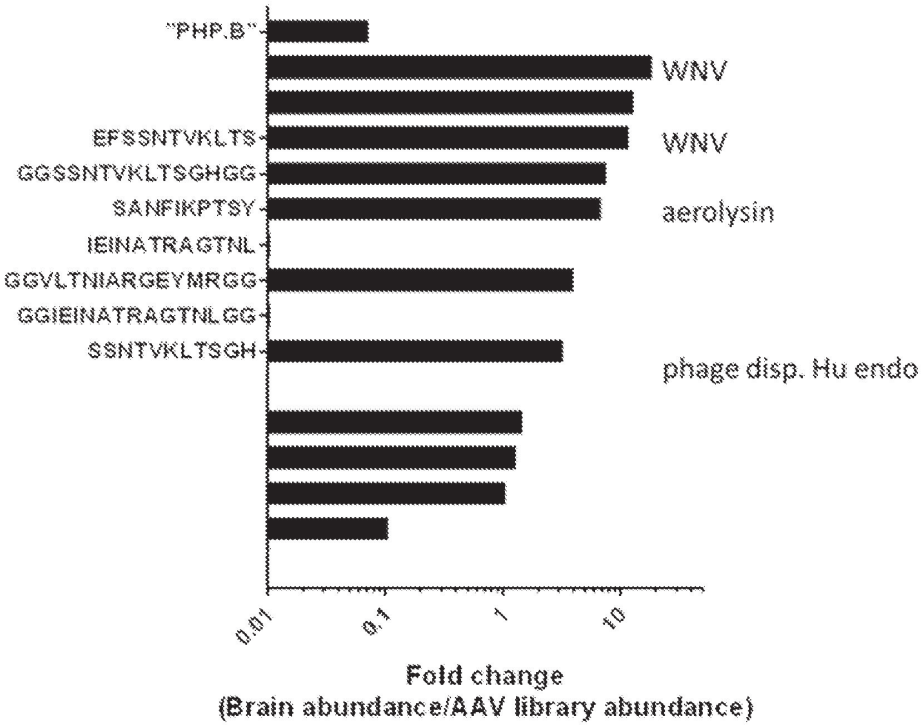

"PHP.B"
WNV
EFSSNTVKLTS
WNV
GGSSNTVKLTSGHGG
SANFIKPTSY
aerolysin
IEINATRAGTNL
GGVLTNIARGEYMRGG
GGIEINATRAGTNLGG
SSNTVKLTSGH
phage disp. Hu endo
0.01
0.1
1
10
Fold change
(Brain abundance/AAV library abundance)

FIG 2B

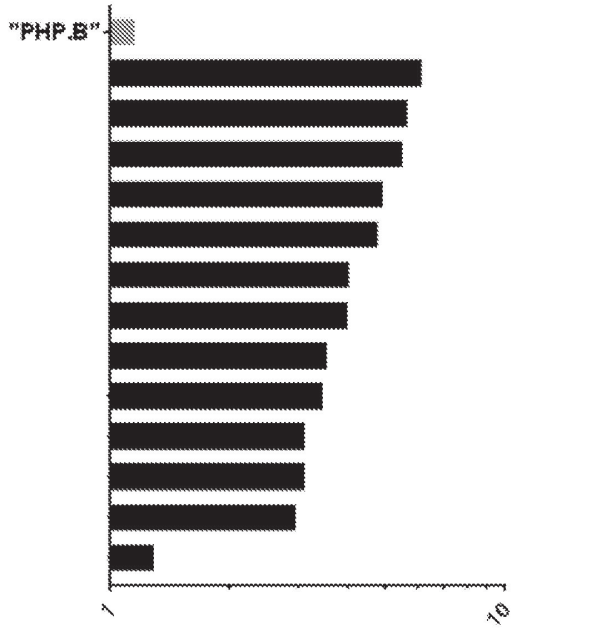

"PHP.B"
1
10
Fold change
(Lower SC abundance/AAV library abundance)

FIG 3A

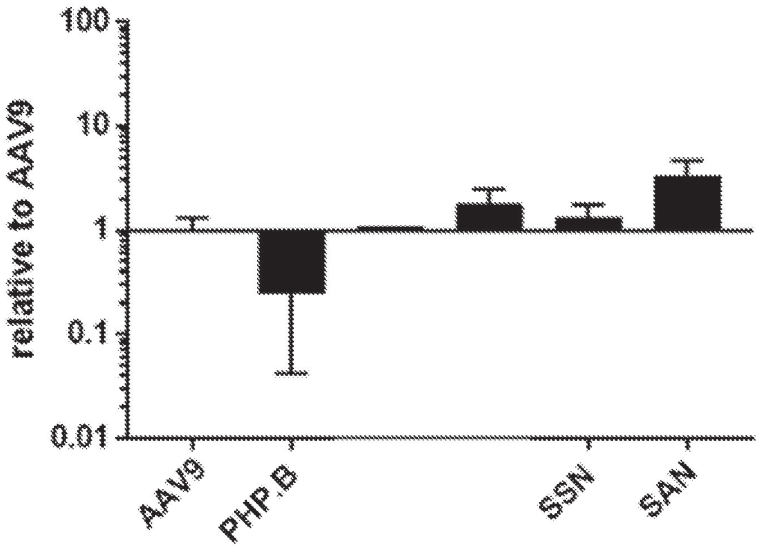

100
10
1
0.1
0.01
relative to AAV9
AAV9
PHP.B
SSN
SAN

FIG 3B

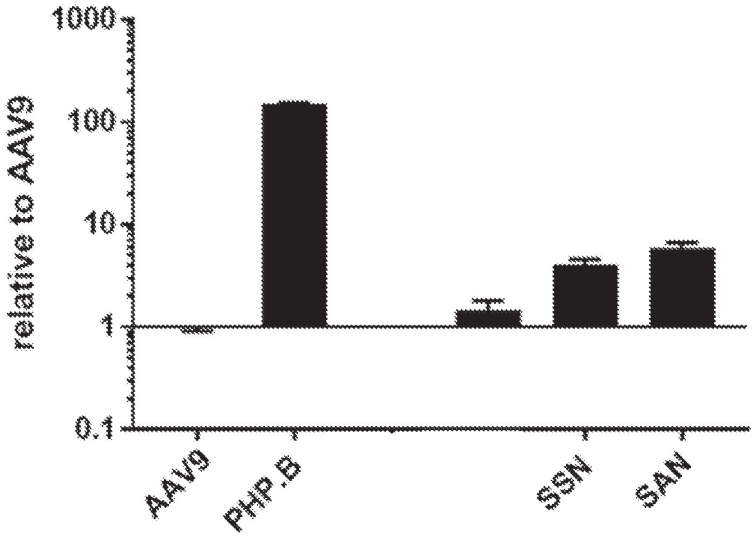

1000
100
10
1
0.1
relative to AAV9
AAV9
PHP.B
SSN
SAN

FIG 3C

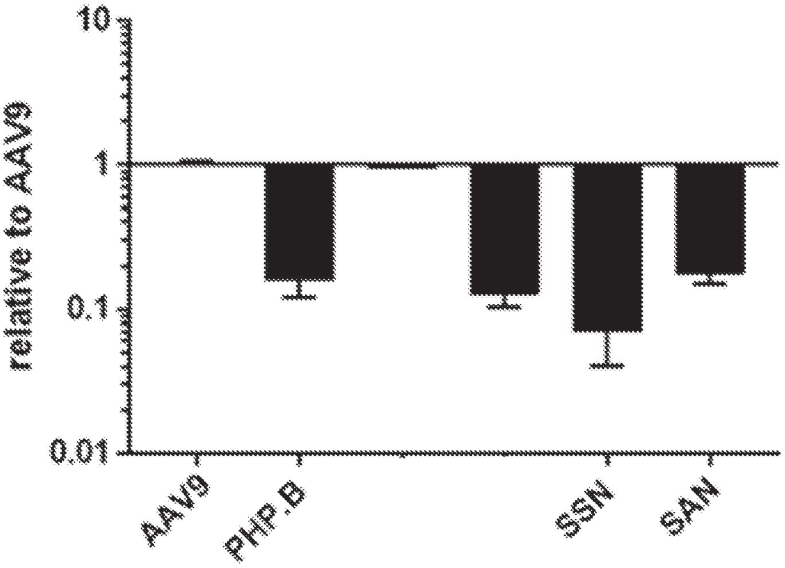

relative to AAV9
10
1
0.1
0.01
AAV9
PHP.B
SSN
SAN

FIG 3D

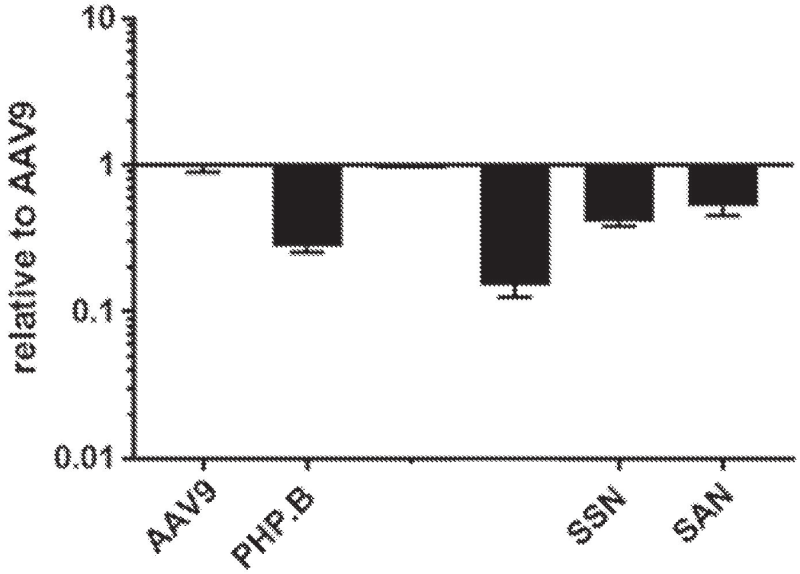

relative to AAV9
10
1
0.1
0.01
AAV9
PHP.B
SSN
SAN

FIG 4

566 571 576 581 586 591 596 601 606 611
IKTTNPVATESYGQVATNHQSAQAQTGWVQNQGILPGMVWQDRDVYLQ AAV9
566 571 576 581 586 591 596 601 606 611
EEEIKTTNPVATEEYGIVADNLQQQNTAPQIGTVNSQGALPGMVWQNRDV AAV8
66 571 576 581 586 591 596 601 606 611 6
IRPTNPVATEEYGIVSSNLQAANTAAQTQVVNNQGALPGMVWQNRDVYLQ AAV7
551 556 561 566 571 576 581 586 591 596
ASNTALDNVMITDEEEIKATNPVATERFGTVAVNLQSSSTDPATGDVHVM AAV6
556 561 566 571 576 581 586 591 596 601
QPVNRVAYNVGGQMATNNQSSTTAPATGTYNLQEIVPGSVWMERDVYLQG AAV5
6 561 566 571 576 581 586 591 596 601 60
FTSEELAATNATDTDMWGNLPGGDQSNSNLPTVDRLTALGAVPGMVWQN AAV4
566 571 576 581 586 591 596 601 606 611
EEIRTTNPVATEQYGTVANNLQSSNTAPTTRTVNDQGALPGMVWQDRDVY AAV3B
566 571 576 581 586 591 596 601 606 611
RTTNPVATEQYGSVSTNLQRGNRQAATADVNTQGVLPGMVWQDRDVYLQG AAV2
566 571 576 581 586 591 596 601 606 611
IKATNPVATERFGTVAVNFQSSSTDPATGDVHAMGALPGMVWQDRDVYLQ AAV1

FIG 5

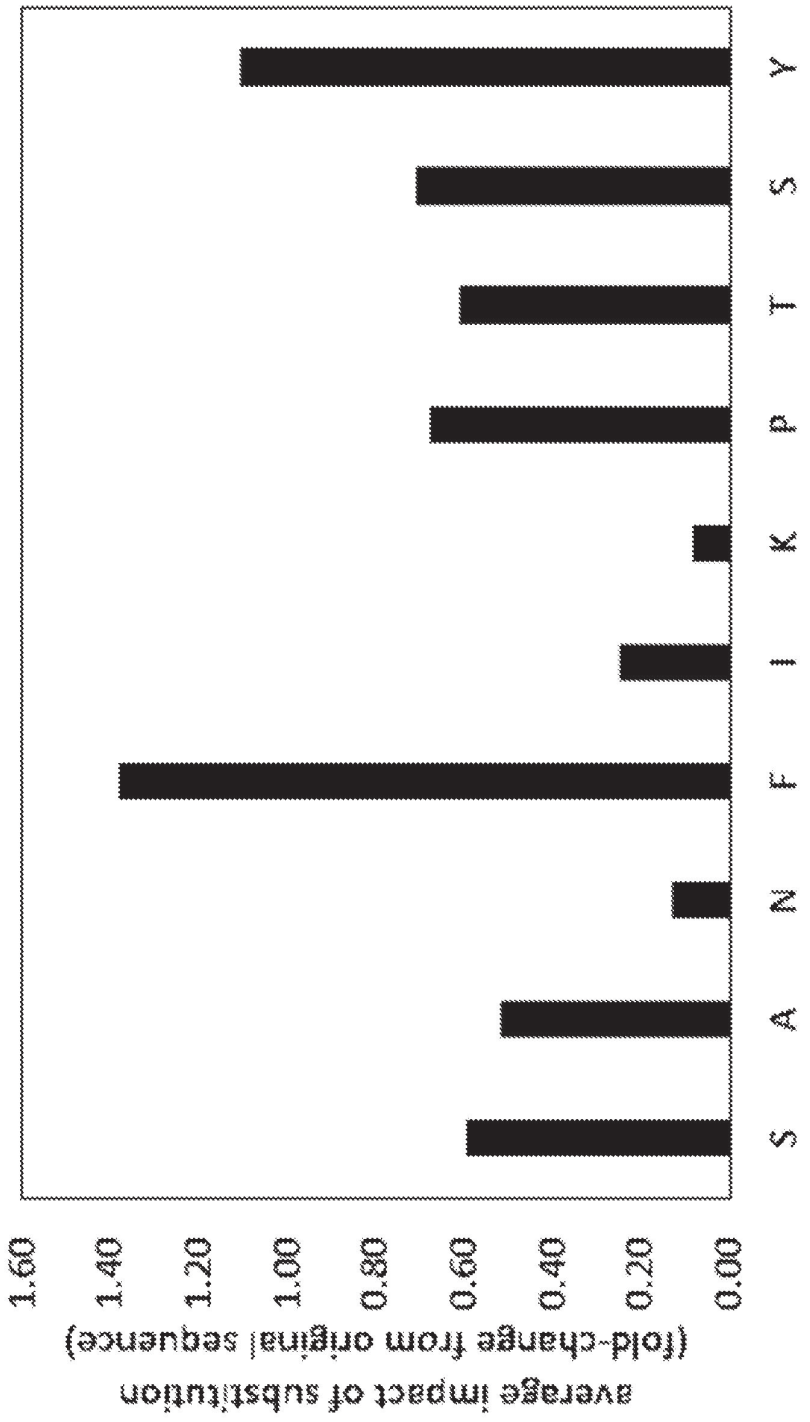

average impact of substitution
(fold-change from original sequence)
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
S
A
N
F
I
K
P
T
S
Y

FIG 6

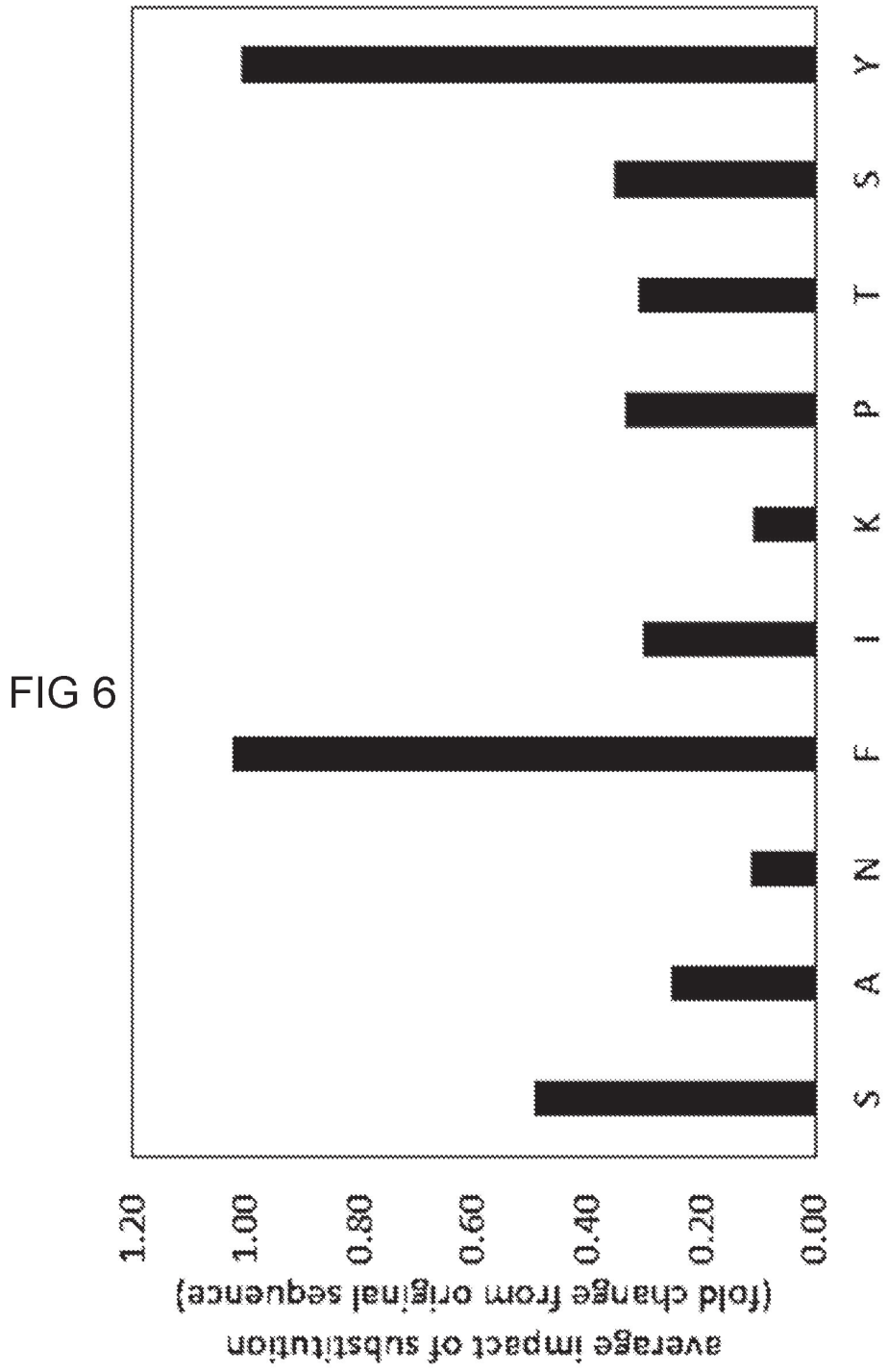

average impact of substitution
(fold change from original sequence)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
S
A
N
F
I
K
P
T
S
Y

FIG 7A

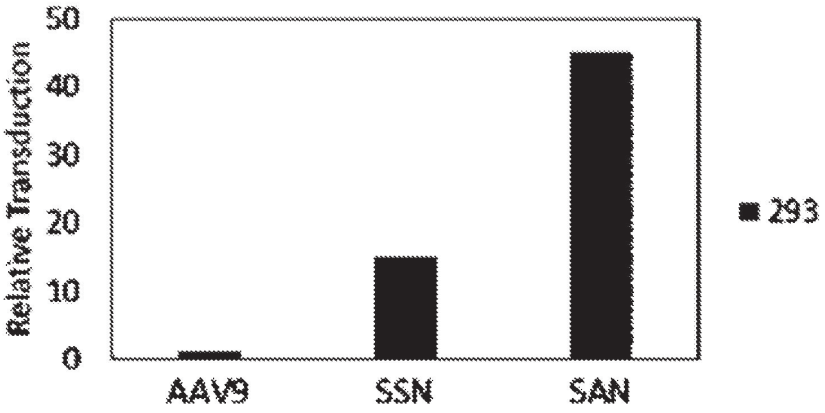


FIG 7B

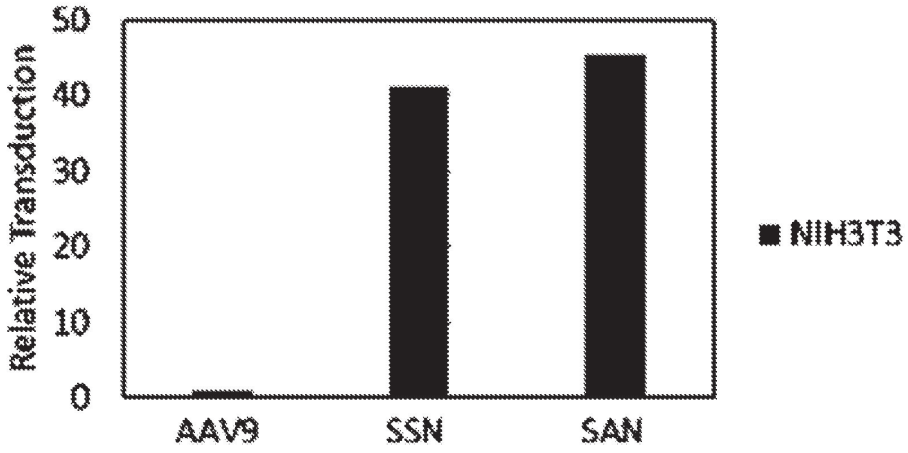


FIG 7C

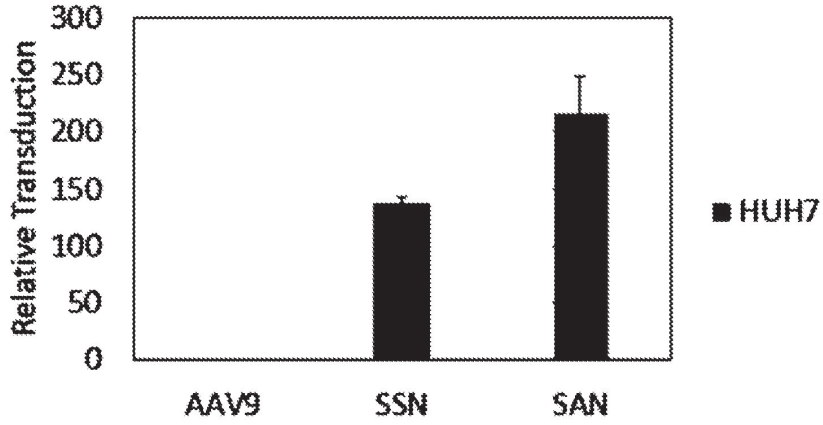


FIG 7D

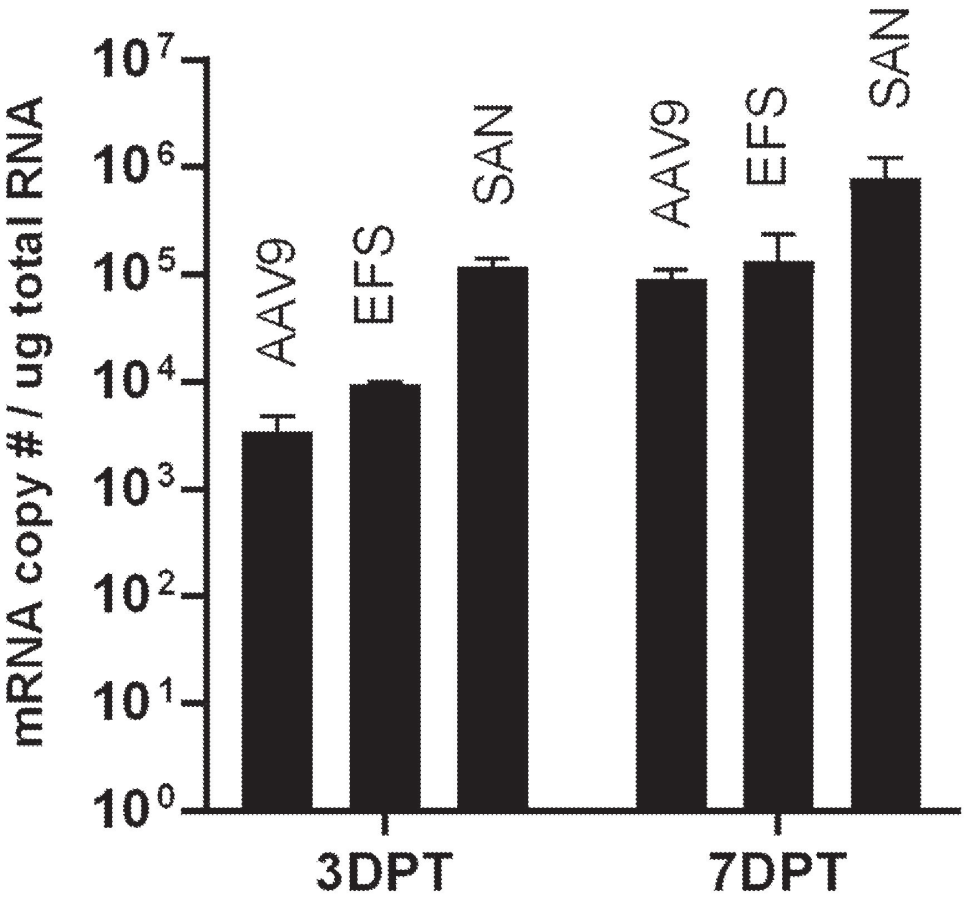

mRNA copy # / ug total RNA
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0
AAV9
EFS
SAN
AAV9
EFS
SAN
3DPT
7DPT

FIG 7E

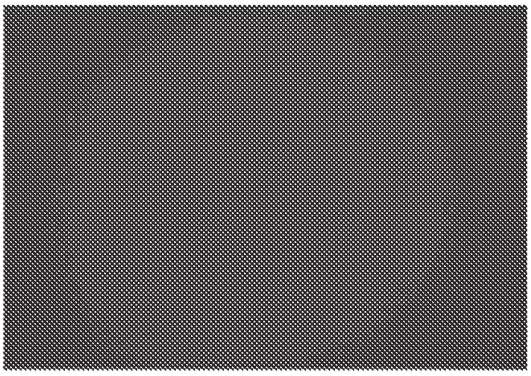


FIG 7F

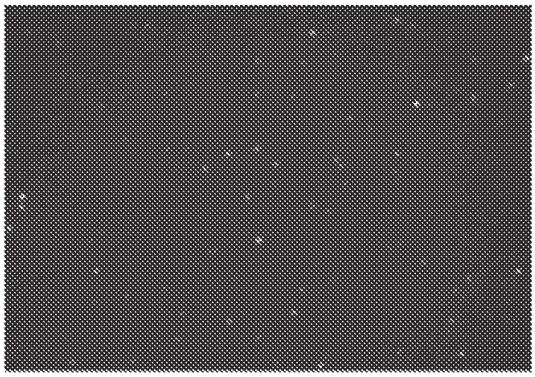


FIG 7G

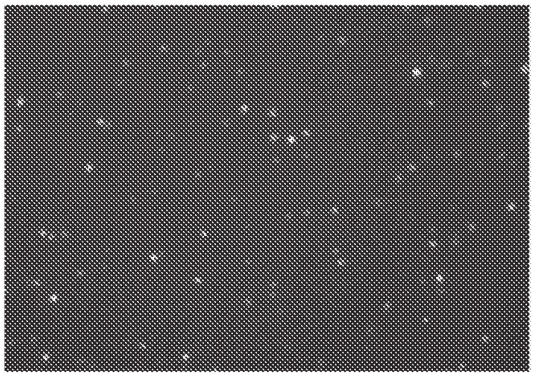


FIG 7H

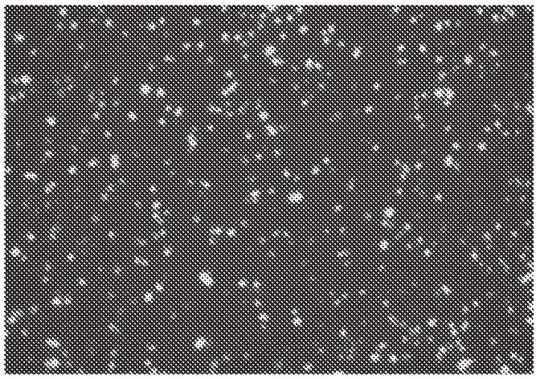
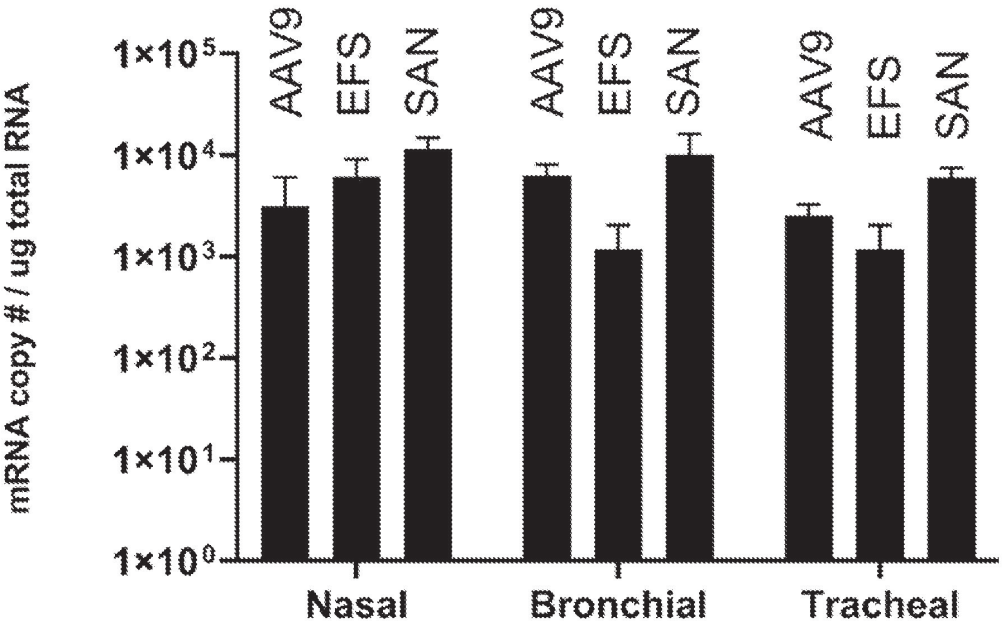


FIG 8


mRNA copy # / ug total RNA
1×10^5
1×10^4
1×10^3
1×10^2
1×10^1
1×10^0
AAV9
EFS
SAN
AAV9
EFS
SAN
AAV9
EFS
SAN
Nasal
Bronchial
Tracheal