

Figure 1.

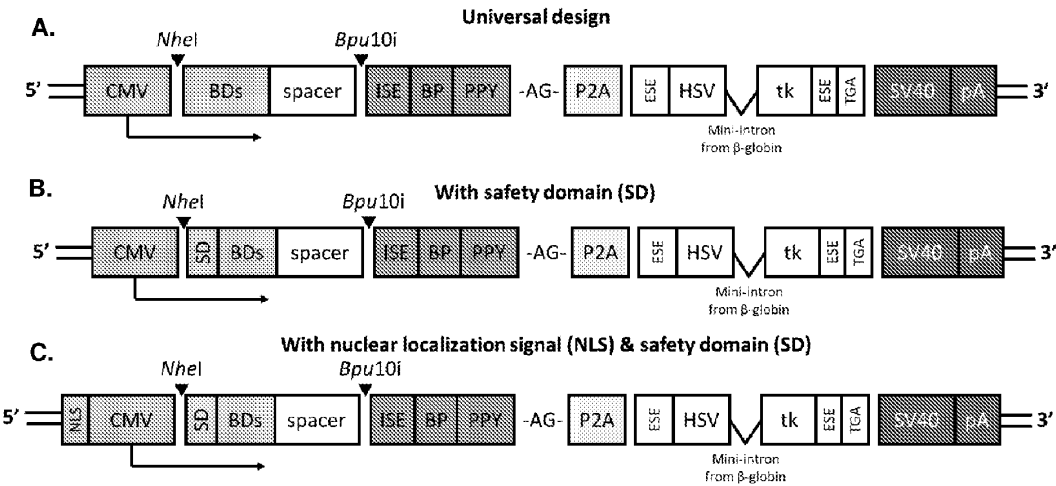


Figure 2.

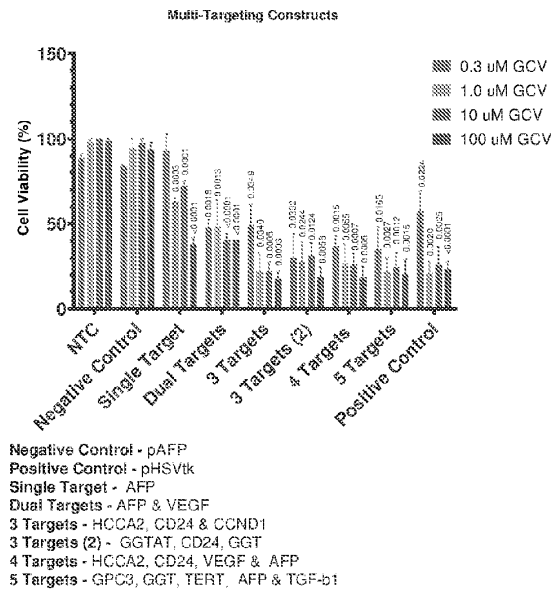


Figure 3.

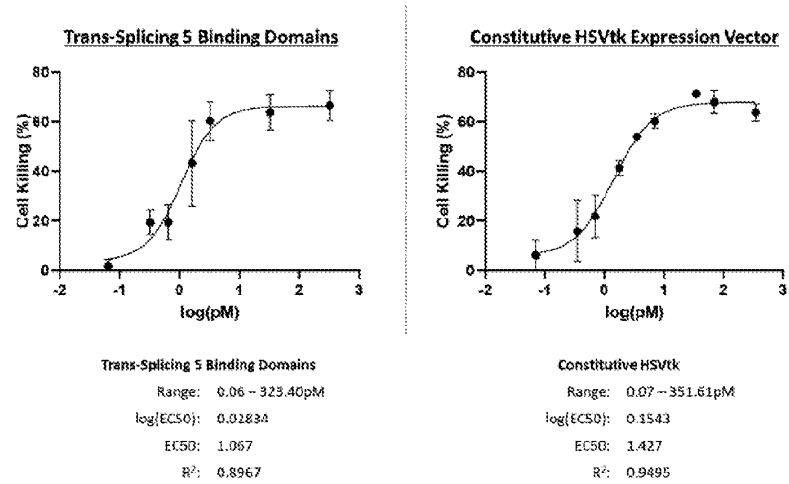


Figure 4.

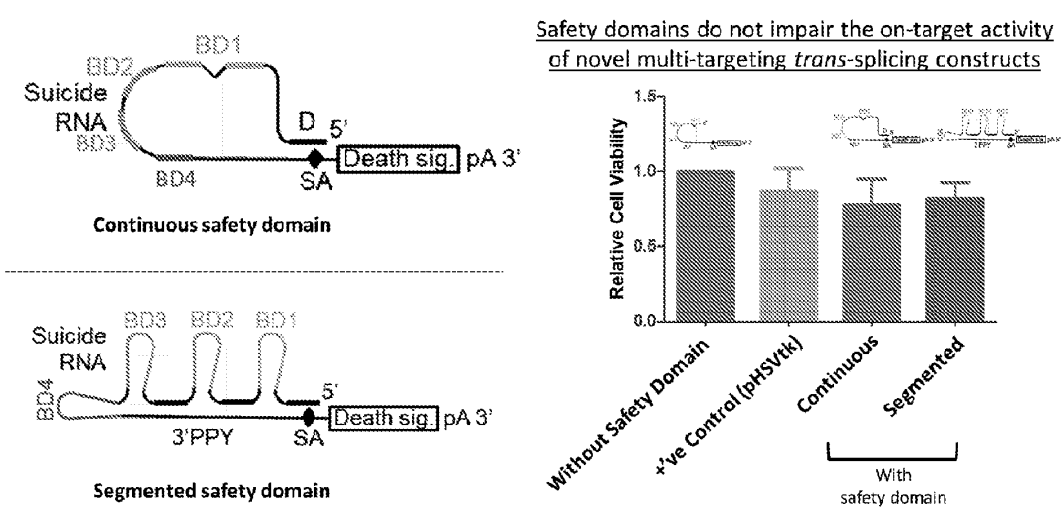


Figure 5.

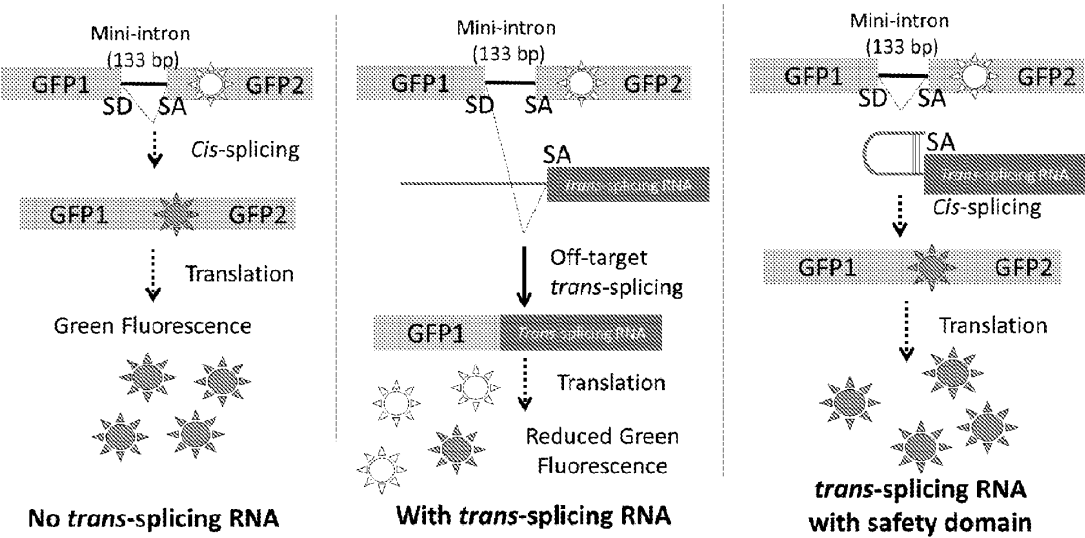


Figure 6.

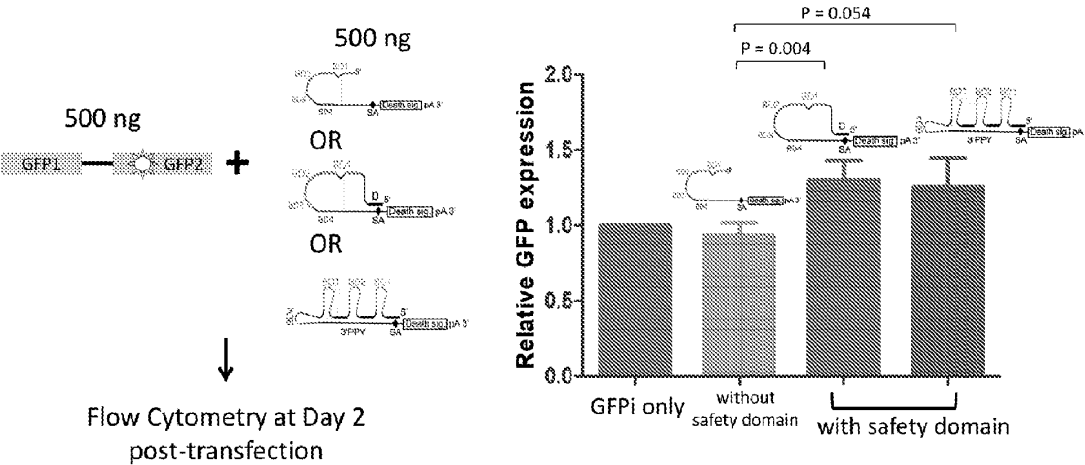


Figure 7.

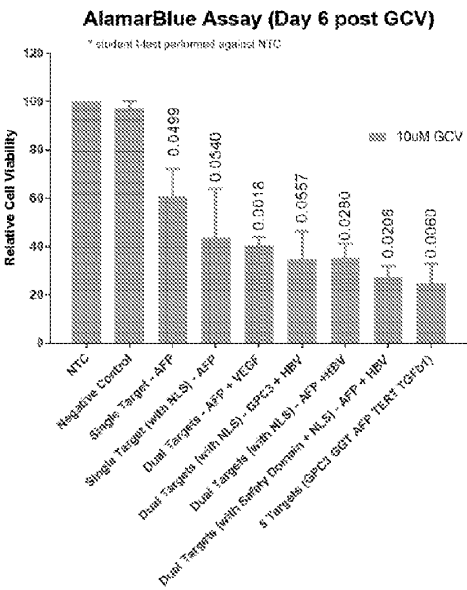


Figure 8.

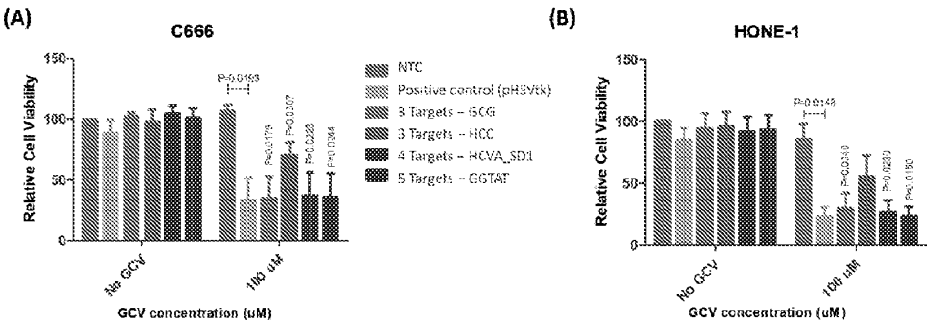


Figure 9.

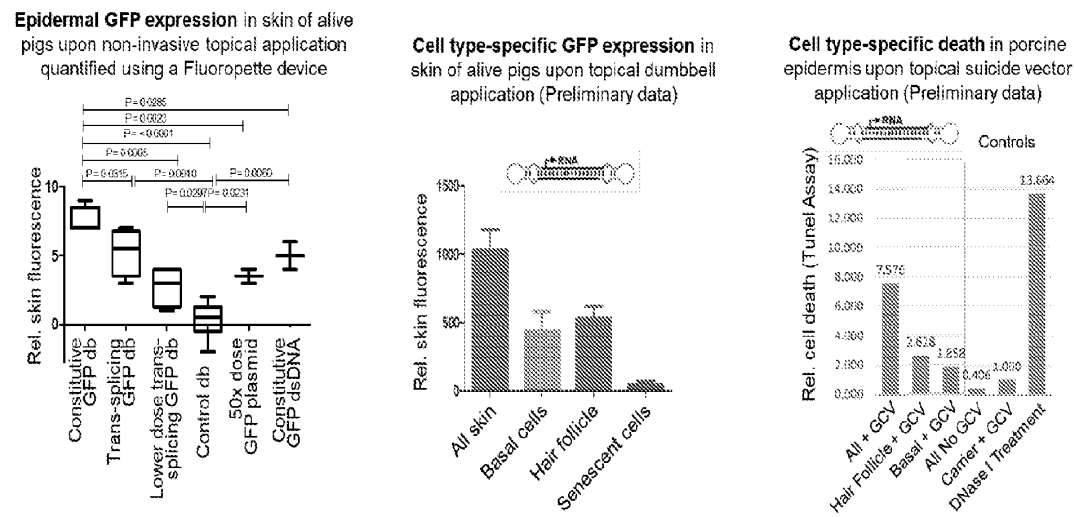


Figure 10.

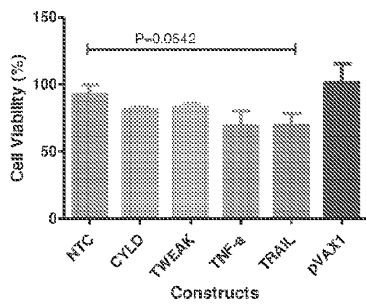


Figure 11.

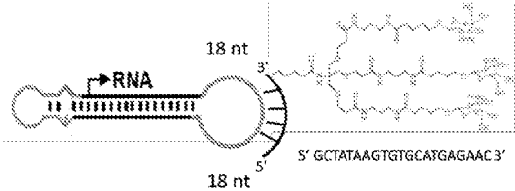


Figure 11 continued.

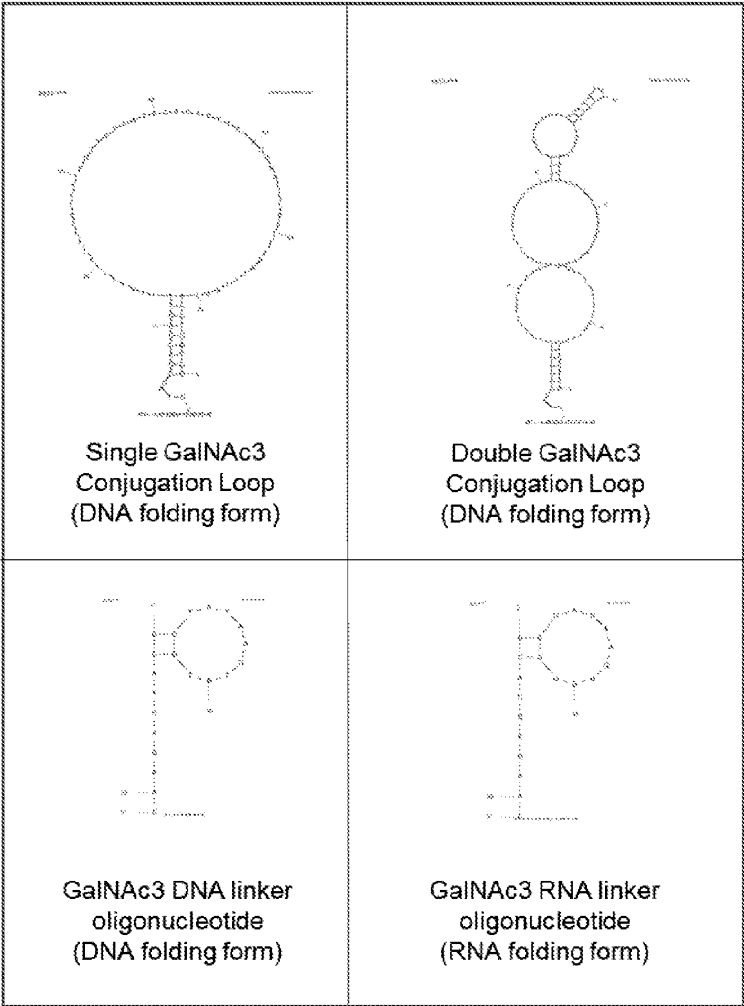


Figure 12.

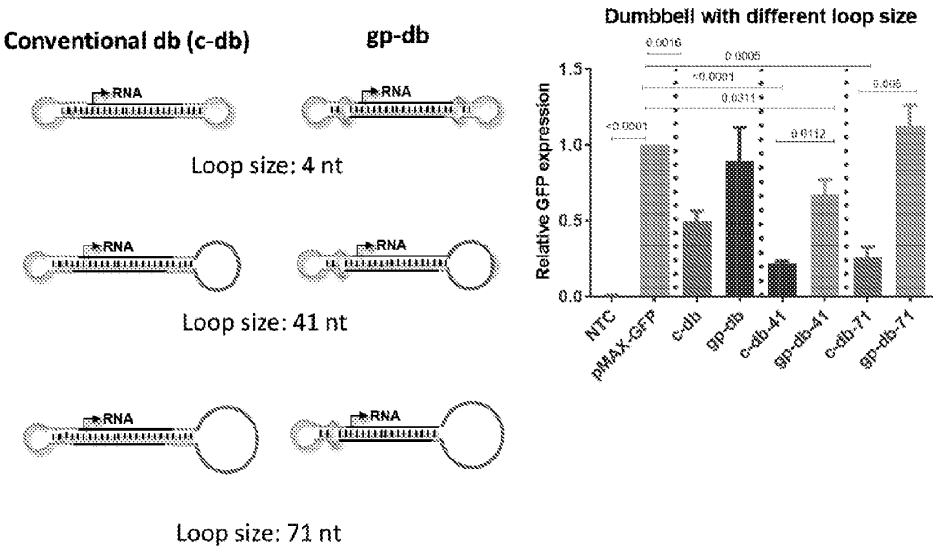


Figure 13.

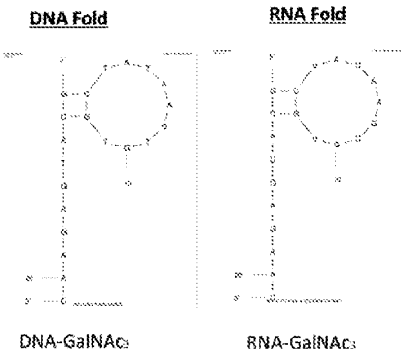


Figure 13 Continued.

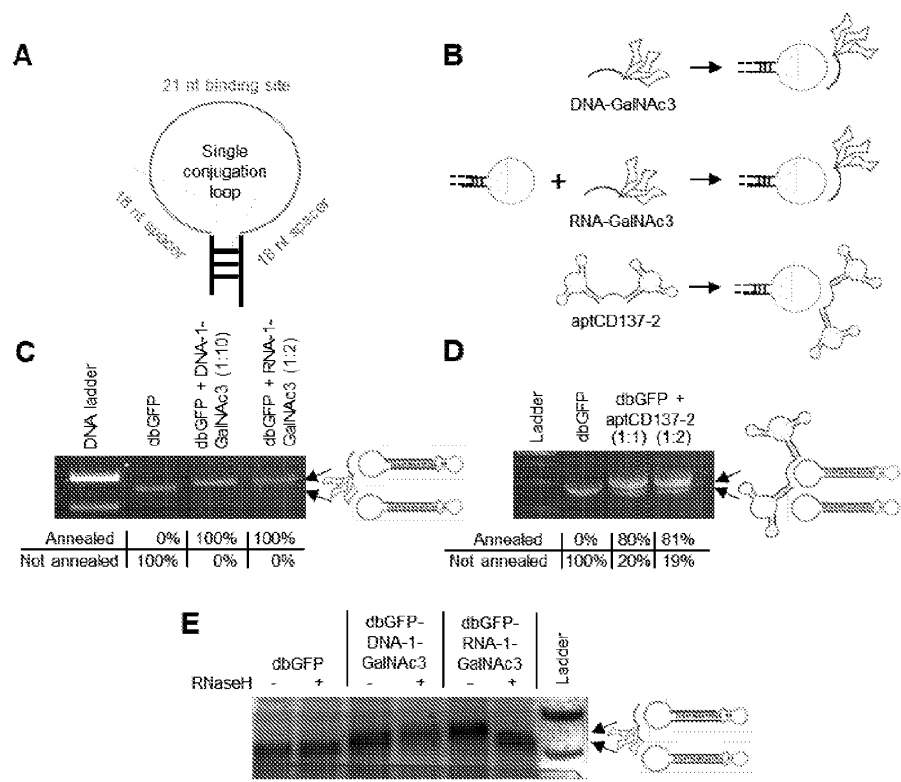


Figure 14.

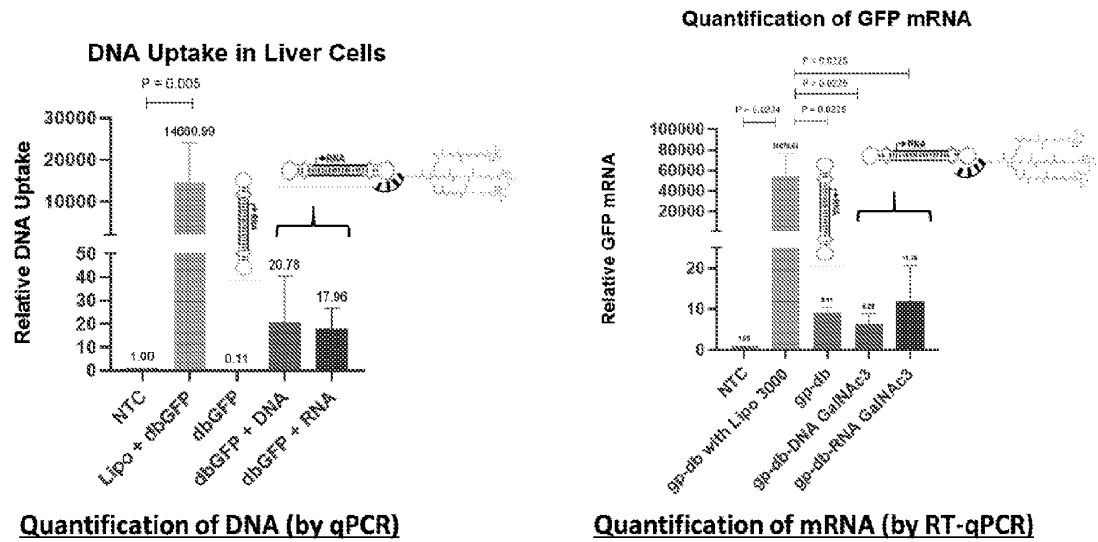


Figure 15

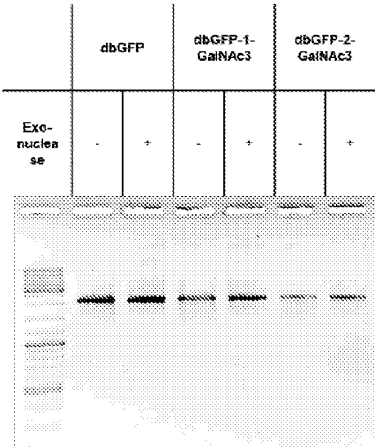


Figure 15 Continued.

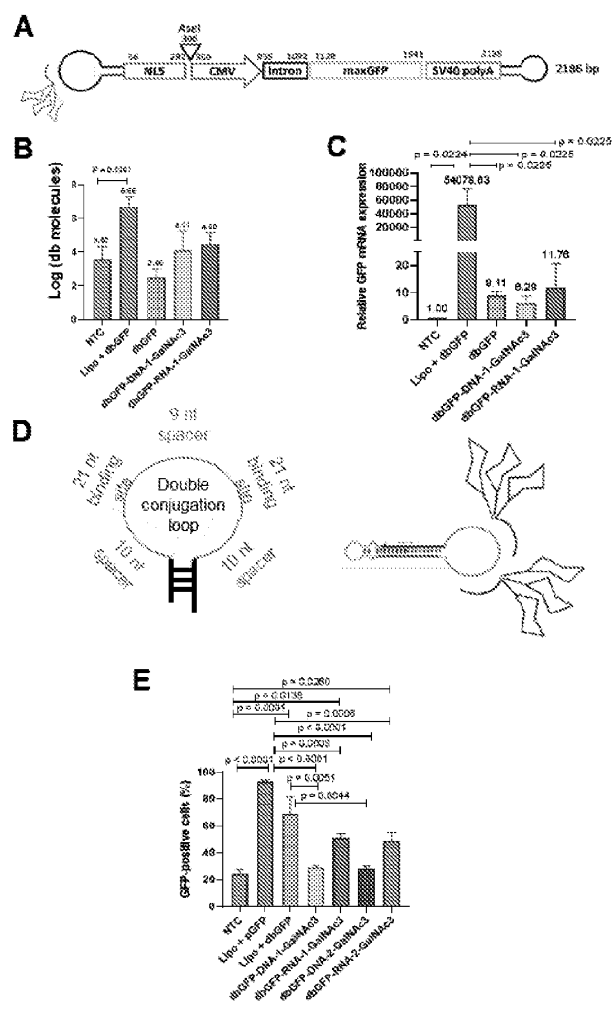


Figure 16.

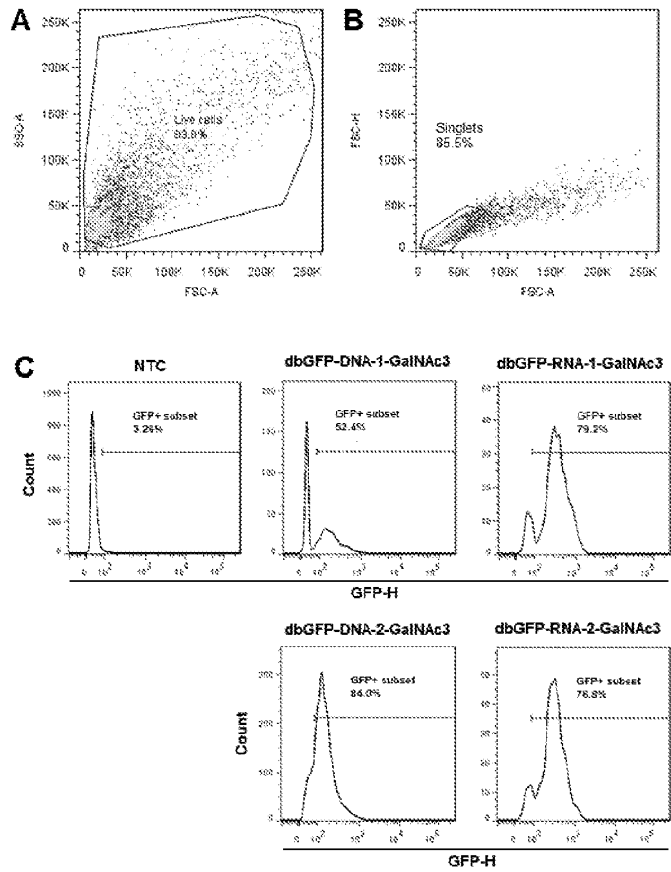


Figure 17.

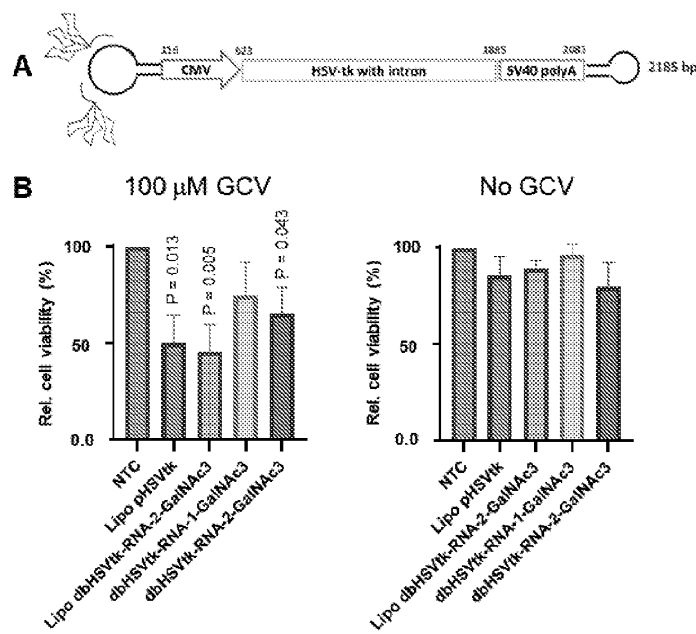


Figure 18.

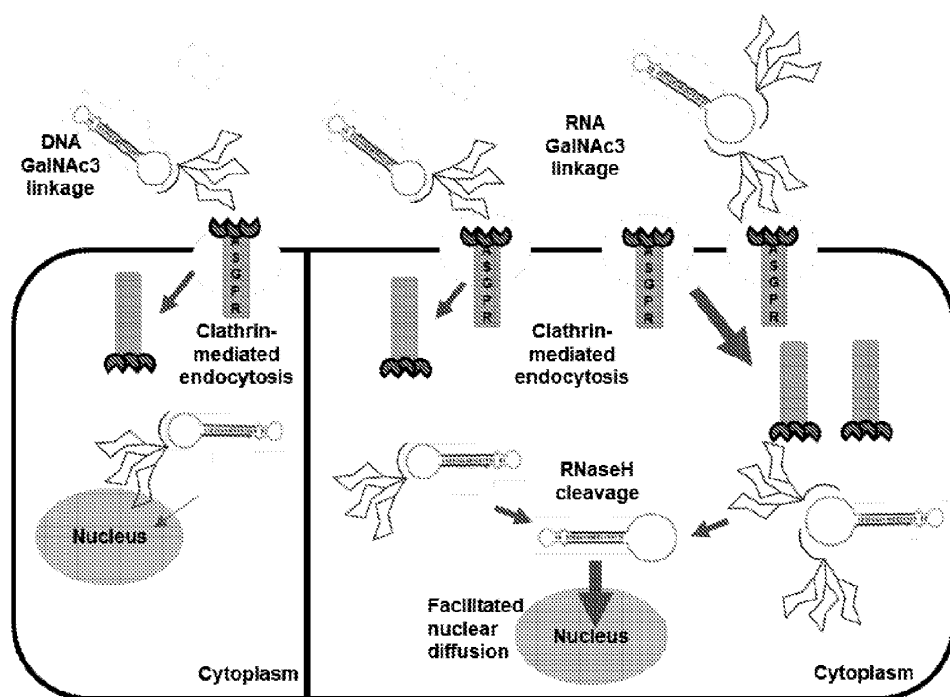


Figure 19.

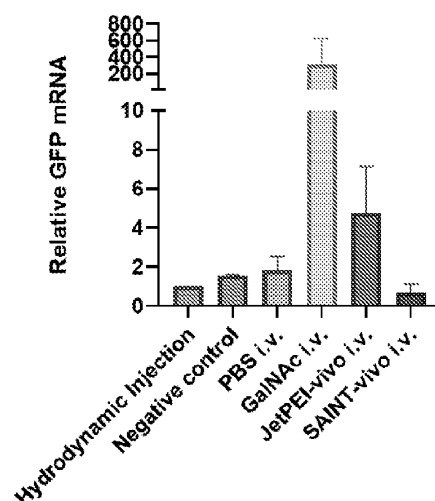


Figure 20.

Sequence Listing (all sequences from 5' to 3')

Feature sequences

1. Nuclear localisation signal (NLS)/ SV40 enhancer:

CGATGGAGCGGAGAATGGGCGGAAC TGGGCGGAGTTAGGGCGGGATGGGCGGAGTTAGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCCTAAC
 TGACACACATTCCACAGC

2. Safety domain (SD): CTGCAAAAAAAGGCAAAAAA

Primers

Trans-splicing dumbbells gpPCR primer:

3. Fw-API-TS:

5-pATCCAGTTTCTGGA-API-TGACTAGTTAGTTATTAATAGTAATCAATTACGGG -3

4. Rv-API-TS:

5-pAAGGTCTTTTGACCT-API-AGATACATTGATGAGTTTGGACAAACC-3

GalNAc

5. GalNAc attachment loop primer (ELAN):

5-

pCTAGCGACCAGTTTATTTTATTTTATTTTAGTTCTCATGCACACTTATAGCGGTTTGGTTTGGTTTGGTAA
CTGGTCG-3

6. GalNAc attachment loop primer (gpPCR):

5-

pATCCAGTTttattttattttatttttaGTTCTCATGCACACTTATAGCggtttggtttggttAACTGGA
-AP1-GCGATGTACGGGCCAGATATA-3

7. Fw_gp_2GalNAc_8s:

5-

pATCCAGttttatttttaGTTCTCATGCACACTTATAgggaaacccGTTCTCATGCACACTTATAttggtttgta
CTGGA-AP1-GCGATGTACGGGCCAGATATA-3

8. Rv_gp_2GalNAc_8s:

5-

pATCCAGttttatttttaGTTCTCATGCACACTTATAgggaaacccGTTCTCATGCACACTTATAttggtttgta
CTGGA-AP1-GCTTCCCAACCTTACCAGAGG-3

9. GalNAc DNA Oligo:

5-GCTATAAGTGTGCATGAGAAC-GalNAc3

10. GalNAc RNA Oligo (RNA underlined):

5-GCUAUAAGUGUGCAUGAGAAC-GalNAc3

Aptamer

11. Aptamer CD137 dimer:

5-

GGGAGAGAGGAAGAGGGAUGGGCGACCGAACGUGCCCUCAAAGCCGUUCACUAACCAGUGGCAUAACCCAGA
GGUCGAUAGUACUGGAUCCCCCCCCCGCUAUAAGUGUGCAUGAGAACCCGGGGGAGAGAGGAAGAGGGAUG
GGCGACCGAACGUGCCCUCAAAGCCGUUCACUAACCAGUGGCAUAACCCAGAGGUCGAUACUACUGGAUCCC
CCC-3

12. Aptamer CD137 monomer:

5-

GGGAGAGAGGAAGAGGGAUGGGCGACCGAACGUGCCCUCAAAGCCGUUCACUAACCAGUGGCAUAACCCAGA
GGUCGAUAGUACUGGAUCCCCCCC-3

13. Aptamer against PSMA

5-

GGGAGGACGAUGCGGAUCAGCCAUGUUUACGUCACUCCUUGUCAAUCCUCAUCGGCAGACGACUCGCCCCGA-3
HCC-targeting constructs

Targeting HCCA2, CD24, CCND1 (HCC)

14. BD+spacers (HCC):

GCTAGCGTAGCCCGGCAACAGTTCCTTTATACAAATTCACCAGATGATACAAAACATATTTTTTTAGCCGGGA
AGCGCCGAATCGATCGTGATCTAAAGATCCTCTACACCAACAAAATTATTATGTTTATTAACTGACGATCGA
ATGGTACCTCTGAAACACCTTCCCTTGACTCTTTCCACGCCTCCACCACCTTCAACCTCTTCTTCGCCTCCC
CCATCTT

15. BD-HCCA2: AACAGTTCCTTTATACAAATTCACCAGATGATACAAAACATATTTTTTTA

16. BD-CD24: GATCTAAAGATCCTCTACACCAACAAAATTATTATGTTTATTAACTGAC

17. BD-CCND1: ACACCTTCCTTGACTCTTTCCACGCCTCCACCACCTTCAACCTCTTTCT

18. Spacer1: GTAGCCCGGC

19. Spacer2: GCCGGAAGCGCCGAATCGATCGT
 20. Spacer3: GATCGAATGGTACCTCTGA
 21. Spacer4: TCGCCTCCCCATCTT
 22. Full sequence of p3EL_HCCA2+CD24+CCND1 (p3EL_HCC):

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 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
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 CCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCAGCTCACCACCCAGGCTCCATACCGACGATCTGCGAC
 CTGGCGCGCACGTTTTCGCGGGGAGATGGGGGAGGCGAACTGAAACTTGTTTATTGCAGCTTATAATGGTTACA
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23. Full sequence of p3EL_HCCA2+CD24+CCND1_NLS (p3EL_HCC_NLS):

CGATGGAGCGGAGAATGGGCGGAACGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
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24. Full RNA sequence of p3EL_HCCA2+CD24+CCND1 or
 p3EL_HCCA2+CD24+CCND1_NLS:

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 CGAUCGAAUGGUACCUUGAUAACACCUUCCUUGACUCUUUCCACGCCUCCACCACCUUAACCUUUUUUUC
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 GAAAAUGCCACGCUACUGCGGGUUUAUUAUAGACGGUCCCCACGGGAUGGGGAAAACACCACCACGCAACUG
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 CAAACGCCUCCGUUCCCAUGCAGCUCUUAUCCUGGAUUAACGACCAUACGCCCGCGCGGACGCCUG
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25. Full sequence of p3EL_HCCA2+CD24+CCND1_GFP:

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 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
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 TGTATCTGAAGACAATAGCAG

26. Full sequence of p3EL_HCCA2+CD24+CCND1_NLS_GFP:

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 TGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGAGGCTGGGGACTTTCCACACCTTAAC
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 CTTGGGCTGGGTACTAACACGATCGTTTTTTTCCCTTTTTTTTCCAGGGAAGCGGAGCTACTAACTTCAGCT
 GCTGAAGCAGGCTGGAGACGTGGAGGAGAACCCTGGGCTCCCGCCATGAAGGTAAGTATCAAGGTTACAAGA
 CAGGTTTAAGGAGACCAATAGAAACTGGGCTTGTGAGACAGAGACGACTCTTGGCTTCTGATAGGCACCTA
 TTGGTCTTACTGACATCCACTTTGCTTTCTCTCCACAGATCGAGTGCCGCATCACCGGCACCTGAACGGCG
 TGGAGTTCGAGCTGGTGGGCGGCGGAGAGGGCACCCCGAGCAGGGCCGCATGACCAACAAGATGAAGAGCAC
 CAAAGGCGCCCTGACCTTCAGCCCCTACCTGCTGAGCCACGTGATGGGCTACGGCTTCTACCACTTCGGCACCT
 TACCCAGCGGCTACGAGAACCCTTCTGACGCCATCAACAACGGCGGCTACACCAACACCCGCATCGAGA
 AGTACGAGGACGGCGGCGTGCTGCACGTGAGCTTACGCTACCGCTACGAGGCGGCGCGCTGATCGGCGACTT
 CAAGGTGTTGGGCACCGGCTTCCCGAGGACAGCGTGATCTTACCGACAAGATCATCCGCAGCAACGCCACC
 GTGGAGCACTGCACCCCATGGGCGATAACGTGCTGGTGGGCAGCTTCGCCCGCACCTTCAGCTGCGCGACG
 GCGGCTACTACAGCTTCGTGGTGGACAGCCACATGCACCTCAAGAGCGCCATCCACCCAGCATCCTGCAGAA

CGGGGGCCCCATGTTTCGCCTTCCGCCGCGTGGAGGAGCTGCACAGCAACACCGAGCTGGGCATCGTGGAGTAC
CAGCAGCCTTCAAGACCCCCATCGCCTTCGCCAGATCTCGAGCTCGATGAACTTGTATTGTCAGCTTATA
ATGGTTACAAATAAAGCAATAGCATCACAAATTCACAAATAAAGCATTTCCTACTGCATTCTAGTTGTGG
TTTGTCCAAATCATCAATGTATCTGAAGACAATAGCAG

27. Full RNA sequence of p3EL_HCCA2+CD24+CCND1_GFP or
p3EL_HCCA2+CD24+CCND1_NLS_GFP:

UCAGAUCGCUAAGGUAGCCCGGCAACAGUCCUUAUACAAAUUACACCAUGAUACAAAACAUUUUUUUA
GCCGGGAAGCGCCGAAUCGAUCGUAUCUAAAGAUCCUCUACACCAACAAAUAUUUUAUUUUAACUGA
CGAUCGAAUGGUACCUCUGAAACACCUUCCUUGACUCUUUCCACGCCUCCACCACCUUCAACCUCUUUCUUC
GCCUCCCCCAUCUUUUCUAGGCUUUUUUUGUCUUUUUUUAACCUUGGGCCUGGGCCUGGGUACUAACACG
AUCGUUUUUUCCUUUUUUCCAGGGAAGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUGGAGACGUG
GAGGAGAACCUCUGGCCUCCCGCAUGAAGGUAAAGUAUCAAGGUUACAAGACAGGUUUUAAAGGAGACCAUAGA
AACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUCAGACAUCCACUU
UGCCUUUCUCUCCACAGAUCGAGUGCCGCAUACCCGGCACCUGAACGGCGUGGAGUUCGAGCUGGUGGGCGG
CGGAGAGGGCACCCCCGAGCAGGGCCGCAUGACCAACAAGAUGAAGAGCACCAAGGGCGCCUGACCUUCAGC
CCCUACCUGCUGAGCCACGUGAUGGGCUACGGCUUCUACCACUUCGGCACCUACCCACGGCGCUACGAGAACC
CCUCCUGCAGGCCAUCAACAACGGCGGCUACACCAACACCCGCAUCGAGAAGUACGAGGACGGCGGCGUGCU
GCACGUGAGCUUCAGCUACCGCUACGAGGCCGCGCGUGAUCGGCGACUUCAGGUGGUGGGCACCGGCUUC
CCCGAGGACAGCGUGAUCUUCACCGACAAGAUAUCCGACGAACGCCACCGUGGAGCACCUGCACCCCAUGG
GCGUAACGUGCUGGUGGGCAGCUUCGCGCGCACCUCAGCCUGCGCGACGGCGGCUACUACAGCUUCGUGGU
GGACAGCCACAUGCACUUAAGAGCGCAUCCACCCAGCAUCCUGCAGAACGGGGGCCCAUGUUCGCCUUC
CGCCGCGUGGAGGAGCUGCAGCAACACCGAGCUGGGCAUCGUGGAGUACCAGCAGCCUUAAGACCCCCA
UCGCCUUCGCCAGAUCUCGAGCUCGAUGAAACUUGUUUAUUGCAGCUUAUAUGGUUACAAUAAAGCAAUAG
CAUCACAAAUUUCACAAAUAAAGCAUUUUUUUCACUGC

Targeting GGT+CD24+GPC3

28. BD (GGT+CD24+GPC3)+spacer only:

GCTAGCGTAGCCCGGCTAGATAGATAGATAGGAAGAAATAAGTAAGAATAACAAGCAAACAACAAAAGCCGGG
AAGCGCCGAATCGATCGTGATCTAAAGATCCTCTACACCAACAAAATTATTATGTTTATTAACTGACGATCG
AATGGTACCTCTGATTTCTCTTTCCATTGCTCTTTAACCTAAATTCCTGTGTCCAATTATTCCTTCCC

29. BD-GGT:

TAGATAGATAGATAGGAAGAAATAAGTAAGAATAACAAGCAAACAACAAA

30. BD-CD24:

GATCTAAAGATCCTCTACACCAACAAAATTATTATGTTTATTAACTGAC

31. BD-GPC3:

TTTCCTTTCCATTGCTCTTTAACCTAAATTCCTGTGTCCAATTATTCCTTCCC

32. Spacer5: GTAGCCCGGC

33. Spacer6: GCCGGGAAGCGCCGAATCGATCGT

34. Spacer7: GATCGAATGGTACCTCTGA

35. Full sequence with p3EL_GGT+CD24+GPC3 (p3EL_GCG):

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCAATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACA
TAACTTACGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGG
CATTATGCCCAGTACATGACCTTATGGGACTTTCCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
CCACCCCATTTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAATGTCGTAACAAC
TCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTAGTGA
ACCGTCAGATCGCTAGCGTAGCCCGGCTAGATAGATAGATAGGAAGAAATAAGTAAGAATAACAAGCAAACA
CAAAGCCGGGAAGCGCCGAATCGATCGTGATCTAAAGATCCTCTACACCAACAAAATTATTATGTTTATTAA

ACTGACGATCGAATGGTACCTCTGATTTCTCTTTCCATTGCTCTTTAACCTAATTTCTCTGTGTCCTCAATTATTC
 CCTTCCCCCTCAGCGCTTTTCATTTTTGTCTTTTTTTAACCTGGGCCTGGGCCTGGGTACTAACACGATCGTTT
 TTTTCCCTTTTTTTCCAGGAAGCGGAGCTACTAACTTCAGCCTGCTGAAGCAGGCTGGAGACGTGGAGGAGA
 ACCCTGGGCTGCTTCGTACCCCTGCCATCAACACGCGTCTGCGTTTCGACCAGGCGGCGCGATCACGGGGACA
 CAGCAACCGACGACGGCGTTGCGCCCTCGCCGGCAGCAAGAAGCCACGGAAGTCCGCCCGGAGCAGAAAATG
 CCCACGCTACTGCGGGTTTATATAGACGGTCCCCACGGGATGGGGAAAACCACCACCACGCAACTGCTGGTG
 CCTGGGTTCGCGCGACGATATCGTCTACGTACCCGAGCCGATGACTTACTGGCGGGTCTGGGGGCTTCCGA
 GACAATCGCGAACATCTACACCACACAACACCGCCTCGACCAGGTAAGTATCAAGGTTACAAGACAGGTTTAA
 GGAGACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCCTTTCTGATAGGCACCTATTGGTCTTA
 CTGACATCCACTTTGCCTTTCTCTCCACAGGTTGAGATATCGGCCGGGGACGCGGCGGTGGTAATGACAAGCG
 CCCAGATAACAATGGGCATGCCTTATGCCGTGACCGACGCCGTTCTGGCTCCTCATATCGGGGGGGAGGCTGG
 GAGCTCACATGCCCCGCCCCCGGCCCTCACCTCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGTCTAC
 CCGGCCGCGGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTCTGTGGCCCTCATCCCCCGGA
 CCTTGGCCCGGCACAAACATCGTGTTGGGGGCCCTTCCGGAGGACAGACACATCGACCGCTGGCCAAACGCCA
 GCGCCCGGCGGACGGCTTGACCTGGCTATGCTGGCCGCGATTTCGCCGCTTTACGGGCTGCTTGCCCATACG
 GTGCGGTATCTGCAGGGCGGCGGGTCTGGCGGGAGGATTGGGGACAGCTTTCGGGGACGCGCGTGGCGCCCC
 AGGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACACGTTATTTACCCTGTTTCGGGC
 CCCCAGTTGCTGGCCCCCAACGGCGACCTGTATAACGTGTTTGCCTGGGCCTTGACGCTTTGGCCAAACGC
 CTCCGTCCCATGCACGTCTTTATCTGGATTACGACCAATCGCCCCCGGCTGCCGGGACGCCCTGCTGCAAC
 TTACCTCCGGGATGGTCCAGACCCACGTACCACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCAC
 GTTTGCGCGGAGATGGGGGAGGCGAAGTGAAGCTGTTTATTGACGCTTATAATGGTTACAAATAAAGCAAT
 AGCATCACAAATTTACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATG
 TATCTGAAGACAATAGCAG

36.

Full sequence of p3EL GGT+CD24+GPC3 NLS (p3EL GCG NLS):

CGATGGAGCGGAGAATGGGCGGAAGTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
 TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCCATTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCCCTACTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
 ACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTT
 CCAAAATGTCGTAACAACCTCCGCCCCATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTAGTGAACCGTCAGATCGCTAGCTAGCCCGGCTAGATAGATAGATAGGAAGAAATAAGTA
 AGAATAACAAGCAAAACAACAAAAGCCGGGAAGCGCGGAATCGATCGTGATCTAAAGATCCTCTACACCAACAA
 AATTATTAATGTTTATTAAGTACGATCGAATGGTACCTCTGATTTCTCTTTCCATTGCTCTTTAACCTAATT
 TCTGTGTCCTCAATTATTCCTTTCCCTCAGCGCTTTCATTTTTGTCTTTTTTTAACCTGGGCCTGGGCCTGG
 GTACTAACACGATCGTTTTTTTCCCTTTTTTTCCAGGAAGCGGAGCTACTAAGTTTCAGCCTGCTGAAGCAGG
 CTGGAGACGTGGAGGAGAACCCTGGGCTGCTTCGTACCCCTGCCATCAACACGCGTCTGCGTTTCGACCAGGC
 GGCGCGATCACGGGGACACAGCAACCGACGGACGGCGTTGCGCCCTCGCCGGCAGCAAGAAGCCACGGAAGTC
 CGCCCGGAGCAGAAAATGCCACGCTACTGCGGGTTTATATAGACGGTCCCCACGGGATGGGGAAAACCACCA
 CCACGCAACTGCTGGTGGCCCTGGGTTTCGCGGACGATATCGTCTACGTACCCGAGCCGATGACTTACTGGCG
 GGTGCTGGGGGCTTCCGAGACAATCGCGAACATCTACACCACACAACACCGCCTCGACCAGGTAAGTATCAAG
 GTTACAAGACAGGTTTAAAGGAGACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCCTTTCTGAT
 AGGCACCTATTGGTCTTACTGACATCCACTTTGCCCTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGG
 CGGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCCGTGACCGACGCCGTTCTGGCTCCTCA
 TATCGGGGGGAGGCTGGGAGCTCACATGCCCCGCCCCGGCCCTCACCTCATCTTCGACCGCCATCCCATC
 GCCGCCCTCCTGTGCTACCCGGCCGCGGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTCTG
 TGGCCCTCATCCCGCCGACCTTGGCCGGCACAAACATCGTGTTGGGGGCCCTTCCGGAGGACAGACACATCGA
 CCGCTTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGAAGTGGCTATGCTGGCCGCGATTTCGCCGCTTTAC
 GGGCTGCTTGCCAAATACGGTTCGGTATCTGCAGGGCGGCGGGTCTGGCGGGAGGATTGGGGACAGCTTTCGG
 GGACGGCCGTGCCGCCCGAGGTTGCCGAGCCCCAGAGCAACGCGGGGCCACGACCCCATATCGGGGACAGCTT

ATTTACCCCTGTTTCGGGCCCCCCGAGTTGCTGGCCCCCAACGGCGACCTGTATAACGTGTTTGCCTGGGCCTTG
GACGTCCTTGCCAAACGCCTCCGTCCCATGCACGTCTTTATCCTGGATTACGACCAATCGCCCCGCCGGCTGCC
GGGACGCCCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTCACCACCCCAGGCTCCATACCGACGAT
CTGCCACCTGGCGCGCACGTTTGGCGGGGAGATGGGGGAGGCGAACTGAAACTTGTTTATTGCAGCTTATAAT
GTTTCAAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTT
TGTCCAAACATCAATGTATCTGAAGACAATAGCAG

37. Full RNA sequence of p3EL_GGT+CD24+GPC3 or p3EL_GGT+CD24+GPC3 NLS:

UCAGAUCGCUAGCGUAGACCCGGGCUAGAUAGAUAGAUAGGAAGAAAUAAGUAAGAAUAACAAGCAAAACAACAAA
AGCCGGGAAGCGCCGAAUCGAUCGUGAUCUAAAAGAUCUCUACACCAACAAAAUUUAUGUUUAUUAACUG
ACGAUCGAAUGGUACCUCUGAUUUUCUUUUCCAUGGCGUCUUUAACCUAAUUUUCUGUGUCCAUAUAUUCUUU
CCCCUCAGCGCUUUCAUUUUUGUCUUUUUUUAACCUUGGGCCUGGGCCUGGGUACUAACAcgaUcgUUUUUUU
CCCUUUUUUUUCACGGGAAGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUGGAGACUGGGAGGAGAACC
UAGGCGUCGUCUCUGAACCCUGGCAUACACACGCGUCGUCGCGUACGACCAGCGGGCGGAUCACGGGGACACGC
AAGCCAGCGACGGCGUUGCGCCCCUCGCGGACGCAAGAAGCCACGGGAAGUCCGCCCGGAGCAGAAAUAAGCCCCA
CGCUACUGCGGGGUUUAUAUAGACGGUCCCCACGGGAUGGGGAAAAACCACCACCACGCAACUGCUGGUGGCCCTU
GGGUUCGCGCGACGAUAUCGUCUACGUACCCGAGCCGAUGACUUAACUGGCGGGUGCUGGGGGCUUCCGAGACA
AUCGCGAACAUUCACACCACACAACACCGCCUCGACCAGGUAAGUAUCAAGGUACAAGACAGGUUAAGGAG
ACCAAUAGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUAACUGA
CAUCCACUUGGCCUUUCUCUCCACAGGGUGAGAUUACGGCCGGGGACGCGGGCGGUGGUAAUGACAAGCGCCCA
GAUAACAAUUGGGCAUGCCUUAUGCCGUGACCGACGCGCGUUCUGGCUCUCUAUAGCUGGGGGGAGGCUGGGAGC
UCACAUGGCCCCGCCCCCGGCCCCUACCCUACUUCGACCGCCCAUCCCAUCGCGCCGCGUGCUACCCGG
CCGCGGGAUACCUUUAUGGGCAGCAUAGCCCCCAGGCCGUGUGCGGUUCGUGGCCCUCAUCCGCGCCAGCCU
GCCCGGCACAAACAUCGUGUUGGGGGGCCUUCGCGAGGACAGACACAUCGACCGCCUGGCCAAACGCCAGCGC
CCCGCGGAGCGGCUUGACCUGGCUAUGCUGGCCGCGAUUCGCCCGGUUACGGGCUGCUUGCCAAUACGGUGC
GGUAUCUGCAGGGCGGCGGGGUCUGGCGGGAGGAUUGGGGACAGCUUUCGGGGACGGCCGUGCCGCCCCAGGG
UGCCGAGCCCCAGAGCAACGCGGGGCCACGACCCCAUAUCGGGGACACGUUAUUUACCCUGUUUCGGGCCCCC
GAGUUGCUGGCCCCCCAACGGCGACCUGUAUAACGUGUUUGCCUGGGCCUUGGACGUCUUGGCCAAACGCCUCC
GUCCCAUGCACGUCUUUAUCCUGGAUUAACGACCAUUCGCCCCGCCGGCUGCCGGGACGCCUGCUGCAACUUAC
CUCCGGGAUGGUCAGACCCACGUCACACCCAGGCUCCAUACCGACGAUCUGCGACCUGGCGCGCACGUUU
GCGCGGGAGAUUGGGGGAGCGCAACUGAUAACUUGUUUAUUGCAGCUUAUAUGGUUACAAUAAGCAUAAGCA
UCACAAAUUUCACAAAUAAGCAUUUUUUUCACUGC

38. Full sequence of p3EL GGT+CD24+GPC3 GFP:

ACTAGCTAGTTATTATTAATAGTAATAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGGTTACATAACCTTACGGTAAATGGCCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA

CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGAATAGCGGTTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTTTTTTGGCACAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC

TCCGCCCCCATTGACGCAAAATGGGCGGTAGGCGGTGACGGTGGGAGGTCATATAAGCAGAGCTGGTTTTAGTGAACCGTCAGATCGCTAGCGGTAGCCCGGTAGATAGATAGATAGAGAAATAAGTAAGAATAAACAACCAACAA

CAAAAGCCGGGAAGCGCCGAATCGATCGTGATCTAAGATCTCTTACACCAACAAAATTATTATGTTTTATTAA

ACTGACGATCGAATGGTACCTCTGAATTTCTCTTTCCTTTCCTTAAACCTAATTTCTCTGTGTCCAATTATTC

CTTTCCCTTTTTTTTCCAGGGAAGCGGAGCTACTAACTTCAGCCTGCTGAAGCAGGCTGGAGACGTGGAGGAGA

ACCTTGGGCTCCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAACTGGG

CTTGTCGAGACAGAGACGACTCTTGCGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCCAATTTGCCTTT

CTCTCCACAGATCGAGTGCCGCATCACCGGCACCTGAACGGCGTGGAGTTTCGAGCTGGTGGGCGGCGGAGAG

GGCACCCCCGAGCAGGGCCGCATGACCAACAAGATGAAGAGCACCAAAGGCGCCCTGACCTTCAGCCCCCTACC

TGCTGAGGCCACGTGATGGGCTACGGCTTCTACCACCTTCGGCACCTACCCAGCGGCTACGAGAACCCCTTCCT

GCACGCCATCAACAACGCGCGCTACACCAACACCCGCATCGAGAAGTACGAGGACGGCGGCGTCTGTCACGTG

AGCTTCAGTACCCTACGAGGCGCGCGCTGATCGCGCACTCAAGTGGTGGGCAACCGGCTGGCCGAGG

ACAGCGTGATCTTACCAGACAAGATCATCCGCGAGCAACGCCACCGTGGAGACCTGCACCCCATTTGGCGATAA

CGTGCTGTTGGGCAGCTTCGCCCCGACCTTCAGCCTGCGCGACGGCGGCTACTACAGCTTCGTGGTGGACAG

CACATGCACTTCAAGAGCGCCATCCACCCCAGCATCCTGCAGAACGGGGGCCCATGTTTCGCCCTTCCGCCGCG
TGGAGGAGCTGCACAGCAACACCGAGCTGGGCAATCGTGGAGTACCAGCACGCCCTTCAAGACCCCCATCGCCTT
CGCCAGATCTCGAGCTCGATGAAACTTGTATTGTCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACA
AATTTACAAATAAAGCATTTTTTTTACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTGAAG
ACAATAGCAG

39. Full sequence of p3EL_GGT+CD24+GPC3_GFP_NLS:

CGATGGAGCGGAGAATGGGCGGAACCTGGGCGGAGTTAGGGCGGGATGGGCGGAGTTAGGGCGGGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
ATGGAGTTCCGCGTTACATAACTTACGGTAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGACTC
ACGGGGATTTCGAAGTCTCCACCCCAATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAACCTCCGCCCCATTGACGCAATGGGCGGTAGGCGTGTACGGTGGAGGTCTATATAA
GCAGAGCTGGTTTAGTGAACCGTCAGATCGCTAGCGTAGCCCGCTAGATAGATAGATAGGAAGAAATAAGTA
AGAATAACAAGCAAAACAACAAAAGCCGGGAAGCGCGGAATCGATCGTGATCTAAAGATCCTCTACACCAACAA
AATTATTATCTTTATTAAGTACGATCGAATGGTACCTCTGATTTCTCTTTCCATTGCTCTTTAACTTAATT
TCCTGTGTCGAATTATTCCTTTCCCTGCTTTTCAATTTTTTGTCTTTTTTTAACCTGGGCTTGGGCTGG
GTACTAACACGATCGTTTTTTTTTCCCTTTTTTTCCAGGAAGCGGAGCTACTAATTCAGCCTGCTGAAGCAGG
CTGGAGACGTGGAGGAGAACCCTGGGCTTCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTAAGG
AGACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACCTATTGGTCTTACT
GACATCCACTTTGCCTTTCTCTCCACAGATCGAGTGCCGCATCACCGGCACCTGAACGGCGTGGAGTTCGAG
CTGGTGGGCGCGGAGAGGGCACCCCGAGCAGGGCCGCATGACCAACAAGATGAAGAGCACCAAGGCGCCC
TGACCTTCAGCCCCCTACCTGCTGAGCCACGTGATGGGCTACGGCTTCTACCCTTCGGCACCTACCCAGCGG
CTACGAGAACCCTTCTGTCACGCCATCAACAACGGCGGCTACACCAACACCCGCATCGAGAAGTACGAGGAC
GGCGGCGTGTGTCAGCTGAGCTTACGCTACCGCTACGAGGCGGCGCGGTGATCGGCGACTTCAAGGTGGTGG
GCACCGGCTTCCCCGAGGACAGCGTGATCTTACCGACAAGATCATCCGAGCAACGCCACCGTGGAGCACCT
GCACCCCATGGGCGATAACGTGCTGGTGGGCGAGTTCGCCCGCACCTTCAGCCTGCGCGACGGCGGCTACTAC
AGCTTCGTGGTGGACAGCCACATGCACCTCAAGAGCGCCATCCACCCAGCATCCTGCAGAACGGGGGCCCA
TGTTCCGCTTCCGCCGCGTGGAGGAGTGCACAGCAACACCGAGCTGGGCAATCGTGGAGTACCAGCACGCCTT
CAAGACCCCATCGCCTTCGCCAGATCTCGAGCTCGATGAACTTGTATTATGCAGCTTATAATGGTTACAAA
TAAAGCAATAGCATCACAATTTTACAAATAAAGCATTTTTTTTACTGCATTCTAGTTGTGGTTTGTCCAAAC
TCATCAATGTATCTGAAGACAATAGCAG

40. Full RNA sequence of p3EL_GGT+CD24+GPC3_GFP and
p3EL_GGT+CD24+GPC3_GFP_NLS:

UCAGAUCCUAGCCGUAGCCCGGCUAGAUAGAUAGAUAGGAAGAAUAAGUAAGAAUAACAAGCAAAACAACAA
AGCCGGGAAGCGCCGAUUGAUCUGAUCUAAAGAUCCUCUACACCAACAAAUUAUUAUGUUUAUUAACUG
ACGAUCGAUUGGUACCUUGAUUUCUCUUAUCCAUUGCUCUUAACCUAAUUAUCCUGUGUCCAAUUAUCCCUU
CCCUCUAGCGCUUUAUUAUUGUCUUUUUUUAACUGGGCCUGGGCCUGGGUACUAAACACGAUCGUUUUUUU
CCCUUUUUUUUCCAGGGAAGCGGAGCUACUAACTUACAGCCUGCUGAAGCAGGCUGGAGACUGGAGGAGAACC
UGGGCCUCCCGCCAUGAAGGUAAAGUAUCAAGGUUACAAGACAGGUUAAGGAGACCAUAAGAAACUGGGCUUG
UCGAGACAGAGACGACUCUUGCGUUCUGAUAGGCACCUAUUGGUCUUAUCGACAUCCACUUAUGCCUUCUCU
CCACAGAUCCGAGGCGCAUACCGGCACCCUGAACGGCGUGGAGUUCGAGCUGGUGGGCGCGGAGAGGGCA
CCCCCGAGCAGGGCCGAUGACCAACAAGAUGAAGAGCACCAAAAGGCGCCUGACCUUCAGCCCCUACCCUGCU
GAGCCACGUGAUGGGCUACGGCUUCUACACUUCGGCACCUACCCAGCGGCUACGAGAACCCCUUCUGCAC
GCCAUCAACAACGGCGGCUACACCAACACCCGCAUCGAGAAGUACGAGGACGGCGGCGUGCUGCACGUGAGCU
UCAGCUACCGCUACGAGGCGGCGCGGUGAUCGGCGACUUAAGGUGGUGGGCACCGGCUUCCCCGAGGACAG
CGUGAUCUUAACCGACAAGAUCAUCCGCGAGCAACGCCACCGUGGAGCACCUGCACCCCAUGGGCGAUAAACGUG
CUGGUGGGCAGCUUCGCCCGCACCUUCAGCCUGCGGACGGCGGCUACUACAGCUUCUGUGGAGACAGCCACA
UGCACUUAAGAGCGCCAUCCACCCAGCAUCCUGCAGAACGGGGGCCCAUGUUCGCCUUCGCCCGCGUGGA
GGAGCUGCACAGCAACACCGAGCUGGGCAUCGUGGAGUACCAGCACGCCUUAAGACCCCAUCGCCUUCGCC

AGAUCUCGAGCUCGAUGAAACUUGUUUAUUGCAGCUUAUAAUGGUUACAAUAAAGCAAUAGCAUCACAAAUU
UCACAAUAAAGCAUUUUUUUCACUGC

Targeting HCCA2+CD24+VEGF+AFP

41. BD (HCCA2+CD24+VEGF+AFP)+spacers:

GCTAGCGTAGCCCCGGCAACAGTTCCTTTATACAAATTCACCAGATGATACAAAACATATTTTTTTAGC
CGGGAAGCGCCGAATCGATCGTGATCTAAAGATCCTCTACACCAACAAAATTATTATGTTTATTAAAC
TGACGATCGAATGGTACCTGTCCACTTTCTTTCTTGATCCTTATATTCCTGTGCCCCCTTTCTCTCCT
CCCCACAGTGGACATTTCCGGTAATTCTCCACCTCTCTAAACCTAAATTAAATTTCTTCTCTAAACC
TCTTTCCTAGTTCTGAG

42. BD-HCCA2: AACAGTTCCTTTATACAAATTCACCAGATGATACAAAACATATTTTTTTA

43. BD-CD24: GATCTAAAGATCCTCTACACCAACAAAATTATTATGTTTATTAAACTGAC

44. BD-VEGF: TTTCTTTCTTGATCCTTATATTCCTGTGCCCCCTTTCTCTCCTCCCCACA

45. BD-AFP: ACCTCTCTAAACCTAAATTAAATTTCTTCTCTAAACCTCTTTCCTAGTT

46. Spacer8: GTAGCCCCGGC

47. Spacer9: GCCGGAAGCGCCGAATCGATCGT

48. Spacer10: GATCGAATGGTACCTGTCCAC

49. Spacer11: GTGGACATTTCCGGTAATTCTCC

50. Full sequence of Full sequence of p3EL_HCCA2+CD24+VEGF+AFP
(p3EL_HCVA):

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCAATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
TAACCTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
GGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTCACGGGGATTCCAAGTCT
CCACCCCATGACGTCAATGGGAGTTTGTTTTGGCACAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
TCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTAGTGA
ACCGTCAGATCGCTAGCGTAGCCCCGGCAACAGTTCCTTTATACAAATTCACCAGATGATACAAAACATATTTT
TTTAGCCGGGAAGCGCCGAATCGATCGTGATCTAAAGATCCTCTACACCAACAAAATTATTATGTTTATTAA
CTGACGATCGAATGGTACCTGTCCACTTTCTTTCTTGATCCTTATATTCCTGTGCCCCCTTTCTCTCCTCCC
ACAGTGGACATTTCCGGTAATTCTCCACCTCTCTAAACCTAAATTAAATTTCTTCTCTAAACCTCTTTCTTA
GTTCTCTCTGCTTTTCATTTTGTCTTTTTTTAACTTGGGCTGGGCTGGGTACTAACACGATCGTTTTTTTT
CCCTTTTTTCCAGGGAAGCGGAGCTACTAATTTCAGCCTGCTGAAGCAGGCTGGAGACGTGGAGGAGAACCC
TGGGCTGCTTTCGTACCCCTGCCATCAACACGCGTCTGCGTTGACACGGCGGCGGATCACGGGGACACAGC
AACCAGCGACGGCGTTGCGCCCTCGCCGGCAGCAAGAAGCCACGGAAGTCCGCCCCGAGCAGAAAATGCCCA
CGCTACTGCGGGTTTATATAGACGGTCCCCACGGGATGGGAAAACACCACCACGCAACTGCTGGTGGCCCT
GGGTTGCGCGCAGATATCGTCTACGTACCCGAGCGGATGACTTACTGGCGGGTGTGGGGGCTTCCGAGACA
ATCGCGAATCTACACCACACAACACCGCCTCGACCAGGTAAGTATCAAGTTACAAGACAGGTTTAAGGAG
ACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCCTTCTGATAGGCACCTATTGGTCTTACTGA
CATCCACTTTGCCTTTCTCTCCACAGGTGAGATACGGCCGGGACGCGCGGTGGTAATGACAAGCGCCCA
GATAACAAATGGGCATGCCCTATGCCGTGACCGACGCGGTTCTGGCTCCTCATATCGGGGGGAGGCTGGGAGC
TCACATGCCCCGCCCGGCCCTCACCTCATCTCGACCGCCATCCCATCGCCGCCCTCTGTGCTACCCGG
CCGCGCGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTCTGTGGCCCTCATCCCCCGACCTT
GCCCCGCACAAACATCGTGTTGGGGGCCCTTCCGGAGGACAGACACATCGACCGCTGGCCAAACGCCAGCGC
CCCGCGAGCGGCTTACCTGGCTATGCTGGCCGCTTACGGGCTGCTTGGCAATACGGTGC
GGTATCTGCAGGCGCGCGGTCTGTGGCGGAGGATTGGGGACAGCTTTCCGGGACGCGCTGCCGCCAGGG
TGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACACGTTATTTACCTGTTTGGGGCCCC
GAGTTGCTGGCCCCCAACGGCGACCTGTATAACGTGTTTGCTGGGCCCTTGACGCTCTTGCCAAACGCCTCC
GTCCCATGACAGTCTTTATCCTGGATTACGACCAATCGCCCGCGGCTGCCGGGACGCGCTGCTGCAACTTAC
CTCCGGATGGTCCAGACCCACGTCACACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGACGTTT
GCGCGGGAGATGGGGGAGGCGAACTGAACTTGTATTGACGCTTATAATGGTTACAAATAAGCAATAGCA
TCACAAATTTACAAATAAAGCATTTTTTTCTACGCTTCTAGTTGTGGTTGTCCAACTCATCAATGTATC
TGAAGACAAATAGCAG

CGATCGAGCGGGAGAAATGGGCGGAACATGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGGT
TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCCTGCTGGGGAGCCTGGGGACTTTCCACACCTTAAC
TGACACACATTCCACAGCACTAGCTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATAT
ATGGAGTTCGCGCTTACATAAATTACGGTAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCACTTGGCAGTACATAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGA
GGTAAATGGCCCGCTGGCATTTAGCCAGTACATGACCTTATGGGACTTTCTTACTTTGGCAGTACATCTAGC
TATTAGTCATCGCTATTACCATGGTGATGCGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
ACGGGGATTTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAACATCCGCCCCATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTAGTGAACCGTCAGATCGCTAGCGTAGCCCGGCAACAGTTCTCTTTATACAAATTCACCGA
TGATACAAAACATATTTTTTTAGCCGGGAAGCGCCGAATCGATCGTGATCTAAAGATCTCTACACCAACAAA
ATTATTATGTTTTATTAAACGACGATCGAATGGTACCTGTCCACTTTCTTTCTTGATCCTTATATTCTGTGC
CCCTTTTCTTCTCTCCACAGTGGACATTTCCGGTAATTCTCCACCTCTCTAAACCTAAATTAATTTTTCTT
CTCTAAACCTCTTTCTTAGTTGCTTTGCTTTTGTCTTTTTTAACTTGGCCTGGGCCTGGGCCTGGGTAC
TAACAGCATCGTTTTTTTCTTTTTCAGGGAAGCGGAGCTACTAACTTCAGCCTGCTGAAGCAGGCTGG
AGACGTGGAGGAGAACCTTGGCCCTGCTTCGTACCCCTGCCATCAACACGCGTCTGCGTTCCACAGCGCGCG
CGATCACGGGGACACAGCAACCGACGGACGGCGTTGCGCCCTCGCCCGCAGCAAGAAGCCACGGAAGTCCGCC
CGGAGCAGAAAATGCCACGCTACTGCGGGTTTTATATAGACGGTCCCCACGGGATGGGGAAAAACCACCACC
GCAACTGCTGGTGGCCCTGGGTTCGCGCGACGATATCGTCTACGTACCCGAGCCGATGACTTACTGGCGGGTG
CTGGGGGCTTCCGAGACAATCGCGAACATCTACACCACACAACACCGCCTCGACCAGGTAAGTATCAAGGTTA
CAAGACAGGTTTAAAGGAGACCAATAGAAACTGGGCTTGTCGAGACAGAGACGACTCTTGCGTTTCTGATAGGC
ACCTATTGGTCTTTACTGACATCCACTTTGCCTTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGGCGGT
GGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCCGTGACCGACGCGCTTCTGGCTCCTCATAT
GGGGGGGAGGCTGGGAGCTCATATGCCCCGCCCCGGCCCTACCCCTCATCTTCGACCGCCATCCCCATGCCG
CCTCCTGTGCTACCGCGCCGCGCATACCTTATGGCGAGCATGACCCCCAGGCGGTGCTGGCGTTCTGTGGC
CCTCATCCCGCCGACCTTGCCCGGCGACAAACATCGTGTTGGGGGCCCCCTCCGGAGGACAGACACATCGACCGC
CTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACC TGCTATGCTGGCCGCGATTTCGCCGCGTTTACGGGC
TGCTTGCCAATACGGTGGCGTATCTGCAGGGCGGCGGGTCTGGCGGGAGGATTGGGGACAGCTTTTCGGGGAC
GGCGGTGCCGCCCCAGGTTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACAGCTTATTT
ACCTGTTTTCGGGCCCCGAGTTGCTGGCCCCAACGCGACCTGTATAACGTGTTTGCCTGGGCCTTGAGC
TCTTGGCCAAACGCCTCCGTCCCATGCACGTCTTTATCTTGATTACGACCAATCGCCCGCCGGCTGCCGGGA
CGCCCTGCTGCAACTTACCCTCCGGGATGGTCCAGACCCACGTCAACACCCAGGCTCCATACCGACGATCTGC
GACCTGGCGCGCACGTTTTCGCGCGGAGATGGGGGAGGCGAACTGAAACTTGTTTTATTGCAGCTTATAATGGTT
ACAAATAAAGCAATAGCATACAAATTTTCAAAATAAAGCATTTTTTTCACGTGATTCTAGTTGTGGTTTGTC
CAAACCTCATCAATGTATCTGAAGACAATAGCAG

UCAGAUCCGUAAGCGUAGCCCGGCAACAGAUCCUUUAUACAAAUCACCAGAUGAUACAAAACAUAUUUUUUA
GCCGGGAAGCGCCGAAUCGAUCGUGAUCUAAAAGAUCCUCUACACCAACAAAUAUAUAGUUUAUUAACUGA
CGAUCGAAUGGUACCUGUCCACUUUCUUUCUUGAUCCUUAUAUCCUGUGGCCCUUUUCCUUCUCCCCACAG
UGGACAUUCCGGUAAUUCUCCACCUCUCUAAACCUAAAUUAUUUUUUCUUCUCUAAACCUCUUUCCUAGUU
UCAGCGCUUUCAUUUUUGUCUUUUUUUAACCUGGGCCUGGGCCUGGGUACUAACAgaUcgUUUUUUUCCCU
UUUUUUCAGGGAAGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUGGAGACGUGGAGGAGAACCCUGGg
CCUGCUUCGUACCCCGCCAUCAACACGCGUCUGCGUUCGACCAGGCGGCGCGAUACAGGGGACACAGCAACC
GACGGACGGCGUUGCGCCUUCGCCGGCAGCAAGAAGCCACGGAAGUCCGCCCGGAGCAGAAAAUGCCACGCU
ACUGCGGGUUUAUAUAGACGGUCCCCACGGGAUGGGGAAAACCAACCACGCAACUGCUGGUGGGCCUGGGU
UCGCGCGACGAUAUCGUCUACGUACCCGAGCCGAUGACUUAUCUGCGGGGUGCUGGGGGCUUCCGAGACAAUCG
CGAACAUCUACACCAACACAACACCGCCUCGACCAGGUAGUAUCAAGGUACAAGACAGGUUAAGGAGACCA
AUAGA AACUGGCCUUGCGAGACGAGACGACUCUUGCGUUAUCGAUAGGCACCUAUUGGUUUUACUGACAU
CACUUUGCCUUUCUCUCCACAGGUGAGAGUAUCGGCCGGGGCAGCGGCGGUGGUAUUGACAACGCGCCAGAUA

53. Full sequence of p3EL HCCA2+CD24+VEGF+AFP GFP (p3EL HCVA GFP):

54. Full sequence of p3EL_HCCA2+CD24+VEGF+AFP_GFP-NLS
(p3EL HCVA GFP NLS):

CGATGGAGCGGAGAATGGCGGGAAGTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCCTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATAT
ATGGAGTTCCGCGTTACATAACTTACGGTAATGGCCCGCTTGCTGACCGCCCAACGACCCCCGCCCATTTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCACCTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTTGGCATTATGCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
TATTAGTCATCGCTATTACCATTGGTGATGCGGTTTTGGCAGTACATCAATGGGCTGGATAGCGGTTTGACTC
ACGGGGATTTTCCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTT

CCAAAATGTCGTAACAACTCCGCCCATTTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTAGTGAACCGTCAGATCCTAGCGTAGCCCGGCAACAGTTCCCTTTATACAAATTCACCCAGA
 TGATACAAAACATAATTTTTTTAGCCGGGAAGCGCCGAATCGATCGTGTATCTAAAGATCCTCTACACCAACAAA
 ATTATTATGTTTATTAACTGACGATCGAATGGTACCTGTCCACTTTCTTTCTTGATCCTTATATTCCTGTGC
 CCTTTTCCCTTCCTCCCCACAGTGGACATTTCCGGTAATTCTCCACCTCTCTAAACCTAAATTAATTTTCTT
 CTCATAACCTCTTTCTAGTTCTGACGCTTTTCATTTTGTCTTTTTTTAAACCTGGGCTGGGCTGGGTAC
 TAACACGATCGTTTTTTTTTCCCTTTTTTTCCAGGGAAGCGGAGCTACTAATTTCAGCCTGCTGAAGCAGGCTGG
 AGACGTGGAGGAGAACCCTGGGCTCCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGAC
 CAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACCTATTGGTCTTACTGACA
 TCCACTTTGCCTTTCTCTCCACAGATCGAGTGGCGCATCACCGGCACCCTGAACGGCGTGGAGTTGAGCTGG
 TGGGCGGCGGAGAGGGCACCCCGAGCAGGGCCGATGACCAACAAGATGAAGAGCACCAAGGCGCCCTGAC
 CTTACAGCCCTACCTGCTGAGCCACGTGATGGGCTACGGCTTCTACCCTTCGGCACCTACCCACAGCGGCTAC
 GAGAACCCCTTCTGACGCCATCAACAACGGCGGTACACCAACACCCGCATCGAGAAGTACGAGGACGGCG
 GCGTGTGACAGTGAAGCTTACGCTACGAGGCGGCGCGGTGATCGGCGACTTCAAGGTGGTGGGCAC
 CGGCTTCCCGGAGGACAGCGTGATCTTACCAGCAAGATCATCCGAGCAACGCCACCGTGGAGCAGCTGCAC
 CCCATGGGCGATAACGTGCTGGTGGGCGAGCTTCGCCCGCACCTTCAGCCTGCGCGACGGCGGCTACTACAGCT
 TCGTGGTGGACAGCCACATGCACTTCAAGAGCGCCATCCACCCAGCATCCTGCAGAACGGGGGCCCCATGTT
 CGCCTTCCGCGCGTGGAGGAGCTGCACAGCAACACCGAGCTGGGCATCGTGGAGTACCAGCAGCCTTCAAG
 ACCCCCATCGCCTTCGCCAGATCTCGAGCTCGATGAACTTGTTTATTGCAGCTTATAATGGTTACAAATAAA
 GCAATAGCATCACAATTTACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTTGTCCAAACTCAT
 CAATGTATCTGAAGACAATAGCAG

55. Full RNA sequence of p3EL_HCCA2+CD24+VEGF+AFP_GFP_NLS or
 p3EL_HCCA2+CD24+VEGF+AFP_GFP:

UCAGAUCCUAGCGUAGCCCGGCAACAGUCCUUAUACAAAUACACCAUGAUACAAACAAUUAUUUUUA
 GCCGGGAAGCGCCGAUUGCAUUGAUUUAUAGAUCCUUAACCAACAAAUUAUUUAUGUUAUUAUAAACUGA
 CGAUUGAAUGGUACGUUCCACUUAUUCUUAUUAUCCUUAUUAUCCUGUGCCCUUUUCCUUCUCCCCACAG
 UGGACAUUUCCGGUAAUUCUCCACCUCUUAACCUAAAUUUUAUUUUCUUAACCUUUUCCUAGUU
 GCUUUAUUUUUUGUCUUUUUUUAACCUUGGCCUUGGCCUUGGUACUAAACAGAUUGUUUUUUCCCU
 UUUUUUCCAGGGAAGCGGAGCUACUAAUUCAGCCUGCUGAAGCAGGCUUGGAGACGUGGAGGAGAACCUGGG
 CCUCCCGCAUGAAGGUAAAGUAUACAAGGUUACAAGACAGGUUAAGGAGACCAUAGAAACUGGGCUUGUCGA
 GACAGAGACGACUUCUGGUUUCUGAUAGGCACCUAUGGUCUUAUGACAUCCACUUGCCUUCUUCUCCAC
 AGAUCGAGUGCCGCAUACCCGGCACCCUGAACGGCGUGGAGUUCGAGCUGGUGGGCGGCGAGAGGGCACCCC
 CGAGCAGGGCCGCAUGACCAACAAGAUGAAGAGCACCAAAAGGCGCCUGACCUUACGCCCCUACCUGCUGAGC
 CACGUGAUGGGCUACGGCUUCUACCACUUCGGCACCUACCCAGCGGCUACGAGAACCCCUUCCUGCAGGCCA
 UCAACAACGGCGGCUACACCAACACCCGCAUCGAGAAGUACGAGGACGGCGGCGUGCUGCAGCUGAGCUUCAG
 CUACCGCUACGAGGCGGCGCGGUGAUCGGCGCAUCUUAAGGUGGUGGACCGGCUUCCCGGAGGACAGCGUG
 AUCUUCACCCGCAAGAUCAUCCGACGACGACCGCAGGAGCACCUGCACCACCAUGGGCGAUAACGUGUGG
 UGGGCGAGCUUCGCGCCGACCUUCAGCCUGCGGACGGCGGCUACUACAGCUUCGUGGUGGACAGCCACAUGCA
 CUUCAAGAGCGCAUCCACCCAGCAUCCUGCAGAACGGGGGCCCCAUGUUCGCCUUCGCGCGGUGGAGGAG
 CUGCAGCAACACCGAGCUGGGCAUCGUGGAGUACGAGCAGCCUUAAGACCCCAUCGCCUUCGCCAGAU
 CUCGAGCUCGAUGAAACUUGUUUAUUGCAGCUUAUUAUGGUUACAAAUAAAGCAUAGCAUCACAAAUUCAC
 AAUUAAGCAUUUUUUUCACUGC

56. SD+BD (HCCA2+CD24+VEGF+AFP)+spacers:

CCTAGCTGCAAAAAAAGGGAAAAAAGTAGCCCGGCAACAGTTCCCTTTATACAAATTCACCAAGATGA
 TACAAAACATAATTTTTTTAGCCGGGAAGCGCCGAATCGATCGTGTATCTAAAGATCCTCTACACCAACA
 AAATATTATGTTTATTAACTGACGATCGAATGGTACCTGTCCACTTTCTTTCTTGATCCTTATATT
 CCTGTGCCCCCTTTCTCTTCCCTCCCCACAGTGGACATTTCCGGTAATTCTCCACCTCTCTAAACCTAAA
 TTAATTTTCTTCTCTAAACCTTTCTAGTTCTGACG

57. Full sequence of p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 1
 (p3EL_HCVA_SD1)

ACTAGTTAGTTATTATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT

GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCATTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCTGTAACAAC
 TCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCGCTAGCCTGGAAAAAAGGGAAAAAAGTAGCCCCGGCAACAGTTCTTTATACAAAATTCACC
 AGATGATACAAAACATATTTTTTTAGCCGGGAAGCGCCGAATCGATCGTGATCTAAAGATCCTCTACACCAAC
 AAAATTTATATGTTTATTAACTGACGATCGAATGGTACCTGTCCACTTTCTTTCTTGATCCTTATATTCTGT
 TGCCCCCTTTCTTCTCTCCACAGTGGACATTTCCGGTAATTCTCCACCTCTCTAAACCTAAATTAATTTTT
 CTTCTCTAAACCTCTTTCTAGTTCTCAAGCTTTTCATTTTTTGTCTTTTTTTAACTGGGCCTGGGCCTGGG
 TACTAACACGATCGTTTTTTTTCCCTTTTTTCCAGGGAAGCGGAGCTACTAATTACAGCTGCTGAAGCAGGC
 TGGAGACGTGGAGGAGAACCCTGGGCCTGCTTCGTACCCCTGCCATCAACACGCGTCTGCGTTCGACCAGGCG
 GCGCGATCACGGGGACACAGCAACCGACGGACGGCGTTGCGCCCTCGCCGGCAGCAAGAAGCCACGGAAGTCC
 GCGCGAGCAGAAAAATGCCACGCTACTGCGGGTTATATAGACGGTCCCCACGGGATGGGAAAACACCAC
 CAGCAACTGCTGGTGGCCCTGGGTTGCGCGACGATATCGTCTACGTACCCGAGCCGATGACTTACTTGCGG
 GTGCTGGGGCTTTCCGAGACAATCGCAACATCTACACCAACAACACCGCTCGACCAGGTAAGTATGAAGG
 TTACAAGACAGGTTTAAGGAGACCAATAGAAACTGGGCTTGTGAGACAGAGACGACTCTTGCCTTTCTGATA
 GGCACCTATTGGTCTTACTGACATCCACTTTGCCCTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGGC
 GGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCCTTATGCCGTGACCGACGCGCTTCTGGCTCCTCAT
 ATCGGGGGGGAGGCTGGGAGCTCACATGCCCGGCCCGGCCCTCACCCTCATCTTCGACCGCCATCCCATCG
 CCGCCCTCCTGTGTACCCGGCCGCGGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTCTGT
 GGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTTGGGGGCCCTTCCGGAGGACAGACACATCGAC
 CGCTGGCCAAACGCCAGCGCCCGCGGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTTCGCCGCTTTACG
 GGCTGCTTGCCAATACGGTGCGGTATCTGCAGGGCGGCGGGTCTGTCGGGGAGGATTGGGGACAGCTTTCCGG
 GACGGCCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACACGTTA
 TTTACCTGTTCGGGCCCCGAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTTTGCTGGGCCTTGG
 ACGTCTTGCCAAACGCCCTCCGTCCCATGCAGCTTTTATCCTGGATTACGACCAATCGCCCGCGGCTGCCG
 GGACGCCCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTACCACCCAGGCTCCATACCGACGATC
 TGCGACCTGGCGCGCAGCTTTGCGCGGGAGATGGGGAGGCGAACTGAACTTGTTTATTGCAGCTTATAATG
 GTTACAAATAAGCAATAGCATCACAATTTACAAAAATAAGCATTTTTTTTCACTGCATTCTAGTTGTGGTTT
 GTCCAAACTCATCAATGTATCTGAAGACAATAGCAG

58. Full sequence of p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 1_NLS
 (p3EL_HCVA_SD1_NLS)

CGATGGAGCGGAGAATGGGCGGAAGTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
 TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCGCTTGGCTGACCGCCCAACGACCCCCGCCCATTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAAACTGCCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTC
 ACGGGGATTTCGAAGTCTCCACCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTT
 CCAAAATGTCGTAACAACCTCCGCCCATTTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTTAGTGAACCGTCAGATCGCTAGCCTGGAAAAAAGGGAAAAAAGTAGCCCCGGCAACAGTT
 CCTTTATACAAAATTCACCAGATGATACAAAACATATTTTTTTAGCCGGGAAGCGCCGAATCGATCGTGATCTA
 AAGATCCTCTACACCAACAAAATTTATTATGTTTATTAACTGACGATCGAATGGTACCTGTCCACTTTCTTTT
 TTGATCCTTATATTCTGTGCCCCCTTTTCTTCTCTCCACAGTGGACATTTCCGGTAATTCTCCACCTCTCT
 AAACCTAAATTAATTTTTCTTCTCTAAACCTCTTTCTAGTTCTCAAGCTTTTCATTTTTTGTCTTTTTTTAA
 CCTGGGCCTGGGCCTGGGTACTAACACGATCGTTTTTTTTCCCTTTTTTCCAGGGAAGCGGAGCTACTAACTT
 CAGCTGCTGAAGCAGGCTGGAGACGTGGAGGAGAACCCTGGGCCTGCTTCGTACCCCTGCCATCAACACGCG
 TCTGCGTTCGACCAGGCGGCGGATCACGGGACACAGCAACCGACGGACGGCGTTGCGCCCTCGCCGGCAGC

AAGAAGCCACGGAAGTCCGCCCCGAGCAGAAAAATGCCACGCTACTGCGGGTTTATATAGACGGTCCCCACGG
 GATGGGGAAAAACCAACACCACTGCTGGTGGCCCTGGGTTTCGCGCGACGATATCGTCTACGTACCCGAG
 CCGATGACTTACTGGCGGGTGTGGGGGCTTCCGAGACAATCGCGAACATCTACACCACACAACACCGCCTCG
 ACCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAACTGGGCTTGTGAGACAGAGACG
 ACTCTTGGCTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTCTCTCCACAGGGTGAAT
 ATCGGCGCGGGACGCGGGCGGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCCTTATGCCGTGACCGAC
 GCGGTTCTGGCTCCTCATATCGGGGGGAGGCTGGGAGCTCACATGCCCCGCCCCCGGCCCTCACCTCATCT
 TCGACCGCCATCCCATCGCGCCCTCCTGTGCTACCCGGCGCGCGATACCTTATGGGAGCATGACCCCCCA
 GGCGTGTGGGCTTCGTGGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGGGCCCTTCCG
 GAGGACAGACATCGACCGCTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCG
 CGATTGCGCCGCTTACGGGCTGCTTGCCAAATACGGTGCCTGATCTGCAGGGCGCGGGTCTGTGGCGGGAGGA
 TTGGGGACAGCTTTCGGGGACGGCCGTGCCGCCACAGGTTGCCGAGCCCCAGAGCAACCGGGGCCACGACCC
 CATATCGGGACACGTTATTTACCTGTTCGGGCCCCGAGTTGCTGGCCCCAACGGCGACCTGTATAACG
 TGTTTGCTGGGCTTGGACGCTTGGCCAAACGCTCCGTCCCATGCACGCTTTATCTTGATTACGACCA
 ATCGCCCGCGGCTGCGGGAGCGCCCTGCTGCACTTACCTCCGGGATGGTCCAGACCCAGTCACCAACCCCA
 GGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTTGCGCGGGAGATGGGGGAGGCGAACTGAAACTTGT
 TTATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACT
 GCATTCTAGTTGTGGTTTGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

59. Full RNA sequence of p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain

1_NLS or p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 1:

UCAGAUCCUAGCCUGGAAAAAAGGGAAAAAAGUAGCCCCGGCAACAGUCCUUUAUACAAAUACACCAU
 GAUACAAAACAUUUUUUUUAGCCGGGAAGCGCGAAUUGAUCGUGAUCUAAAGAUCCUCUACCAACAAAA
 UUAUUUUGUUUAUUAACUGACGAUCGAUUGGUACUGUCCACUUUCUUUCUUGAUCCUUUAUUCUGUGCC
 CCUUUUCUUCUCCCCACAGUGGACAUUUCGGUAAUUCUCCACCUCUCUAAACUAAAUUAAUUUUUCUUC
 UCUAAACUCUUUCUAGUUUUCGCUUUAUUUUGUCUUUUUUUAACCUGGGCCUGGGCCUGGGUACU
 AACAcgaUcgUUUUUUUCCUUUUUUUCCAGGGAAGCGGAGCUACUACUUCAGCCUGUGAAGCAGGCUGGA
 GACGUGGAGGAGAACCUGGGCCUGCUUCGUACCCUGCCAUCAACACGCGUCUGCGUUCGACCAGGCGGCGC
 GAUCACGGGGACACAGCAACCGACGGACGGCGUUGCGCCUCGCGGCGAGCAAGAAGCCACGGAAAGUCCGCC
 GGAGCAGAAAAUGCCACGCUACUGCGGGUUUAUUAUAGACGGUCCCCACGGGAUGGGGAAACCACCAACAG
 CAACUGCUGGUGGCCCUGGGUUCGCGCGACGAUUCGUACGUACCCGAGCCGAUGACUUAUGGCGGGUGC
 UGGGGGCUUCCGAGACAAUCGCGAACAUCAACACACACACCGCCUCGACCAGGUAAGUAUCAAGGUUAC
 AAGACAGGUUAAGGAGACCAUAGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCA
 CCUAUUGGUCUUAUGACAUCCACUUUGCCUUUCUCCACAGGGUGAGAUUACGGCCGGGGACGCGGCGGUG
 GUAAUGACAAGCGCCCAUAUAAAUUGGGCAUGCCUUAUGCCGUGACCGACGCCGUUCUGGCUCUUAUUCG
 GGGGGAGGCUUGGAGCUCACAUCCCCGCCCCGGCCUCACCCUACUUCGACCGCAUCCAUUGCCGC
 CCUCCUGUGCUACCCGGCCGCGCAUACCUUAUGGGCAGCAUGACCCCCAGGCCGUGCUGGCGUUCUGGGCC
 CUCAUCCCGCCGACCUUGCCCGGCACAAACAUUGUUGGGGGCCUUCGAGGACAGACACAUUGACCGCC
 UGGCCAAACGCCAGCGCCCCGGCGAGCGGCUUGACUGGCUAUGCUGGCCGCGGAUUCGCCGCUUUAACGGCU
 GCUUGCCAAUACGGUUGCGGUACUGCAGGGCGGGGUCGUGGCGGGAGGAUUGGGGACAGCUUUCGGGACG
 GCGGUGCCGCCACAGGUGCCGAGCCCCAGAGCAACGCGGGGCCACGACCCCAUACGGGGACAGCUUAUUUA
 CCCUGUUUCGGCCCCCGAGUUGCUGGCCCCCAACGCGGACCUGUAUAACGUGUUUGCCUGGGCCUUGGACGU
 CUUGGCCAAACGCCUCCGUCUCCAUAGCAGCUCUUUAUCCUGGAUUAACGACCAUUCGCCCGCCGCGUGCCGGGAC
 GCCCUGCUGCAACUUAACUCCGGGAUGGUCCAGACCCAGCUCACCACCCAGGCUCUUAACGACGACUUGCG
 ACCUGGCGCGCACGUUUGCGCGGGAGAUUGGGGAGGCGAACUGAAACUUGUUUAUUGCAGCUUAUAUUGGUUA
 CAAAUAAAGCAAUAGCAUCACAAAUUUCACAAAUAAAGCAUUUUUUUACUGC

60. Full sequence of p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 1_GFP:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACCTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTCACGGGGATTTCCAAGTCT
 CCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC

TCCGCCCATTTGACGCAAATGGGCGGTAGGCGGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTAGTGA
 ACCGTGATCGCTAGCCTGGAAAAAAGGGAAAAAAGTAGCCCGGCAACAGTTCCCTTTAATAAAAATTCACC
 AGATGATACAAAACATATTTTTTTAGCCGGGAAGCGCCGAATCGATCGTGATCTAAAGATCCCTCTACACCAAC
 AAAATTATATGTTTATTAAGTGAACGATCGAATGGTACCTGTCCACTTTCTTTCTTGATCCCTATATTCCTG
 TGGCCCTTTTCCCTCCCTCCCCACAGTGGACATTTCCGGTAATTCTCCACCTCTCTAAACCTAAATTAATTTT
 CTTCTCTAAACCTCTTTCCCTAGTTCTCAGGCTTTTCATTTTTTGTCTTTTTTTAAACCTGGGCTGGGCTGGG
 TACTAACACGATCGTTTTTTTTCCCTTTTTTTCCAGGAAGCGGAGCTACTAACTTCAGCCTGCTGAAGCAGGC
 TGGAGACGTGGAGGAGAACCCTGGGCTCCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGA
 GACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCCTTTCTGATAGGCACCTATTGGTCTTACTG
 ACATCCACTTTGCCCTTCTCTCCACAGATCGAGTGCCGCATCACCGGCACCTGAACGGCGTGGAGTTCGAGC
 TGGTGGGCGCGGAGAGGGCACCCCGAGCAGGGCCGCATGACCAACAAGATGAAGAGCACCAGGGCGCCCT
 GACCTTCAGCCCTACCTGCTGAGCCACGTGATGGGCTACGGCTTCTACCCTTCGGCACCTACCCAGCGGC
 TACGAGAACCCTTCTGTCACGCCATCAACAACGGCGGCTACACCAACACCCGCATCGAGAAGTACGAGGACG
 GCGCGTGTGTCACGTGAGCTTCAGCTACCGCTACGAGGCCGCGCGCTGATCGGCGACTTCAAGGTGGTGGG
 CACCGCTTCCCGAGGACAGCGTGATCTTACCAGCAAGATCATCCGACGCAACGCCACCGTGGAGCAGCTG
 CACCCCATGGCGATAACGTGCTGGTGGGCGGCTTCCCGCACCTTCAGCCTGCGCGGCGGCTACTACA
 GCTTCGTGGTGGACAGCCACATGCACCTCAAGAGCGCCATCCACCCAGCATCCTGCAGAACGGGGGCCCCAT
 GTTCGCCCTCCGCGCGTGGAGGAGCTGCACAGCAACCCGAGCTGGGCATCGTGGAGTACCAGCACGCTTC
 AAGACCCCATCGCCTTCGCCAGATCTCGAGCTCGATGAACTTGTATTATGCAGCTTATAATGGTTACAAAT
 AAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTCAGTGCATTCTAGTTGTGGTTTGTCCAACT
 CATCAATGTATCTGAAGACAATAGCAG

61. Full sequence of p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain

1 GFP NLS:

CGATGGAGCGGAGAATGGGCGGAACCTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGAGCCTGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGAGCCTGGGACTTTCCACACCTTAAC
 TGACACACATTTCCACAGCAGTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATTTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAACTGCCCACTTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAATGGCCCGCTGGCATTATGCCAGTACATGACCTTATGGGACTTTCTTACTTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
 ACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTT
 CCAAAATGTCGTAACAACCTCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTAGTGAACCGTCAGATCGCTAGCCTGGAAAAAAGGGAAAAAAGTAGCCCGGCAACAGTT
 CCTTTATACAAATTCACAGATGATACAAAACATATTTTTTTAGCCGGGAAGCGCCGAATCGATCGTGATCTA
 AAGATCCTCTACACCAACAAATTTATTATGTTTATTAAGTGAACCTGACGATCGAATGGTACCTGTCCACTTTCTTTT
 TTGATCCCTTATATTCCTGTGCCCTTTTCCCTCCCTCCCCACAGTGGACATTTCCGGTAATTCTCCACCTCTCT
 AAACCTAAATTAATTTTTCTTCTCTAAACCTCTTTCCCTAGTTCTCAGGCTTTTCATTTTTTGTCTTTTTTTAA
 CCTGGGCTGGGCTGGGTACTAACACGATCGTTTTTTTCCCTTTTTTTCCAGGAAGCGGAGCTACTAACTT
 CAGCCTGCTGAAGCAGGCTGGAGACGTGGAGGAGAACCCTGGGCTCCCGCCATGAAGGTAAGTATCAAGGTT
 ACAAGACAGGTTTAAGGAGACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCCTTTCTGATAGG
 CACCTATTGGTCTTACTGACATCCACTTTGCCCTTCTCTCCACAGATCGAGTGCCGCATCACCGGCACCTGA
 ACGCGTGGAGTTTCGAGCTGGTGGGCGGCGGAGAGGGCACCCCGAGCAGGGCCGCATGACCAACAAGATGAA
 GAGACCAAGGCGCCCTGACCTTCAGCCCTACCTGCTGAGCCACGTGATGGCTACGGCTTCTACCCTTC
 GGCACCTACCCAGCGGCTACGAGAACCCTTCCCTGCACGCCATCAACAACGGCGGCTACACCAACACCCGCA
 TCGAGAAGTCCGAGGACGGCGGCGTGTGCACGTGAGCTTCAGCTACCGCTACGAGGCCGCGCGTGATCGG
 CGACTTCAAGGTGGTGGGACCGGCTTCCCGAGGACAGCGTGATCTTACCAGACAAGATCATCCGACGCAAC
 GCCACCGTGGAGCACCTGCACCCCATGGGCGATAACGTGCTGGTGGGCGAGCTTCCGCGCACCTTCAGCCTGC
 GCGACGGCGGCTACTACAGCTTCTGGTGGACAGCCACATGCACCTTCAAGAGCGCCATCCACCCAGCATCCT
 GCAGAACGGGGGCCCCATGTTCCGCTTCCGCGCGTGGAGGAGCTGCACAGCAACACCGAGCTGGGCATCGTG
 GAGTACCAGCACGCTTCAAGACCCCATCGCCTTCGCCAGATCTCGAGCTCGATGAACTTGTATTATGCAG
 CTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTCAGTGCATTCTAG
 TTGTGGTTTGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

62. Full RNA sequence of p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain

1_GFP_NLS or p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 1_GFP:

UCAGAUCCGUAGCCUGGAAAAAAGGGAAAAAAGUAGCCCCGGCAACAGUCCUUUUUACAAAUUCACCCAGAU
GAUACAAAACAUAUUUUUUUAGCCGGGAAGCGCCGAAUUCGAUCGUGAUUCUAAAAGAUCCUACACCAACAAAA
UUAUUUAUGUUAUUAUAAACUGAGCAUCGAAUGGUACCGUCCACUUUCUUUCUUGAUCCUUAUUAUCCUGUGCC
CCUUUUCUUCCUCCCCACAGUGGACAUUCCGGUAAUUCUCCACCUCUCUAAACCUAAAUAUUUUUUUCUUC
UCUAAACCUCUUUCCUAGUUCGCGAGGCUUUUUAUUUUUUUAACCUGGGCCUGGGCCUGGGUACU
AACACGAUCGUUUUUUUUCCUUUUUUUCCAGGGAAGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUGGA
GACGUGGAGGAGAACCUGGGCCUCCCGCCAUGAAGGUAAGUAUCAAGGUUACAAGACAGGUUAAGGAGACC
AAUAGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUACUGACAU
CCACUUUGCCUUUCUCCACAGAUCGAGUGCCGAUCACCCGGCACCCUGAACGGCGUGGAGUUCGAGCUGGU
GGGCGGCGGAGAGGGCACCCCGAGCAGGGCCGCAUGACCAACAAGAUGAAGAGCACCAAGGGCGCCUGACC
UUCAGCCCCUACCUGCUGAGCCACGUGAUGGGCUACGGCUUCUACCACUUCGGCACCUACCCAGCGGCUACG
AGAACCCCUCCUGCAGCACAACAACGGCGGCUACACCAACACCCGCAUCGAGAAGUACGAGGACGGCGG
CGUGCUGCAGCUGAGCUUACGCUACCGCUACGAGGCCGGCCGCGUGAUCGGCGACUUAAGGUGGUGGGCACC
GGCUUCCCCGAGGACAGCGUGAUCUACCGACAAGAUAUCCGCAGCAACGCCACCGUGGAGCACCUGCACC
CCAUGGGCGAUAAACGUGCUGGUGGGCAGCUUCGCCCGCACCUUACAGCCUGCGCGACGGCGGCUACUACAGCUU
CGUGGUGGACAGCCACAUGCACUUAAGAGCGCAUCCACCCAGCAUCCUGCAGAACGGGGGCCCCAUGUUC
GCCUUCGCCCGCGUGGAGGAGCUGCACAGCAACACCGAGCUGGGCAUCGUGGAGUACCAGCACGCCUUAAGA
CCCCCAUCGCCUUCGCCAGAUCUCGAGCUCGAUGAAACUUGUUUAUUGCAGCUUAUAAUGGUUACAAAUAAG
CAUAGCAUCACAAAUUUCACAAUAAAGCAUUUUUUUACUGC

63. Full sequence p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 2:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTTCATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTTG
CATTATGCCAGTACATGACCTTATGGGACTTTCCCTACTTGGCAGTACATCTACGTATTAGTCATCTATTATTA
CCATGGTGATGCCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
CCACCCCATTTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
TCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTAGTG
ACCGTCAGATCGCTAGCCCTGGAAAAAAGGGAAAGTAGCCCGGCAACAGTTCCCTTTATACAAATTCACCAATG
ATACAAAACATATTTTTTTAGCCGAAAAACGATCGTCGATCGTGATCTAAAGATCCCTCTACACCAACAAAATT
ATTATGTTTATTAATACTGACGATCGAATGGTACCTGTCCACTTTCTTTCTTGATCCTTATATTCCTGTGCCCC
TTTTCTTCTCTCCCAAGTGGACATTTCCGGTAAATCTCCACCTCTCTAAACCTAAATTAATTTCTTCTC
TAAACCTCTTTCTAGTTCTCTAGGCTTTTCATTTTGTCTTTTTTAACCTGGGCCCTGGGCTGGGTACTAA
CACGATCGTTTTTTTCCCTTTTTTCCAGGGAAGCGGAGCTACTAATTCAGCCTGCTGAAGCAGGCTGGAGA
CGTGGAGGAGAACCCTGGGCTGCTTCGTACCCCTGCCATCAACACGCGTCTGCGTTTCGACAGGCGCGCGA
TCACGGGGACACAGCAACCGACGACGGCGTTGCGCCCTCGCCGCGAGCAAGAAGCCAGGAAGTCCGCCCCG
AGCAGAAAATGCCACGCTACTGCGGGTTTTATATAGACGGTCCCCACGGGATGGGGAAAAACCACCACACGCA
ACTGCTGGTGGCCCTGGGTTCGCGCGACGATATCGTCTACGTACCCGAGCCGATGACTTACTGGCGGGTGTG
GGGGCTTCCGAGACAATCGCGAACATCTACACCACACAACACCGCCTCGACCAGGTAAGTATCAAGGTTACAA
GACAGGTTTAAGGAGACCAATAGAAACTGGGCTTGTCGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACC
TATTGGTCTTACTGACATCCACTTTGCCCTTCTCTCCACAGGGTGAGATATCGGCCGGGGACCGCGCGGTGGT
AATGACAAGCGCCAGATAACAATGGGCATGCCCTATGCCGTGACCGACGCGCTTCGGCTCCTCATATCGGG
GGGGAGGCTGGGAGCTCATATGCCCGCCCCCGGCCCTCACCTCATCTTCGACCGCCATCCCATCGCCGCC
TCTGTGCTACCCGGCGCGCGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGGCTTCGTGGCCCT
CATCCCGCGACCTTGCCCGGCACAAACATCGTGTGGGGGCCCTTCCGGAGGACAGACACATCGACCGCCTG
GCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTTCGCCGCTTTACGGGCTGC
TTGCCAATACGGTGCGGTATCTGCAGGGCGGCGGGTCTGGCGGGAGGATTGGGGACAGCTTTCCGGGACGGC
CGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACAGCTTATTTACC
CTGTTTCGGGCCCCGAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTTTGCCTGGGCTTGGACGTCT
TGGCCAAACGCTCCGTCCCATGCAGTCTTTATCCTGGATTACGACCAATCGCCCGCGCTGCCGGGACGC
CCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTCAACACCCAGGCTCCATACCGACGATCTGCGAC
CTGGCGCGCAGCTTTGCGCGGGAGATGGGGGAGGCGAAGTGAACCTGTTTATTGCAGCTTATAATGGTTACA

64. Full sequence p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 2_NLS:

CGATCGAGCGGAGAATGGGCGGAACTGGGCGGAGTTAGGGGCGCGATGGGCGGAGTTAGGGGCGGCGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATAT
ATGGAGTTCGCGCTTACATAAATTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATT
ACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTGGCATTATGCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATACG
TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATACGGGTTTGACTC
ACGGGGATTTCGAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAACCTCCGCCCCATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATA
GCAGAGCTGGTTTTAGTGAACCGTCAGATCGCTAGCCTGGAAAAAAGGGAAGTAGCCCGGCAACAGTTCCTTT
ATACAAAATTCACCAGATGATACAAAACATATTTTTTTTAGCCGAAAAACGATCGTCGATCGTGATCTAAAGATC
CTCTACACCAACAAAATTAATATGTTTATTAAACTGACGATCGAATGGTACCTGTCCACTTCTCTTCTTGATC
CTTATATTCTGTGCCCCCTTTTCTCTCTCTCCACAGTGGACATTTCCGGTAATTCTCCACCTCTCTAAACCT
AAATTAATTTTTCTTCTCTAAACCTCTTCTCTAGTTTCTCTGCTTTTTCATTTTTTGCTTTTTTTTAACTGGG
CCTGGGCTTGGGTATACACGATCGTTTTTTTTTCTTTTTTTTCCAGGAAGCGGAGCTACTAATCTCAGCTC
CTGGAACGAGGCTGGAGACGTGGAGGAGAACCCTGGGCTCGTTCGTACCCCTGCCATCAACACGCGTCTGCG
TTCGACGAGGCGGCGCGATCACGGGGACACAGCAACCGACGCGACGGCGTTGCGCCCTCGCCGCGCAGCAAGAAG
CCACGGAAGTCCGCCCGGAGCAGAAAAATGCCACGCTACTGCGGGTTTTATATAGACGGTCCCCACGGGATGGG
GAAAACCACCACCACGCAACTGCTGGTGGCCCTGGGTTGCGCGCAGCATATCGTCTACGTACCCGAGCCGATG
ACTTACTTGGCGGGTGTGTTGGGGCTTCCGAGACAATCGCGAACATCTACACCACACAACACCGCCTCGACCAGG
TAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAACTGGGCTTGTCGAGACAGAGACGACTCTT
GCGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCTTTTTCTCTCCACAGGGTGAGATATCGGC
CGGGGACGCGGGGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCCGTGACCGACGCCGT
CTGGCTCTCATATCGGGGGGGAGGCTGGGAGCTACATGCCCGCCCCCGGCCCTCACCTCTTCCG
GCCATCCCATCGCCCGCTTCTGCTACCGCGCCGCGCATACCTTATGGGAGCATGACCCCCAGGCCGT
CTGGCGTTCTGTTGGCCCTCATCCCGCCGACCTTGCCCGGACAAACATCGTGTGGGGGCCCTTCCGGAGGAC
AGACACATCGACCGCTTGCCAAACGCCAGCGCCCCGCGCAGCGGCTTGACCTGGCTATGCTGGCCGCGATT
GCCGCGTTTTACGGGCTGCTTGCCAAATACGGTGCGGTATCTGCAGGGCGCGGGTCTGTCGGGGAGGATTGGG
ACAGCTTTTGGGGACGGCGTGGCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGGCCACGACCCCATAT
GGGACACGTTATTTACCTGTTTTCGGGCCCCGAGTTGCTGCCCCCAACGGCGACCTGTATAACGTGTTTG
CCTGGGCGCTTGGACGTCTTGCCAAACGCCTCCGTCCCATGCACGTCTTTATCTTGATTACGACCAATCGCC
CGCCGGCTGCGGGGACGCCCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTCAACACCCAGGCTCC
ATACCGAGATCTGCGACCTGGCGCGCACGTTTGCGCGGGAGATGGGGGAGGCGAACGAACTTGTATTATG
CAGCTTATAATGTTTACAAATAAAGCAATAGCATCAGAAATTCACAAATAAAGCATTTTTTCACTGCATTC
TAGTTGTGGTTTTGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

[illegible]

GGUCUUACUGACAUCCACUUUGCCUUUCUCUCCACAGGGUGAGAUUUCGGCCGGGGACGCGCGGGUGGUAUUG
 ACAAGCGCCAGAUAAUUGGGCAUGCCUUUUGCCGUGACCGACCGCUUCUGGCUCCUAUUCGGGGGGG
 AGGCUUGGAGCUCACAUAGCCCCGCCCCCGGCCUCACCCUCAUCUUCGACCGCCAUCCCAUCCGCCGCCUCCU
 GUGCUACCCGGCCGCGCGAUACCUUUGGGCAGCAUGACCCCCAGGCCGUGCUGGCGUUCUGGGCCUCAUC
 CCGCCGACCUUGCCCGGCACAAACAUUGUUGGGGGCCUUCGGAGGACAGACACAUCGACCGCCUGGCCA
 AACGCCAGCGCCCCGGCGAGCGGCUUGACCUGGCUAUGCUGGCCGCGAUUCGCCGCUUACGGGCUGCUUGC
 CAUACGGUGCGGUUUCUGCAGGGCGGGCGGUGCUGGCGGGAGGAUUGGGGACAGCUUUCGGGGACGGCCGUG
 CCGCCCCAGGGUGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCAUUCGGGGACAGCUUUAUUUACCCUGU
 UUCGGGCCCCGAGUUGCUGGCCCCAACGGCGACCUGUAUACGUGUUGCCUGGGCCUUGGACGUCUUGGC
 CAAACGCCUCCGUCCCAUGCAGGUCUUAUCCUGGAUUAACGACCAUUCGCCCGCCGGCUGCCGGGACGCCCCG
 CUGCAACUUAUCCCGGAUGGUCCAGACCCACGUCACCACCCAGGCUCCAUACCGACGAUCUGCGACCUGG
 CGCGCACGUUUGCGCGGGAGAUGGGGGAGGCGAACUGAAACUUGUUUAUUGCAGCUUAUAAUGGUUACAAUA
 AAGCAUAGCAUCACAAUUAUACAAUAAAGCAUUAUUUUCACUGC

66. Full sequence p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 2_GFP:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCTGAACAAC
 TCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCCCTAGCCTGGAAAAAAGGGAAGTAGCCCGGCAACAGTTCCCTTATACAAAATTCACCAGATG
 ATACAAAACATATTTTTTTAGCCGAAAAACGATCGTGCATCGTGATCTAAAGATCCCTTACACCAACAAAATT
 ATTATGTTTTATTAAACGTGACGATCGAATGGTACCTGTCCACTTTCTTTCTTGATCCCTTATATCCCTGTGCCCC
 TTTTCCCTTCCCTCCCAAGTGGACATTTCCGGTAATTCTCCACCTCTCTAAACCTAAATTTAAATTTTCTTCTC
 TAAACCTCTTTCTTAGTTTCTGCTTTTCTTTTAACTTGGGCTGGGCTGGGTACTAA
 CACGATCGTTTTTTTCCCTTTTTTTCCAGGGAAGCGGAGCTACTAATTCAGCCTGCTGAAGCAGGCTGGAGA
 CGTGGAGGAGAACCCTGGGCTCCCGCCATGAAGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAA
 TAGAACTGGGCTTGTCGAGACAGAGACGACTCTTCGCTTTCTGATAGGCACCTATTGGTCTTACTGACATCC
 ACTTTGCCCTTCTCTCCACAGATCGAGTGCCGCATCACCGGCACCTGAACGGCGTGGAGTTCGAGCTGGTGG
 GCGGCGGAGAGGGCACCCCGAGCAGGGCCGCATGACCAACAAGATGAAGAGCACCAAGGCGCCCTGACCTT
 CAGCCCCTACCTGCTGAGCCACGTGATGGGTACGGCTTCTACCACTTCGGCACCCTACCCAGCGGCTACGAG
 AACCCCTTCTGACGCCATCAACAACGGCGGTACACCAACACCCGCATCGAGAAGTACGAGGACGGCGGGCG
 TGCTGCAGCTGAGCTTCAGCTACCGTACGAGCGCGCCGCGTGATCGGCGACTTCAAGGTGGTGGGACCCGG
 CTTCCCGGAGGACAGCGTGATCTTCCACGACAAGATCATCCGCAGCAACGCCACCGTGGAGCACCTGCACCCC
 ATGGGCGATAACGTGCTGGTGGGACGTTCCGCCGACCTTCAGCCTGCGCGACGGCGGCTACTACAGCTTCG
 TGGTGGACAGCCACATGCACTTCAAGAGCGCCATCCACCCAGCATCTGCAGAACGGGGGCCCCATGTTTCGC
 CTTCCGCCGCTGGAGGAGCTGCACAGCAACACCGAGCTGGGCATCGTGAGTACCAGCACGCTTCAAGACC
 CCCATCGCTTCGCCAGATCTCGAGCTCGATGAACTTGTTTATTGACGCTTATAATGGTTACAAATAAAGCA
 ATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCACTTCTAGTTGTGGTTTTGTCCAAACTCATCAA
 TGTATCTGAAGACAATAGCAG

67. Full sequence p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 2_GFP-NLS:

CGATGGAGCGGAGAATGGCCGGAAGTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACCTTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACCTTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTTAAC
 TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGTGCGGTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTC
 ACGGGGATTTCCAAGTCTCCACCCCATGACGTCAATGGGAGTTTGTGTTTTGGCACCAAAATCAACGGGACTTT
 CCAAAATGTCGTAACAACCTCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA

68. Full RNA sequence of p3EL_HCCA2+CD24+VEGF+AFP_Safety Domain 2 GFP and p3EL HCCA2+CD24+VEGF+AFP Safety Domain 2 GFP NLS:

Targeting GGT+GPC3+TERT+AFP+TGF- β 1

GCCTAGCCGTAGCCCGGCGGTAGATAGATAGATAGGAAGAAATAAGTAAGAATAACAAGCAAACAACAAA
ACCGCCGGGAAGCGCCGAATGATCGTTTCTCTTTCCATTGCTCTTTAACCTAATTTCTGTGTCCAAT
TATTCCCTTCCCCGATCAATCCTGTCCACC AAAATTCCCATCTTAACCACCTTTCTCTTTACACTTECTT
AAFCATTTTG CATGTTTTCTCTCCAGATG GTGGACAACCTCTCTAAACCTAAATIAAATTTTCTTC
TCTAAACCTCTTTTCTAGTTTCTCCCGCGCAATTCGGTCTCTCTTATCTTCTAACAATCCTATCTTATT
CTGTCTGTCCCCACCTGT

72. Spacer14: CGATCAATCCTGTCCACC

73. Spacer15: GTGGACA
 74. Spacer16: TCTCCCGCGC
 75. BD-GGT:

TAGATAGATAGATAGGAAGAAATAAGTAAGAATAACAAGCAAACAACAAAA

76. BD-GPC3:
 TTCTCTTTCCATTGCTCTTTAACCTAATTTCCTGTGTCCAATTATTCCCTTCCC
 77. BD-TERT:
 AAATTCCTCATCTTACCACCTTTTCCTTTTACACTTCTTAATCATTTTGCATGTTTTCTCTCTCCAGAT
 G
 78. BD-AFP: ACCTCTCTAAACCTAAATTAATTTTCTTCTCTAAACCTCTTTCTAGTT
 79. BD-TGF- β 1:
 AATTCGGTCTCTCTTATCTTCTAACATCCTATCTTATTCGTCTGTCCCCACCTGT
 80. Full sequence of p3EL_GGT+GPC3+TERT+AFP+TGF- β 1 (p3EL_GGTAT):

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTCCAAGTCT
 CCACCCCATTGACGTCAATGGGAGTTTTGTTTTGGCACC AAAATCAACGGGACTTTCCAAAATGTCTGTAACAAC
 TCCGCCCCATTGACGCAAAATGGGCGGTAGGCGGTGACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCCTAGCGTAGCCCGGCGGTAGATAGATAGATAGGAAGAAATAAGTAAGAATAACAAGCAAAC
 AACAAAACCGCCGGGAAGCGCCGAATGATCGTTCTCTTTCCATTGCTCTTTAACCTAAATTCCTGTGTCCAA
 TTATTCCTCTCCCGCATCAATCCTGTCCACC AAAATTCCTCTTTTACCACTTTTCTCTTTTACACTTTCTTAATC
 ATTTTGCATGTTTTCTCTCTCCAGATGGTGGACAACCTCTCTAAACCTAAATTAATTTTCTCTCTAAACCT
 CTTTCTAGTTTCTCTCCGCGCAATTCGGTCTCTCTTATCTTCTAACATCCTATCTTATTCTGTCTGTCCCCAC
 CTGTGCTTTTCAATTTTTGTCTTTTTTTAACTGGGCGTGGGCTGGGTACTAACACGATCGTTTTTTT
 TCCCTTTTTTTTCCAGGGAAGCGGAGCTACTAATTCAGCCTGCTGAAGCAGGCTGGAGACGTGGAGGAGAACC
 CTGGGCGTCTTCTGACCCCTGCCATCAACACGCGTCTGCGTTTCGACCAGGCGGCGCATCACGGGGACACAG
 CAACCGACGACGGCGTTGCGCCCTCGCCGGCAGCAAGAAGCCACGGAAGTCCGCCCGGACGAGAAAATGCC
 ACGCTACTGCGGGTTTATATAGACGGTCCCCACGGGATGGGGAAAACCACCACCACGCAACTGCTGGTGGCCC
 TGGGTTTCGCGGACGATATCGTCTACGTACCCGAGCCGATGACTTACTGGCGGGTGTGGGGGCTTCCGAGAC
 AATCGGAACATCTACACCACACAACACCGCCTCGACCAGGTAAGTATCAAGTTACAAGACAGGTTTAAGGA
 GACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACCTATTGGTCTTACTG
 ACATCCACTTTTGCTTTTCTCTCCAGGGTGAGATATCGGCCGGGGACGCGGCGGTGGTAATGACAAGCGCCC
 AGATAACAATGGGCATGCCTTATGCCGTGACCGACGCCGTTCTGGCTCCTCATATCGGGGGGAGGCTGGGAG
 CTCACATGCCCCGCCCCGCGCCCTACCCCTCATCTCGACCGCCATCCCATCGCCGCCCTCTGTGCTACCCG
 GCCGCGGATACCTTATGGGCAGCATGACCCCCAGGCGGTGCTGGCGTTCTGTGGCCCTCATCCCGCCGACCT
 TGCCCGGCACAAACATCGTGTGGGGGCCCTTCCGAGGACAGACACATCGACCGCTGGCCAAACGCCAGCG
 CCCC GGCGACGGCTTGACCTGGCTATGCTGGCCGCGATTGCGCGCGTTTACGGGCTGCTTGCCAATACGGTG
 CGGTATCTGCAGGGCGGCGGGTCTGTGGCGGGAGGATTGGGGACAGCTTTCGGGGACGGCGTGCCGCCCCAGG
 GTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACACGTTATTTACCTGTTCGGGCCCC
 CGAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTTGCTTGGGCTTGGACGCTTGGCCAAACGCCTC
 CGTCCCATGCACGTCTTTATCTGGATTACGACCAATCGCCCGCGGCTGCCGGGACGCGCTGCTGCAACTTA
 CCTCCGGGATGGTCCAGACCCACGTCACCACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTT
 TGCGCGGGAGATGGGGGAGGCGAACTGAACTTGTATTGTCAGCTTATAATGGTTACAAATAAAGCAATAGC
 ATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTAT
 CTGAAGACAATAGCAG

81. Full sequence of p3EL_GGT+GPC3+TERT+AFP+TGF-
 β 1_NLS (p3EL_GGTAT_NLS):

CGATGGAGCGGAGAATGGGCGGAAC TGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGGAGCCTGGGGACTTTCACACCTGGT

TGCTGAGCTAAATTGAGATGCATGCTTTGTCATACTTTCGCCGTGCTGGGGAGCCTGGGGACTTTCCACACCCCTAAC
TGACACACATTCCACAGCAGCTAGTTAGTTATTAATAGTAATCAATTACGGGGTCAATTAGTTCATAGCCCATAT
ATGGAGTTCGCGCTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATTTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGAAGTTCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCACCTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGAGCTTTCCCTACTTGGCAGTACATCTACG
TATTAGTCAATCCGATATTACCATGGTGTATGCGGTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACT
ACGGGGATTTCCTCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTT
C AAAAATGTTCGTAACAACATCCGCCCCATTGACGCAAAATGGGCGGTAGGCGGTACGTTACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTAGTGAACCGTCAGATCGCTAGCGTAGCCCGGCGGTAGATAGATAGATAGGAAGAAATAAG
TAAGAATAACAAGCAAAACAACAAAACCGCCGGGAAGCGCCGAATGATCGTTTCTCTTTCCATTGCTCTTTAAC
CTAATTTCTGTGTCCAAATTAATCCCTTCCCGGATCAATCCTGTCCACCAAAATTCCTCATCTTACCACCTTTTCC
TTTACACTTTCTTAATCATTTTCATGTTTCTTCTTCCAGATGGTGGACAACCTCTCTAAACCTAAATTAA
ATTTTCTTCTCTAAACCTCTTTCCCTAGTTTCTCCCGCGCAATTCGGTCTCTCTTATCTTCTAAACATCCTATCT
TATTCGTGTGTGTCCCAACCTGTTCGAGTCTTTTCATTTTTTTGCTTTTTTTAACCTGGGCCGTTGGGCTGGGTA
CTAACACGATCGTTTTTTTTCCCTTTTTTCCAGGGAAGCGGAGCTACTAACTTACCGCTGCTGAAGCAGGCTG
GAGCGTGGAGGAGAACCCTGGGCGTGCTTCGACCCCTGCCATCAACACGCGTCTGCGTTGCACGAGCGCGC
GCGATCACGGGGACACAGCAACCGCAGGACGCGGTGCGCCCTCGCCGCGCAGCAAGAAGCCACGGAAGTCCGC
CCGGAGCAGAAAAATGCCACGCTACTGCGGGTTTTATATAGACGGTCCCCACGGGATGGGGAAAACCAACCACCA
CGCAACTGCTGGTGGCCCTGGGTTCGCGCGACGATATCGTCTACGTACCCGAGCCGATGACTTACTGGCGGGT
GCTGGGGGCTTCCGAGACAATCGCGAACATCTACACCACACAACACCGCCTCGACCAGGTAAAGTATCAAGGTT
ACAAGACAGGTTTTAAGGAGACCAATAGAAACTGGGCTTGTGAGACAGAGACGACTCTTGCCTTTCTGATAGG
CACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGGCGG
TGGTAATGACAAGCGCCAGATAACAATGGGCGATGCCCTTATGCCGTGACACGACGCGCTTCTGGCTCCTCATAT
CGGGGGGGAGGCTGGGAGCTCACATGCCCCGCCCCGGCCCTCACCTCATCTTGCACCGCCATCCCATCGCC
GCCCTCCTGTGCTACCGCGCCGCGCATACCTTATGGCGAGCATGACCCCCAGGCGGTGCTGGCGTTCTGTG
CCCTCATCCGCGCCGACCTTTGCCCGGCACAAACATCGTGTGGGGGCCCTTCCGGAGGACGACACATCGACCG
CCTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTTCGCCGCGTTTACGGG
CTGCTTGCCAATACGGTGCAGTATCTGACAGGGCGGCGGGTCTGGCGGGAGGATTGGGGACAGCTTTCGGGGA
CGGCCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGCCCCACGACCCCATATCGGGGACAGCTTATT
TACCCTGTTTCGGGGCCCCGAGTTGCTGGCCCCCAACGGCGACCTGTATAACGTGTTTGCCGTTGGGCTTGGAC
GTCTTGGCCAAACGCCTCCGTCCCATGCACGTCTTTATCCTGGATTACGACCAATCGCCCGCCGGCTGCCGGG
ACGCCCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTCACCAACCCAGGCTCCATACCGACGATCTG
CGACCTGGCGCGCACGTTTTCGCGGGAGATGGGGGAGGCGAAGTGAACCTGTTTATTGACGCTTATAATGGT
TACAAATAAAGCAATAGCATACGAAATTCACAAATAAAGCAATTTTTTCACTGCATTCTAGTTGTGTTTGT
CCAAACTCATCAATGTATCTGAAGACAATAGCAG

82. Full RNA sequence of p3EL GGT+GPC3+TERT+AFP+TGF- β 1 or

p3EL GGT+GPC3+TERT+AFP+TGF- β 1 NLS:

UCAGAUCGCUAGCGUAGCCCGCGCGGUAGAUAGAUAGAUAGGAAGAAAUAAGUAAGAAUAACAGCAAAACAACA
AAACCGCCGCGGAAGCGCCGAAUGAUCGUUUCUCUUCUCCAUUGCUCUUAACCUAAAUUCCUGUGUCCAAUUUAU
UCCCUUCCCGGAUCAAUCCUGUCCACCAAAAUUCCCAUCUUAACCAUUFUUCUUAUACACUUCUUAUAUCAUUU
UGCAUGUUFUUCUUCUCCCGAGAUUGUGGACAACCUCUCUAAACCUA AAAUUAUUUUUCUUCUCUAAACCUCUUU
CCUAGUUUCUCCCGCGCAAUUCGGGUCUCUCUUAUCUUCUAACAUCUUAUUCUUAUUCUGUCUGUCCCCACUGU

GCUUUAUUAUUUGUCUUUUUUUAACCUUGGGCCUGGGCCUGGGUACUAACA_{cgaUcg}UUUUUUUCCCUUUUUUU
CCAGGGAAGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUGGAGACGUGGAGGAGAACCCUGG_gCCUGCU
UCGUACCCUGCCAUAACACGCGUCUGCGUUCGACCAGGCGGCGCGAUCACGGGGACACAGCAACCGACGGA
CGGCGUUGCGCCUCGCCGGCAGCAAGAAGCCACGGAAGUCCGCCCGGAGCAGAAAUGCCACGCUACUGCG
GGUUUAUAUAGACGGUCCCAACGGGAUGGGGAAAACCACCACCACGCAACUGCUGGUGGCCUUGGGUUCGCGC
GACGAUAUCGUCUACGUACCCGAGCCGAUGACUUAACUGGCGGGUGCUGGGGGCUUCCGAGACAAUCGCGAACA
UCUACACCACACAACACCGCCUCGACCAGGUAAGUAUCAAGGUUACAAGACAGGUUUAAGGAGACCAUAGAA
ACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUAUCUGACAUCCAUUU
GCCUUUCUCUCCACAGGGUGAGAUUUCGCGCGGGGACGCGCGGUGGUAAUGACAAGCGCCAGAUAAACAUG
GGCAUGCCUUAUGCCGUGACCGACGCGCGUUCUGGCUCUUAUACUGGGGGGGAGGCUGGGAGCUCACAUGCC

83. Full sequence of p3EL GGT+GPC3+TERT+AFP+TGF- β 1 GFP:

84. Full sequence of p3EL GGT+GPC3+TERT+AFP+TGF- β 1 GFP NLS:

35/87

85. Full RNA sequence of p3EL_GGT+GPC3+TERT+AFP+TGF- β 1_GFP or p3EL_GGT+GPC3+TERT+AFP+TGF- β 1_GFP NLS:

Targeting HBV

GCTAGCGGAAAGAGGAATTAGAGGCAAAACGGGCAACAAACAATGATAGTAAAGAAGAACCAACAAGA
ACAAAAAGCATAGCAGCAAAATGAAGAGGAAGATGATAAACGCTCTTCTCAGTCCGGTACCTCTGA
GCTAGC

CGAATTGAGACGACAAACGGGGCAACAAACAATGATAGTAAAGCAAGAACCAACAAGAAGAAAAGGCATAG
CAGCAAAAATGAAGAGCAAGATGATAAAAAAG

89. Spacer18 : TCTTTCCTCAGTCCGGTACCTCTGA

90. Full sequence of p3EL_HBV:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACTTACGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGTGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCAATTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCTGTAACAAC
 TCCGCCCAATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCGCTAGCGGAAAGAGGAATTAGAGGACAAACGGGCAACAAACAATGATAGTAAACAAGAACCA
 ACAAGAAGAAACGGCAGCAGCAAAATGAAGAGGAAGATGATAAAACGCTTTCTCAGTCCGGTACCTCTG
 ACGTCCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAAAACCTGGGCTTGTCTGAGAC
 AGAGACGACTCTTGGCTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCCTTCTCTCCACAGG
 GTGAGATATCGGCCGGGGACGCGCGGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCCGT
 GACCGACGCCGTCTGGCTCCTCATATCGGGGGGGAGGCTGGGAGCTCACATGCCCGCCCCCGGCCCTCACC
 CTCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGGATACCTTATGGGCAGCATGA
 CCCCCAGGCGGTGCTGGCGTTCTGGGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGGGC
 CCTTCCGGAGGACAGACACATCGACCGCCTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATG
 CTGGCCGCGATTGCGCCGCTTTACGGGCTGCTTGCCAATACGGTGCGGTATCTGCAGGGCGCGGGTCTGGC
 GGGAGGATTGGGGACAGCTTTCCGGGACGGCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGCCC
 ACGACCCCATATCGGGGACAGCTTATTTACCTGTTTCGGGCCCCGAGTTGCTGGCCCCAACGGCGACCTG
 TATAACGTGTTTGGCTGGGCTTGGACGCTCTTGCCCAAACGCTCCGTCCCATGCACGCTTTATCCTGGATT
 ACGACCAATCGCCCCGGGTGCGGGGACGCGCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTAC
 CACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTTGC CGGGAGATGGGGGAGGCGAACTGA
 AACTTGTATTATGCAGCTTATAATGGTTACAAATAAGCAATAGCATCACAAATTTACAAAATAAGCATT
 TTTCACTGCATTCTAGTTGTGGTTTTGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

91. Full sequence of p3EL_HBV_NLS:

CGATGGAGCGCAGAATGGCCGGAATGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
 TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAATGGCCCGCTGGCATTATGCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGATGCGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
 ACGGGGATTTCCAAGTCTCCACCCCATTCAGTCAATGGGAGTTTGTGTTTTGGCACCAAAATCAACGGGACTTT
 CCAAAATGTCGTAACAACCTCCGCCCATTTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTAGTGAACCGTCAGATCGCTAGCGGAAAGAGGAATTAGAGGACAAACGGGCAACAAACAAT
 GATAGTAAAGAACAACCAACAAGAGAAAAGGCA TAGCAGCAAAATGAAGAGCAAGATGATAAAACCTCTTTC
 CTCAGTCCGGTACCTCTGAACGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGA
 AACTGGGCTTGTGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTT
 TGCCTTTCTCTCCACAGGGTGAGATATCGGCCGGGACGCGCGGTGGTAATGACAAGCGCCAGATAACAAT
 GGGCATGCCTTATGCCGTGACCGACGCGGTTCTGGCTCCTCATATCGGGGGGGAGGCTGGGAGCTCACATGCC
 CCGCCCCCGGCCCTCACCTCATCTTCGACCGCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGCGAT
 ACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTCGTGGCCCTCATCCCGCCGACCTTGCCCGGCAC
 AAACATCGTGTGGGGGCCCTTCCGAGGACAGACACATCGACCGCTGGCCAAACGCCAGCGCCCCGGCGAG
 CGGCTTGACCTGGCTATGCTGGCCGCGATTGCGCCGCTTTACGGGCTGCTTGCCAATACGGTGCCTGATCTGC
 AGGGCGGCGGGTCTGTTGGCGGGAGGATTGGGGACAGCTTTCCGGGACGCGCGTGCCGCCCCAGGGTGCCGAGCC
 CCAGAGCAACGCGGGCCACGACCCCATATCGGGGACAGCTTATTTACCTGTTTCCGGCCCCGAGTTGCTG
 GCCCCAACGGCGACCTGTATAACGTGTTTGCCTGGGCTTGGACGCTTTGGCCAAACGCTCCGTCCCATGC
 ACGTCTTTATCCTGGATTACGACCAATCGCCCGCGGCTGCCGGGACGCGCTGCTGCAACTTACCTCCGGGAT
 GGTCCAGACCCACGTACACACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTTGC CGGGAG
 ATGGGGGAGGCGAACTGAAACTTGTATTATGACGCTTATAATGGTTACAAATAAGCAATAGCATCACAAAT

TCACAAATAAAGCATTTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAACTCATCAATGTATCTGAAGACAA
TAGCAG

92. Full RNA sequence of p3EL_HBV_NLS or p3EL_HBV:

UCAGAUCGCUAGCGGAAAGAGGAAUUAAGAGGACAAACGGGCAACAAACAUAUGAUAGUAAAGAAACCAACAA
CAAGAAAAGGCAUAGCAGCAAAAUGAAGAGGAAGCAUCAAACGUCUUUCCUCAGUCCGGUACCUCUGA
GCGGCUUUCAUUUUUUGUCUUUUUUUAACCUGGGCCUGGGCCUGGGUACUAACAcgaUcgUUUUUUUCCCUUU
UUUUCAGGGAAGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUUGGAGACGUGGAGGAGAACCUGGgCC
UGCUUCGUACCCCUGCCAUCAACACGCGUCUGCGUUCGACCAGGCGGCGCGAUCACGGGGACACAGCAACCGA
CGGACGGCGUUGCGCCCUCCGCGGAGCAAGAAGCCACGGAAGUCCGCCCGGAGCAGAAAAUGCCACGCUAC
UGCGGGUUUAUAUAGACGGUCCCAACGGGAUGGGGAAAACACCACCACGCAACUGCUGGUGGCCCUGGGUUC
GCGCGACGAUAUCGUCUACGUACCCGAGCCGAUGACUUAACUGGCGGGUGCUGGGGGCUUCCGAGACAAUCGCG
AACAUCAACACCACACAACACCGCCUCGACCAGGUAAGUAUCAAGGUACAAGACAGGUUAAGGAGACCAAU
AGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUAUCUGACAUCCA
CUUUGCCUUUCUCUCCACAGGGUGAGAUUACGGCCGGGGACGCGGCGGUGGUAUUGACAAGCGCCAGAUAAAC
AAUGGGCAUGCCUUAUGCCGUGACCGACGCCGUUCUGGCUCCUCAUAUACGGGGGGAGGCUUGGGAGCUCACAU
GCCCGCCCCCGGCCUCACCCUCAUCUUCGACCGCAUCCCAUCCGCGCCUCCUGUACCCGGCCGCGC
GAUACCUUAUGGGGAGCAUGACCCCCAGGCCGUGCUGGCGUUCUGGCGCCUCAUCCCGCGACCUUGGCCGG
CACAAACAUCGUGUUGGGGGCCCUCCGGAGGACAGACAUACGACCGCCUGGCCAAACGCCAGCGCCCCGGC
GAGCGGCUUGACCUUGGCUAUGCUGGCCGCGAUUCGCCGCUUACGGGCGUCUUGCCAAUACGGUGCGGUAUC
UGCAGGGCGGCGGGUCCUGGCGGGAGGAUUGGGGACAGCUUUCGGGGACGGCCUGCCGCCACAGGUGCCGA
GCCCCAGAGCAACCGGGGCCACGACCCCAUAUCGGGACACGUUAUUUACCCUGUUUCGGCCCCCGAGUUG
CUGGCCCCCAACGGCGACCGUAUAACGUGUUUGCCUGGGCCUUGGACGUCUUGGCCAAACGCCUCCGUGCCCA
UGCAGGUCUUUAUCCUGGAUUAACGACCAUUCGCCCGCCGCGUGCCGGGACGCCUGCUGCAACUUAACUCCGG
GAUGGUCCAGACCCACGUCACCACCCAGGCUCCAUACCGACGAUCUGCGACCUGGCGCGACGUUUGCGCGG
GAGAUGGGGGAGGCGAACUGAAACUUGUUUAUUGCAGCUUAUAAUGGUUACAAUAAAGCAAUAGCAUCACAA
AUUUCACAAUAAAGCAUUUUUUCACUGC

93. SD+BD (HBV)+spacer only:

GCTAGCGCTGGAAGGAAAGGGAAGGAAAGGCTAGCGGAAAGAGGAAATTAGAGGACAAACGGGCAACAAAC
AATGATAGTAAAGAAGAACCAACAAGAAAGGCAATAGCAGCAAAATGAAGAGGAAGATGATAAAA
CGTCTTTCTCAGTCCGGTACCTCTGA

94. Full sequence of p3EL_HBV:

ACTAGTTAGTTATTATAGTAATCAATTACGGGGTCAATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACA
TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCACTT
GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
CATTATGCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
CCACCCCATTGACGTCAATGGGAGTTTTGTTTTGGCACAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
TCCGCCCATTTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTAGTGA
ACCGTCAGATCGCTAGCGCTGGAAGGAAAGGGAAGGAAAGGCTAGCGGAAAGAGGAAATTAGAGGACAAACGGGCA
ACAAACAATGATAGTAAAGAAGAACCAACAAGAAAGGCAATAGCAGCAAAATGAAGAGGAAGATGATAAAA
ACGCTTTTCTCAGTCCGGTACCTCTGAACCTGAGCCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAG
ACCAATAGAAACTGGGCTTGTGAGACAGAGACGACTCTTGCGTTTTCTGATAGGCACCTATTGGTCTTACTGA
CATCCACTTTGCCTTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGGCGGTGGTAATGACAAGCGCCCA
GATAACAATGGGCATGCCTTATGCCGTGACCGACGCCGTCTGGCTCCTCATATCGGGGGGGAGGCTGGGAGC
TCACATGCCCCGCCCCCGGCCCTACCCCTCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGTACCCGG
CCGCGCGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTCTGTTGGCCCTCATCCCGCCGACCTT
GCCCCGCACAAACATCGTGTTGGGGGCCCTTCCGGAGGACAGACACATCGACCGCTGGCCAAACGCCAGCGC
CCCGCGGACGGCTTGACCTGGCTATGCTGGCCGCGATTGCGCGCGTTTACGGGTGCTTGCCAATACGGTGC
GGTATCTGCAGGGCGGCGGGTCTGGCGGGAGGATTGGGGACAGCTTTCCGGGACGGCGGTGCCGCCACAGGG
TGCCGAGCCCCAGAGCAACGCGGGGCCACGACCCCATATCGGGGACACGTTATTTACCCTGTTTCGGGCCCCC
GAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTTTGCCTGGGCTTGGACGCTTTGGCCAAACGCCTCC
GTCCCATGCAGCTCTTTATCTGGATTACGACCAATCGCCCCCGGCTGCCGGGACGCCCTGCTGCAACTTAC

CTCCGGGATGGTCCAGACCCACGTCACCACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTT
GCGCGGGAGATGGGGGAGGCGAACTGAACTTTGTTATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCA
TCACAAATTTACAAATAAAGCATTTTTTTCTACTGCATTCTAGTTGTGGTTTGTCCAACTCATCAATGTATC
TGAAGACAATAGCAG

95. Full sequence of p3EL_HBV_NLS:

CGATGGAGCGGAGAATGGGCGGAACGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
ATGGAGTTCCCGGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAACTGCCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
ACGGGGATTTCAGTCTCCACCCCAATTGACGTCAATGGGAGTTGTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAACTCGCCCCATTGACGCAATGGGCGGTAGGCGGTACGTTGGAGGCTCATATAA
GCAGAGCTGGTTTAGTGAACCGTCAGATCGCTAGCTTGGAAAAAAGGGAAAAAAGCTAGCGGAAAGAGGAA
TTAGAGGACAAACGGGCAACAAACAATGATAGTAAAGAAGAACCAACAAGAGAAAAAGGCAAGCAGCAAAAT
GAAGAGGAAGATGATAAAACGCTCTTTCTCAGTCCGGTACCTCTGAAGCTAGCCAGGTAAGTATCAAGGTTA
CAAGACAGGTTTAAAGGAGACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCCTTTCTGATAGGC
ACCTATTGGTCTTACTGACATCCACTTTTGCCTTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGGCGGT
GGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCCGTGACCGACGCGGTTCTGGCTCTCATATC
GGGGGGGAGGCTGGGAGCTCACATGCCCGCCCCCGGCCCTCACCTCATCTTCGACCGCCATCCCATCGCCG
CCCTCCTGTGCTACCCGGCCGCGCATACCTTATGGGCAGCATGACCCCCAGGCGGTGCTGGCGTTCTGGC
CCTCATCCCGCCGACCTTGGCCGGCACAAACATCGTGTGGGGGCCCTTCCGGAGGACAGACACATCGACCGC
CTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTTCGCCGCGTTTACGGGC
TGCTTGCCAAATACGGTGCGGTATCTGCAGGGCGCGGGTCGTGGCGGGAGGATTGGGGACAGCTTTCTGGGGAC
GGCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACAGCTTATTT
ACCTGTTTTCGGGCCCCGAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTTTGCCTGGGCTTGGACG
TCTTGCCAAACGCTCCGTCCATGCAGCTTTTATCCTGGATTACGACCAATCGCCCCCGGCTGCGGGGA
CGCCCTGTGCAACTTACCTCCGGGATGGTCCAGACCCACGTCACCACCCAGGCTCCATACCGACGATCTGC
GACCTGGCGCGCACGTTTGC CGGGAGATGGGGGAGGCGAACTGAACTTGTATTATGCAGTTATAATGGTT
ACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTCTACTGCATTCTAGTTGTGGTTTGTCT
CAAACCTCATCAATGTATCTGAAGACAATAGCAG

96. Full RNA sequence of p3EL_HBV_NLS and p3EL_HBV:

UCAGAUCGCUAGCGCUGGAAAAAAGGGAAAAAAGCCTAGCGGAAAGAGGAAUAGAGGGACAAACGGGCAACAA
ACAAUGAUAGUAAGAGAAAGAACCAACAAGAAGAAAGGCAUAGCAGCAAAAGUAAGAGGAAGAUAAACGU
CUUUCUCAGUCCGGUACCUCUGAGCCTAGGCGCUUUCUUAUUUUUAACCUUGGGCCUGGGCCUGGG
UACUAAACAgAUcgUUUUUUUCCUUUUUUUCCAGGGAAGCGGAGCUACUAAUUCAGCCUGCUGAAGCAGGC
UGGAGACGUGGAGGAGAACCUGGgCCUGCUUCGUACCCUGCCAUAACACGCGUCUGCGUUCGACAGGCG
GCGCGAUACGGGGACACAGCAACCAGCGGACGGCGUUGCGCCUCGCCGAGCAAGAAGCCACGGAAGUCC
GCCCCGAGCAGAAAAUGCCACGCUACUGCGGGUUUAUAUAGACGGUCCACGGAUGGGGAAAACACCAC
CACGCAACUGCUGGUGGGCCUGGUUCGCGGACGAUAUCGUACGUACCCGAGCCGAUGACUUAUCUGGCGG
GUGCUGGGGGCUUCCGAGACAAUCGCAACAUACACCACACAACACCGCCUCGACCAGGUAAGUAUCAAGG
UUACAAGACAGGUUUAAAGGAGACCAUAGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUA
GGCACCUAUUGGUCUUAUCUGACAUCCAUUUUGCCUUUCUCCACAGGGUGAGUAUUCGCGCGGGGACGCGG
GGUGGUAAUGACAAGCGCCAGAUAAUAGGGGCAUGCCUUUAUGCCGUGACCGCGGUGCGGCUUCGCUCAU
AUCGGGGGGGAGGCUGGGAGCUCACAUGCCCCCGCCCGCCUCACCCUCAUCUUCGACCGCAUCCCAUCG
CCGCCCUCCUGUCUACCCGCGCGCGAUACCUUAUGGGCAGCAUGACCCCCAGGCGUGCGUGGCGUUCGU
GGCCCUCAUCCCGCGGACCUUGCCCGGCACAAACAUUGUUGGGGGCCCUUCCGAGGACAGACACAUCGAC
CGCCUGGCCAAACGCCAGCGCCCCGGCGAGCGGCUUGACCUGGCUAUGCUGGCCGGAUUCGCCGCUUACG

GGCUGCUUGCCAAUACGGUGCGGUAUCUGCAGGGCGGCGGGUCGUGGCGGGAGGAUUGGGGACAGCUUUCGGG
 GACGGCCUGCCGCCCCAGGGUGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCAUUAUCGGGGACACGUUA
 UUUACCCUGUUUCGGGGCCCCGAGUUGCUGGCCCCAACGGCGACCUGUAUAACGUGUUUGCCUGGGCCUUGG
 ACGUCUUGGCCAAACGCCUCCGUCUCAUGCAGUCUUUAUUCUGGAUUAACGACCAAUCGCCCCGCCGGCUGCCG
 GGACGCCUGCUGCAACUUACCUCGGGAUGGUCCAGACCCACGUCACCACCCAGGCUCCAUACCGACGAUC
 UGCGACCUGGCGCGCACGUUUGCGCGGGAUGGGGGAGGCGAACUGAAACUUGUUUAUUGCAGCUUAUAUG
 GUUACAAUAAAGCAAUAGCAUCACAAUUCACAAUAAAGCAUUUUUUUCACUGC

Targeting GPC3

97. BD (GPC3)+Spacer:

GCTAGTCTAGAGGTACCTCTGATTTCTCTTTCCATTGCTCTTTAACCTAATTTCCCTGTGTCCAATTAT
 TCCCTTCCCCTCAG

98. BD-GPC3 :

TTTCTCTTTCCATTGCTCTTTAACCTAATTTCCCTGTGTCCAATTATTTCCCTTCCC

99. Spcaer18 : TCTAGAGGTACCTCTGA

100. Full sequence of p3EL_GPC3:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCAATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACTTACGGTAAATGGCCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
 TCCGCCCAATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCATATAAGCAGAGCTGGTTTAGTGA
 ACCGTCAGATCCTAGTCTAGAGGTACCTCTGATTTCTCTTTCCATTGCTCTTTAACCTAATTTCCCTGTGTCC
 AATTAATTCCTTCCCCTCAGCCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAAACT
 GGGCTTGTGAGACAGAGACACTCTTGGCGTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCC
 TTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGCGGTGGTAATGACAAGCGCCAGATAACAATGGGC
 ATGCCTTATGCCGTGACCGACCGCGTTCTGGCTCCTCATATCGGGGGGAGGCTGGGAGCTCACATGCCCCGC
 CCCCCGCCCTCACCTCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGGATACCT
 TATGGGCAGCATGACCCCCCAGGCCGTGCTGGCGTTGCTGGCCCTCATCCCGCCGACCTTGCCCGGCACAAAC
 ATCGTGTGGGGGCCCTTCCGGAGGACAGACACATCGACCGCTGGCCAAACGCCAGCGCCCCGGCGAGCGGC
 TTGACCTGGCTATGCTGGCCGCGATTGCGCGCGTTTACGGGCTGCTTGCCAATACGGTGGCGGTATCTGCAGGG
 CGGCGGGTCTGTTGGCGGGAGGATTGGGGACAGCTTTGCGGGACGGCGGTGCGCGCCCGAGGTGCGGAGCCCCAG
 AGCAACGCGGGCCACGACCCCATATCGGGGACACGTATTTACCCTGTTTTCGGGCCCCCGAGTTGCTGGCCC
 CCAACGGCGACCTGTATAACGTGTTTGCTGGGCCCTTGACGTCTTGCCAAACGCCCTCCGTCCCATGCACGT
 CTTTATCTGGATTACGACCAATCGCCCGCCGCTGCCGGGACGCCCTGCTGCAACTTACCTCCGGGATGGTC
 CAGACCCACGTACACACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTTGCGCGGGAGATGG
 GGGAGGCGAACTGAAACTTGTTTATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTAC
 AAATAAAGCATTTTTTTTACTGCATTCTAGTTGTGTTTGTCCAAACTCATCAATGTATCTGAAGACAATAGC
 AG

101. Full sequence of p3EL_GPC3_NLS:

CGATGGAGCGGAGAATGGGCGGAACCTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCCCTAAC
 TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAATGGCCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGTATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC

102. Full RNA sequence of p3EL_GPC3_NLS or p3EL_GPC3:

UCAGAUCCGUAUCUAGAGGUACCUUGAUUUUCUCUUUCCAUUGCUCUUUUAACCUAAUUUCCUGUGUCCAAUU
AUUCCCUUCCGCGUAGGCUUUUCAUUUUUGUCUUUUUUUAACCUUGGGCCUGGGCCUGGGUACUAACAcgaUc
gUUUUUUUCCCUUUUUUCCAGGGAAGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUGGAGACGUGGAG
GAGAACCUCUGGgCCUGCUUCGUACCCUUGCCAUAACACGCGUCUGCGUUCGACCAGGCGGCGCGAUCACGGG
GACACAGCAACCGACGGACGGCGUUGCGCCCUCGCCGGCAGCAAGAAGCCACGGAAGUCCGCCCGGAGCAGAA
AAUGCCCAACGCUACUGCGGGUUUAUAUAGACGGUCCCCACGGGAUGGGGAAAACCACCACCACGCAACUGCUG
GUGGCCCUGGGUUCGCGCGACGAUAUCGUCUACGUACCCGAGCCGAUGACUUACUGGCGGGUGCUGGGGGCUU
CCGAGACAAUCGCGAACAUCUACACCACACAACACCGCCUCGACCAGGUAAGUAUCAAGGUACAAGACAGGU
UUAAGGAGACCAUAAGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGU
CUUACUGACAUCCACUUUGCCUUUCUCUCCACAGGGUGAGAUACUGGCCGGGGACGCGGCGGUGGUAAUGACA
AGCGCCCAGAUAAACAUGGGCAUGCCCUUAUGCCGUGACCAGCCGCUUCUGGCUCUUAUACUGGGGGGGGAGG
CUGGGAGCUCACAUGCCCCGCCCCGGCCCUACCCUACAUCUUCGACCAGCCAUCCCAUCGCGCGCCUCCUGUG
CUACCCGGCCGCGCGAUACCUUAUGGGCAGCAUGACCCCCAGGCCGUGCUGGCGUUCGUGGCCCUACUCCCG
CCGACCUUGGCCCGGCACAAACAUUGUGUUGGGGGGCCUUCUCCGGAGGACAGACACAUCGACCGCCUGGCCAAAC
GCCAGCGCCCCGGCGAGCGGCUUGACCUGGCUAUGCUGGCCGCGGAUUCGCCCGGUUACGGGCUGCUUGCCAA
UACGGUGCGGUUAUCUGCAGGGCGGCGGGGUCGUGGCGGGAGGAUUGGGGACAGCUUUCGGGGACGGCCGUGCCG
CCCCAGGGUGCCGAGCCCCAGAGCAACGCGGGGCCACGACCCCAUAUCGGGGACAGGUUAUUUACCCUGUUUC
GGGCCCCCGAGUUGCUGGCCCCAACGGCGACCUGUAUAACGUGUUUGCCUGGGCCUUGGACGUCUUGGCCAA
ACGCCUCCGUCUCCAUAGCAGGUCUUAUCCUGGAUUAACGACCAUUCGCCCCGCGGUGCCGGGACGCCCCUGCUG
CAACUUACCUCCGCGGAUGGUCGACGCCACGUCACCCCAAGGCUUACCGACGACUUCGCGACCUGGCGC
GCACGUUUUGCGCGGGAGAUGGGGGAGGCGGAACUGAAACUUGUUUAUUGCAGCUUAUAUUGGUUACAAAUAAG
CAAUAGCAUCAAAAUUUCACAAAUAAGCAUUUUUUGACUGC

GCTAGCCTGGAAGGGGAGGTACCTCTGATTTCTCTTCCATTGCTCTTTAACTAATT
TCCTGTGTCCAATTATTCCTTCCTCCCTGAGG

ACTAGT TAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGGTTACA
TAACTTACGGTAAATGGCCCGCTTGCTGACCGCCCAACGACCCCGCCCATTGACGTCAAATAGCGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
GGCAGTACATCAAGTGATCATATGCCAAGTACGCCCTTATTGACGTCAATGACGGTAAATGGCCCGCTTG
CATATTGCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCAGCTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTGGGAGTACATCAATGGGGCTGTAAGCGGTTTGACTCACGGGGATTTCCAAGTCT

105. Full sequence of p3EL GPC3 SD NLS:

106. Full RNA sequence of p3EL GPC3 SD NLS or p3EL GPC3 SD:

UCAGAUCGCTAGCCUGGAAAAAAGGGAAAAAAGGUACCUCUGAUUUUCUUCUCCAUUGCUCUUUAACCUAA
UUUCCUGUGUCCAAUAUUTCCUUCCCGCTGAGGCTUUUCAUUUUUGUCUUUUUUUAACCUUGGCCUGGGCCU
GGGUACUAACA_{cgaUcg}UUUUUUUCCCCUUUUUUUCCAGGGAAGCGGAGCUACUAACUUCAGCCUGCUGAAGCA
GGCUGGAGACGUGGAGGAGAACCCUGGgCCUGCUUCGUACCCCUGCCAUCAACACGCGUCUCGCGUUCGACCAG
GCGGCGCGAUCACGGGGACACAGCAACCGACGGACGGCGUUGCGCCCUCGCCGGCAGCAAGAGCCACGGAAG
UCCGCCCGGAGCAGAAAAUGCCACGCUACUGCGGGUUUAUAUAGACGGUCCCCACGGGAUGGGGAAAAACCAC

CACCACGCAACUGCUGGGUGGCCUGGGUUCGCGCGACGAUAUCGUCUACGUACCCGAGCCGAUGACUUACUGG
 CGGGUGCUGGGGCUUCCGAGACAAUCGCGAACAUACACACACAACACCGCCUCGACCAGGUAAGUAUCA
 AGGUUACAAGACAGGUUUAAGGAGACCAUAAGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUG
 AUAGGCACCUAUUGGUCUUAUGACAUCCACUUGCCUUUCUCUCCACAGGGUGAGAUUACGGCCGGGGACGC
 GGCGGUGGUAAUGACAAGCGCCAGAUAAACAAUGGGCAUGCCUUAUGCCGUGACCGACGCCGUUCUGGCUCCU
 CAUAUCGGGGGGGAGGCUGGGAGCUCACAUGCCCCGCCCCGGCCUCACCCUCAUCUUCGACCGCCAUCCCA
 UCGCCGCCUCCUGUGCUACCCGGCCGCGCGAUACCUUAUGGGCAGCAUGACCCCCAGGCCGUGCUGGGCUU
 CGUGGCCCUCAUCCCGCCGACCUUGCCCGGCACAAACAUUGUUGGGGGCCUUCGGAGGACAGACACAUC
 GACCGCCUGGCCAAACGCCAGCGCCCCGGCGAGCGGUUGACCUGGCUAUGCUGGCCGCGAUUCGCCGCGUUU
 ACGGGCUGCUUGCCAAUACGGUGCGGUUACUGCAGGGCGCGGGGUCUGGGCGGAGGAUUGGGGACAGCUUC
 GGGGACGGCCGUGCCGCCCCAGGGUGCCGAGCCCCAGAGCAACGCGGGGCCACGACCCCAUAUCGGGGACAG
 UUAUUUACCCUGUUUGGGCCCCCGAGUUGCUGGCCCCCAACGGCGACCUGUAUAACGUGUUUGCCUGGGCCU
 UGGACGUCUUGGCCAAACGCCUCCGUGCCCAUGCAGCUCUUUAUCCUGGAUUAACGACCAUUCGCCCGCCGCG
 CCGGACGCCCUGCUGCAACUUAACUCCGGGAUGGUCCAGACCCACGUCACCACCCAGGCUCCAUACCGAGC
 AUCUGCGACCUGGCGCGCACGUUUGCGCGGGAGAUUGGGGAGGCGAACUGAAACUUGUUUAUUGCAGCUUAUA
 AUGGUUACAAAUAAGCAUAAGCAUACAAAUUCACAAAUAAGCAUUUUUUCACUGC

Targeting HBV+GPC3

107. BD (HBV+GPC3)+spacer:

GCTAGAGGAAATTAGAGGACAAAACGGGCAACATACAAATGATAGTAAAGAAGAACCAACAAGAAAGAAAAG
 GCATAACGACGCAAAATGAAGAGGAAGATGATAAAACGCTTTTCTCAGTCCGGTACCTCTGATTTCTCT
 TTCCATTGCTCTTTAACCTAATTTCTGTGTCCAATTATTCCCTTCCC

108. BD-HBV:

GGAAATTAGAGGACAAAACGGGCAACAAACAAATGATAGTAAAGAAGAACCAACAAGAAAGGCAATAG
 CAGCAAAATGAAGAGGAAGATGATAAAACG

109. BD-GPC3:

TTTCTCTTTCCATTGCTCTTTAACCTAATTTCTGTGTCCAATTATTCCCTTCCC

110. Spacer18: TCTTTCTCAGTCCGGTACCTCTG

111. Full sequence of p3EL_HBV+GPC3:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCTGTAACAAC
 TCCGCCCATTTGACGCAAAATGGGCGGTAGGCGGTGACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCCTAGAGGAAATTAGAGGACAAAACGGGCAACATACAAATGATAGTAAAGAAGAACCAACAAGAA
 GAAAAGGCAATAGCAGCAAAATGAAGAGGAAGATGATAAAACGCTTTTCTCAGTCCGGTACCTCTGATTTCTC
 TTCCATTGCTCTTTAACCTAATTTCTGTGTCCAATTATTCCCTTCCCCTCAGGTAAGTATCAAGG
 TTACAAGACAGGTTAAGGAGACCAATAGAACTGGGCTTGTCGAGACAGAGACGACTCTTGCGTTTCTGATA
 GGCACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACAGGTGAGATATCGGCCGGGACGCGGC
 GGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCCGTGACCGACGCCGTTCTGGCTCCTCAT
 ATCGGGGGGAGGCTGGGAGCTCACATGCCCCGCCCCGCCCCCTACCCCTCATCTTCGACCGCCATCCCATCG
 CCGCCCTCCTGTGCTACCCGGCCGCGGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTCTGT
 GGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTTGGGGGCCCTTCCGGAGGACAGACACATCGAC
 CGCCTGGCCAAACGCCAGCGCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTGCGCCGCTTTACG
 GGTGCTTGCCAATACGGTGCGGTATCTGCAGGGCGCGGGTCGTGGCGGGAGGATTGGGGACAGCTTTTCGGG
 GACGGCCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACAGCTTTA
 TTTACCTGTTCGGGCCCCGAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTTTGCTGGGCCCTTGG
 ACGTCTTGCCAAACGCCTCCGTCCCATGCACGCTTTATCCTGGATTACGACCAATCGCCCGCCGGCTGCCG

GGAGCGCCCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTCACCACCCCAGGCTCCATACCGACGATC
TGCGACCTGGCGCGCACGTTTGCGCGGGGAGATGGGGGAGGCGAACTGAAACTTGTTTATTGCAGCTTATAATG
GTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTCAGTGCATTCTAGTTGTGGTTT
GTCCAAACTCATCAATGTATCTGAAGACAATAGCAG

112. Full sequence of p3EL_HBV+GPC3_NLS:

CGATGGAGCGCGGAGAATGGCGGGAAC TGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGGT
TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTTAAC
TGACACACATTTCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTTCATTAGTTCATAGCCCATAT
ATGGAGTTCGCGGTTACATAAECTTACGGTAAATGGCCCGCTTGGCTGACCGCCCAACGACCCCCGCCCATTGA
CGTCAATAATGACGCTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCATATGGGTGGGAGTATT
ACGGTAAACTGCCCACTTTGGCAGTACATAAGTGATCATATGCCAAGTACGCCCTATTGACGTCATATGAC
GGTAAATGGCCCGCTGGCATTTATGCCCAGTACATGACTTATGGGACTTTCCTACTTTGGCAGTACATCTACG
TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGACTC
ACGGGGATTTCGAAGTCTCCACCCCATTTGACGTCATATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTGCTAACAACTCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTTAGTGAACCGTCAGATCCTTAGAGGAAATGAGAGGACAAACCGGCCAACATACAATGATAGTA
AAGAAGAACCAACAAGAAGAAAAGGCATAGCAGCAAAAATGAAGAGGAAGATGATAAAACCTCTTTTCTCAGTC
CGGTACCTCTGATTTCTCTTTCCATTGCTCTTTAACTTAATTTCTGTGTCCAATTAATTCCTTCCCCTTCCCCTTCTC
CCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAAACTGGGCTTGTCGAGACAGAGACG
ACTCTTGCGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCCTTTCTCTCCACAGGGTGAGAT
ATCGGCCCGGGACGCGCGGTGGTAATGACAAGCGCCGATACAACATGGGCATGCTTATGCCGTGACCGAC
CGCGTTCTGGCTCCTCATATCGGGGGGAGGCTGGGAGCTCACATGCCCGCCCGCCCGCCCTCACCCTCATCT
TCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGGATACCTTATGGGCAGCATGACCCCCCA
GGCCGTGCTGGCGTTCTGTGGCCCTCATCCGCGCGACCTTGCCCGGCACAAACATCGTGTGGGGGGCCCTTCCG
GAGGACAGACACATCGACCGCTTGCCAAACGCCAGCGCCCGCGGAGCGGCTTGACCTGGCTATGCTGGCCG
CGATTGCGCGGTTTTACGGGTGCTTGCCAATACGGTGCGGTATCTGCAGGGCGGCGGCTCGTGGCGGGAGGA
TTGGGGACAGCTTTTCGGGGACGGCGTGCCGCCCCAGGTTGCCGAGCCCCAGAGCAACGCGGGGCCACGACCC
CATATCGGGGACACGTTATTTACCCGTGTTTCGGGCCCCGAGTTGCTGGCCCCCAACGGCGACCTGTATAACG
TGTTTGCTGGGCCTTGACGCTCTTGGCCAAACGCCCTCCGTCCCATGCACGCTTTTATCCTGGATTACGACCA
ATCGCCCGCGCGCTGCCGGGACGCCCTGCTGCACTTACCTCCGGGATGGTCCAGACCCACGTCACCACCCCA
GAGTCCATACCGACGATCTGCGACCTGGCGCGCAGCTTTGCGCGGAGATGGGGAGGCGAACTGAAACTTGT
TTATTGCAGCTTATAATGTTTACAAATAAAGCAATAGCATACAAATTTACAAATAAAGCATTTTTTTCACCT
GCATTCTAGTTGTGGTTTTGTCCAAACTCATCAATGTATCTGAAGACAATAGCAG

113. Full RNA sequence of p3EL HBV+GPC3 or p3EL HBV+GPC3 NLS:

UCGACAU CCUAGAGGAAUUGACGACACAAACCGGCCAACAUACAUAUGAUAGUAAAGAAGAACCAACAAGAAGAA
AGGCAUAGCAGCAAAAUGAAGACGGAAGAUGAUAAAAACUCUUUCCUCAGUCCGGUACCUCUGAUUUCUCUUUC
CAUUGCUCUUUAACCUAAUJUCCUGUGUCCAAUUAUJCCCUUCCUCCUCCGACGCGCUCUUUUAUUUUGUCUUUUUU
UAACCUGGGCCUGGGCCUGGGUACUAACAgaUcgUUUUUUUCCCUUUUUUCCAGGGAAGCGGAGCUACUA
CUUCAGCCUGCUGAAGCAGGCUGGAGACGUGGAGGAGAACCUCUGGgCCUGCUUCGUACCCCUGCCAUCAACAC
GCGUCUGCGUUCGACCAGGCGGC GCGAUACGCGGGACACAGCAACCGACGGACGGCGTUUGCGCCUCGCCGGC
AGCAAGAAGCCACGGAAGUCCGCCCGGAGCAGAAAUGCCACGCUACUGCGGGUUUAUAUAGACGGUCCCCA
CGGGAUGGGGAAAACCAACCACCGCAACUGCUGGUGGCCCUUGGGUUCGCGCGACGAUAUCGUCUACGUACCC
GAGCCGAUGACUUAACUGGCGGGUGCUGGGGGCUUCCGAGACAAUCGCGAACAUUACACCACACAACACCGCC
UCGACCAGGUAAGUAUCAAGGUUACAAGACAGGUUUAAGGAGACCAUAAGAAACUGGGCUUGUCGAGACAGAG
ACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUAUGACAUCCACUUGCCUUCUCUCCACAGGGUGA
GAUAUCGGCCGGGGACGCGCGGGUGGUAUUGACAAGCGCCAGAUAAACAUGGGCAUGCCUUAUGCCGUGACC
GACGCCGUUCUGGCUCUCAUAUCGGGGGGGAGGCUGGGAGCUCACAUGCCCCGCCCCGGCCUCACCCUCA
UCUUCGACCGCCAUCUCAUCGCCGCCUCCUGUGCUACCCGGCCGCGCGAUACCUUAUGGGCAGCAUGACCCC
CCAGGCCGUGCUGGCUUCUGUGGCCCUCAUCCCGCCGACCUUGCCCGGCACAAACAUCGUGUUGGGGGCCCUU
CCGGAGGACAGACACAUCGACCGCCUGGCCAAACGCCAGCGCCCCGGCGAGCGGCTUGACCUGGCUAUGCUG
CCGCGAUUCGCCGCGUUUACGGGCUGCUUGCCAUAACGGUGCGGUUAUCUGAGGGCGCGGGUCUGGACGGGA
GGAUUGGGGACAGCUUUCGGGGACGGCCGUGCCGCCCCAGGGUGCCGAGCCCCAGAGCAACGCGGGGCCACGG

CCCCAUUUCGGGGACACGUUUAUUUACCCUGUUUCGGGCCCCGAGUUGCUGGCCCCCAACGGCGACCUGUAUA
ACGUGUUUGCCUGGGCCUUGGACGUCUUGGCCAAACGCCUCCGUCUCAUGCACGUCUUUAUCCUGGAUUAACGA
CCAAUCGCCCCCGCGGUGCCGGGACGCCUGGUGCAACUUAUCCUCCGGGAUGGUCCAGACCCACGUCACCACC
CCAGGCUCCAUAACCGACGAUCUGCGACCUGGCGCGCACGUUUGCGCGGGAGAUGGGGGAGGCGAACUGAAACU
UGUUUAUUGCAGCUUAUAUAGGUUACAAUAAAGCAAUAGCAUCACAAUUAUACAAUAAAGCAUUUUUUUC
ACUGC

114. SD+BD (HBV+GPC3)+spacer:

GCTAGACTGGAAAAAAGGGAAAAAACTCTAGAGGAATTAGAGGACAAACGGGCAACATACAAATGATAGTAA
GAAGAAACCAACAAGAAAGGCAATAGCAGCAAAATGAAGAGGAAGATGATAAAACGCTTTTCTCAGTCCG
GTACCTCTGATTTCTCTTTCCATTGCTCTTTAACTTAATTTCTGTGTCCAATTATTCCTTCCCCTCAG

115. Full sequence of p3EL_HBV+GPC3_SD:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACA
TAACTTACGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCACTT
GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
CATTATGCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTCCAAGTCT
CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
TCCGCCCATTTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
ACCGTCAGATCCTAGACTGGAAAAAAGGGAAAAAACTCTAGAGGAATTAGAGGACAAACGGGCAACATACA
ATGATAGTAAAGAAAGCAACAAGAAAGGCAATAGCAGCAAAATGAAGAGGAAGATGATAAAACGCTCTT
TCCCTCAGTCCGGTACCTCTGATTTCTCTTTCCATTGCTCTTTAACTTAATTTCTGTGTCCAATTATTCCTT
CCCCTCAGTCCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAAACTGGGCTTGTGAG
ACAGAGACGACTCTTGCGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACA
GGGTGAGATATCGGCCGGGACGCGCGGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCC
GTGACCGACCGCTTCTGGCTCCTCATATCGGGGGGAGGCTGGGAGCTCACATGCCCCGCCCCGGCCCTCA
CCCTCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGCGCGCGATACCTTATGGGCAGCAT
GACCCCCCAGCCGTGCTGGCGTTCTGGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGG
GCCCTTCCGGAGGACAGACACATCGACCGCTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTA
TGCTGGCCCGGATTCGCCCGCTTTACGGGCTGCTTGCCAATACGGTGGGTATCTGCAGGGCGGCGGGTCTGT
GCGGGAGGATTGGGACAGCTTTTGGGACGCGGCTGCCCCAGGGTGCCGAGCCCCAGACCAACGCGGGC
CCACGACCCCATATCGGGGACAGTTATTTACCTGTTTTGGGCCCCGAGTTGCTGGCCCCCAACGCGGACC
TGTATAACGTGTTTTGCCTGGGCTTGGACGTCTTGCCAAACGCTCCGTCCCATGCAGCTCTTTATCCTGGA
TTACGACCAATCGCCCGCGGCTGCCGGGACGCGCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTC
ACCACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTTGCGCGGAGATGGGGGAGGCGAACT
GAAACTTGTATTATGACGCTTATAATGGTTACAAATAAGCAATAGCATCACAAATTTACAAATAAAGCATT
TTTTTCACATGATCTAGTTGTGGTTTTGTCCAACATCAATGTATCTGAAGACAATAGCAG

116. Full sequence of p3EL_HBV+GPC3_SD_NLS:

CGATGGAGCGGAGAATGGGCGGAACGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACCTTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACCTTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
TGACACACATTTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCACTTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTGGCATTATGCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
ACGGGGATTTCAGAGTCTCCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAACCTCGCCCCATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTTAGTGAACCGTCAGATCCTAGACTGGAAAAAAGGGAAAAAACTCTAGAGGAATTAGAGG
ACAAACGGGCAACATACAATGATAGTAAAGAAAGCAACAAGAAAGGCAATAGCAGCAAAATGAAGAGG
AAGATGATAAAACGCTTTTCTCAGTCCGGTACCTCTGATTTCTCTTTCCATTGCTCTTTAACTTAATTTCT
GTGTCCAATTATTCCTTCCCCTCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATA

GAAACTGGGCTTGTCTGAGACAGAGACGACTCTTGCCTTCTGATAGGCACCTATTGGTCTTACTGACATCCAC
TTTGCCTTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGGCGGTGGTAATGACAAGCGCCAGATAACA
ATGGGCATGCCTTATGCCGTGACCGACGCCGTTCTGGCTCCATATCGGGGGGGAGGCTGGGAGCTCACATG
CCCCGCCCCCGGCCCTCACCCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGCG
ATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTTCGTGGCCCTCATCCCGCCGACCTTGCCCGGC
ACAAACATCTGCTGTTGGGGGCCCTTCGGAGGACAGACACATCGACCGCTTGGCCAAACGCCAGCGCCCGCGG
AGCGCGCTTGACCTGGCTATGCTGGCCGCGATTTCGCCGCTTACGGCTGCTTGCCAAATACGGTGGCGGTATCT
GCAGGGCGGCGGGTCTGTGGCGGAGGATTGGGACAGCTTTCGGGGACGCGCGTCCCGCCCCAGGGGTGCCGAG
CCCCAGAGCAACGCGGGGCCACGACCCCATATCGGGGACACGTTATTTACCCTGTTTCGGGCCCCGAGTTGC
TGGCCCCCAACGGCGACCTGTATAACGTGTTTGCTGGGCCTTGGACGTCTTGGCCAAACGCTCCGTCCCAT
GCACGTCTTTATCTGGATTACGACCAATCGCCGCGCGGTGCCGGGACGCCCTGCTGCAACTTACCTCCGGG
ATGGTCCAGACCCACGTACCCACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTTGC GCGGG
AGATGGGGGAGGCGAACTGAAACTTGTTTATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAA
TTTCACAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTGTGCCAAATCATCAATGTATCTGAAGAC
AATAGCAG

[illegible]

Targeting HBV and AFP

118. BD (HBV+AFP)+spacer:

GCTAGAGGAAAGAAGGAATTAGAGGACAAACGGCCAAACAAACAATGATAGTAAAGAAACCAACAAGA
AGAAAAAGCATAGCAACAAAATGAAGAGCAAGATGATAAAACGTCTTTCTCAGTCCGGTACCTCTGA
TTCTTCGGGCCACCTCTCTAAAAATAAAATTAATTTCTTCTCTAAACCTCTTTCTAGTTGGCCCTT
TCTTTCC

119. BD-HBV:

GGGAATTAGAGGACAAAACGGGGCAACAAACAATGATAGTAAAGAAGAACCAACAAGAAGAAAAGGCATAG
CACCACAAAATGAAGAGGAAGATGATAAAACG

120. BD-AFP:

GGGCCACCTCTCTAAAAATAAATTAAATTTTCTTCTCTAAACCTCTTTTCTAGTTGGCCC

ACTAGT TAGTTATTAATAGTAAATCAATTACGGGGTCATTAGTTTCATAGCCCATATATGGAGTTCGCCGTTTACA
TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCACTT
GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGG
CATTATGCCCAGTACATGACCTTATGGGACTTTCCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGACTCACGGGGATTTCGAAGTCT
CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
TCCGCCCATTTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTAGTGA
ACCGTCAGATCGCTAGAGGAAAGAGGAATTAGAGGACAAACGGGCAACAAACAATGATAGTAAACAAGAACCA
ACAAGAAGAAAAGGCATAGCAGCAAAATGAAGAGGAAGATGAATAAAACGCTCTTTCTCAGTCCGGTACCTCTG
ATTCTCTGGGCCAGCTCTCTAAAAATAAATTAATTTCTCTCTCTAAACCTCTTTCTAGTTGGCCCTTTCTGT
TCCCTGACCCAGGTCAGGTAAAGTAAAGTTTACAAGCAGGTTTAAAGGACCAATAGAAAATGGCCCTTTCCTGAG
ACAGAGACGACTCTTGCGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACA
GGGTGAGATATCGGCCGGGGACGCGGCGGTGGTAAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCC
GTGACCGACGCGGTTCTGGCTCCTCATATCGGGGGGGAGGCTGGGAGCTCACATGCCCCGCCCCGGCCCTCA
CCCTCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGCGATACCTTATGGGCAGCAT
GACCCCCCAGGCCGTGCTGGCGTTCTGGGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGG
GCCCTTCCGGAGGACAGACACATCGACCGCTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTA
TGCTGGCCGCGATTGCGCCGCTTTACGGGCTGCTTGCCAAACGGTGCGGTATCTGCAGGGCGCGGGTCTGTG
GCGGGAGGATTGGGGACAGCTTTCGGGGACGGCCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGC
CCACGACCCCATATCGGGGACACGTTATTTACCCTGTTTCGGGCCCCCGAGTTGCTGGCCCCAACGGCGACC
TGTATAACGTGTTTGCTGGGCCCTTGACGTCTTGCCAAACGCCTCCGTCCCATGCACGTCTTTATCCTGGA
TTACGACCAATCGCCCCGCCGCTGCGGGACGCCCCGTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTC
ACCACCCCAAGCTCCATACCGACGATCTGCGACCTGGCGCGCAAGTTTGCGCGGGAGATGGGGAGGCGGAAT
GAAACTTGTTTATTGTCAGTTATAATGTTTACAATAAAGCAATAGCATCACAAATTCACAAATAAAGCATT
TTTTTCACTGCATTCTAGTTGTGGTTTTGTCCAAACTCATCAATGTATCTGAAGACAATAGCAG

CGATGGAGCGGAGAAATGGGCGGAAC TGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCGTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCGTGCTGGGGAGCCTGGGGACTTTCCACACCTTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTTCATTAGTTCATAGCCCATAT
ATGGAGTTCGCGCTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCACTTGGCAGTACATAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATTGGCCCGCTGGCATATTGCCAGTACATGACCTTATGGGACTTTCTACTTTGGCAGTACATCTACG
TTTAGTTCATCGCTATTACCATGGTGATGCGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
ACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAAC TCCGCCCCATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTAGTGAACCGTCAGATCGCTAGAGGAAAGAGCAATTAGAGGCACAAACGGGCAACAAACAAT
GATAGTAAAGAAGAACCACCAACAAGAAAAGGCATAGCAGCAAAATGAAGAGCAAGATGATATAAAAGCTCTTTT
CTCAGTCCGGTACCTCTGATTCC TCGGGCCACCTCTCTAAAA TAAATTAAATTTTCTTCTCTAAACCTCTTT
CCTAGTTGGCCCTTTCTTTCC CCGAGGTAAGTATCAAGGTTACAAGACAGGTTTAAAGGAGACCAATA
GAAACTGGGCTTGTCTGAGACAGAGACGACTCTTGCCTTTCTGATAGGCACCTATTGGTCTTACTGACATCCAC
TTTGCCCTTTCTCTCCACAGGGTGAGATCTCGGCCGGGACGCGCGGTGGTAAATGACAAGCGCCGACATAACA
ATGGGCATGCCTTATGCCGTGACCGACGCCGTTCTGGCTCTCATATCGGGGGGGAGGCTGGGAGCTCACATG
CCCCGCCCCCGGCCCTCACCTCATCTTTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGCG
ATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTTCGTGGCCCTCATCCCGCCGACCTTGCCCGGC
ACAAACATCGTGTTGGGGGCCCTTCGGAGGACAGACACATCGACCGCTTGGCCAAACGCCAGCGCCCCGGCG
AGCGGCTTGACCTGGCTATGCTGGCCGCGATTTCGCCGCGTTTACGGGCTGCTTGCCAATACGGTGCGGTATCT
GCAGGGCGGCGGGTTCGTGGCGGAGGATTGGGGACAGCTTTCGGGGACGCGCGTGCCGCCCCAGGGTGCCGAG
CCCCAGAGCAACGCGGGCCACGACCCCATTCGGGGACACGTTATTTACCCTGTTTTCGGGCCCCCGAGTTGC
TGGCCCCCAACGGCGACCTGTATAACGTATTTGGCTGGGCCCTTGGACGTCTTGGCCAAACGCTCCGTCCCAT
GCACGCTTTTATCTGGATTACGACCAATCGCCCGCGGCTGCCGGACGCGCTGCTGCAACTTACCTCCGG
ATGTTCCAGACCCACGTTCACACCCAGGCTCCATACCGACGACTCTGCGACCTGGCGCGACGTTTTCGCGGG

AGATGGGGGAGGCGAACTGAAACTTGTATTGTCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAA
TTTCACAAATAAAGCATTTTTTTTCTACTGCATTCTAGTTGTGGTTTTGTCCAACTCATCAATGTATCTGAAGAC
AATAGCAG

123. Full RNA sequence of p3EL_HBV+AFP_NLS or p3EL_HBV+AFP:

UCAGAUCGCUAGAGGAAAGAGGAAUUAAGAGGACAAACCGGCCAACAAACAUAUGAUGUAAAGCAACCAACAA
GAAGAAAAGGCAUAGCAACCAAAUUAAGAGGAGAGUAUAAAACGUCUUUCCUCAGUCCGGUACCCUCUGAUUC
CUCGGGCCACCUCUCUAAAAUAAAUUAAAUUUUUCUUAACCUUUCUAGUUUGGCCCUUUCUUUCC
GCUUUAUUUUUUGUCUUUUUUUAACCUUGGCCUGGGCCUGGGUACUAACAgUcgUUUUUUUCCCU
UUUUUCCAGGGAAGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUGGAGACGUGGAGGAGAACCUGGG
CCUGCUUCGUACCCUCGCCAUACACGCGUCUGCGUUCGACCAGGCGGCGGAUCACGGGGACACAGCAACC
GACGGACGGCGUUGCGCCUCGCGGCAGCAAGAGCCACGGAAGUCCGCCCGGAGCAGAAAUGCCACGCU
ACUGCGGGUUUAUAUAGACGGUCCCCACGGGAUGGGGAAAACACCACCACGCAACUGCUGUGGCCCUUGGU
UCGCGCGACGAUAUCGUCUACGUACCCGAGCCGAUGACUUAUGGCGGGUGCUGGGGGCUUCCGAGACAAUCG
CGAACAUCAACACCACACAACACCGCCUCGACCAGGUAAGUAUCAAGGUUAACAAGACAGGUUAAGGAGACCA
AUAGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUAUGACAUC
CACUUUGCCUUCUCCACAGGUGAGUAUUCGGCCGGGACGCGGCGUGGUAAUGACAAGCGCCAGAAUA
ACAAUUGGCAUGCCUUAUGCCGUGACCGACGCCUUCUGGCUCCUAUAUUGGGGGGGAGGCGUGGAGCUCAC
AUGCCCCGCCCGGCCCUACCCUAUCUUCGACCGCAUCCCAUCGCCGCCUCCUGUCUACCCGGCCGC
GCGAUACCUUAUGGGCAGCAUAGCCCCCAGGCCGUGCUGGCGUUCGUGGCCCUAUCGCCCGACCUUGCCC
GGCACAACAUUGGUUGGGGGCCCUUCCGGAGGACAGACAUACGACCGCCUGGCCAAACGCCAGCGCCCCG
GCGAGCGGUUGACCUUGGCUAUGCUGGCCGCGAUUCGCCGCGUUUACGGGCUUGCUUGCCAAUACGGUGCGGUA
UCUGCAGGGCGGCGGGUGCUGGCGGGAGGAUUGGGGACAGCUUUCGGGGACGGCCUGCCGCCCCAGGGUGCC
GAGCCCCAGAGCAACGCGGGCCACGACCCCAUAUCGGGGACACGUUAUUUACCCUGUUUCGGGGCCCCGAGU
UGCUGGCCCCCAACGGCGACCUUAUAACGUGUUGCCUGGGCCUUGGACGUCUUGGCCAAACGCCUCCGUCC
CAUGCACGUCUUUAUCCUGGAUUAACGACCAUUCGCCCGCCGGCUGCCGGGACGCCUUGCUGCAACUUAUCCUCC
GGGAUGGUCCAGACCCACGUCACCACCCAGGCUCAUACCGACGAGUUCGCGACCUUGGCGCGCAUGUUGCGC
GGGAGAUUGGGGAGGCGAACUGAAACUUGUUUAUUGCAGCUUAUAUGGUUACAAUAAAGCAAUAGCAUCAC
AAAUUUCACAAAUAAGCAUUUUUUCACUGC

124. SD+BD (HBV+AFP)+spacer:

GCTAGACTGCAAAAAAAGGGAAAAAATCTAGAGGAAAGAGGAATTACAGGACAAACCGGCCAACAAAC
AATGATACTAAAGCAAGAACCAACAGAGAGAAAAGGCATAGCAGCAAAATGAGAGGGAAGATGATAAAA
CGTCTTCTCAGTCCGGTACCTCTGATTCTCTGGGCCACCTCTCTAAAAATAAAATTAAATTTTCTTC
TCTAAACCTCTTTCTAGTTGGCCCTTTCTTTCC

125. Full sequence of p3EL_HBV+AFP_SD:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGTTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACA
TAACTTACGTTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTCACGGGGATTTCCAAGTCT
CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCTGTAACAAC
TCCGCCCATTTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTAGTGA
ACCGTCAGATCGCTAGACTGCAAAAAAAGGCAAAAAATCTAGAGGAAAGAGGAATTACAGGACAAACCGGCCA
ACAAACAAATGATAGTAAAGAGAACCAACAGAGAGAAAAGGCATAGCAGCAAAATGAGAGGGAAGATGATAAA
ACGCTTTTCTCAGTCCGGTACCTCTGATTCTCTGGGCCACCTCTCTAAAAATAAAATTAAATTTTCTTCTCTA
AACCTCTTTCTTAGTTGGCCCTTTCTTTCCCGCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGG
AGACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACCTATTGGTCTTACT
GACATCCACTTTGCCTTTCTCTCCACAGGTGAGATATCGGCCGGGGACGCGCGGTGGTAATGACAAGCGCC
CAGATAACAAATGGGCATGCCTTATGCCGTGACCGACGCGGTTCTGGCTCTCATATCGGGGGGGAGGCTGGGA
GCTCACATGCCCCGCCCCCGGCCCTACCCCTCATCTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCC
GGCCGCGCGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTCTGTGGCCCTCATCCCCGCCGACC
TTGCCCCGCAACAAATCGTGTTGGGGGCCCTTCCGGAGGACAGACACATCGACCGCTGGCCAAACGCCAGC
GCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTGCGCGCGTTTACGGGCTGCTTGCCAATACGGT
GCGGTATCTGCAGGGCGGCGGCTCGTGGCGGGAGGATTGGGGACAGCTTTCGGGGACGGCCGTGCCGCCCCAG

126. Full sequence of p3EL HBV+AFP SD NLS:

127. Full RNA sequence of p3EL HBV+AFP SD NLS or p3EL HBV+AFP SD:

49/87

UCGGGGGGGAGGCUGGGAGCUCACAUGCCCCGCCCCGGCCUCACCCUCAUCUUGGACCGCCAUCCC
 AUCGGCGCCCUCCUGUGCUACCCGGCCGCGGAUACCUUAUGGGCAGCAUGACCCCCAGGCCGUGCU
 GCGUUCGUGGGCCCUCAUCCCGCCGACCUUGCCCCGGCACAACAUCGUGUUGGGGGCCCUCCGGAGG
 ACAGACACAUCGACCGCCUGGCCAAACGCCAGCGCCCCGGCGAGCGGCUUGACCUGGCUAUGCUGGCC
 GCGAUUCGCCCGUUUACGGGCGUGCUUGCCAAUACGGUGCGGUUAUCUGCAGGGCGCGGGUCGUGGGC
 GGAGGAUUGGGGACAGCUUUCGGGACGGCCGUGCCGCCCCAGGGUGCCGAGCCCCAGAGCAACGCGG
 GCCCACGACCCCAUAUCGGGACACGUUAUUUACCCUGUUUCGGGCCCCCGAGUUGCUGGCCCCCAAC
 GCGGACCUGUAUAACGUGUUUGCCUGGGCCUUGGACGUCUUGGCCAAACGCCUCCGUCUCCAUACGCU
 CUUUAUCCUGGAUUAACGACCAUUCGCCCCGCCGCGUGCCGGGACGCCUGCUGCAACUUAUCCUCCGGGA
 UGUCCAGACCCACGUCACCACCCAGGCUCCAUACCGACGAUCUGCGACCUGGCGCGCAGCUUUGCG
 CGGGAGAUGGGGGAGGCGAACUGAAACUUGUUUAUUGCAGCUUAUAUUGGUUACAAAUAAGCAAUAG
 CAUCACAAAUUUCACAAAUAAGCAUUUUUUCACUGC

128. Full sequence of p3EL_HBV+AFP_SD_GFP:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTATAGCCCATATATGGAGTTCGCGGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCTGAACAAC
 TCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCGTAGCCCTGGAAAAAAGGGAAAAAATCTAGAGGAAAGAGGAAATTAGAGGACAAAACGGCCA
 ACAAAACAATGATAGTAAAGAAGAACCAACAAGAAGAAAAGCCATAGCAGCAAAAATGAAGAGCAAGATGATAAA
 ACGTCTTTCCCTCAGTCCGGTACCTCTGATTCCTCGGCCACCTCTCTAAAAATAAATTTAAATTTTCTTCTCTA
 AACCTCTTTCCCTAGTTGGCCCTTTCTTTCCCTCTCTGCTTTTTCATTTTTGTCTTTTTTTAACTGGGCGCTGGG
 CCTGGGTACTAACACGATCGTTTTTTTTCCCTTTTTTTTCCAGGGAAGCGGAGCTACTAAGTTTACGCTGTGAA
 GCAGGCTGGAGACGTGGAGGAGAACCCTGGGCCCTCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTT
 TAAGGAGACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACCTATTGGTC
 TTACTGACATCCACTTTGCCTTTCTCTCCACAGATCGAGTGCCGCATCACCGGCACCTGAACGGCGTGGAGT
 TCGAGCTGGTGGGCGGCGGAGAGGGCACCCCGAGCGGGCCGCATGACCAACAAGATGAAGAGCACCAAAAGG
 CGCCCTGACCTTCAGCCCCCTACCTGCTGAGCCACGTGATGGGCTACGGCTTCTACCACCTTCGGCACCTACCCC
 AGCGGCTACGAGAACCCCTTCTTGCACGCCATCAACAACGGCGGCTACACCAACACCCGCATCGAGAAGTACG
 AGGACGGCGGCGTGTGTCACGTGAGCTTCAGTACCCTACGAGGCGGCGCGGTGATCGGCGACTTCAAGGT
 GGTGGGACCGGCTTCCCGAGGACAGCGTGATCTACCCACAAGATCATCCGAGCAACGCCACCGCTGGAG
 CACCTGCACCCCATGGGCGATAACGTGCTGGTGGCGACCTTCGCGCGACCTTCAGCCTGCCGACGGCGGCT
 ACTACAGCTTCGTGGTGGACAGCCACATGCACCTCAAGAGCGCCATCCACCCAGCATCCTGCAGAACGGGGG
 CCCCATGTTTCGCTTCCGCGCGTGGAGGAGCTGCACAGCAACACCGAGCTGGGCATCGTGGAGTACCAGCAC
 GCCTTCAAGACCCCATCGCCTTCGCCAGATCTCGAGCTCGATGAACTTGTTTATTGCAGCTTATAATGGTT
 ACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCATTCTAGTTGTGGTTTGTC
 CAAACTCATCAATGTATCTGAAGACAATAGCAG

129. Full sequence of p3EL_HBV+AFP_SD_GFP-NLS:

CGATGGAGCGGAGAATGGGCGGAAGTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTTAAC
 TGACACACATTTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
 ACGGGGATTTCCAAGTCTCCACCCATTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTT
 CAAAATGTCGTAACAACCTCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTAGTGAACCGTCAGATCGTAGCCCTGGAAAAAAGGGAAAAAATCTAGAGGAAAGAGGAA
 TTAGAGGACAAAACGGGCAACAAAACAATGATAGTAAAGAAGAACCAACAAGAAGAAAAGCCATAGCAGCAAAAAT

GAAGAGGAAGATGATAAAACGTCTTTCTCAGTCCGGTACCTCTGATTCTCGGGCCACCTCTCTAAAAATAA
 ATTAATTTTCTTCTCTAAACCTCTTTCTAGTTGGCCCTTTCTTTCCGCTTTTCATTTTTGTCTTT
 TTTTAACCTGGGCTGGGCTGGGTACTAACACGATCGTTTTTTTCCCTTTTTTTCCAGGAAGCGGAGCTAC
 TAACCTCAGCCTGCTGAAGCAGGCTGGAGACGTGGAGGAGAACCCTGGGCTCCCGCCATGAAGGTAAGTATC
 AAGTTACAAGACAGGTTTAAGGAGACCAATAGAACTGGGCTTGTGAGACAGAGACGACTCTTGCCTTTCT
 GATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACAGATCGAGTGCCGCATCACCGGCA
 CCTGAACGCGCTGGAGTTTCGAGCTGGTGGGCGCGGAGAGGGCACCCCGAGCAGGGCCGCATGACCAACAA
 GATGAAGAGCACCAAGGCGCCCTGACCTTCAGCCCCCTACCTGCTGAGCCACGTGATGGGCTACGGCTTCTAC
 CACTTCGGCACCTACCCAGCGGCTACGAGAACCCTTCTGTCACGCCATCAACAACGGCGGCTACACCAACA
 CCCGCATCGAGAAGTACGAGGACGGCGGCTGCTGCACGTGAGCTTCAGCTACCGCTACGAGGCCGGCGGCT
 GATCGGCGACTTCAAGGTGGTGGGCACCGGCTTCCCGAGGACAGCGTGATCTTACCAGCAAGATCATCCGC
 AGCAACGCCACCGTGGAGCACCTGCACCCCATGGGCGATAACGTGCTGGTGGGCAGCTTCGCCCCGACCTTCA
 GCCTGCGCGACGGCGGCTACTACAGCTTCGTGGTGGACAGCCACATGCACTTCAAGAGCGCCATCCACCCAG
 CATCTGCAGAACGGGGGCCCCATGTTCCGCTTCCGCGCGTGGAGGAGCTGCACAGCAACACCGAGCTGGGC
 ATCGTGGAGTACCAGCAGCCTTCAAGACCCCCATCGCCTTCGCCAGATCTCGAGCTCGATGAACTTGTTTA
 TTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCA
 TTCTAGTTGTGGTTTGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

130. Full RNA sequence of p3EL_HBV+AFP_SD_GFP or
 p3EL_HBV+AFP_SD_GFP:

UCAGAUCGCUAGCCUGGAAAAAAGGGAAAAAAUUCUAGAGGAAAGAGGAAUAGAGGACAAAACGGCCAAACA
 ACAAGUAGUAGUAAAGAAAGCAACAAGAAGAAAGGCAUAGCAGCAAAAUGAAGAGGAGAGUAGUAAAACGU
 CUUUCUCAGUCCGGUACCUCUGAUUCCUGGGGCCACCUCUCUAAAAUAAAUUUUUCUUCUUAACCC
 UCUIUCCUAGUUGGCCCUUUCUUCUUCGCUUUAUUAUUUUGUCUUUUUUUAACCUGGGCCUGGGCCUG
 GGUACUAAACAGAUUGUUUUUCCUUUUUUCCAGGGAAGCGGAGCUACUACUUCAGCCUGCUGAAGCAG
 GCUGGAGACGUGGAGGAGAACCUGGGCCUCCGCCAUGAAGGUAAGUAUCAAGGUUACAAGACAGGUUUAAG
 GAGACCAUAGAAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUCUGAUAGGCACCUAUUGGUCUUA
 UGACAUCCACUUGCCUUCUCUCCACAGAUUGAGUGCCGCAUACCGGCACCCUGAACGGCGUGGAGUUCGA
 GCUGGUGGGCGGCGGAGAGGGCACCCCGAGCAGGCGCGAUGACCAACAAGAUGAAGAGCACCAAAAGCGCC
 CUGACCUCAGCCCCUACCUGCUGAGCCACGUGAUGGGCUACGGCUUCUACCACUUCGGCACCUACCCAGCG
 GCUACGAGAACCCUUCUGCAGGCCAUCAACAACGGCGGCUACCAACACCCGCAUAGAGAAGUACGAGGA
 CGGCGGCGUGCUGCAGCUGAGCUUACGUACCGCUACGAGGCGCGCGGUGAUCGGCGACUUAAGGUGGUG
 GGCACCGGCUUCCCCGAGGACAGCGUGAUCUACCGACAAGAUCAUCCGCAGCAACGCCACCGUGGAGCACC
 UGCACCCCAUGGGCGAUAAACGUGCUGGUGGGCAGCUUCGCCCCGACCUUCAGCCUGCGGACGGCGGCUACU
 CAGCUUCGUGGUGGACAGCCACAUGCACUUAAGAGCGCCAUCCACCCAGCAUCCUGCAGAACGGGGGCCCC
 AUGUUCGCCUUCGCGCGUGGAGGAGCUGCAGCAACACCGAGCUGGGCAUCGUGGAGUACCAGCAGCCU
 UCAAGACCCCAUCGCCUUCGCCAGAUUCGAGCUCGAUGAAACUUGUUUAUUGCAGCUUAUAAUGGUUACAA
 AUAAGCAUAGCAUACAAAUUCACAAUAAAGCAUUUUUUCACUGC

Targeting AFP and VEGF

131. BD (AFP+VEGF)+spacer only:

GCTAGCACCTCTCTAAACCTAAATTAATTTTCTTCTCTAAACCTCTTTCTAGTTGGACTGACGTCA
 CTCAGTCCTCTGAATTCTTTCTTTCTTGATCCTTATATTCCTGTGCCCCCTTTCTCTCTCTCCCCACA

132. BD-AFP: ACCTCTCTAAACCTAAATTAATTTTCTTCTCTAAACCTCTTTCTAGTT

133. BD-VEGF: TTTCTTTCTTGATCCTTATATTCCTGTGCCCCCTTTCTCTCTCTCCCCACA

134. Full sequence of p3EL_AFP+VEGF_GFP (p3EL_AV_GFP):

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCAATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACCTTACGTTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA

CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
 TCCGCCCATTTGACGCAAATGGGCGGTAGGCGTGACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCGCTAGCACCTCTCTAAACCTAAATTTAAATTTTCTTCTCTAAACCTCTTTCTTAGTTGGACTG
 ACGTCACTCAGTCTCTGAATTTCTTTCTTTCTTGATCCTTATATTCCTGTGCCCCCTTTCTCTCTCCCCAC
 ACGTCAAGGCTTTTCATTTTTTGCTTTTTTTTAACTGGGCCTGGGCCTGGGTACTAACACGATCGTTTTTTTTCC
 CTTTTTTTCCAGGAAGCGGAGCTACTAATTTCAGCCTGCTGAAGCAGGCTGGAGACGTGGAGGAGAACCCTG
 GGCTCCCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAACTGGGCTTGTC
 GAGACAGAGACGACTCTTGCGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCTTTCTCTCC
 ACAGATCGAGTGCCGCATCACCGGCACCTGAACGGCGTGGAGTTCGAGCTGGTGGGCGCGGAGAGGGCACC
 CCCGAGCAGGCGCGCATGACCAACAAGATGAAGAGCACCAAGGCGCCCTGACCTTCAGCCCCCTACCTGCTGA
 GCCACGTGATGGGCTACGGCTTCTACCACCTTCGGCACCTACCCAGCGGCTACGAGAACCCCTTCTGACGCG
 CATCAACAACGGCGGCTACACCAACACCCGCATCGAGAAGTACGAGGACGGCGGCGTGCTGCACGTGAGCTTC
 AGCTACCGCTACGAGGCCGGCGCGTGATCGGCGACTTCAAGGTGGTGGGCACCGGCTTCCCCGAGGACAGCG
 TGATCTTACCGACAAGATCATCCGACGCAACGCCACCGTGGAGCACCTGCACCCCATGGGCGATAACGTGCT
 GGTGGGCGAGCTTCGCCCGCACCTTCAGCCTGCGCGACGGCGGCTACTACAGCTTCGTGGTGACAGCCACATG
 CACTTCAAGAGCGCCATCCACCCAGCATCTGCAGAACGGGGGCCCCATGTTGCGCTTCCGCCGCGTGGAGG
 AGCTGCACAGCAACACCGAGCTGGGCATCGTGGAGTACCAGCACGCTTCAAGACCCCCATCGCTTCCGCGAG
 ATCTCGAGCTCGATGAAACTTGTATTATGACGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTT
 ACAAATAAAGCATTTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTGAAGACAATA
 GCAG

135. Full sequence of p3EL_AFP+VEGF_GFP-NLS (p3EL_AV_GFP-NLS):

CGATGGAGCGGAGAATGGGCGGAAC TGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGAGCCTGGGGACTTTCCACACCTTAAC
 TGACACACATTCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCGCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAAACTGCCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAAATGGCCCGCTTGGCATTATGCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
 ACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTGTTTTGGCACCAAAATCAACGGGACTTT
 CCAAAATGTCGTAACAACCTCCGCCCATTTGACGCAAAATGGGCGGTAGGCGTGACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTAGTGAACCGTCAGATCGCTAGCACCTCTCTAAACCTAAATTTAAATTTTCTTCTCTAAACC
 TCTTTCTTAGTTGGACTGACGTCACTCAGTCTCTCTGAATTTCTTTCTTTCTTGATCCTTATATTCCTGTGCCC
 CTTTTCTTCTCTCCCCACAACGCTTTTCATTTTTTGCTTTTTTTTAACTGGGCCTGGGCCTGGGTACTA
 ACACGATCGTTTTTTTTTCCCTTTTTTTTCCAGGAAGCGGAGCTACTAACTTCAGCCTGCTGAAGCAGGCTGGAG
 ACGTGGAGGAGAACCCTGGGCCTCCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCA
 ATAGAACTGGGCTTGTCGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACCTATTGGTCTTACTGACATC
 CACTTTGCTTTCTCTCCACAGATCGAGTGCCGCATCACCGGCACCTGAACGGCGTGGAGTTCGAGCTGGTG
 GCGGCGGAGAGGGCACCCCGAGCAGGGCCGCATGACCAACAAGATGAAGAGCACCAAGGCGCCCTGACCT
 TCAGCCCCCTACCTGCTGAGCCACGTGATGGGCTACGGCTTCTACCACCTTCGGCACCTACCCAGCGGCTACGA
 GAACCCCTTCTGACGCGCATCAACAACGGCGGCTACACCAACACCCGCATCGAGAAGTACGAGGACGGCGGC
 GTGCTGCACGTGAGCTTACGCTACCGCTACGAGGCCGGCGCGTGATCGGCGACTTCAAGGTGGTGGGCACCG
 GCTTCCCCGAGGACAGCGTGATCTTACCGACAAGATCATCCGACGCAACGCCACCGTGGAGCACCTGCACCC
 CATGGGCGATAACGTGCTGGTGGGCGAGCTTCGCCCCGACCTTCAGCCTGCGCGACGGCGGCTACTACAGCTTC
 GTGGTGGACAGCCACATGCACCTTCAAGAGCGCCATCCACCCAGCATCTGCAGAACGGGGGCCCCATGTTTCG
 CCTTCCGCCGCGTGGAGGAGCTGCACAGCAACACCGAGCTGGGCATCGTGGAGTACCAGCACGCTTCAAGAC
 CCCCATCGCTTCGCCAGATCTCGAGCTCGATGAACTTGTATTATGACGCTTATAATGGTTACAAATAAAGC
 AATAGCATCACAAATTTACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCA
 ATGTATCTGAAGACAATAGCAG

136. Full RNA sequence of p3EL_AFP+VEGF_GFP or
 p3EL_AFP+VEGF_GFP-NLS:

UCAGAUCGCUAGCCACCUCUCUAAACCUAAAUAUAAUUAUUCUUCUCUAAACCUUUUCCUAGUUGGACUGACGU
CACUCAGUCCUCCUGAAUUCUUUUCUUUCUUGAUCCUUAUUAUUCUGUGCCCCUUUUCUCCUCCCCACA
GCUUUAUUAUUCUUCUUUUUAACCUUGGCCUGGGCCUGGGUACUAAACACGAUCGUUUUUUCCCUUU
UUUCCAGGGAAGCGGAGCUACUAAUUCAGCCUGCUGAAGCAGGCUGGAGACGUGGAGGAGAACCUGGGCC
UCCCGCCAUGAAGGUAAGUAUCAAGGUACAAGACAGGUUAAGGAGACCAUAGAAACUGGGCUUGUCGAGA
CAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUACUGACAUCCACUUUGCCUUUCUCCACAG
AUCGAGUGCCGCAUCACCGGCACCCUGAACGGCGUGGAGUUCGAGCUGGUGGGCGGCGAGAGGGCACCCCG
AGCAGGGCCGCAUGACCAACAAGAUGAAGAGCACCAAAGGCGCCUGACCUUCAGCCCUUACCUGCUGAGCCA
CGUGAUGGGCUACGGCUUCUACCACUUCGGCACCUCACCCAGCGGCUACGAGAACCCCUUCCUGCAGGCCAUC
AACAACGGCGGCUACACCAACACCCGCAUCGAGAAGUACGAGGACGGCGGCGUGCUGCAGCUGAGCUUCAGCU
ACCGCUACGAGGCCGGCCGCGUGAUCGGCGACUUAAGGUGGUGGGCACCGGCUUCCCCGAGGACAGCGUGAU
CUUCACCGACAAGAUAUCCGCAGCAACGCCACCGUGGAGCACCUGCACCCTCAUGGGCGAUAACGUGCUGGUG
GGCAGCUUCGCCCGCACCUUCAGCCUGCGCGACGGCGGCUACUACAGCUUCGUGGUGGACAGCCACAUGCACU
UCAAGAGCGCCAUCCACCCAGCAUCCUGCAGAACGGGGGCCCCAUGUUCGCCUUCGCCCGGUGGAGGAGCU
GCACAGCAACACCGAGCUGGGCAUCGUGGAGUACCAGCAGCCUUAAGACCCCAUCGCCUUCGCCAGAUUCU
CGAGCUCGAUGAAACUUGUUAUUGCAGCUUAUUAUGGUUACAAUAAAGCAUAGCAUCACAAAUUUCACAA
AUAAGCAUUUUUUCACUGC

Sus scrofa (porcine) skin targeting

137. BD (KRT14+CASP14+AKNAK2+KRT1+KRT10+KRT2)+spacer:

GCTAGCTTTGTTTCCAGCCTCGGGCATAGATGCTTAGATTCTTTTFTTATTTTFTTFTTGTGGCCTC
CCTGCTGAGCGAATTTGTTTACAGATTTTATCTGAATATCATCTTTATTTATCTCACAATACCATGGGT
CGCTCGGCAAGCCCGGCGCCTAGAAAAGGCAAAAAGACAATAACAAAACAAAACAAAAAAGCAAAAA
CTAAAAACACGCACATACAAATGAAACAATTTATCCCGCCGGGCTATTCTCCTTCACCCCTTACTTACT
TTTGATTTCTCCAGATGTCTACTCTGAAACCTCTTTGCTACCTTTCTTTTCACTCACCACCTCATTTCA
GCGGCGATTGCAGCTGCGTGCTTTTCTTTTCATTAACAAACAGCTCCACCTTTATTTCTCCTTTCTTTT
CACTGACCTTTTCATTTTCTCCTGTGTTCCCTATTCTTAGGCAGCTGCGTTGCGCGCTGATGATTGAGC
CCCTACACTGGGAACCACCTTTATGCCTCCGGTTTCGGCCCTAAAAAGACAAATAATAAAATAAAATAAA
ATAAAATAAAAAAAATAAAATAAATTTAATT

138. BD-KRT1:

ATTCTCCTTCACCCCTTACTTACTTTTGATTTCTCCAGATGTCTACTCTGAAACCTCTTTGCTACCTTTCTCT
TCACTCACCACCTCAT

139. BD-KRT2:

TGATTCGACCCCTACACTGGGAACCACCTTTATGCCTCCGGTTTCGGCCCTAAAAAGACAAATAATAAAATAAA
TAAATAAAATAAAAAAAATAAAATAAATTTAATT

140. BD-KRT10:

GTGCTTTTCTTTCATTAACAAACAGCTCCACCTTTATTTCTCCTTTCTTTTCACTGACCTTTTCATTTTCTCCT
GTGTTCCCTATTCTTAG

141. BD-KRT14 :

CLAGCCTCCGGCAGATAGCTGAGATCTTTTFTTATTTTFTTFTTGT

142. BD-CASP14 :

TTTGTTTACAGATTTTATCTGAATATCATCTTTATTTATCTCACAATACCATGGG

143. BD-AKNAK2 :

CTAGAAAAGGCAAAAAGACAATAACAAAACAAAACAAAAAAGCAAAAACATAAAACACGCACATACAAATGA
AACAAATTTATCCC

144. Spacer19 : TTTGTTT

145. Spacer20 : GGCCTCCCTGCTGAGCGAA

146. Spacer21 : TCGCTCGGCAAGCCCGGCGCC

147. Spacer22 : TCAGCGGCGATTGCAGCTGC

148. Full sequence of

p3EL_KRT14+CASP14+AKNAK2+KRT1+KRT10+KRT2 (p3EL_all skin (ss)):

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACA
TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
CCACCCCAATTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
TCCGCCCAATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
ACCGTCAGATCGCTAGCTTTGTTTTCCAGCCTCCGGCATAGATGGTTAGATTCTTTTTTTTATTTTTTTTTTGT
GGCCTCCCTGCTGAGCGAAATTTGTTTACAGATTCTTATCTGAATATCATCTTTATTAATCTCAGATACCATGGG
TCGCTCGGCAAGCCCGGCGCTAGAAAAGGCCAAAAGACAATAACAAAACAAAACAAAAAAGCAAAACTAA
AAACACGCACATACAAATGAAACAATTATCCCGCCGGGCTATTCTCTTCCACCCCTTACTTACTTTTTGATTCT
TCCAGATGTTTACTCTGAAACCTCTTTGCTACCTTTCTTTCACTCAACACCTCATTCAGCGGCGATTGCAGC
TGCGTGCTTTTCTTTCAATTAACAAACAGCTCCACCTTTATTTCTCTTTCTTTTCACTGACCTTTCATTTTCT
CCTGTGTTCCCTATTCTTAGGCAGCTGCGTTTCGCCGTGATGATTGACCCCTACACTGGGAACCACTTATG
CCTCCGGTTCCGCCCCATAAAAGACAAATAATAAAATAAAATAAAATAAAATAAAATAAAATAAAATTTA
ATTCTTTTCCAGGTAAGTATCAAGGTTACAAGACAGGTTAAGGAGACCAATAGAAACTGGGCTTGTGCGAG
ACAGAGACGACTCTTGCGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCTTTCTCTCCACA
GGGTGAGATATCGGCCGGGACGCGCGGTGGTAAAGACAAGCGCCAGATAACAATGGGCATGCCTTATGCC
GTGACCGACGCGTTCTGGCTCCTCATATCGGGGGGAGGCTGGGAGCTCACATGCCCGCCCCCGGCCCTCA
CCCTCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGCGATACCTTATGGGCAGCAT
GACCCCCCAGGCGGTGCTGGCGTTCTGTTGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGG
GCCCCTTCCGGAGGACAGACACATCGACCGCTTGCCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTA
TGCTGGCCGCGATTTCGCCGCTTTACGGGCTGCTTGCCAATACGGTGCCTTATCTGCAGGGCGCGGGTCTGTG
GCGGGAGGATTGGGGACAGCTTTTCGGGGACGCGCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGC
CCACGACCCCATATCGGGGACACGTTATTTACCTGTTCGGGGCCCCGAGTTGCTGGCCCCAACGGCGACC
TGTATAACGTGTTTGCCTGGGCTTGGACGCTTTGGCCAAACGCTCCGTCCCATGCACGTCTTTATCCTGGA
TTACGACCAATCGCCCGCCGGCTGCGGGACGCGCTGCTGCAACTTACCTCCGGATGGTCCAGACCCACGTC
ACCACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTTGC CGGGAGATGGGGGAGGCGAACT
GAAACTTGTTTTATGTCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATT
TTTTTCACTGCATTCTAGTTGTGGTTTTGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

149. Full sequence of

p3EL_KRT14+CASP14+AKNAK2+KRT1+KRT10+KRT2_NLS (p3EL_all skin
(ss)_NLS):

CGATGGAGCGGAGAATGGGCGGAAGTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCCTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATTTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
ACGGGGATTTCGAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAACTCCGCCCATTTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTTAGTGAACCGTCAGATCGCTAGCTTTGTTTTCCAGCCTCCGGCATAGATGGTTAGATTCTTT
TTTTTTTTTTTTTTTTTGGCTCCCTGCTGAGCGAAATTTGTTTACAGATTCTTATCTGAATATCATCTTTAT
TATCTCAGATACCATGGCTCGCTCGGCAAGCCCGGCGCTAGAAAAGGCCAAAAGACAATAACAAAACAAAAC
AAAAAAGCAAAACTAAAAACACGCACATACAAATGAAACAATTATCCCGCCGGGCTATTCTCTTCCACCC
TTACTTACTTTTGATTCTTCCAGATGTTTACTCTGAAACCTCTTTGCTACCTTTCTTTCACTCAACACCTCA
TTACGCGGCGATTGCAGCTGCGTGCTTTTCTTTCAATTAACAAACAGCTCCACCTTTATTTCTCTTTCTTTT
ACTGACCTTTCAATTTCTCTGTGTTCCCTATTCTTAGGCAGCTGCGTTTCGCCGTGATGATTGACCCCTAC

150. Full RNA sequence OF

p3EL KRT14+CASP14+AKNAK2+KRT1+KRT10+KRT2:

151. Full sequence of

ACTAGTGTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGGTTACA
TAACTTACGGTAAATGGCCCCCTGGCTGACCGCCCAACGACCCCCGCCCATTTACGTCAATAATGACGTATG

152. Full sequence of
p3EL_KRT14+CASP14+AKNAK2+KRT1+KRT10+KRT2_GFP-NLS (p3EL_all skin
(ss) GFP NLS):

56/87

AGACGTGGAGGAGAACCCTGGGCCTCCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGAC
CAATAGAAACTGGGCTTTGTTCGAGACAGAGACGACTCTTGGCTTTCTGATAGGCACCTATTGGTCTTACTGACA
TCCACTTTGCTTTCTCTCCACAGATCGAGTGCCGCATCACCGGCACCCTGAACGGCGTGAGTTTCGAGCTGG
TGGCGGCGGAGAGGGGACCCCCGAGCAGGGCCGCATGACCAACAAGATGAAGAGCACCAGGCGCCCTGAC
CTTCAGCCCCCTACCTGCTGAGCCAGTGATGGGCTACGGCTTCTACCACTTCGGCACCTACCCAGCGGCTAC
GAGAACCCTTCTTGCACGCCATCAACAACGGCGGCTACACCAACACCCGCATCGAGAAGTACGAGGACGGCG
GCGTGCTGCACGTGAGCTTACGCTACCGCTACGAGGCCGGCCGCGTGATCGGCGACTTCAAGGTGGTGGGCAC
CGGCTTCCCCGAGGACAGCGTGATCTTACCGACAAGATCATCCGAGCAACGCCACCGTGAGCACCTGCAC
CCCATGGGCGATAACGTGCTGGTGGGCAGCTTCGCCCCGACCTTCAGCTGCGCGACGGCGGCTACTACAGCT
TCGTGGTGGACAGCCACATGCACCTTCAAGAGCGCCATCCACCCAGCATCCTGCAGAACGGGGCCCCATGTT
CGCCTTCCGCGCGGTGGAGGAGCTGCACAGCAACCCGAGCTGGGCATCGTGGAGTACCAGCAGCCTTCAAG
ACCCCATCGCCTTCGCCAGATCTCGAGCTCGATGAAACTTGTATTGTCAGCTTATAATGGTTACAAATAAA
GCAATAGCATCACAATTTTCAAAATAAAGCATTTTTTCTACTGCATTCTAGTTGTGGTTGTCCAAACTCAT
CAATGTATCTGAAGACAATAGCAG

153. Full RNA sequence of

p3EL_KRT14+CASP14+AKNAK2+KRT1+KRT10+KRT2_GFP-NLS or

p3EL_KRT14+CASP14+AKNAK2+KRT1+KRT10+KRT2_GFP:

UCAGAUUCGCTAGCUUUUUUUUCCAGCCUCCGGCAUAGAGGCGUAGAUUCUUUUUUUAUUUUUUUUUUUUGGCC
UCCUGUGAGCGAAUUUUUUUACAGAUUUUUUACUAAAUUACUUCUUUAUUUUUACUACUAAUCCUCCU
UCGGCAAGCCCGGCGCUAGAAAAGGCAAAAAGACAAUAACAAAACAAAACAAAAAAGCAAAAACUAAAAAC
ACGCACAUACAAAUGAAACAAUUAUCCCGCGCGGCUAUUCUCCUUCACCCCUUACUUAUUUGAUUUCUCCA
GAUGUCUACUCUGAAACCUCUUUGCUACCUUUCUUCACUCACCACCUCUUCAGCGGCGAUUCAGCUGCG
UGCUUUUUCUUAUUAACAAACAGCUCCACCUUUAUUUCUCCUUCUUCUACUGACCUUUAUUUUUCUG
UGUCCCUUAUUUCUAGGCAGCUGCGUUCGCCGUGAUUAUUCGACCCUACACUGGGAACCAUUAUGCCUC
CGGUUCGGCCCUAAAAAGACAAUAAUAAAAUAAAAUAAAAUAAAAUAAAAUAAAAUAAAAUAAUUU
UUAUUAUUUUUUGUCUUUUUUUAACUGGGCCUGGGCCUGGGUACUACACGAUCGUUUUUUCCCU
UUUUUUCCAGGGAAGCGGAGCUACUACUUCAGCCUGCUGAAGCAGGCGUGGAGACGUGGAGGAGAACCUGGG
CCUCCCGCAUGAAGGUUAAGUAUCAAGGUUACAAGACAGGUUAAGGAGACCAUAGAAACUGGGCUUGUCGA
GACAGAGACGACUCUUGCGUUCUGAUAGGCACCUAUGGUCUUAUGACAUCCACUUGCCUUCUCUCCAC
AGAUCGAGUGCCGAUCACCGGCACCCUGAACGGCGUGGAGUUCGAGCUGGUGGGCGGCGAGAGGGCACCCC
CGAGCAGGGCCGAUGACCAACAAGAUGAAGAGCACCAAGGCGCCUGACCUUCAGCCCUUACCUUGCUGAGC
CACGUGAUGGGCUACGGCUUCUACCACUUCGGCACCUACCCAGCGGCUACGAGAACCCUUCUGCAGGCCA
UCAACAACGGCGGCUACACCAACACCCGCAUCGAGAAGUACGAGGACGGCGGCGUGCUGCAGCUGAGCUUCAG
CUACCGCUACGAGGCGCGCCGCGUGAUCGGCGACUUAAGGUGGUGGGCACCGGCUUCCCGAGGACAGCGUG
AUCUUCACCGACAAGAUAUCCGACGCAACGCCACCGUGGAGCACCUGCACCCCAUGGGCGAUAAACGUGCUGG
UGGGCAGCUUCGCCCGCACCUUCAGCCUGCGCGACGGCGGCUACUACAGCUUCGUGGUGGACAGCCACAUGCA
CUUCAAGAGCGCAUCCACCCAGCAUCCUGCAGAACGGGGGCCCCAUGUUCGCCUUCGCCCGGUGGAGGAG
CUGCAGCAACACCGAGCUGGGCAUCGUGGAGUACCAGCACGCCUUAAGACCCCAUCGCCUUCGCCAGAU
CUCGAGCUCGAUGAAACUUGUUUAUUGCAGCUUAUAAUGGUUACAAAUAAGCAUAGCAUCACAAAUUCAC
AAAUAAAGCAUUUUUUUCACUGC

Targeting basal cells

154. BD (KRT15+TP73+COL17A1)+spacer:

GCTAGCTCCATATGCCGCGGAGAGGACCAAGAAATAGCAGAGACAAAAAATAAATAAAAAATTA
AAAAAATAAAAAAACTAATTCCCGGAGCCCGCGCTATCCACCCATCCACCAATCCATCCCCCTGCCA
GCCAGGCACTTATCCATCCAAACATCTTCCATCCACACCCATCCATCTCCTCATCTATGCATCCAGC
GCCGGGCTTCAGCGGCGATTGCAGCTGCUCAGTTCTTGCAATTTCTTATAACACTTACGTCAAAACAT
TTCCGCAGCTGCGTTCCCGCCTCAG

155. KRT15:

TCCATATGCCGCGGAGAGGACCAAGAAATAGCAGAGACAAAAAATAAATAAAAAATTA
AtAAAAAACTaaTT

156. COL17A1:

CCAGTTCCTTCCAAATTTCCCTATaaCACTTACGTCAAAAACATTTCC

157. TP73:

TATCCACCCATCCACCATCCATCCCCCGGCCAGCCAGCCACTTATCCATCCAAACCATCTTCCCATCCACACCC
ATCCATCTCCCTCATCTATCCATCCAGC

158. Spacer23: CCCGGAGCCCGGCGC

159. Spacer24: GCCGGGCTTCAGCGCGGATTGCAGCTGC

160. Spacer25: GCAGCTGCGTTCCGCCG

161. Full sequence of p3EL_KRT15+TP73+COL17A1 (p3EL_basal(ss)):

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCAATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGG
CATTATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGACTCACGGGGATTTCCAAGTCT
CCACCCCATGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
TCCGCCCATGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
ACCGTCAGATCGCTAGCTCCATATGCCGCGGAGAGGACCAAGAAATAGCAGAGACAAAAAATAAATAA
AAATTAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAA
AGCCAGCCCACTTATCCATCCAAACCACTTCCGATCCCAACCATCCATCTCTCTCATCTATCCATCCAGC
GGCTTCAGCGCGGATTGCAGCTGCCAGTTCTTCCAAATTTCCCTATAACACTTACGTCAAAAACATTTCCGCAGC
TGCGTTCCGCCGCTTCAGCCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAAACTGGG
CTTGTCTGAGACAGAGACACTCTTGGCGTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTT
CTCTCCACAGGGTGAGATATCGGCCGGGACGCGCGGTGGTAATGACAAGCGCCAGATAACAATGGGCATG
CCTTATGCCGTGACCGACGCGTCTTGGCTCTCATATCGGGGGGAGGCTGGGAGCTCACATGCCCGCCCC
CGGCCCTCACCTCATCTTCGACCGCCATCCCATCGCCGCCCTCTGTGCTACCCGGCCGCGGATACCTTAT
GGGAGCATGACCCCCAGGCGGTGCTGGCGTTCTGTGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATC
GTGTTGGGGGCCCTTCCGGAGGACAGACACATCGACCGCCTGGCCAAACGCCAGCGCCCCGCGGAGCGGCTTG
ACCTGGCTATGCTGGCCGCGATTTCGCCGCGTTTACGGGCTGCTTGCCAATACGGTGCGGTATCTGCAGGGCGG
CGGGTCGTGGCGGGAGGATTGGGGACAGCTTTCGGGGACGGCCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGC
AACGCGGGCCACGACCCCATATCGGGGACAGCTTATTTACCTGTTCGGGCCCCGAGTTGCTGGCCCCCA
ACGGCGACCTGTATAAGTGTTTTGCTGGCCCTTGACGCTTTGGCCAAACGCCCTCCGTCCCATGCAGCTCTT
TATCCTGGATTACGACCAATCGCCCGCGGCTGCCGGGACGCCCTGCTGCAACTTACCTCCGGGATGGTCCAG
ACCCACGTCACACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTTGC CGGGAGATGGGGG
AGGCGAACTGAAACTTGTTTTATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAA
TAAAGCATTTTTTCTACTGCATTCTAGTTGTGGTTGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

162. Full sequence of p3EL_KRT15+TP73+COL17A1_NLS

(p3EL_basal(ss)_NLS):

CGATGGAGCGGAGAATGGGCGGAACCTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACCTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATTTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCCTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACG
TATTAGTCATCGCTATTACCATGTTGATCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGA
ACTGAGTTTCCAAAGTCTCCACCCCAATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAACCTCGCCCATTTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTTAGTGAACCGTCAGATCGCTAGCTCCATATGCCGCGGAGAGGACCAAGAAATAGCAGAGA
CAAAAAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAA

163. Full RNA sequence of p3EL_KRT15+TP73+COL17A1_NLS or p3EL_KRT15+TP73+COL17A1:

164. Full sequence of p3EL KRT15+TP73+COL17A1 GFP:

[illegible]

165. Full sequence of p3EL KRT15+TP73+COL17A1 GFP NLS:

166. Full RNA sequence of p3EL_KRT15+TP73+COL17A1_GFP-NLS or p3EL_KRT15+TP73+COL17A1_GFP:

[illegible]

Targeting hair follicle

GCCTAGCTCGCTCGGCAAAAGTCACGTGTTTTCCCTCTCCTTTCTCTCTAATCCOFTTACTCTTCCCTATTCC
TCCTCTATTTTTTTTTTTTTTTTTTTTTTTATTTTTTTAAATTTTTTTTATGGCTCTTTGCTCTTTTT
TTTTGTTGTAGCTATTTCTTGGTTTTTTGCTGAGCGAATGAAAGCGCAGAGGGATCCTGTCTCTGTCTCT
CCCTGTCTCCACTCACCACCCCTGCCCTACTACCTGATTCTCTCTTGAATTATTGTCTCTCTGTGT
CAAAATTAAAAATAAAAAATCTA

GATCCTGTCTCTGTCTCTCCCTGTCTCCACTCACCACCCCTGCCCTACTACCTGATTCTCTCTTGAATTAT
 TGTCTCTCTGTGTCAAAATTAAAAATAAAAAAATCTA

AAGTCACTGTTTTCCCTCTCCTTTTCCTTCTAATCCCTTTACCTCTTCTCTATTCTCTCTTAATTTTTTTTTTTTTTT
TTTTTTTTTATTTTTTTAAATTTTTTTTATGGTCTTTTGCGCTTTTCTTTTGTGGGTAGCTATTTCTTGG

172. Full sequence of p3EL FGF-7+HOXC13 (p3EL follicle(ss)):

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173. Full sequence of p3EL FGF-7+HOXC13 NLS (p3EL follicle(ss) NLS):

173. Full sequence of p3EL FGF-7+HOXC13 NLS (p3EL follicle(ss) NLS):

174. Full RNA sequence of p3EL_FGF-7+HOXC13 or p3EL_FGF-7+HOXC13 NLS:

[illegible]

175. Full sequence of p3EL_FGF-7+HOXC13_GFP (p3EL_follicle(ss)_GFP):

176. Full sequence of p3EL_FGF-7+HOXC13_GFP-NLS
(p3EL follicle(ss) GFP NLS):

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177. Full RNA sequence of p3EL_FGF-7+HOXC13_GFP or p3EL_FGF-7+HOXC13 GFP NLS:

Targeting senescence cells

GCTAGCTTTTTCGGGGCCGGGGGGCTCTCTCTCTCTCTTTCTTCCTTCCTTCCATTITTTTTTTTTTTT
TTCCCCCGGGCCGGTCAGCGGCGATTGCAGCTGCGACTCATACCTCTCTTCTACTACCTTTCTATCA
TAAATCTCTCCACATTTCAAACCCCGCAGCTGCGTTTCGCCGCGTTTCGCTC

CTCTCTCTCTCTCTTTCTTCCTTCCATTCTTTCTTTTGTCTTLAGTCTTTTGTTGTTGG
TTGATGCATTTCTTGG

186. Full RNA sequence of p3EL FOXO4+P16 NLS or p3EL FOXO4+P16:

187. Full sequence of p3EL FOXO4+P16 GFP (p3EL senescence(ss) GFP):

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188. Full sequence of

CGATGGAGCGGAGAATGGCGGGAACCTGGGCGGAGTTAGGGGCGGGATGGGCGGGAGTTAGGGGCGGGACTATGGG
TTGCTGACTAATTGAGATGTCATGCTTTGCATACTTCTGCCGTCTGGGGAGCCTGGGGACTTTCCACACCTTGGT
TGCTGACTAATTGAGATGTCATGCTTTGCATACTTCTGCCGTCTGGGGAGCCTGGGGACTTTCCACACCTTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
ATGGAGTTCGCGCTTACATAACTTACGGTAAATGGCCCGCTTGCTGACCGCCCAACGACCCCCGCCCATTTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTTGGCATTATGCCAGTACATGACCTTATGGGACTTTCCCTACTTGGCAGTACATCTACG
TATTAGTCACTCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
ACGGGGATTTCGAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTGCTAACAACTCCGCCCCATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTAGTGAACCGGCTAGCTTTTTTCCGGGCCGGGGGGCTCTCTCTCTCTCTTTTCTCTCTCT
CCATTTTTTTTTTTTTTTTTTTTTCCCCCGGCCCGGTACGCGCGGATTGCAGCTGCGACTCATACCTCTCTCTCTCT
ACCTTCTATCATATAAAATCTCTCCACATTTCAAACCCCCGCAGCTGCGTTTCGCGCGGTTTCGCCCTCTCTCTCTCT
CTTTCATTTTTTGTCTTTTTTTTAACTGGGCCTGGGCCTGGGTACTAACACGATCGTTTTTTTTCCCTTTTTTTT
CAGGGAAGCGGAGCTACTAACTTCAGCCTGCTGAAGCAGGCTGGAGACGTGGAGGAGAACCCTGGGCCTCCCG
CCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAACTGGGCTTGTGAGACAGAG
ACGACTCTTGCCTTTCTGATAGGCACCTATTGGCTTACATGCATCCACTTTGCCCTTCTCTCCACAGATCGA
GTCCCGCATACCCGGCACCTTGAACGGCTGGAGTTTCAGCTGGTGGCGGCGGAGAGGCGCACCCCCGAGCAG
GCGCCGATGACCAACAAGATGAAGAGCACCAAGGCGCCCTGACCTTCAGCCCCCTACCTTGCCTGAGCCACGTGA
TGGGCTACGGCTTCTACCACCTTCGGCACCTACCCAGCGGCTACGAGAACCCCTTCTTGCACGCCATCAACAA
CGGCGGCTACACCAACACCCGCACTGAGAAGTACGAGGACGGCGGCGTGTGTCACGTGAGCTTTCAGCTACCGC
TACGAGGCCGGCCGCGTGTATCGCGACTTCAAGGTGGTGGGCACCGGCTTCCCCGAGGACAGCGTGATCTTCA
CGACAAGATCATCCGAGCAACGCCACCGTGGAGCACCCTGACCCCCATGGGCGATAACGTGCTGGTGGGCGAG
CTTCGCCCGCACCTTTCAGCCTGCGCGACGGCGGCTACTACAGCTTCGTGGTGGACAGCCACATGCACCTTCAAG
AGCGCCATCCACCCAGCATCCTTGACAGAACGGGGGCCCATGTTTCGCCCTTCCGCGCGGTGGAGGAGCTGCACA
GCAACACCGAGCTGGGCATCGTGGAGTACCAGCAGCCCTTCAAGAACCCCCATCGCCTTCCGCCAGATCTCGAGC
TCGATGAAACTTGTTTATTGACGCTTATAATGGTTACAAATAAGACCAATAGCATACAAATTTACAAATAAA
GCATTTTTTTTCACTGCATTTCTAGTTGTGGTTTTGTCCAAACTCATCAATGTATCTGAAGACCAATAGCAG

189. Full RNA sequence of p3EL FOXO4+P16 GFP or

[illegible]

GUGAUCGGCGACUUC AAGGUGGUGGGCACCGGCUUCCCCGAGGACAGCGUGAUCUUCACCGACAAGAUCAUCC
 GCAGCAACGCCACCGUGGAGCACCUGCACCCCAUGGGCGAUACGUGCUGGUGGGCAGCUUCGCCCCGACCCU
 CAGCCUGCGCGACGGCGGCUACUACAGCUUCGUGGUGGACAGCCACAUGCACUUC AAGAGCGCCAUCACCCCC
 AGCAUCCUGCAGAACGGGGGGCCCCAUGUUCGCCUUCGCGCGUGGAGGAGCUGCACAGCAACACCGAGCUGG
 GCAUCGUGGAGUACCAGCACGCCUUC AAGACCCCAUCGCCUUCGCCAGAUCUCGAGCUCGAUGAAACUUGUU
 UAUUGCAGCUUAUAUGGUUACAAUAAAGCAAUAGCAUCACAAAUUUCACAAAUAAAGCAUUUUUUUUCACUG
 C

Prostate cancer specific

Targeting PSA

190. BD (PSA)+spacer:

GCTAGAGATCGGCCGGGGCCCTCTCATACCCCTCATACCCACACACTTCAGGGATAAAACACTTCCTTT
 TCTTTTCATTCTCTTTCTTTTTTTTTTTTTTTTTTTTTTTTATAGAGCCGGCCGATC

191. BD-PSA :

GGCCCTCTCATACCCCTCATACCCACACACTTCAGGGATAAAACACTTCCTTTCTTTTCATTCTCTTT
 CTCTTTTTTTTTTTTTTTTTTTTTTATAGAG

192. Spacer31 : GATCGGCCGG

193. Spacer32 : CCGGCCGATC

194. Full sequence of p3EL_PSA:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
 TCCGCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATC GCTAGAGATCGGCCGGGGCCCTCTCATACCCCTCATACCCACACACTTCAGGGATAAAACACT
 TCTTTTCTTTTCATTCTCTTTCTTTTTTTTTTTTTTTTTTTTTTTTATAGAGCCGGCCGATC CTTAGGTAAG
 TATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAAACTGGGCTTGTCGAGACAGAGACGACTCTGCGT
 TTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACAGGGTGAGATATCGGCCGG
 GACGCGCGCGTGGTAATGACAAGCGCCAGATAACAATGGGCGATGCCTTATGCCGTGACCGACGCGCTTCTGG
 CTCTCATATCGGGGGGAGGCTGGGAGCTCACATGCCCCGCCCCCGGCCCTCACCTCATCTTCGACCGCCA
 TCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTG
 GCGTTCTGTGGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGGGGCCCTCCGGAGGACAGAC
 ACATCGACCGCTTGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTGCGCCG
 CGTTTACGGGCTGCTTGCCAATACGGTGCGGTATCTGCAGGGCGGCGGGTCTGGCGGGAGGATTGGGGACAG
 CTTTCGGGGACGGCCGTGCGGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGG
 ACACGTTATTTACCTGTTCGGGGCCCCGAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTTTGCCCTG
 GGCTTGCCGGGACGCCCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTACCCACCCAGGCTCCATAC
 CGACGATCTCGACCTGGCGCGCACGTTTGCGCGGAGATGGGGGAGGCGAACTGAAACTTCTTTATTGACAGC
 TTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCATTCTAGT
 TGTGGTTTGTCAAACTCATCAATGTATCTGAAGACAATAGCAG

195. Full sequence of p3EL_PSA-NLS:

CGATGGAGCGGAGAATGGGCGGAAC TGGGCGGAGTTAGGGCGGGATGGGCGGAGTTAGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCCTAAC
 TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAAATGGCCCGCTGGCATTATGCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACG

196. Full RNA sequence of p3EL PSA or p3EL PSA NLS:

197. SD+BD (PSA) only:

198. Full sequence of p3EL PSA SD:

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199. Full sequence of p3EL PSA SD NLS:

200. Full RNA sequence of p3EL PSA SD or p3EL PSA SD NLS:

70/87

201. Full sequence of p3EL PSA GFP:

202. Full sequence of p3EL PSA GFP NLS:

CGATGGAGCGGAGAATGGGCGGAAC TGGGCGGAGTTAGGGCGGGATGGGCGGAGTTAGGGCGGGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
TGACACACATTCCACAGCAGCTAGCTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATAT
ATGGAGTTCGCGCTTACATAACTTACGGTAAATGGCCCGCTTGGCTGACCGGCCAACGACCCCCGCCCCATTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGACTTTCCATTGACGTCAATGGGTGGAGTATT
ACGGTAAACTGCCCATCTGGGAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC

203. Full RNA sequence of p3EL PSA GFP or p3EL PSA GFP NLS:

204. Full sequence of p3EL PSA GFP SD:

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205. Full sequence of p3EL PSA GFP SD NLS:

206. Full RNA sequence of p3EL PSA GFP SD or p3EL PSA GFP SD NLS:

73/87

AGCUACCGCUACGAGGCCGGCCGCGUGAUCGGCGACUUCAAGGUGGUGGGCACCGGCUUCCCCGAGGACAGCG
 UGAUCUUCACCGACAAGAUAUCCGCAGCAACGCCACCGUGGAGCACCUGCACCCTCAUGGGCGAUAACGUGCU
 GGUGGGCAGCUUCGCCCCGACCUUCAGCCUGCGCGACGGCGGCUACUACAGCUUCGUGGUGGACAGCCACAUG
 CACUUCACAGAGCGCCAUCCACCCAGCAUCCUGCAGAACGGGGGCCCCAUGUUCGCCUUCGCCCGGUGGAGG
 AGCUGCACAGCAACACCGAGCUGGGCAUCGUGGAGUACCAGCAGCCUUCAGACCCCCAUCGCCUUCGCCAG
 AUCUCGAGCUCGAUGAAACUUGUUUAUUGCAGCUUAUAUUGGUACAAAUAAAGCAAUAGCAUCACAAAUUUC
 ACAAUAAGCAUUUUUUUCACUGC

Targeting PSMA

207. BD (PSMA)+spacer:

GCTAGAGACTGAAAAACAACAAGCAGACAAACAAAAAACATAGAAGAACAGAAACAGAAAAA
 CATACAAACAAAAACAGAAATAAGAACAGAAACAAAAAACACACACAAAAGAACAGAAAAAGAAAA
 TGCCAACGTGACACCATCAAGGCTCAG

208. BD-PSMA :

GACTGAAAAACAACAAGCAGACAAACAAAAAACATAGAAGAACAGAAACAGAAAAA
 AACAAAAACAGAAATAAGAACAGAAACAAAAAACACACACAAAAGAACAGAAAAAGAAAAATGCCAA
 CGTGACACCATCAAGG

209. Full sequence of p3EL_PSMA:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCGCGGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCACTT
 GGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCATTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
 TCCGCCCATTTGACGCAAAATGGGCGGTAGGCGTGACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCGCTAGAGACTGAAAAACAACAAGCAGACAAACAAAAAACATAGAAGAACAGAAACAGAAAA
 AAAAAACAACAAACAAAAACAGAAATAAGAACAGAAACAAAAAACACACACAAAAGAACAGAAAAAGAAAA
 ATGCCAACGTGACACCATCAAGGCTCAGCCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAAGGAGACAAA
 TAGAAACTGGGCTTTGTGAGACAGAGACGACTCTTCGGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCC
 ACTTTGCCTTTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGGCGGTGGTAATGACAAGCGCCAGATAA
 CAATGGGCATGCCTTATGCCGTGACCGACGCGGTTCTGGCTCCTCATATCGGGGGGAGGCTGGGAGCTCACA
 TGCCCCGCCCCGGCCCTCACCTCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCG
 CGATACCTTATGGGCAGCATGACCCCGCAGGCGTGCTGGCGTTCTGGGCCCTCATCCCGCCGACCTTGCCCG
 GCACAAACATCGTGTTGGGGGCCCTTCCGGAGGACAGACACATCGACCGCTGGCCAAACGCCAGCGCCCCGG
 CGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTTCGCCGCGTTTACGGGCTGCTTGCCAAACAGGTGCGGTAT
 CTGCAGGGCGGGGCTCGTGCGGGGAGGATTGGGGACAGCTTTCGGGGACGGCCGTGCCGCCCCAGGGTGCCG
 AGCCCCAGAGCAACGGGGGCCACGACCCCATATCGGGGACAGCTTATTTACCTGTTTCGGGCCCCCGAGTT
 GCTGGCCCCCAACGGCGACCTGTATAACGTGTTTGCTGGGCCCTTGACGTCTTGGCCAAACGCCCTCCGTCCC
 ATGCACGTCTTTATCTCGATTACGACCAATCGCCCGCGGCTGCCGGGACGCCCCTGCTGCAACTTACCTCCG
 GGATGGTCCAGACCCACGTACACACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCAGTTTGCGCG
 GGAGATGGGGGAGGCGAACTGAACTTGTATTATGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACA
 AATTTACAAATAAAGCATTTTTTTTCACTGCATTCTAGTTGTGGTTTTGTCCAAACTCATCAATGTATCTGAAG
 ACAATAGCAG

210. Full sequence of p3EL_PSMA-NLS:

CGATGGAGCGGAGAATGGGCGGAACGCGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
 TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATTTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAACTTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG

TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
 ACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTT
 CCAAAATGTCGTAACAACATCCGCCCATTTGACGCCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTAGTGAACCGTCAGATCCTAGAGACTGAAAACAAACAAGCAGACAAAACAAAAAACATAG
 AAGAACAGAAACAGAAAAAAACATACAAACAAAAACAGAAATAAGAACAGAAACAAAAACACACACAA
 AAGAACCAGAAAAAGAAAAATGCCAACGTGACACCATCAAGGCTGAGGCTCCAGGTAAGTATCAAGGTTACAAGA
 CAGGTTTTAAGGAGACCAATAGAAACTGGGCTTGTCTGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACCTA
 TTGGTCTTACTGACATCCACTTTGGCTTTCTCTCCACAGGGTGAGATATCGGCCGGGGACGCGGCGGTGGTAA
 TGACAAGCGCCAGATAACAATGGGCATGCCCTTATGCCGTGACCGACGCCGTTCTGGCTCCTCATATCGGGGG
 GGAGGTGGGAGCTCATATGCCCCGCCCCGGCCCTCACCCTCATCTTCGACCGCCATCCCATCGCCGCCCTC
 CTGTGCTACCCGGCCGCGGATACCTTATGGGCAGCATGACCCCCAGGCCGTGCTGGCGTTCTGTGGCCCTCA
 TCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGGGCCCCCTTCGGAGGACAGACACATCGACCGCCTGGC
 CAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTTCGCCGCGTTTACGGGCTGCTT
 GCCAATACGGTGCAGTATCTGCAGGGCGGGGCTCGTGGCGGGAGGATTGGGGACAGCTTTTCGGGGACGGCCG
 TGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACAGCTTATTTACCCT
 GTTTTCGGGCCCCGAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTTTGGCTGGGCTTGGACGTCTTG
 GCCAAACGCTCCGTCCCATGCACGTCTTTATCCTGGATTACGACCAATCGCCCGCGGCTGCCGGGACGCCC
 TGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTACCACCCAGGCTCCATACCGACGATCTGCGACCT
 GCGCGCACGTTTTCGCGGGGAGATGGGGGAGGCGAACTGAAACTTGTATTATGCAGCTTATAATGGTTACAAA
 TAAAGCAATAGCATCACAATTTTCAAAATAAAGCATTTTTTTCACCTGCATTCTAGTTGTGTTTGTCCAAAC
 TCATCAATGTATCTGAAGACAATAGCAG

211. Full RNA sequence of p3EL PSMA NLS or p3EL PSMA:

UCAGAUCGCTAGAGACUGAAAAACAACAAGCAGACAAAACAAAAAACAUAGAAGAACAGAAACAGAAAAAA
 AACAUACAACAAAAACAGAAUAAGAACAGAAACAAAAAACACACACAAAAAGAACAGAAAAAGAAAAUGC
 CAACGUGACACCAUCAAGGCTGAGGCTGCUUUCAUUUUUGUCUUUUUUUAACUGGGCCUGGGCCUGGGUACUA
 ACAGaUcgUUUUUUUCCUUUUUUUCCAGGGAAGCGGAGCUACUAACUUCAGCCUGCUAAGCAGGCUGGAG
 ACGUGGAGGAGAACCUGGgCCUGCUUCGUACCCUGCCAUAACACGCGUCUGCGUUCGACCAGGCGGCGCG
 AUCACGGGGACACAGCAACCGACGGACGGCGUUGCGCCUCGCGGCAGCAAGAAGCCACGGAAGUCCGCCCG
 GAGCAGAAAAUGCCACGCUACUGCGGGUUUAUAGACGGUCCCCACGGGAUGGGGAAAACCACCACACGC
 AACUGCUGGUGGCCUUGGCUUCGCGCGACGAUAUCGUCUACGUACCCGAGCCGAUGACUUAUGGGCGGUGCU
 GGGGGCUUCGAGACAAUCGCAACAUCUACACCACACAACACCGCCUCGACCAGGUAAGUAUAAGGUUACA
 AGACAGGUUAAGGAGACCAUAAGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCAC
 CUAUUGGUCUUAUCUGACAUCACUUGCCUUCUCUCCACAGGGUGAGAUUUCGGCCGGGACGCGGCGGUGG
 UAAUGACAAGCGCCAGAUAAACAUGGGCAUGCCUUAUGCCGUGACCGACGCGGUUCUGGCUCCUAUAUCGG
 GGGGAGGCGUGGAGCUCACAUGCCCCGCCCCGCCCCUACCCUACUUCGACCGCCAUCCCAUCGCGCGCC
 CUCCUGUCUACCCGCGCGCAUACCUUAUGGGCAGCAUGACCCCGAGGCCGUGCGUUGCGUGGCC
 UCAUCCCGCCGACCUUGCCCGGCACAAACAUCGUGUUGGGGGCCCUUCCGGAGGACAGACACAUCGACCGCCU
 GGCCAAACGCCAGCGCCCCGCGAGCGGCUUGACCUGGCUAUGCUGGCGCGCAUUCGCCGCGUUACGGGCGU
 CUUGCCAAUACGGUGCGGUUAUCUGCAGGGCGCGGGUCUGUGGCGGGAGGAUUGGGGACAGCUUUCGGGACGG
 CCGUGCCGCCCCAGGGUGCCGAGCCCCAGAGCAACCGGGGCCACGACCCCAUAUCGGGGACAGCUUAUUUAC
 CCUGUUUCGGCCCCCGAGUUGCUGGCCCCCAACGGCGACCUGUAUAACGUGUUUGCCUGGGCCUUGGACGUC
 UUGGCCAAACGCCUCCGUCUCCAUACGUCUUAUCCUGGAUUAACGACCAUUCGCCCGCGGCGUGCCGGGACG
 CCCUGCUGCAACUUAUCCUCCGGGAUGGUCCAGACCCACGUCACCACCCAGGCUCCAUACCGACGAUCGCGA
 CCUGGCGCGACGUUUGCGCGGGGAGUUGGGGAGGCGAACUGAAACUUGUUUAUUGCAGCUUAUAAUGGUUAC
 AAUAAAGCAUAGCAUACAACAAUUAACAAUAAAGCAUUUUUUUACUGC

212. SD+BD (PSMA)+spacer:

GCTAGACTCTGGAAAAAAGGGAAAAAACTCTAGAGACTGAAAACAAACAAGCAGACAAAACAAAAAACAA
 TAGAAGAAACAGAAACAGAAAAAAACATACAAACAAAAACAGAAATAAGAACAGAAACAAAAAAC
 ACACACAAAAAGAACAGAAAAAGAAAAATGCCAACGTGACACCATCAAGGCTGAGGCTCCAGGTAAGTATCAAGGTTACAAGA

213. Full sequence of p3EL PSMA SD:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTTCATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACTTACGGTAAATGGCCCCCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCATTGACGTCAATGGGTGGAGTATTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCCGCTTG

CATTATGCCAGTACATGACCTTATGGGACTTTCCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTTGACTCACGGGGATTTCCAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCTGTAACAAC
 TCCGCCCATTTGACGCAAATGGGCGGTAGGCGGTGACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTAGTGA
 ACCGTGAGATCCTAGACTGCGAAGGAAAAAGGGAAAAAACTCTAGAGACTGAAAAACAAACAGCAGACAAACAAA
 AAAACATAGAAGAACAGAAACAGAAAAAAACATACAAACAAAAACAGAAATAAGAACAGAAACAAAAAA
 CACACACAAAAAGAACAGAAAAAGAAAATGCCAACGTGACACCATCAAGGCTGAGCCAGGTAAAGTATCAAG
 GTTACAAGACAGGTTTAAAGGAGACCAATAGAACTGGGCTTGTCGAGACAGAGACGACTCTTGCGTTTTCTGAT
 AGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACAGGGTGAGATATCGGCCGGGACGCGG
 CGGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCCGTGACCGACGCCGTCTGGCTCCTCA
 TATCGGGGGGAGGCTGGGAGCTCACATGCCCCGCCCCGGCCCTCACCTCATCTTCGACCGCCATCCCATC
 GCCGCCCTCCTGTGCTACCCGGCCGCGGATACCTTATGGGCAGCATGACCCCCCAGGCCGTGCTGGCGTTTCG
 TGGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGGGCCCTTCCGGAGGACAGACACATCGA
 CCGCTTGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCGCGATTCCGCCGTTTAC
 GGGTGCTTGCCAAATACGGTGCGGTATCTGCAGGGCGCGGGTCTGTCGGCGGAGGATTGGGGACAGCTTTTCGG
 GGACGGCGGTGCCGCCCGAGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCATATCGGGGACACGTT
 ATTTACCTGTTCGGGCCCGGAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTTTGCTGGGCTTG
 GACGTCTTGCCAAACGCTCCGTCCCATGCACGTCTTTATCTGGATTACGACCAATCGCCCGCGGCTGCC
 GGGACGCCCTGCTGCAACTTACCTCCGGGATGGTCAGACCCACGTACCCACCCAGGCTCCATACCGACGAT
 CTGCGACCTGGCGCGACGTTTGCGCGGGAGATGGGGGAGGCGAACTGAACTTGTTTATGACGTTTATAAT
 GGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCATCTAGTTGTGGTT
 TGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

214. Full sequence of p3EL_PSMA_SD_NLS:

CGATGGAGCGGAGAATGGGCGGAAGTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACCTTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACCTTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
 TGACACACATCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAAACTGCCCACCTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAAATGGCCCGCTTGGCATTATGCCAGTACATGACCTTATGGGACTTTCCCTACTTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTC
 ACGGGGATTTCCAAGTCTCCACCCCATGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTT
 CAAAATGTCGTAACAACCTCCGCCCATTTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTAGTGAACCGTCAGATCCTAGACTGCGAAGGAAAAAGGGAAAAAACTCTAGAGACTGAAAAACA
 AACAAGCAGACAAACAAAAAAACATAGAAGAACAGAAACAGAAAAAAACATACAAACAAAAACAGAAATA
 AGAACAGAAACAAAAAAACACACACAAAAGAACAGAAAAAGAAAATGCCAACGTGACACCATCAAGGCTGAG
 CCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAAGGAGACCAATAGAACTGGGCTTGTCGAGACAGAGAC
 GACTCTTGCGTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACAGGGTGAGA
 TATCGCCCGGGACGCGCGGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCCGTGACCGA
 CGCGTTTCTGGCTCCTCATATCGGGGGGAGGCTGGGAGCTCACATGCCCCGCCCCGGCCCTCACCTCATC
 TTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGGATACCTTATGGGCAGCATGACCCCCC
 AGGCCGTGCTGGCGTTCTGTTGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGGGCCCTTCC
 GGAGGACAGACACATCGACCGCTTGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCC
 GCGATTGCCCGGTTTACGGGCTGCTTGCCAATACGGTGCGGTATCTGCAGGGCGGCGGTGCTGGCGGGAGG
 ATTTGGGGACAGCTTTTCGGGGACGGCGGTGCCGCCCGAGGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACC
 CCATATCGGGGACACGTTATTTACCTGTTTCGGGCCCGGAGTTGCTGGCCCCAACGGCGACCTGTATAAC
 GTGTTTGCTGGGCTTGACGCTTTGGCCAAACGCTCCGTCCCATGCACGTCTTTATCCTGGATTACGACC
 AATCGCCCGCGGCTGCCGGGACGCCCTGCTGCAACTTACCTCCGGGATGGTCAGACCCACGTCACACCCC
 AGGCTCCATACCGACGATCTGCGACCTGGCGCGACGTTTGCGCGGGAGATGGGGGAGGCGAACTGAACTTG
 TTTATTGACGTTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTAC
 TGCATTCTAGTTGTGGTTTGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

215. Full RNA sequence of p3EL_PSMA_SD_NLS or p3EL_PSMA_SD:

UCAGAUCGCUAGACUGGAAAAAAGGGAAAAAAUUCUAGAGACUGAAAAACAAACAAGCAGACAAAACAAAAAA
 CAUAGAGAAACAGAAAACAGAAAAAAACAUACAAAACAAAAACAGAAUAAGAACAGAAAACAAAAAACACA
 CACAAAAGAACAGAAAAAGAAAUGCCAACGUGACACCAUCAAGGCGGCGGCGCUUUUCAUUUUUGUCUUUU
 UUAACCUGGGCCUGGGCCUGGGUACUAACAgaUcgUUUUUUUCCCUUUUUUCCAGGGAAGCGGAGCUACUA
 ACUUCAGCCUGCUGAAGCAGGCUGGAGACGUGGAGGAGAACCUGGgCCUGCUUCGUACCCUGCCAUCAACA
 CGCGUCUGCGUUCGACCAGGCGGCGCAUCACGGGGACACAGCAACCAGCGACGGCGUUGCGCCCUCCGCCG
 CAGCAAGAAGCCACGGAAGUCCGCCCGGAGCAGAAAAUGCCACGCUACUGCGGGUUUAUAUAGACGGUCCCC
 ACGGGAUGGGGAAAACCACCACCACGCAACUGCUGGUGGGCCUGGGUUCGCGCGACGAUAUCGUCUACGUACC
 CGAGCCGAUGACUUACUGGGCGGUGCUGGGGGCUUCCGAGACAAUCGCGAACAUACACCACACAACACCGC
 CUCGACCAGGUAAGUAUCAAGGUUACAAGACAGGUUAAGGAGACCAUAAGAAACUGGGCUUGUCGAGACAGA
 GACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUUUACUGACAUCACUUUGCCUUUCUCCACAGGGUG
 AGAUUUCGGCCGGGACGCGGGCGUGGUAUAGACAAGCGCCAGAUAAACAAUGGGCAUGCCUUUAUGCCGUGAC
 CGACGCCGUUCUGGCUCCUCAUAUCGGGGGGGAGGCUUGGAGCUCACAUGCCCCGCCCGGCCCUACCCUC
 AUCUUCGACCGCCAUCCCAUCGCGGCCUCCUGUGCUACCCGGCCGCGCGAUACCUUAUGGGCAGCAUGACCC
 CCCAGGCCUGCUGGCGUUCGUGGGCCUCAUCCCGCCGACCUUGCCCGGCACAAACAUUGUGUGGGGGCCCU
 UCCGGAGGACAGACAUCAUCGACCGCCUGGCCAAACGCCAGCGCCCCGGCGAGCGGCUUGACCUUGCUAUGCUG
 GCCGCGAUUCGCCCGGUUACGGGCGUGCUUGCCAAUACGGUGCGGUAUCUGCAGGGCGCGGGUCUGUGCGGG
 AGGAUUGGGGACAGCUUUCGGGGACGGCCGUGCCGCCAGGGUGCCGAGCCCCAGAGCAACGCGGGGCCACG
 ACCCAUAUCGGGGACACGUUAUUUACCCUGUUUCGGGCCCGGAGUUGCUGGCCCCCAACGGCGACCUGUAU
 AACGUGUUUGCCUGGGCCUUGGACGUCUUGGCCAAACGCCUCCGUCCAUAGCAGCUCUUUAUCCUGGAUUACG
 ACCAAUCGCCCGCCGGCUGCCGGGACGCCUGUGCAACUUACCUCGGGAUGGUCCAGACCCACGUCACCAC
 CCCAGGCUCCAUACCGACGAUCUGCGACCUGGCGCGCACGUUUGCGCGGGAGAUGGGGGAGGCGAACUGAAAC
 UUGUUUAUUGCAGCUUAUAAUGGUUACAAUAAAGCAUAGCAUCACAAUUCACAAUAAAGCAUUUUUU
 CACUGC

216. Full sequence of p3EL_PSMA_GFP:

ACTAGTTAGTTATTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTTG
 CATTATGCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACAAAATCAACGGGACTTTCCAAAATGTCTGAACAAC
 TCCGCCCATTTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCGCTAGGACTGAAAACAAACAGCAGACAAAACAAAAAACATAGAAGAACAGAAAACAGAAAA
 AAAAAACATACAAACAAAAACAGATAAGAACAGAAACAAAAACACACAAAAAGAACAGAAAAAGAAAA
 ATGCCAAGCTGACACCATCAAGGCGCTTTTGTCTTTTTTTTAACCTGGGCTGGGCTGGGTA
 CTAACACGATCGTTTTTTTTTCCCTTTTTTCCAGGGAAGCGGAGCTACTAATTTCAGCCTGCTGAAGCAGGCTG
 GAGACGTGGAGGAGAACCCTGGGCCCTCCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGA
 CCAATAGAAACTGGGCTTGTCTGAGACAGAGACGACTCTTGCGTTTCTGATAGGCACCTATTGGTCTTACTGAC
 ATCCACTTTGCCTTTCTCTCCACAGATCGAGTGCCGCATCACGGCACCTGAACGGCGTGGAGTTCGAGCTG
 GTGGGCGGCGAGAGGGCACCCCGAGCAGGGCCGCATGACCAACAAGATGAAGAGCACCAAAGGCGCCCTGA
 CCTTCAGCCCCCTACCTGCTGAGCCACGTGATGGGTACGGCTTCTACCACTTCGGGCACCTACCCAGCGGCTA
 CGAGAACCCCTTCTGACGCCATCAACAACGGCGGTACACCAACACCCGCATCGAGAAGTACGAGGACGGC
 GGCGTGTGACGCTGAGCTTACGCTACCGCTACGAGGCCGGCCGCGTGATCGGCGACTTCAAGGTGGTGGGCA
 CCGGCTTCCCGAGGACAGCGTGATCTTACCGACAAGATCATCCGACGCAACGCCACCGTGGAGCACCTGCA
 CCCCATGGGCGATAACGTGCTGGTGGGCAGCTTCGCCCGCACCTTCAGCCTGCGCGACGGCGGCTACTACAGC
 TTCGTGGTGGACAGCCACATGCACTTCAAGAGCGCCATCCACCCAGCATCCTGCAGAACGGGGGCCCCATGT
 TCGCCTTCCGCCGCGTGGAGGAGCTGCACAGCAACACCGAGCTGGGCATCGTGGAGTACCAGCACGCTTCAA
 GACCCCATCGCCTTCGCCAGATCTCGAGCTCGATGAAACTTGTTTATTGCAGCTTATAATGGTTACAAATAA
 AGCAATAGCATCACAATTTTCAAAATAAAGCATTTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCA
 TCAATGTATCTGAAGACAATAGCAG

217. Full sequence of p3EL_PSMA_GFP-NLS:

CGATGGAGCGGAGAATGGGCGGAAC TGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC

TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAACTGCCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGATGCGGTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
 ACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTT
 CCAAAATGTCGTAACAACCTCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
 GCAGAGCTGGTTTAGTGAACCGTCAGATCCTAGAGACTGAAAAACAAACAAGCAGACAAAAACAAAAACATAG
 AAGAACAGAAACAGAAAAAAACATACAAACAAAAACAGAAATAGAACAGAAACAAAAACACACACAA
 AAGAACCAGAAAAAGAAAAATGCCAACGTGACACCATCAAGGCTTTTCATTTTTTGTCTTTTTTTAACC
 TGGGCTGGGCTGGGTACTAACACGATCGTTTTTTTCCCTTTTTTTCCAGGGAAGCGGAGCTACTAACTTCA
 GCCTGCTGAAGCAGGCTGGAGACGTGGAGGAGAACCCTGGGCTCCCGCCATGAAGGTAAGTATCAAGGTTAC
 AAGACAGGTTTAAGGAGACCAATAGAACTGGGCTTGTCGAGACAGAGACGACTCTTGCCTTTCTGATAGGCA
 CCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACAGATCGAGTGGCGCATCACCGGCACCTGAAAC
 GGCTGGAGTTTCGAGCTGGTGGGCGGAGAGGGCACCOCGAGCAGGGCCGCATGACCAACAAGATGAAGA
 GCACCAAGGCGCCCTGACCTTCAGCCCCTACCTGCTGAGCCACGTGATGGGCTACGGCTTCTACCACTTCGG
 CACCTACCCAGCGGCTACGAGAACCCTTCTGACAGCCATCAACAACGGCGGCTACACCAACACCCGCATC
 GAGAAGTACGAGGACGGCGGCTGCTGCACGTGAGCTTACGCTACCGCTACGAGGCGGCGCGTGATCGGCG
 ACTTCAAGGTGGTGGGCACCGGCTTCCCGGAGGACAGCGTGATCTTACCGACAAGATCATCCGACGAACGC
 CACCGTGGAGCACCCTGCACCCCATGGGCGATAACGTGCTGGTGGGCGAGCTTCGCCCCGACCTTCAGCCTGCGC
 GACGGCGGCTACTACAGCTTCGTGGTGGACAGCCACATGCACCTTCAAGAGCGCCATCCACCCAGCATCCTGC
 AGAACGGGGGCCCATGTTTCGCTTCCGCGCGTGGAGGAGCTGCACAGCAACACCGAGCTGGGCATCGTGGA
 GTACCAGCAGCCTTCAAGACCCCCATCGCTTTCGCCAGATCTCGAGCTCGATGAACTTGTTTATTGCAGCT
 TATAATGGTTACAAATAAAGCAATAGCATCACAAATTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTT
 GTGGTTGTCTCCAAACTCATCAATGTATCTGAAGACAATAGCAG

218. Full RNA sequence of p3EL_PSMa_GFP or p3EL_PSMa_GFP NLS:

UCAGAUCGCUAGAGACUGAAAAACAAACAAGCAGACAAACAAAAACAUAGAAGAACAGAAACAGAAAAAA
 AACAUACAAACAAAAACAGAAUAAGAACAGAAACAAAAAACACACACAAAAAGAACAGAAAAAGAAAAUGC
 CAACGUGACACCAUCAAGCGCTGCUUUAUUUUUGUCUUUUUUUAACUGGGCCUGGGCCUGGGUACUAA
 CACGAUCGUUUUUUCCUUUUUUUCCAGGGAAGCGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUGGAGA
 CGUGGAGGAGAACCCUGGGCCUCCCGCAUGAAGGUAAGUAUCAAGGUUACAAGACAGGUUUAAGGAGACCA
 UAGAAACUGGGCUUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUAACUGACAUC
 ACUUUGCCUUUCUCCACAGAUUGAGUGCCGAUACCCGGCACCCUGAACGGCGUGGAGUUCGAGCUGGUGG
 GCGGCGGAGAGGGCACCCCGAGCAGGGCCGAUGACCAACAAGAUGAAGAGCACCAGGCGCCUGACCUU
 CAGCCCCUACCCUGCUGAGCCACGUAUGGGCUACGGCUUUCUACCAUUCGGCACCUACCCAGCGGCUACGAG
 AACCCCUUCUGCACGCCAUCAACAACGGCGGCUACACCAACACCCGCAUCGAGAAGUACGAGGACGGCGGCG
 UGCUGCACGUGAGCUUCAGCUACCGCUACGAGGCGGCGCGUGAUCGGCGACUUAAGGUGGUGGGCACCGG
 CUUCCCCGAGGACAGCGUGAUCUACCGACAAGAUCAUCCGACGCAACGCCACCGUGGAGCACCUGCACCC
 AUGGGCGAUAAACGUGCUGGUGGGCAGCUUCGCCGCACCUUCAGCCUGCGGACGGCGGCUACUACAGCUUCG
 UGGUGGACAGCCACAUGCACUUAAGAGCGCAUCCACCCAGCAUCCUGCAGAACGGGGGCCCCAUGUUCGC
 CUUCCGCCGCGUGGAGGAGCUGCACAGCAACACCGAGCUGGGCAUCGUGGAGUACCAGCACGCCUUAAGACC
 CCCAUCGCCUUCGCCAGAUUCGAGCUGCAUGAAACUUGUUUAUUGCAGCUUAUAAGGUUACAAAUAAAGCA
 AUAGCAUCACAAAUUACAAAUAAAGCAUUUUUUCACUGC

219. Full sequence of p3EL_PSMa_GFP_SD:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACTTACGTTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCCTT
 GGCAGTACATCAAGTGATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCTGTAACAAC
 TCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTAGTGA
 ACCGTCAGATCCTAGACTGGAACAAAAAGGGAAAAAACTAGAGACTGAAAAACAAACAAGCAGACAAAAACAA
 AAAACATAGAAGAACAGAAACAGAAAAAAACATACAAACAAAAACAGAAATAGAACAGAAACAAAAAA

220. Full sequence of p3EL PSMA GFP SD NLS:

221. Full RNA sequence of p3EL PSMA GFP SD NLS or p3EL PSMA GFP SD:

79/87

GAAGAGCACCAAAGGCGCCUGACCUUCAGCCCUACCUGCUGAGCCACGUGAUGGGCUACGGCUUCUACCAC
 UUCGGGACCUACCCAGCGGCUACGAGAACCCUUCUCCUGCAGCCAUCAACAACGGCGGCUACACCAACACCC
 GCAUCGAGAAGUACGAGGACGGCGGCGUGCUGCAGCUGAGCUUCAGCUACCGCUACGAGGCCGGCCGCGUGAU
 CGGCGACUUAAGGUGGUGGGCACCGGCUUCCCCGAGGACAGCGUGAUCUUCACCGACAAGAUAUCCGCAGC
 AACGCCACCGUGGAGCACCUGCACCACAUGGGCGAUAACGUGCUGGUGGGCAGCUUCGCCCGCACCUCAGCC
 UGC CGCAGCGCGGCUACUACAGCUUCGUGGUGGACAGCCACAUGCACUUAAGAGCGCCAUCCACCCAGCAU
 CCUGCAGAACGGGGGCCCCAUGUUCGCCUUCGCCCGCGUGGAGGAGCUGCACAGCAACACCGAGCUGGGCAUC
 GUGGAGUACCAGCAGCCUUAAGACCCCAUCGCCUUCGCCAGAUUCGAGCUCGAUGAAACUUGUUUAUUG
 CAGCUUAUAAUGGUUACAAAUAAAGCAAUAGCAUCACAAAUUUCACAAAUAAAGCAUUUUUUCACUGC

Targeting PSA and PSMA

222. BD (PSMA+PSA)+spacer

GCTAGAGACTGAAAAACAAACAAGCAGACAAACAAAAAACATAGAAGAACAGAAACAGAAAAAACATAC
 AACAAAAAACAGAAATAAGAACAGAAACAAAAAACACACACAAAAAGAACAGAAAAAGAAAAATGCCAACGTG
 ACACCATCAAGGGATCGGCCGGGGCCCTCTCATACCTCATACCCACACACTTCAGGGATAAAACACTTCCTT
 TCTTTTCATTCTTTCTTTCTTTTTTTTTTTTTTTTTTTTTTTTATAGAGCCGGCCGATC

223. BD-PSMA :

GACTGAAAAACAAACAAGCAGACAAACAAAAAACATAGAAGAACAGAAACAGAAAAAACATACA
 AACAAAAAACAGAAATAAGAACAGAAACAAAAAACACACACAAAAAGAACAGAAAAAGAAAAATGCCAA
 CGTGACACCATCAAGG

224. BD-PSA :

GGCCCTCTCATACCTCATACCCACACACTTCAGGGATAAAACACTTCCTTTCTTTTCATTCTTTT
 CTFTTTTTTTTTTTTTTTTTTTTTTTTATAGAG

225. Spacer31 : GATCGGCCGG

226. Spacer32 : CCGGCCGATC

227. Full sequence of p3EL_PSM+PSA:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATATATGGAGTTCGGCGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCCACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGACTCACGGGGATTTCCAAGTCT
 CCACCCCATTGACGTCAATGGGAGTTTTGTTTTGGCACAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
 TCCGCCCCATTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTGAGATCGCTAGAGACTGAAAAACAAACAAGCAGACAAACAAAAAACATAGAAGAACAGAAACAGAAAA
 AAAAAACATACAAACAAAAAACAGAAATAAGAACAGAAACAAAAAACACACACAAAAAGAACAGAAAAAGAAA
 ATGCCAACGTGACACCATCAAGGGATCGGCCGGGGCCCTCTCATACCTCATACCCACACACTTCAGGGATAA
 AACACTTCTCTTTCTTTTCATTCTTTCTTTCTTTTTTTTTTTTTTTTTTTTTTTTATAGAGCCGGCCGATC
 GGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAAACTGGGCTTGTCTGAGACAGAGACGACTC
 TTGCGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCTCCACAGGGTGAGATATCG
 GCCGGGGACGCGGCGGTGGTAATGACAAGCGCCAGATAACAATGGGCATGCCTTATGCCGTGACCGACGCCG
 TTCTGGCTCCTCATATCGGGGGGAGGCTGGGAGCTACATGCCCCGCCCCGGCCCTCACCTCATCTTCGA
 CCGCCATCCCATCGCCGCCCTCCTGTGCTACCGGCGCGCGATACCTTATGGGCAGCATGACCCCCAGGCC
 GTGCTGGCGTTCTGTGGCCCTCATCCCGCCGACCTTGCCCGGCACAAACATCGTGTGGGGGCCCTTCCGGAGG
 ACAGACACATCGACCGCTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCTGGCTATGCTGGCCGCGAT
 TCGCCGCGTTTACGGGCTGCTTGCCAATACGGTGCGGTATCTGCAGGGCGGCGGGTCTGTGGCGGGAGGATTGG
 GGACAGCTTTTCGGGGACGGCCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACGCGGGCCACGACCCCAT
 TCGGGGACACGTTATTTACCTGTTTTCGGGCCCCGAGTTGCTGGCCCCAACGGCGACCTGTATAACGTGTT
 TGCTGGGCTTGGACGTCTTGGCCAAACGCCCTCCGTCCCATGACAGTCTTTATCTTGATACGACCAATCG
 CCGCGCGCTGCGGGGACGCCCTGCTGCAACTTACCTCCGGGATGGTCCAGACCCACGTCACCAACCCAGGCT
 CCATACCGACGATCTGCGACCTGGCGCGCACGTTTGGCGGGAGATGGGGGAGGCGAACTGAAACTTGTATTAT
 TGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCAT
 TCTAGTTGTGTTTGTCCAACTCATCAATGTATCTGAAGACAATAGCAG

CGATCGAGCGGGAGAAATGGGCGGAACATGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGCGGGACTATGGT
TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCCCTGCTGGGGAGCCTGGGGACTTTCCACACCCCTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTTCATTAGTTCATAGCCCATAT
ATGGAGTTCGCGCTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCCGCCCATTTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTGGCATTATGCCGAGTACATGACCTTATGGGACTTTCTACTTTGGCAGTACATCTACG
TATTAGTCACTGCTATTACCATGGTGTATGCGGTTTTGGCAGTACATCAATGGGCTGGGATAGCGGTTTGACTC
ACGGGGATTTCGAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAACCTCCGCCCCATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTTAGTGAACCGTCAGATCGCTAGAGACTGAAAAACAAACAGCAGACAAACAAAAAACATAG
AAGAACAGAAACAGAAAAAACAATACAAACAAAAACAGAAATAGAACAGAAACAAAAAACACACACAA
AAGAACCAGAAAAAGAAAAATGCCAACGTGACACCATCAAGGATCGGGCCGGGGCCCTCTCATACCCCTCATACC
CACACACTTCAGGGGATAAAACACTTCCTTTTCTTTTCATTTCTTTCTTTTTTTTTTTTTTTTTTTTATAGAGCC
GGCCGATC██████████CCAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAATAGAAACTGGGCTTG
TCGAGACAGAGACGACTCTTTCGCTTCTTGATAGGCACCTATTGGTCTTACTGACATCCACTTTGCCTTTCTCT
CCACAGGGTGAGATATCGGCCCGGGACCGCGCGGTGGTAAATGACAAGCGCCAGATAACAAATGGGCATGCCTT
ATGCCGTGACCGACGCGCTTTCGCTCCTCATATCGGGGGGAGGCTGGGAGCTACATGCCCGCCCCCGG
CCTCACCCCTCATCTTCGACCTCCCATCCCATCGCCGCCCTCTGTGCTACCCGGCCGCGCGATACCTTATGGG
AGCATGACCCCCCAGGCCGTGCTGGCGTTTCGTGGCCCTCATCCCCGCCGACCTTGCCCGGCACAAACATCGTGT
TGGGGGGCCCTTCCGGAGGACAGACACATCGACCGCTTGGCCAAACGCCAGCGCCCCGGCGAGCGGCTTGACCT
GGCTATGCTGGCCGCGATTTCGCCGCGTTTACGGGCTGCTTGCCAATACGGTGCAGTATCTGCAGGGCGGGCGG
TCGTGGCGGGAGGATTGGGGACAGCTTTCGGGGACGGCGTGCCGCCCCAGGGTGCCGAGCCCCAGAGCAACG
CGGGCCACGACCCCATATCGGGGACACGTTATTTACCTGTTCGGGGCCCCGAGTTGCTGCCCCCAACGG
CGACCTGTATAACGTGTTTGCCTGGGCCTTGGACGCTTGGCCAAACGCCTCCGTCCCATGACAGCTCTTTATC
CTGGATTACGACCAATCGCCCCCGCGGCTGCCGGGACGCCCTGCTGCAACTTACCTCCGGGATGGTCCGAGACCC
ACGTACCAACCCCAAGCTCCATACCGACGATCTGCGACCTGGCGCGCAGCTTTGCGCGGAGATGGGGGAGG
GACTGAAACTTGTTTATTGACAGTTATAATGGTTACAAATAAGACAATAGCATCAAAAATTCACAAATAAA
GATTTTTTTTTCACTGCATTTAGTTGTGGTTTTGTCCAAACTCATCAATGTATCTGAAGACAATAGCAG

UCAGAUUCGUUAGAGACUGAAAAACAACAAGCAGACAAACAAAAAAACAUAAGAAGAACAGAAAAACAGAAAAAA
 AACAUACAAACAAAAAACAGAAUAAGAACAGAAACAAAAAAACACACACAAAAGAACCCAGAAAAAGAAAAUAGC
 CAACGUGACACCAUCAAGGGAUCGGCCGGGGCCUUCUAUACCCUUAUACCCACACACUUCAGGGGAUAAAAACA
 CUUCCUUUUCUUUUCAUUUCUUUUCUUUUUUUUUUUUUUUUUUUUUUUAGAGCCGGCCGAUCGCGACGCUUUC
 UUUUUGUCUUUUUUUAACCGGGCCUGGGCCUGGGUACUAACAgaUcgUUUUUUUCCCUUUUUUUCAGGGA
 AGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCUGGAGACGUGGAGGAGAACCUCGGgCCUGCUUCGUACC
 CCUGCCAUCAACACGCGUCUGCGUUCGACCAGGCGGCGCCGAUCACGGGGACACAGCAACCAGACGGACGGCGUU
 GCGCCUUCGCCGGCAGCAAGAAGCCACGGAAGUCCGCCGGAGCAGAAAAUGCCACGCUACUGCGGGUUUAU
 AUAGACGGUCCCCACGGGAUGGGGAAAAACCAACCAACAGCAACUGCUGGUGGCCUUGGGUUCGCGCGACGAUA
 UCGUCUAAGUAACCGAGCGGAUCUAUACUGGCGGGGUCUGGGGGUCCGAGACAAUCGCAACUACAC
 CACACAACACCGCCUGCAGCAGGUAAGUAUAGGUUAACAGACAGGUUUAAGGAGACCAAUAAGAACUAGGGC
 UUGUCGAGACAGAGACGACUCUUGCGUUUCUGAUAGGCACCUAUUGGUCUUAACUGACAUCCACUUGCCUUUC
 UCUCCACAGGGUGAGAUUACGGCCGGGGACGCGCGGUGGUAAUGACAAGCGCCAGAUAACAAUGGGCAUGC
 CUUAUGCCGUGACCGACGCCGUUCUGGCUCUCUAUAUCGGGGGGGAGGCUGGGAGCUCACAUGCCCGCCCCC
 GGCCUCACCCUCAUCUUCGACCGCCAUCCCAUCGCCGCCUCCUGUGCUACCCGGCCGCGGAUACCUUAUG
 GGCAGCAUGACCCCCAGGCCUGCUGGCGUUCGUGGCCCUAUCCCGCCGACCUUGCCCGGCACAAACAUUG
 UGUUGGGGGCCCUUCCGGAGGACAGACACAUCGACCGCCUGGCCAAACGCCAGCGCCCCGCGAGCGGCUUGA
 CCUGGCUAUGCUGGCCGCGGAUUCGCCCGGUUACGGGCGUCUUGCCAAUACGGUGCGGUUAUCGACAGGGCGGC
 GGGUCGUGGCGGGGAGGAUUGGGGACAGCUUUCGGGGACGGCCGUGCCGCCACAGGGUGCCGAGCCCCAGAGCA
 ACGCGGGCCACGACCCCAUAUCGGGGACAGGUAAUUACCCUGUUUCGGGCCCCGAGUUGCUGGCCCCCAA
 CGCGGACCUUAUACCGUAUUGCCUGGGCCUUGGACGUCUUGGCCAAACGCCUCCGUCCACGACGUCUUU
 AUCCUGGAUUACGACCAUUCGCCCGCGGCGUGCCGGGACGCCUGCUGCAACUUAUCCUCCGAGGUGGUCAGU

CCCACGUCACCACCCAGGCUCCAUACCGACGAUCUGCGACCUGGCGCGCACGUUUGCGGGGAGAUGGGGGA
GGCGAACUGAAACUUGUUUAUUGCAGCUUUAUAAUGGUUACAAUAAAGCAUAGCAUCACAAUUCACAAU
AAAGCAUUUUUUCACUGC

230. SD+BD (PSMA+PSA)+spacer:

GCTAGCACTGGAAAAAAGGGAAAAAACTCTAGAGACTGAAAAACAACAAGCAGACAAACAAAAAACA
TAGAAGAACAGAAACAGAAAAAACAATACAAACAAAAACAGAATAAGAACAGAAACAAAAAAC
ACACACAAAAGAACCAGAAAAAGAAAATGCCAACGTGACACCATCAAGGGATCGGCCGGGGCCCTCTC
ATACCCCTCATACCCACACACTTCAGGGATAAAAACACTTCCTTTTCTTTTCATTCTTTCTTTT
TTTTTTTTTTTAGAGCCGGCCGATCCTCTAG

231. Full sequence of p3EL_PMSA+PSA_SD:

ACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
TAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGG
CATTATGCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
CCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGATTTCCAAGTCT
CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACAAAATCAACGGGACTTTCCAAAATGTCGTAACAAC
TCCGCCCCATTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
ACCGTCAGATCCTAGCACTGGAAAAAAGGGAAAAAACTCTAGAGACTGAAAAACAACAAGCAGACAAACAAA
AAAACATAGAAGAACAGAAACAGAAAAAACAATACAAACAAAAACAGAATAAGAACAGAAACAAAAAAC
CACACACAAAAGAACCAGAAAAAGAAAATGCCAACGTGACACCATCAAGGGATCGGCCGGGGCCCTCTCATAC
CCTCATACCCACACACTTCAGGGATAAAAACACTTCCTTTTCTTTTCATTCTTTTCTTTTCTTTTCTTTT
TTTAGAGCCGGCCGATCCTCTAGCCAGGTAAGTATCAAGGTTACAAGACAGGTTAAGGACACCAATAGAAA
CTGGGCTTGTCGAGACAGAGACGACTCTTGCGTTTTCTGATAGGCACCTATTGGTCTTACTGACATCCACTTTG
CCTTTCTCTCCACAGGTTGAGATATCGGCCGGGGACGCGCGGTGTAATGACAAGCGCCAGATAACAATGG
GCATGCCCTTATGCCGTGACCGACGCGGTTCTGGCTCCTCATATCGGGGGGGAGGCTGGGAGCTCACATGCCCC
GCCCCCGCCCTCACCCCTCATCTTCGACCGCCATCCCATCGCCGCCCTCCTGTGCTACCCGGCCGCGCGATAC
CTTATGGGCAGCATGACCCCGCAGGCGTGCTGGCGTTCTGGCCCTCATCCCGCCGACCTTGCCCGGCACAA
ACATCGTGTGGGGGCCCTTCCGGAGGACAGACATCGACCGCTGGCCAAACGCCAGCGCCCGGCGAGCG
GCTTGACCTGGCTATGCTGGCCGCGATTGCGCCGCTTTACGGGCTGCTTGCCAATACGGTGGGTATCTGCAG
GGCGGCGGGTCTGTGGCGGGAGGATTGGGGACAGCTTCGGGGACGCGCGTGCCGCCCCAGGTTGCCGAGCCCC
AGAGCAACGCGGGCCACGACCCCATATCGGGGACACGTTATTTACCCTGTTTCGGGGCCCCGAGTTGCTGGC
CCCCAACGGCGACCTGTATAACGTGTTTGCTGGGCTTGGACGTCTTGCCAAACGCCCTCCGTCCCATGCAC
GTCTTTATCTTGATTACGACCAATCGCCCGCCGGCTGCCGGGACGCCCTGCTGCAACTTACCTCCGGGATG
TCCAGACCCACGTCACACCCAGGCTCCATACCGACGATCTGCGACCTGGCGCGCACGTTTGCGCGGGAGAT
GGGGGAGGCGAACTGAACTTGTATTGACAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTT
ACAAATAAAGCATTTTTTTTACTGCAATCTAGTTGTGGTTTGTCCAACTCATCAATGTATCTGAAGACAATA
GCAG

232. Full sequence of p3EL_PMSA+PSA_SD_NLS:

CGATGGAGCGGAGAATGGGCGGAACCTGGGCGGAGTTAGGGCGGGATGGGCGGAGTTAGGGCGGGACTATGG
TTGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
TGCTGACTAATTGAGATGCATGCTTTGCATACCTTCTGCCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
TGACACACATTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATTTGA
CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
GGTAAATGGCCCGCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
TATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTC
ACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTGTTTTGGCACCAAAATCAACGGGACTTT
CCAAAATGTCGTAACAACTCCGCCCATTTGACGCAATGGGCGGTAGGCGGTGACGGTGGGAGGTCTATATAA
GCAGAGCTGGTTTTAGTGAACCGTCAGATCCTAGCACTGGAAAAAAGGGAAAAAACTCTAGAGACTGAAAAACA
AACAAGCAGACAAACAAAAAACAATAGAAGAACAGAAACAGAAAAAACAATACAAACAAAAACAGAAATA
AGAACAGAAACAAAAAACAACACACAAAAGAACCAGAAAAAGAAAATGCCAACGTGACACCATCAAGGGATCG

233. Full RNA sequence of p3EL PMSA+PSA SD or p3EL PMSA+PSA SD NLS:

234. Full sequence of p3EL PMSA+PSA GFP:

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235. Full sequence of p3EL PMSA+PSA GFP NLS:

236. Full RNA sequence of p3EL_PMSA+PSA_GFP-NLS or p3EL PMSA+PSA GFP:

84/87

AGCGGAGCUACUAACUUCAGCCUGCUGAAGCAGGCGUGGAGACGUGGAGGAGAACCCUGGGCCUCCCGCCAUGA
 AGGUAAGUAUCAAGGUUACAAGACAGGUUUAAGGAGACCAAUAGAAACUGGGCUUUGUCGAGACAGAGACGACU
 CUUGCGUUUCUGAUAGGCACCUAUUGGUCUUAUGACAUCCACUUUGCCUUUCUCCACAGAUUGAGUGCCG
 CAUCACCGGCACCCUGAACGGCGUGGAGUUCGAGCUGGUGGGCGGCGGAGAGGGCACCCCGAGCAGGGCCGC
 AUGACCAACAAGAUGAAGAGCACCAGAGGCGCCUGACCUUACAGCCCCUACCUGCUGAGCCACGUGAUGGGCU
 ACGGCUUUCUACCACUUCGGCACCUCACCCAGCGGCUACGAGAACCCUUCUGCACGCCAUCAACAACGGCGG
 CUACACCAACACCCGCAUCGAGAAGUACGAGGACGGCGGCGUGCUGCACGUGAGCUUACGCUACCGCUACGAG
 GCCGGCCGCGUGAUCGGCGACUUAAGGUGGUGGGCACCGGCUUCCCGAGGACAGCGUGAUCUUCACCGACA
 AGAUAUCCGCGACGAACGCCACCGUGGAGCACCUGCACCCCAUGGGCGAUAACGUGCUGGUGGGCAGCUUCGC
 CCGCACCUUCAGCCUGCGCGACGGCGGCUACUACAGCUUCGUGGUGGACAGCCACAUGCACUUAAGAGCGCC
 AUCCACCCAGCAUCCUGCAGAACGGGGGCCCAUGUUCGCCUUCGCCGCGUGGAGGAGCUGCACAGCAACA
 CCGAGCUGGGCAUCGUGGAGUACCAGCACGCCUUAAGAGCCCCAUCGCCUUCGCCAGAUUCGAGCUCGAUG
 AAACUUGUUUAUUGCAGCUUAUAAUGGUUACAAUAAAGCAUAGCAUACAAAUUUCACAAUAAAGCAUUU
 UUUUCACUGC

237. Full sequence of p3EL_PSMa+PSA_GFP:

ACTAGTTAGTTATTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACA
 TAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTT
 GGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGG
 CATTATGCCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTA
 CCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCT
 CCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCTGTAACAAC
 TCCGCCCATTTGACGCAAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTGGTTTTAGTGA
 ACCGTCAGATCCTGAGCACTGGAAAAAAGGGAAAAAACTGAGCACTGAAAAACAAACAGCAGACAAAAACAA
 AAAACATAGAAGAACAGAAACAGAAAAAAGAAAAATGACCAACGTGACACCATCAAGGGATCGGCGCGGCGCTCTCATAC
 CACACACAAAAAGAACAGAAAAAAGAAAAATGACCAACGTGACACCATCAAGGGATCGGCGCGGCGCTCTCATAC
 CCTCATACCCACACACTTCAGGGGATAAAACACTTCCTTTCTTTTCAATTCCTTTCTTTTCTTTTCTTTTCTTTT
 TTTAGAGCCGCGCGATCGCTTTCATTTTGTCTTTTTTTAACCTGGGCTGGGCTGGGTACTAAC
 ACGATCGTTTTTTTTTCCCTTTTTTCCAGGGAAGCGGAGCTACTAAGTTTACGCTGCTGAAGCAGGCTGGAGAC
 GTGGAGGAGAACCCTGGGCTCCCGCCATGAAGGTAAGTATCAAGGTTACAAGACAGGTTTAAGGAGACCAAT
 AGAAACTGGGCTTTGTGAGACAGAGACGACTCTTGGCTTTCTGATAGGCACCTATTGGTCTTACTGACATCCA
 CTTTGGCTTTCTCTCCACAGATCGAGTGCCGCATCACCGGCACCTGAACGGCGTGGAGTTTCGAGCTGGTGGG
 CGGCGGAGAGGGCACCCCGAGCAGGGCGCATGACCAACAAGATGAAGAGCACCAAGGCGCCCTGACCTTC
 AGCCCCTACCTGCTGAGCCACGTGATGGGTACGGCTTCTACCACTTCGGCACCTACCCAGCGGCTACGAGA
 ACCCTTTCTGACGCCATCAACAACGGCGGTACACCAACACCCGCGATCGAGAAGTACGAGGACGGCGGCGT
 GCTGACCTGAGCTTACGCTACCGCTACGAGGCGCGCGCTGATCGGCGACTTCAAGGTTGGTGGGCGCGGCG
 TTCCCCGAGGACAGCGTGATCTTACCGACAAGATCATCCGAGCAACGCCACCGTGGAGCACCTGCACCCCA
 TGGGCGATAACGTGCTGGTGGGCGAGCTTCGCCCCGACCTTACGCTGCGCGACGGCGGCTACTACAGCTTCGT
 GGTGGACAGCCACATGCACCTTCAAGAGCGCCATCCACCCAGCATCTGAGAGCGGGGCCCCATGTTTCGCC
 TTCCGCGCGTGGAGGAGCTGCACAGCAACACCGAGCTGGGCGATCGTGGAGTACCAGCAGCCTTCAAGACCC
 CCATCGCTTCGCCAGATCTCGAGCTCGATGAACTTGTATTATGAGCTTATAATGGTTACAAATAAAGCAA
 TAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAAT
 GTATCTGAAGACAATAGCAG

238. Full sequence of p3EL_PSMa+PSA_GFP-NLS:

CGATGGAGCGGAGAATGGGCGGAAGTGGGCGGAGTTAGGGGCGGATGGGCGGAGTTAGGGGCGGAGTATGCG
 TTGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCGCTGCTGGGGAGCCTGGGGACTTTCCACACCTGGT
 TGCTGACTAATTGAGATGCATGCTTTGCATACTTCTGCGCTGCTGGGGAGCCTGGGGACTTTCCACACCTAAC
 TGACACACATTTCCACAGCACTAGTTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
 ATGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCCCGCCCATTTGA
 CGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
 ACGGTAACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGAC
 GGTAATGSCCGCTTGGCATTATGCCAGTACATGACCTTATGGGACTTTCTTACTTGGCAGTACATCTACG
 TATTAGTCATCGCTATTACCATGGTGTGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGA
 ACGGGGATTTCCAAGTCTCCACCCCATGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTT
 CCAAAATGTCGTAACAACCTCCGCCCATTTGACGCAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAA

239. Full RNA sequence of p3EL_PSMA+PSA_GFP or p3EL PSMA+PSA GFP NLS:

240. CMV enhancer + CMV promoter

241. Mini-intron

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242. Binding site on dumbbell loop to aptamer or GalNAc₃
GTTCTCATGCACACTTATAGC
243. Universal pVAX1 forward gap-primer
ATCCAGTTTCTGGA/idSp/
244. Universal pVAX1 reverse gap-primer
AAGGTCTTTTGACCT/idSp/GAAGCCATAGAGCCCACCG
245. Gap primer for one GalNAc₃
/5Phos/ATCCAGTTTATTTTATTTTATTTTAGTTCTCATGCACACTTATAGCGGTTTGTTTGTTTGTTGTTA
ACTGGA-AP1GCGATGTACGGGCCAGATATA
246. Gap primer for two GalNAc₃
/5Phos/ATCCAGTTTATTTTATTTTATTTTAGTTCTCATGCACACTTATAGCGGGAAACCCGTTCTCATGC
ACACTTATAGCGGTTTGTTTGTTTGTTTGTTTGTTTGTTTCTGGA-AP1-GCGATGTACGGGCCAGATATA
247. RT-qPCR Fw_maxGFP
ATCGAGTGCCGCATCACC
248. RT-qPCR Rv_maxGFP
ACTCATCGAGCTCGAGATCTGG
249. Fw-Beta actin
CTGGCACCCAGCACAATG
250. RP-beta actin
GCCGATCCACACGGAGTACT