**Supplementary Figure 12. Primers used in this study**

HBV S gene (Fig. S6)

S(HBVgp2)-F  CTAATTCCAGGATCCTCAACAAACCAGCAGCAG
S(HBVgp2)-R  GAAAATTGGTTAACGCGGTAAAAAGGGACT
X(HBVgp3)-F  CGCTTTGTTTTTGCAGCAGGTCTGGAGCAA
X(HBVgp3)-R  CAGTCTTTAAACACAGTCTTTGAAGTAT
C(HBVGP4)-F  TGGCTTTGGGGGCTGGGACATCGACCCCTTAT
C(HBVGP4)-R  TCATTAACTGTGAGTGGCCCTACAAACTGT

Translocation (Fig. S8)

GFP/Halo-F  ATTGAGTTTTCCAAAAACATATTTTCA
GFP/Halo-R  CCGCGAGGCGGCCGGGTCAAGTGCCAG

Translocation (Fig. S9)

tdTomato/Halo-F  GTCAGGAATTATCTCCAGGGTC
tdTomato/Halo-R  GGAAGCATGATAAACGTCATCG

eccDNA PCR (Fig. S11)

eccBEND3:

1st round PCR-F  CACTAGTCAGAATAACTGAAAATCAGACA
1st round PCR-R  TCAGTATCAGGGCATTGATTGCTCAATTGA
2nd round PCR-F  ATTAAGAGGTTTGATTGATTGATTGATTTG
2nd round PCR-R  ATAAGTCATTTACTGGCCTTTTCTTGTATG
3rd round PCR-F  AGATGGAGTCTCGCTCTGTTGCCCAGGATG
3rd round PCR-R  TCAGGGGCTGGTTTGAGCATGGGAGC
eccGABRR1:

1st round PCR-F   ACCC ACTGC ACTGCTGCATTCCTCATTTGT
1st round PCR-R   TGAGAACAGTTTCCTAGGCACCAGCATACA
2nd round PCR-F   GTCCTAAGCATTGGTTCTGTGCTCTGTCTC
2nd round PCR-R   ACTGAAATCCACAAGTGAGATACTCTATTAA
3rd round PCR-F   CCACTAGCCTGCAGTCCTAGGACAGGT
3rd round PCR-R   GCTTGGTAGATTCTACTAAGGTAATATTGA

eccPRKCB:

1st round PCR-F   AAGATCCTTCTACCTACATCCTCTTAGCTA
1st round PCR-R   TTGTCACTCCCAACGGATAGTGAGAAGCACAA
2nd round PCR-F   TAATCACATACACACCTTGCTGTGAGGG
2nd round PCR-R   ACTCAAAAGGAACCTGAGGCGCTGGCTTC
3rd round PCR-F   GCATGTGGGAAATGTAGTGTGTTATTTCAAGG
3rd round PCR-R   GGATTGCTGACTTAAAGTGAGATCATAAAAAC