The hepatitis B virus post-transcriptional regulatory element alpha contains a conserved RNA stem-loop (HBV PRE SLalpha). SLalpha is present in all the HBV major transcripts. SLalpha was shown to play a role in splicing and nuclear export of unspliced HBV subgenomic RNAs. [1, 2]

SLalpha is a 30-nucleotide stem-loop that contains a G-bulge and CNGG(N) apical loop. The apical loop is a tetraloop of which the first loop residue (C) pairs with the fourth loop residue (G) by bulging out the fifth loop residue. The conserved RNA stem-loop was predicted within the human HBV genotypes A-H and woodchuck hepatitis virus PRE alpha sequences and confirmed by mutagenesis.[1, 3] SLalpha is not present in avian hepatitis virus transcripts. The Rfam structure is based on a covariation model and is consistent with its solution structure. [4]

Despite the PRE being identified 20 years ago, the splicing and nuclear export pathways of unspliced HBV subgenomic RNAs regulated by SLalpha are not fully determined [5,6]

[1] Smith GJ, Donello JE, Hope TJ, Lück R, Steger G. The hepatitis B virus post-transcriptional regulatory element contains two conserved RNA stem-loops which are required for function. Nucleic Acids Res 1998; 26:4818–27.

[2] Hass M, Hannoun C, Kalinina T, Sommer G, Manegold C, Günther S. Functional analysis of hepatitis B virus reactivating in hepatitis B surface antigen-negative individuals. Hepatology 2005; 42:93–103.

[3] Donello JE, Loeb JE, Hope TJ. Woodchuck hepatitis virus contains a tripartite posttranscriptional regulatory element. J Virol 1998; 72:5085–92.

[4] Schwalbe M, Ohlenschläger O, Marchanka A, Ramachandran R, Häfner S, Heise T, Görlach M. Solution structure of stem-loop α of the hepatitis B virus post-transcriptional regulatory element. Nucleic Acids Res 2008; 36:1681–9.

[5] Chen A, Panjaworayan T-Thienprasert N, Brown CM. Prospects for inhibiting the posttranscriptional regulation of gene expression in hepatitis B virus. World J Gastroenterol WJG 2014; 20:7993–8004.

[6] Visootsat A, Payungporn S, T. Thienprasert, NP A conserved RNA structural element within the hepatitis B virus post-transcriptional regulatory element enhance nuclear export of intronless transcripts and repress the splicing mechanism. Mol Biol Rep 2015; 42:1603-4.

https://en.wikipedia.org/wiki/Hepatitis\_B\_virus\_PRE\_beta

The hepatitis B virus post-transcriptional regulatory element beta contains a conserved RNA stem-loop (HBV PRE SLbeta). SLbeta is present in all the HBV major transcripts [1]

SLbeta is a 23-nucleotide stem-loop that contains a 7-base pair stem and a 9-nucleotide loop. The conserved RNA stem-loop was predicted within the human HBV genotypes A-H and woodchuck hepatitis virus PRE beta sequences and confirmed by mutagenesis.[1, 2] SLbeta is more evolutionary conserved than SLalpha. This may partly due to SLbeta sequence also encodes both the X and P proteins. SLbeta is not present in avian hepatitis virus transcripts. The Rfam structure is based on a covariation model.

Despite PRE was identified 20 years ago, the nuclear export pathway of unspliced HBV subgenomic RNAs regulated by SLbeta remain elusive. [3]

[1] Smith GJ, Donello JE, Hope TJ, Lück R, Steger G. The hepatitis B virus post-transcriptional regulatory element contains two conserved RNA stem-loops which are required for function. Nucleic Acids Res 1998; 26:4818–27.

[2] Donello JE, Loeb JE, Hope TJ. Woodchuck hepatitis virus contains a tripartite posttranscriptional regulatory element. J Virol 1998; 72:5085–92.

[3] Chen A, Panjaworayan T-Thienprasert N, Brown CM. Prospects for inhibiting the posttranscriptional regulation of gene expression in hepatitis B virus. World J Gastroenterol WJG 2014; 20:7993–8004.