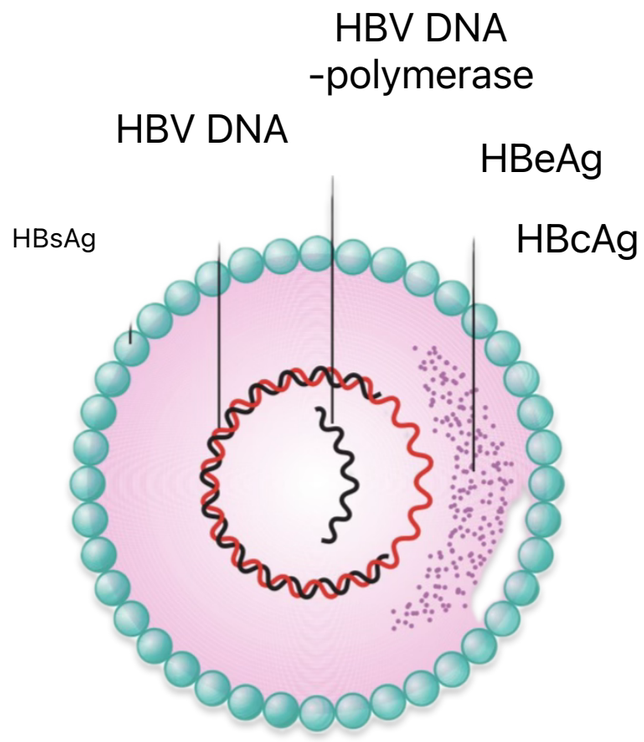
Hepatitis B

HBsAg Hepatitis B surface Antigen

HBeAg Hepatitis B envelope Antigen

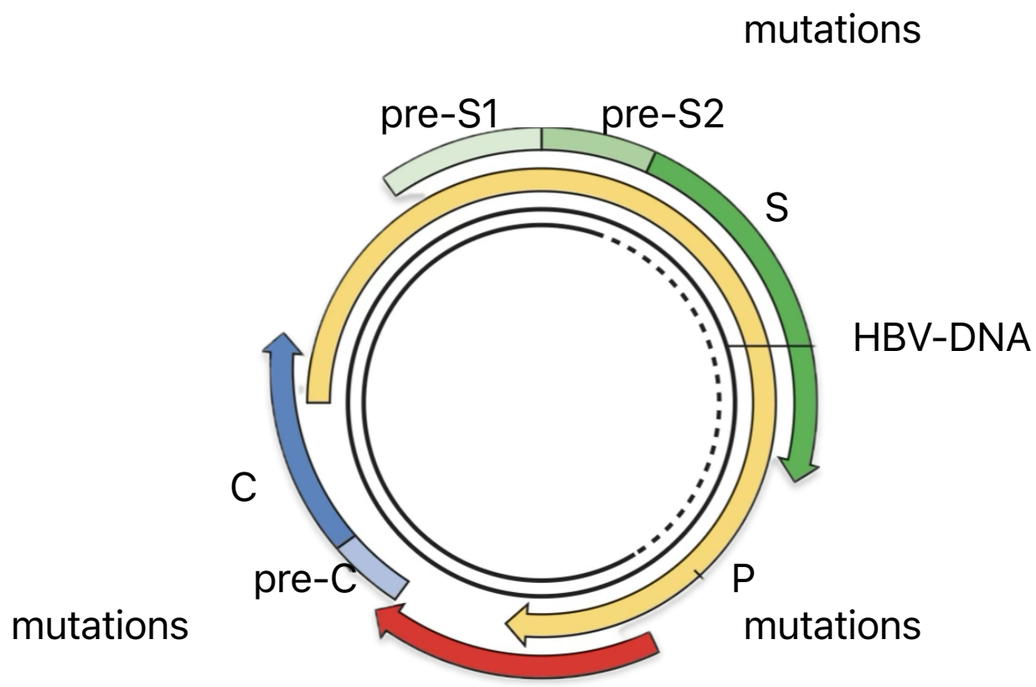
HBcAg Hepatitis B core Antigen



B surface antigen (HBsAg) is a protein that makes up part of the viral envelope.

Hepatitis B core antigen (HBcAg) is a protein that makes up the capsid or core part of the virus (found in the liver but not in blood).

Hepatitis B e antigen (HBeAg) is part of the HBcAg that can be found in the blood and indicates infectivity.



HBV-DNA encodes four proteins: a DNA polymerase needed for viral replication (P), a surface protein (S), a core protein (C) and an X protein. The pre-C and C regions encode a core protein and an e antigen. Although mutations in the hepatitis B virus are frequent, certain mutations have important clinical consequences. Pre-C encodes a signal sequence needed for the C protein to be secreted from the liver cell into serum as e antigen. A mutation in the pre-core region leads to a failure of secretion of e antigen into serum, and so individuals have high levels of viral production but no detectable e antigen in the serum. Mutations can also occur in the surface protein and may lead to the failure of vaccination to prevent infection since surface antibodies are produced against the nativeS protein. Mutations also occur in the DNA polymerase during antiviral treatment with lamivudine.