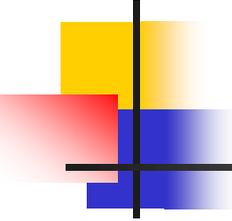


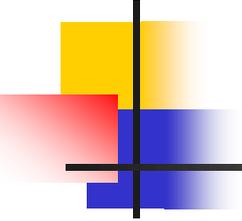
Exosomes association with HCV and HBV Infection

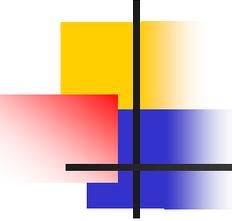
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Introduction

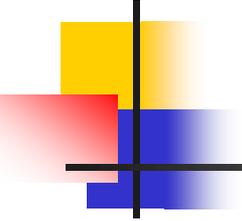
- Hepatitis C virus (HCV) infection is one of the leading causes of liver disease with over 170 million individuals chronically infected worldwide.
- HCV is a positive-sense single-stranded RNA enveloped virus of the Flaviviridae family.
- Severe complications including fibrosis, cirrhosis, and hepatocellular carcinoma are among the long-term effects of HCV infection, making liver transplantation the ultimate choice of treatment for advanced liver disease.
- Recent therapies with anti-HCV E1-E2 or other neutralizing antibodies that attempted to block HCV transmission achieved only limited success.

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- Currently, 350 million people suffer from chronic hepatitis B virus (CHBV) infection worldwide.
 - Hepatitis B virus (HBV) contains partially double-stranded deoxyribonucleic acid (DNA) belongs to Hepadnaviridae family.
 - HBV Patients exhibit an immunosuppressive state and face a high risk of developing hepatocellular carcinoma even if their alanine aminotransferase level is normal and liver damage is minimal.
 - Exosomes are a subpopulation of extracellular vesicles that originate from multivesicular bodies (MVBs), ranging from 40–150 nm in size and are produced by most cell types.
 - Evidence suggests that exosomes can transfer genetic materials between cells; however, their role in HCV/HBV infection remains obscure.



Methods

- Cell culture using cell lines, primary human hepatocytes (PHH) and HCV virus.
- Exosome isolation and purification from cell lines and patient samples.
- Electron microscopy to capture images of exosomes.
- Quantification of exosomes by mass spectrometry to characterize protein content.
- Genome sequencing.
- Western blot analysis for detection of proteins.
- Quantification of miRNA or HCV RNA expression in exosomes and cell lines.

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- Blocking antibody experiments
 - Enzyme-Linked Immunosorbent Assay (ELISA)
 - Objective will be to determine whether exosomes DNA have some traces of viral genome or they have ability to cause hepatitis themselves.
 - Other dimension is to work on HBx protein/ core protein of HBV.