P87

Cooperative transformation of murine fibroblast NIH3T3 cells by hepatitis C virus core protein and hepatitis B virus X protein

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Co-infection with hepatitis B virus (HBV) and hepatitis C Virus (HCV) is associated with increased frequency in the development of hepatocellular carcinoma. Here, we demonstrated that HBV X protein (HBx) and HCV Core cooperate to transform mouse fibroblast NIH3T3 cells. They additively stimulated cell growth, especially in the absence of serum growth factors. In addition, co-expression of HBx and HCV Core had additive effects on the induction of anchorage-independent cell growth as well as on the secretion of matrix metalloproteases, which may contribute to increased metastatic potential. Furthermore, the cells expressing both viral proteins exhibited higher tumorigenicity, as demonstrated in athymic nude mice.