

1138-35-383

Nourridine Siewe*, nourridine@aims.ac.za, and **Avner Friedman**. *Chronic Hepatitis B Virus and Liver Fibrosis: A Mathematical Model*.

Hepatitis B virus (HBV) infection is a liver disorder that can result in cirrhosis, liver failure and hepatocellular carcinoma. HBV infection remains a major global health problem, as it affects more 350 million people chronically and kills roughly 600,000 people annually. Drugs currently used against HBV include IFN- α that decreases viremia, inflammation and the growth of liver fibrosis, and adefovir that decreases the viral load. Each of these drugs can have severe side-effects. In the present paper, we consider the treatment of chronic HBV by a combination of IFN- α and adefovir, and raise the following question: What should be the optimal ratio between IFN- α and adefovir in order to achieve the best ‘efficacy’ under constraints on the total amount of the drugs; here the efficacy is measured by the reduction of the levels of inflammation and of fibrosis? We develop a mathematical model of HBV pathogenesis by a system of partial differential equations (PDEs) and use the model to simulate a ‘synergy map’ which addresses the above question. (Received February 13, 2018)