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The Evaluation of the Induced Immune Response by the Transfected Human Dendritic Cells with HCV Virus Core and E2 Coding mRNA Invitro

Mojgan Bandehpour, Nasrolah Zarghami, Zarin Sharifnia and **Bahram Kazemi**
Cellular and Molecular Biology Research Center, Iran

Background:

Hepatitis C virus is a blood borne disease estimated to infect more than 350 million people globally and is a leading cause of liver cirrhosis, transplantation and hepatocellular carcinoma. Current gold-standard therapy often fails, has significant side effects in many cases and is expensive. The fact that a significant proportion of infected people spontaneously control HCV infection in the setting of an appropriate immune response suggests that a vaccine for HCV is a realistic goal but no vaccine is currently available. The present study was designed to investigate the possibility of a new vaccine against the hepatitis C virus based on mRNA encoding of membrane antigens (Core &E2) of hepatitis C virus.

Material & Methods:

Nucleotide sequence of mRNA encoding core and E2 antigen of HCV virus by bioinformatics program was design and in pGE plasmid vector was prepared .Then in vitro transcription reactions are used to synthesize mRNA from this recombinant DNA template. Nanoparticles encapsulated this mRNA synthesized delivered to Monocytes isolated from human buffy coatand the activation and differentiation of monocyte to dendritic cells was examined.

Results:

The results showed that the combination of this antigens that were expressed in dendritic cells by synthetic mRNA were able to activation and differentiation of dendritic cells. With respect to the unstable structure of mRNA, the use of PLGA nanoparticles as delivery system to dendritic cells is an efficient method. It is recommended to assess the appropriate response of the immune system, study be performed In vivo and Ex vivo. Maybe if properly stimulate the immune system,this combination to be introduced as a good candidate RNA vaccine against hepatitis C.

Keywords: RNA vaccine, Hepatitis C virus, Dendritic cell