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Recent insights into immunity to hepatitis C virus

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Hepatitis C virus (HCV) infection is still a major public health problem worldwide since its first identification in1989. HCV infection was previously claimed to be post-transfusion infection, particularly in developing countries. Recently, due to IV drug abuse, HCV infection became number one health problem in well-developed countries as well. The outcome of acute HCV is determined by the interplay between the host genetics, the virus and the virus-specific immune response. A successful clearance of HCV infection requires the coordinated action of innate immunity and acquired immunity, on the other hand, chronic infection is characterized by the presence of functionally and phenotypically altered NK and T cell responses that are unable to clear the virus but most likely contribute to the ongoing liver disease due to ineffective HCV-specific CD4+ and CD8+ T cell responses. The virus has developed multiple strategies to escape host immune responses. These challenges have to be taken into account for the design of efficient antiviral strategies. A thorough understanding of host-virus interactions is a prerequisite for the rational design of a vaccine. An effective affordable preventive vaccine should be able to induce strong neutralizing antibodies as well as powerful cellular immune responses to provide the best long-term goal for controlling the HCV infection globally. Therapeutic vaccines may be used with DAAs and thus providing IFN-free treatment protocols.

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