Abstract (streszczenie w języku angielskim)

Hepatitis C virus (HCV) infection affects an estimated 58 million people worldwide. Extensive research performed in the last couple of years led to a better understanding of the virus biology, resulting in the discovery of the highly effective direct acting antivirals (DAAs), Unfortunately, because of the high cost of the therapy, majority of the patients is still untreated. Therefore, development of an effective and commonly available vaccine is a major goal of the current HCV research.

The major obstacle in the development of protective immunity against HCV is the high genetic diversity of the virus, manifested primarily in the sequence of HCV envelope glycoproteins – E1E2. E1E2 glycoproteins heterodimer plays an important role in the virus-host interaction and is the main target for the neutralizing antibodies. For that reason, the ideal prophylactic vaccine should induce strong humoral response from the neutralizing antibodies against the highly conserved epitopes accessible on the surface of the HCV E1E2 glycoproteins.

One method to elicit immunogenic response against single epitope is to expose it on the surface of the virus like particles (VLPs). One of the best-known protein assembling into VLPs is the small surface protein (sHBsAg) of hepatitis B virus (HBV), which is widely used as a commercial prophylactic vaccine against hepatitis B virus. sHBsAg tertiary structure forms a hydrophilic loop containing the major B-cell epitopes also known as the "a"- determinant. Because of its immunogenic potential and ability to tolerate insertions, sHBsAg can be applied as an antigen carrier to deliver foreign sequences.

In this study I designed the panel of chimeric sHBsAg particles, in which multiple highly conserved epitopes of HCV E2 glycoprotein were inserted into the hydrophilic loop of the sHBsAg protein, individually or in multi-epitope combinations. The expression of the chimeric proteins was performed in the *Leishmania tarentolae* expression system, which has the potential to produce high-yields of proteins, characterized by the mammalian-like N-glycosylation pattern. Purified, chimeric VLPs were used for mice immunization. Mouse sera were thoroughly characterized and evaluated for their cross-reactivity and neutralizing activity.

The research indicated the chimeric HBV-HCV VLP that in the future could be used as a rationally designed HCV and HBV vaccine.