Immunotherapy for Chronic Liver Diseases

Reference No: B72272

CHALLENGE

Immunotherapy of chronic hepatitis B is particularly difficult as the hepatic microenvironment is limiting local cytotoxic T lymphocyte (CTL) proliferation after infection. However, CTLs are an important element for overcoming chronic infections of the liver. So far only a prophylactic vaccination against hepatitis B virus is available and a protection post-infection by means of vaccination has not been possible to this point. Accordingly, there is a strong demand for new therapeutic options.

INNOVATION

A so far unrecognized anatomic compartment within the liver tissue consisting of myeloid cells - called iMATEs ("intrahepatic myeloid-cell aggregates for T cell population expansion") - can be exploited as a novel vaccination strategy against chronic viral liver infections. iMATEs overcome regulatory cues that limit immune response during chronic liver infections and support local CTL expansion by generation of cocoon-like structures. A dramatic expansion of CTLs in the liver can be achieved by targeted stimulation of iMATEs with TLR9-L as a prophylactic or therapeutic vaccine. The proof-of concept has been shown in vivo in mouse models.

COMMERCIAL OPPORTUNITIES

The present invention provides a convenient and reliable prophylactic as well as therapeutic vaccine strategy. The use of TLR9 agonists induces the formation of iMATEs, which generate a sufficient number of CTLs resulting in the overcoming of chronic viral infections.

Further advantages and opportunities:

- use as prime - jump strategy for enhancement of CTLs
- entities of CTLs are increased at least 5 fold in peripheral organs (e.g. liver)
- use as a prophylactic or therapeutic vaccine against infections with an intracellular pathogen
- readily available as a kit, containing a prime agent and a multiplying jump agent

DEVELOPMENT STATUS

Proof of concept in vivo.

REFERENCES: