Mariusz Skwarczynski et al., J Pharm Drug Deliv Res 2016, 5:3(Suppl)
http://dx.doi.org/10.4172/2325-9604.C1.008

Conformational epitopes-based lipopeptide vaccines against *Schistosoma mansoni* and *Necator americanus*

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Hookworms (including *Necator americanus*) infect more people than HIV and malaria combined, predominantly in third world countries. Human blood fluke (*Schistosoma mansoni*) also infects millions of people worldwide. Both infections are one of the most important health problems in developing countries. Treatment of diseases related to the infections with chemotherapy have limited efficacy and re-infections after treatment are common. The development of vaccines for these infections could substantially reduce the global disability associated with these parasites. Two proteins crucial for pathogens feeding were chosen as antigens for vaccine design: hemoglobin digestion cascade protease Na-APR-1 from hookworm and cathepsin D hemoglobinase (Sm-CatD) from *Schistosoma*. In the case of both antigens high-yield production of them (eukaryotic proteins) was problematic. This prompts us to propose peptide-based strategy for the vaccines development. Thus, appropriate B-cell epitopes have been identified and conjugated to self-adjuvanting lipid core peptide (LCP) systems to avoid using generally toxic classical adjuvants. Produced conjugates were formulated into nanoparticles under aqueous conditions. Several series of vaccine candidates were tested in mice model. The lead candidates induced robust neutralizing humoral immune responses which strongly depended on conformational properties of the peptide epitopes incorporated into conjugates. The use of potentially toxic adjuvants was eliminated and vaccine candidates showed generally good safety profile. These findings are particularly encouraging for the development of single vaccine which can target both helminthiases.

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