

## 9<sup>th</sup> Global Summit and Expo on **Vaccines & Vaccination**

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### **Immuno potentiation of hepatitis B vaccine using biodegradable polymers as adjuvant**

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Vaccines are considered as the most successful medical intervention against various infectious diseases. However, there are significant obstacles for improving immune response especially recombinant vaccines. Therefore, immunopotentiators (adjuvants) are included in vaccine formulation in order to augment immune response. Since 90 years alum is the only adjuvant approved by US FDA for human use. Recently, MF 59 and ASO4 adjuvants were developed and approved for human use. Due to the poor adjuvancity, conventional hepatitis B vaccine require at least 3 dose schedule either at 0, 1 and 6 months or 2, 4 and 8 months depending on the mode of transmission. Though hepatitis B vaccination is more successful but the efficacy of vaccine to deliver a long lasting immune response become a debate because vaccine efficiency also declines with increasing age. Therefore, the development of a delivery system for the hepatitis B vaccine, that could induce the desired antibody levels from a single injection, would be of enormous benefit. In this work the efficacy of various biodegradable polymeric micro particles were screened for their compatibility as an adjuvant for hepatitis B vaccine. Among the various polymeric micro particles screened, the chitosan micro particles was found to be better adjuvant for hepatitis B vaccine, since it induced robust immune response after a single step immunization when compared to alum adsorbed hepatitis B vaccine. The development of single contact hepatitis B vaccine based on chitosan polymer is very important advancement towards the betterment of human health care.

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### **Replication competent viral vectors for vaccine development**

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Viral infections account for 15 million deaths per year, one-third of all mortalities worldwide. The most effective medical approach to combat viral diseases and reduce deaths is vaccinations, which have less adverse side effects than drugs while inducing longer lasting protection from re-infection. Live attenuated, inactivated, or subunit vaccine approaches have been successfully utilized to combat mortalities caused by infectious diseases such as yellow fever, varicella, measles, mumps, rubella, influenza, smallpox, polio, rabies, hepatitis A and B and human papilloma virus. Viruses themselves have also been used as vectors (either replication competent or replication deficient) for development of vaccines against both infectious and non-infectious diseases. The most important factor in the construction of effective viral vectors is finding the right balance between safety and immunogenicity. Although live viral vaccine vectors are highly efficacious, there is also a greater potential risk involved with their broader usage because they are replication-competent. Vaccines based on replication-incompetent viruses are perceived to be safer but there is not yet any vaccine on the market for human use. In this talk, characteristics of both replication-deficient and replication-competent viral vectors and barriers for their developments will be discussed. The talk will specifically focus on a few vector examples that have either generated marketed products or have successfully completed their phase 3 efficacy trials.

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