Bulletin of Pharmaceutical Research 2011;1(3):49-62
An Official Publication of Association of Pharmacy Professionals
ISSN: 2249-6041 (Print); ISSN: 2249-9245 (Online)

REVIEW ARTICLE

FORMULATION AND DEVELOPMENT OF VACCINES AND THEIR SELECTION FOR NEXT GENERATION

Amish A. Dangi*, Navin R. Sheth, Hima H. Sodha, Purvi C. Joshi, Divyesh S. Bhalodiya, Ankita C. Panchal and Pooja R. Ramanuj

Department of Pharmaceutical Sciences, Saurashtra University, Rajkot-360 005, Gujarat, India

**E-mail*: amishdangi@gmail.com
Tel.: +91-9428236404

Received: November 15, 2011 / Revised: December 30, 2011 / Accepted: December 31, 2011

The goal of advancement in vaccine formulation is to generate a strong immune response to the administered antigens. To achieve this objective with vaccines based on insufficiently immunogenic antigens, adjuvant and other formulation materials are alternatives. Vaccines contain various types of additives, excipients, antigen and adjuvants which in combination provide maximum protection against various types of infectious diseases. Vaccine contains various types of lives or killed viruses, inactivated bacterial toxin and polysaccharides. Selection of excipients and adjuvants is a serious task having an implication towards safety, stability and storage of vaccine. Preservatives are used in vaccines to prevent microbial growth. Stabilizers are required in vaccine formulation to keep the vaccine homogenous and stop the components separating. Surfactants or emulsifiers are very important to alter the surface tension of a liquid. Animal products are commonly used in formulation of vaccines and are necessary for growing the vaccine pathogens. Moreover, new vaccine modalities such as DNA vaccines and multiple vaccines are currently being explored for future scope. Novel delivery technologies will be essential component for next generation vaccines.

Key words: Adjuvant, Stabilizer, Animal product, DNA vaccine, Multiple vaccine.

INTRODUCTION

While the development and widespread use of effective vaccines has an extraordinary impact on global health, there remain many infectious and other diseases for which vaccines are not available. Increasing understanding of the immune system and the nature of particular immune responses that are associated with protection from infection or disease are being put to use by vaccine developers who now produce increasingly sophisticated vaccine candidates for complex diseases (Lang and Wood, 1999). Many of the newer vaccine candidates are based on protective antigens which are inherently less immunogenic than the whole cell inactivated or live attenuated vaccines or multicomponent conjugate vaccines that were developed in the past (Luke and Subbarao, 2006). Therefore, adjuvant has become an increasingly important ingredient in novel vaccines being developed today (Podda and Del Giudice, 2003). Vaccines available in the market contain various types of additives (Brewer, 2006), antigens and adjuvants (Garcon *et al* 2007) which in combination provide maximum protection against various types of infectious disease (Lindblad, 2004). This vaccine contains various types of live or killed viruses, inactivated bacterial toxin and polysaccharides (Guy, 2007). This diverse nature of antigens requires various types of excipients to stabilize them (Pashine *et al* 2005). Selection of various types of excipients is a serious task having huge implication towards their safety, stability and storage (Treanor *et al* 2006). Like any other pharmaceutical exicipients intended for human use, the excipients used in vaccines must comply with some rigorous standard of quality, purity, availability and compatibility (Burdin *et al* 2004). Pharmaceutical excipients further