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Production and characterization of viral vectors for vaccine development

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Abstract

Potent immunogenicity and lack of prolonged transgene expression have made Adenoviruses (Ad) attractive viral vectors for vaccine development. They possess a stable virion, allowing inserts of large foreign genes, they can infect many different cell types and the transferred information remains epichromosomal, thus avoiding the risk of insertional mutagenesis. Preclinical and clinical results conclusively showed superiority of Adenovirus-vectored genetic vaccines, based on the most common human Adenovirus serotype 5 (Ad5), for the induction of T cell response. However, pre-existing immunity to Ad5 has shown to blunt significantly the immunological response induced by Ad5-vectored vaccines in rodents, non-human primates and in humans. Chimpanzee Adenoviruses (ChAd) do not cause pathological illness in humans and antibodies against them have low/no seroprevalence in the human population. Moreover, they have been shown to be very good immunogens in animal models. A large screening of ChAd has been performed and several strains were identified, which were rendered replication incompetent and suitable as vaccine vector candidates. Amongst this collection, several replication defective chimpanzee-derived adenoviruses have been selected for evaluation as clinical products against infectious diseases like Ebola, HCV, RSV, leishmaniosis and malaria. The production and the characterization of the ChAd platform and their development as prophylactic and therapeutic vaccines will be presented.

Biography:

Stefania Di Marco is a PhD Biochemist with 18-year research experience in preclinical drug discovery and development, employing molecular biology, biochemistry and X-ray crystallography for functional studies and structure-based drug design in the pharma industry. Eight-year GMP experience in production, testing and release of investigational vaccines for infectious diseases and cancer. She is an author of 54 publications and inventor of four patents (h-index 31; source Google Scholar). Currently, Qualified Person at the GMP facility ADVENT, c/o IRBM Science Park, Pomezia-Roma.