Oreola Donini, Virol Mycol 2018, Volume 7
DOI: 10.4172/2161-0517-C3-029

Using monoclonal antibodies as immune correlates of protection: Thermostable ricin toxin vaccine development

Oreola Donini
Soligenix Inc., USA

Ricin is a highly toxic plant-derived toxin that causes a rapidly progressive respiratory syndrome when inhaled. Ricin toxin is easily derived from castor bean production and constitutes a serious biological threat agent. Soligenix is developing a ricin-toxin vaccine derived from the A-chain moiety of ricin (RiVax®), adjuvanted with aluminum and thermostabilized via lyophilization in conjunction with glassifying excipients. RiVax has demonstrated 100% protection in a rhesus macaque model of aerosolized ricin exposure and safety in two phase 1 clinical studies. Development of a ricin-toxin vaccine will require use of the "Animal Rule". Use of the Animal Rule dictates the identification of immune correlates of protection that can be correlated between human studies and animal models. Recent studies have evaluated immunogenicity measures, including total anti-ricin IgG, neutralizing antibody levels, and epitope competition profiles as potential immune correlates of protection. Epitope competition assays have been specifically developed using neutralizing monoclonal antibodies with known recognition sites (epitopes) on ricin/RiVax. Studies in mice, non-human primates, and humans have suggested that the epitope competition profiles in particular are similar across species and, moreover, that threshold levels of epitope competition may be predictive of survival to subsequent ricin challenge. The stability of these same epitopes on the RiVax protein are also predictive of RiVax drug product potency. In aggregate, these results suggest that epitope recognition may be a powerful tool for vaccine development, particularly under the Animal Rule. This research was supported with funding from NIH/NIAID grant U01AI082210 and NIAID contract #HHSN272201400039C awarded to Soligenix, Inc.

Biography

Oreola Donini has more than 15 years of experience in drug discovery and preclinical development with start-up biotechnology companies and has been instrumental in leading early stage development of novel therapies into the clinic. She is a co-inventor of the Innate Defense Regulator technology. Her research has spanned drug discovery, preclinical development, manufacturing and clinical development in infectious disease, cancer and cancer supportive care. She is a Senior Vice-President and the Chief Scientific Officer with Soligenix. Dr. Donini received her PhD from Queen's University in Kinston, Ontario, Canada and completed post-doctoral work at the University of California, San Francisco.

odonini@soligenix.com

Notes: