Developing a SA11 DLP as a universal backbone for chimeric TLPs

LJC Theart, P Roux, AA van Dijk
North-West University, Potchefstroom, RSA

The commercially licensed rotavirus vaccines currently available are Rotateq® and Rotarix™, both of which are live attenuated viruses. These vaccines have an efficacy of more than 80% in North America, Europe, Australia as well as Latin America. However, the efficacy range is only between 39% to 77% in developing countries of Africa and Asia. Although the reasons for this decreased efficiency are as of yet unknown, it is generally expected that the gap in immunogenicity might be bridged through the use of regional specific vaccine boosters.

One of the methods to address this problem is with the production of VLP, which contains the same antigenic and immunogenic properties as the virus, but are devoid of any genetic material. Our group reported that chimeric VLPs can also be produced on a DS1-like backbone in insect cells using the consensus insect cell codon optimised sequences of African rotavirus field strains (genotypes G2, G8, G12, P[4], P[6], P[8]) obtained from faeces (KC Jere *at al*., journal.pone.0105167) However, only 30% of VLPs had some VP7 attached. Our current approach is the production of a universal SA11 DLP for chimeric particles.

The Bac-to-Bac system was used in this study for the production of consensus sequence SA11 DLP using SF9 and High Five cells. The plasmids pFBd_SA11_VP2/VP6, pFBd_SA11_VP4, pFBd_SA11_VP7 were purchased from GeneScript and used to generate bacmids and recombinant baculovirus. Viral protein synthesis and was evaluated using SDS-PAGE. To verify the production and auto-assembly of tRV-VLPs, sucrose gradient will be used for the isolation of particles and visualise using a TEM.