Rajko Reljic and his Concept Development Award success

Project:

Professor Rajko Reljic is an experienced immunologist who specialises in vaccine development and immunotherapy for tuberculosis (TB), dengue, Buruli ulcer and SARS-CoV2. Rajko won SGUL's Concept Development Award (CDA) allowing him to further develop his work on perfecting the formulation of an aerosolised Covid-19 vaccine, based on a single polypeptide fusion protein that derives its own adjuvanticity and does not require exogenous adjuvants.

Rajko proposed that he would use his CDA to conduct proof-of-concept animal studies to evaluate the efficacy of this vaccine platform, allowing him to accumulate more detailed data.

Technology Overview:

This technology is a novel, protein-only based vaccine platform that derives its own adjuvanticity from a unique polypeptide fusion which allows optimal access to the immune system. This invention can be used for pharmaceutical compositions comprising fusion proteins and for the rapid development of protein-based vaccines for the treatment of infectious diseases or cancer.

Key results:

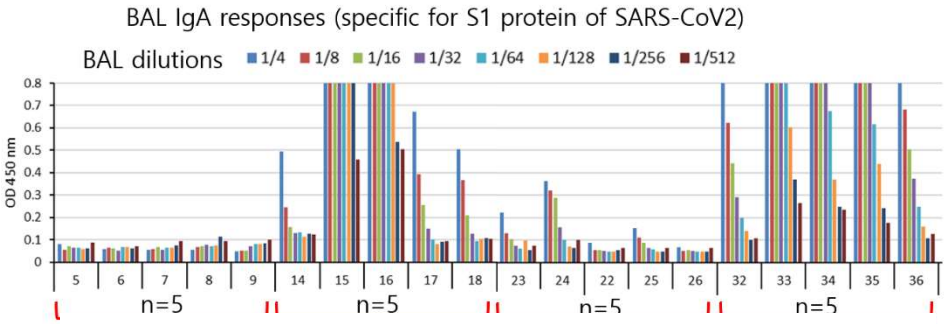

Fig.1 Mucosal (lung) IgA responses in mice immunised by Cov-PCF vaccine using different immunisation regimens.

The new protein-only and sef-adjuvantig vaccine platform was generated, incorporating the antigen of interest (in this case RBD region of the S1 domain of SARS-CoV2), the non-toxic subunit of cholera toxin (CTB) as molecular adjuvant, and the Fc portion of human IgG antibody, for targeting Fcgamma receptors on antigen-presenting cells for efficient uptake. The construct can polymerase and form pentamers through CTB aggregation, thus increasing further the cellular uptake. To demonstrate the capacity of the new vaccine platform to induce robust mucosal (lung) immune responses, mice were immunised by different regimens (Fig.1). Highest IgA antigen-specific responses in bronchoalveolar lavage (BAL) were induced in mice that were primed by systemic injection followed by intranasal boosting. The Cov-PCF vaccine induced robust mucosal antibody responses with or without exogenous adjuvant.

Impact created:

The project resulted in significant achievements both for the researcher and the University.

Filing an initial patent application which now has international protection 2 years later.

Discussion with potential commercial partners (an investigator-initiated project proposal currently being reviewed by MSD)

Basis of a recent project grant application to the MRC.

Three papers expected, demonstrating utility of the new vaccine platform against SARS-CoV2, dengue and TB.