2021
August 13
Webinar

36th International Conference on
Immunology & Immunogenetics

Assessment of the safety of therapeutic COVID 19 specific T cells using a human skin explant assay for Graft versus Host Disease

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Here we use a skin explant assay for Graft versus Host Disease (GvHD) prediction to demonstrate that SARS-CoV-2- specific T cells, isolated using SARS-CoV-2 pooled spike, nucleocapsid and membrane peptides give rise to little or no by-stander GvH type reactivity. The Virus-Specific T cells (VST) were obtained using a GMP compliant process and expanded in culture as a potential COVID-19 therapy. (1)

VST were generated from three COVID convalescent donors (plus matched un-manipulated mononuclear cells as responder controls) and tested against three different third party non-matched peripheral blood lymphocytes in a mixed lymphocyte reaction (MLR). After 7 days of co-culture the VST cells and un-manipulated lymphocytes were assessed for T cell proliferation, cytokine release and tested for histopathological damage using autologous skin from the third party stimulator cells in a unique skin explant model used for predicting GvHD (2,3).

For the skin explant assays all three VST isolates showed minimal GvH type reactivity, Grade 1 (n= 15) or Grade II (n=2) compared to un-manipulated source leukocytes (Grade II n= 9) and Grade III (n=8). T cell proliferation responses were significantly lower in the VST cells. Cytokine response analysis is underway.

This indicates that VSTs used for adoptive therapy of COVID-19 infections are unlikely to induce significant GvHD, and therefore this assay may help support the safety profile of new cell therapies.

Biography

Anne Dickinson was a researcher for over 30 years at Newcastle University, where she used human skin based in vitro assays for predicting graft versus host disease (GvHD), work that has been extensively published in over 100 peer-reviewed journals.
Anne founded Alcyomics Ltd, where the technology was modified and patented for predicting adverse immune skin and systemic responses to compounds including chemicals, cosmetics and pharmaceuticals with development of novel IP.
Anne is a Health Professional Clinical Scientist with experience in the regulatory framework involved in the development of ATMPs and is a partner in the Northern Alliance Advanced Therapy Treatment Centre.