Primary immune cell assays for characterisation of therapeutics

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The immune response is an important mechanism for detection and elimination of infected or malignant cells. The key to developing next generation immunotherapeutics is the development of relevant and robust *in vitro* model systems that characterise effects of therapeutics on immune cell activation, proliferation and regulation.

To enable characterisation of therapeutics on effector T cells, we established an in-house multiplex assay measuring T cell proliferation and release of multiple cytokines. We also established kinetic, real-time co-culture assays including 3D spheroid systems to test the effect of targeting the immune cell compartment on tumour cells. 3D co-culture systems are advantageous over 2D systems as they may represent biologically relevant complexity more adequately. While these assays are very informative, an effect is typically detectable only after several days. To this end, we established a rapid, real-time assay using an Agilent Seahorse XF Analyser which measures T cell activation within minutes, rather than days, as a shift in cellular metabolism.

In addition to monitoring effector T cells, it is equally important to test the effect of therapeutics on tumour-promoting immuno-suppressive cells such as regulatory T cells (Tregs) and tumour-associated macrophages. We have established Treg suppression assays and protocols for differentiation of alternatively activated macrophages (M2).

The development of the above assays has enabled phenotypic screening and characterisation of compound mechanism of action in Lifearc's drug discovery programmes.