

TCS/22/03 – The ABCs of Autoimmunity: Pinpointing Pathogenic Autoimmune B Cells in Rheumatoid Arthritis.

In Scotland, over 68,000 people suffer with rheumatoid arthritis (RA) and there are 2000 new cases per year. It is an incurable, autoimmune disease that causes chronic swelling and destruction of the joints as well as major internal organ damage. It rarely goes into remission, even with expensive new treatments. B cell depletion therapy (BCDT) has been used for over 20 years and is effective because these immune cells drive chronic rheumatoid inflammation. However, BCDT also removes good B cells, and this severely increases the risk of dying from infections, including COVID-19. A major advance would be to ascertain and then selectively target only disease-driving B cells. We have previously identified potentially dangerous autoimmune B cells in RA patients, and we hypothesise that they are the key drivers of this disease.

To prove this, we will utilise cutting edge technologies and data science derived algorithms to undertake an unbiased assessment of the B cells from the blood and joint tissue of RA patients. Samples are either from the very well characterised CSO funded 2 Orbit study (before and after BCDT) or from RA patients undergoing arthroplasty.

This project will confirm if there is a specific B cells signature linked to response to BCDT as well as the pathogenic B cell subset and a means to selectively target them. This data will be beneficial not just for RA patients, but for patients with many other autoimmune diseases, including multiple sclerosis.