

## **TCS/23/04 - Seeking to discover novel treatments for chronic fatigue by better understanding the effect of exercise on inflammation**

The NHS describes exercise as a '**miracle cure we've all been waiting for**'. People with long-term conditions, such as arthritis, have the most to gain from exercise but frequently find it the hardest to undertake due to their disabilities. By understanding how exercise works to improve health, it will be possible to develop new therapies which mimic and further supplement its biological actions.

Specifically, this proposal seeks to determine the roles of the immune system and the brain in reducing chronic fatigue following exercise in patients with arthritis. The majority of the 100k Scottish people with inflammatory arthritis cite **fatigue as a principal determinant of their poor quality of life and work disability**, however they feel this symptom is ignored by the NHS. We will utilise the recently completed LIFT study which successfully showed that a programme of exercise provided important improvements in arthritis related fatigue. That said, on trial completion, half the participants still reported impactful levels of fatigue. We will now use stored blood samples and brain scans from LIFT to examine which distinct elements of the immune system best captured the fatigue alleviating benefits of exercise and then relate these to the scans.

Our findings can unlock 1) the development and/or repurposing of targeted immune therapies and 2) the application of non-invasive brain modulation devices, offering real opportunities to **deliver much needed therapies for chronic fatigue in people with long-term conditions**.