

## **TCS/23/18 - Assessment of Brain Tumours with Dynamic T2\* and Lactate MR under Oxygen Challenge to Evaluate Aerobic and Anaerobic Metabolic Status of Gliomas**

Gliomas are cancerous tumours arising in the brain. Gliomas affect 7 in every 100,000 people in the UK, which means there are around 385 people living with glioma in Scotland at any point in time. Gliomas affect patients of all ages, including children and younger adults. Some types of glioma are more aggressive and grow faster. There have been promising treatment advances to improve survival, however overall the outcome remains poor, especially for aggressive tumour types. To ensure the best personalised treatment for each patient, it is vital to know how aggressive their tumour is and how it might respond to treatment. Gliomas have a unique feature, whereby they break down glucose (the body's main source of energy) into lactate at normal oxygen levels. This is something that normally only happens when there is not enough oxygen around, and is known as the Warburg effect. This is thought to be a marker of more aggressive gliomas, making these grow faster. This pilot study will involve giving oxygen to patients with glioma during their MRI scan to characterise the gliomas and assess the Warburg effect. Patients will have a routine (3T) and an ultra-high-field (7T) MRI scan while inhaling oxygen as part of this study. The information gained will be used to develop a patient-friendly glioma scanning method for use in larger studies. Information from the scans could predict glioma metabolism, grade of aggressiveness, and tumour growth rates. This would allow personalised treatment planning for each patient to improve their survival.