Lay Summary

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An analysis of PPAR expression in human gliomas: its use as a novel diagnostic, prognostic and predictive biomarker

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This research project aims to provide direct translational benefit to patients by investigating a novel biomarker (PPAR: Peroxisome Proliferator-Activated Receptor) which may better predict prognosis and outcome and provide a beneficial treatment target in adult gliomas.

At present, histological grading represents the most reliable, accepted overall indicator for the clinical outcome in adult and paediatric glioma patients. However it is increasingly clear that glial tumours can be subdivided into tumour groups which have fundamentally differing molecular drivers and varying treatment responses. Biomarkers are required so that patients with the same histological diagnosis, tumour location and co-morbidities may receive differing therapies based on the molecular characteristics of their tumours.

We use molecular techniques to study PPAR expression in human glioma samples to establish a relationship with clinical outcome. In collaboration with the University of Edinburgh, we are also analysing how PPAR activating drugs (already in routine clinical use) use may affect the growth and proliferation of brain tumour initiating stem cells without damaging healthy brain. Brain tumour initiating stem cells are responsible for the recurrence and treatment resistance of high grade glial brain tumours. Selectively targeting them in this way therefore has great potential as a novel treatment option to take to early phase clinical trails.

Our preliminary laboratory work has already been presented at national and international conferences and we have on-going collaborations with neurosurgeons and neuro-oncologists as well as clinical geneticists.

Publications:

Date	Publication title
2017	The Transcription Factor PPARα is Overexpressed and is Associated with a Favourable Prognosis in IDH-wildtype Primary Glioblastoma
2018	Evaluation of the Quality of RNA Extracted from Archival FFPE Glioblastoma and Epilepsy Surgical Samples for Gene Expression Assays
2019	shRNA-mediated PPARα Knockdown in Human Glioma Stem Cells Reduces in Vitro Proliferation and Inhibits Orthotopic Xenograft Tumour Growth