Low-grade gliomas are slow-growing, malignant brain tumours that predominantly affect young adults. Patients live with the knowledge that at some stage it will transform into an aggressive high-grade tumour, ultimately leading to their death. The lack of new therapies makes it imperative that we optimise current treatments.

Surgery is the key to management of these tumours. There is good evidence that safe, maximal resection improves survival, and may help patients to avoid the toxic effects of chemotherapy and radiotherapy. Achieving maximal resection is challenging as both healthy and glioma tissue appear identical. If we could accurately identify the margins of these tumours, this would allow more extensive resection without damaging normal healthy brain tissue.

Mutation of isocitrate dehydrogenase (IDH) is an early event in the development of low-grade gliomas. This mutation leads to a large accumulation of oncometabolite 2-hydroxyglutarate (2-HG) in glioma cells [1-2].

The current standard methods for 2-HG detection are Liquid-Chromatography Mass Spectrometry (LC/MS) and Gas-Chromatography Mass Spectrometry (GC/MS), which both can sensitively detect D2HG [3]. However, they have the disadvantages of being costly and, more importantly, much too slow to be useful for a surgeon during an operation to decide between cancerous and non-cancerous tissue during excision.

The goal of the project is to develop a method to rapidly and easily identify 2-HG in brain tissue.

References:

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