Cancerous behaviour is invariably governed by abnormalities within the genomes and epigenomes of tumour cells. These include mutations, copy number alterations such as amplifications, and structural variations that translate into aberrant transcripts and ultimately proteins. Examples of such changes in glioma include IDH1 R132H mutation, EGFR amplification, and FGFR3-TACC3 fusions. However, there are myriad other changes that could alter the biology of tumour with prognostic significance. Some, such as the mTOR pathway, maybe targeted by molecular therapeutic agents.

The BCCA Personalized OncoGenomics (POG) initiative utilizes whole genome, transcriptome, and panel sequencing of tumour to identify aberrant pathways for potential therapeutic intervention. POG aims to return informative and potentially actionable results within five to six weeks from time of biopsy. Over 250 patients have been sequenced in the past two years including 7 patients with CNS malignancies. In all cases, the data generated has served to confirm or re-align pathological diagnoses and also to identify aberrant genes, transcripts, and cellular pathways. In our hands, the integration of transcriptome and genome data has proven to be invaluable especially in comparing global gene expression profile against public cancer databases such as TCGA and ICGA. Moreover, we have incorporated analytic pipeline for measuring the expression of immune-related genes such as PDL1. Lastly, we are analyzing the mutational load and context to derive a “signature” which may inform on the molecular causation of the tumour. POG generates multilayer and granular genomic data that may provide clinical insight and treatment options for different tumour groups.

CONFLICTS OF INTEREST:
None.

ABSTRACT A8

Precision Care of Brain Tumour Patients via Personalized OncoGenomics – Promises and Challenges
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The patient presented as a 39 year old right hand dominant female with medically refractory epilepsy. Pre-operative investigations, including MRI, electro- and magneto-encephalography, and fluorodeoxyglucose positron emission tomography (PET) were concordant with a lesion in the right inferomesial frontal lobe. Subdural electrode recordings demonstrated seizure onset in the right anterior inferior frontal lobe. The patient underwent surgical resection of the lesion.