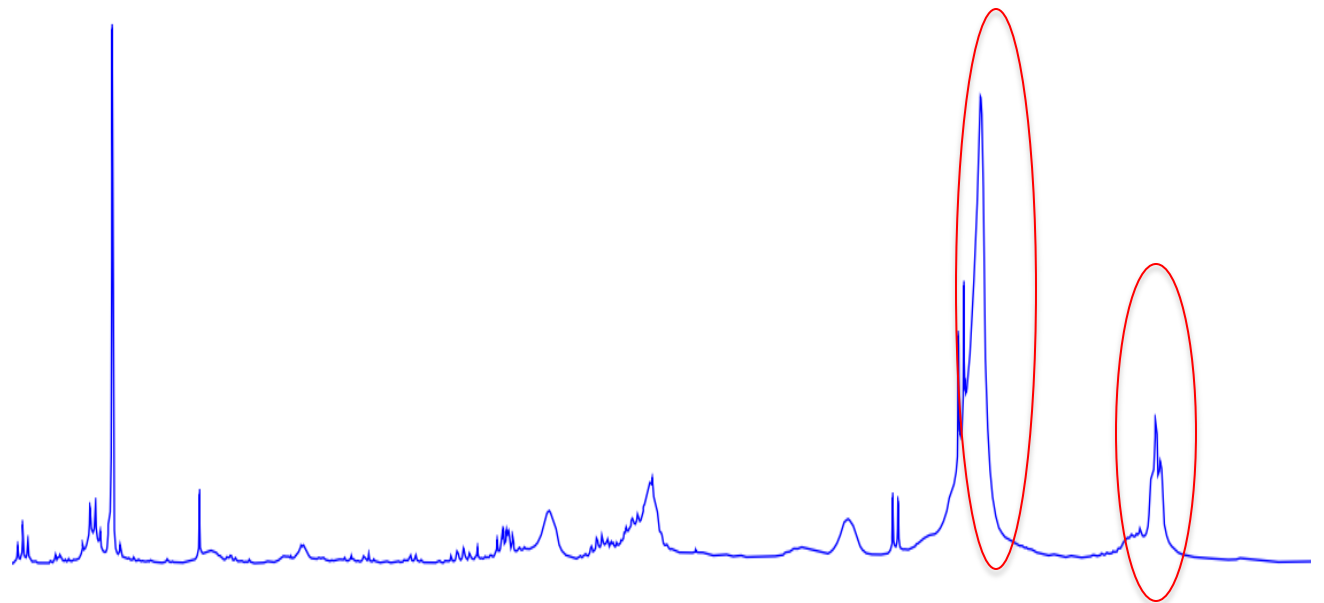
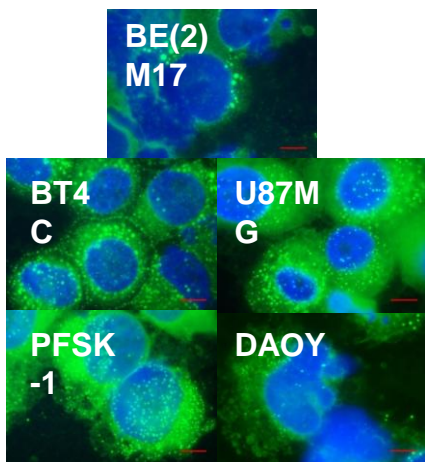


Andrew McCartney Trust Fund Project 2013

Immunohistochemical identification of lipid droplets in brain tumour cells and their association with cancer-related markers



Lipid/fat droplets

- have different sizes and composition across different brain cancer cell lines
- LDs increase in response to treatment
- the variation in size and composition of lipid droplets could contribute to differences in response to treatment
- Further investigation of the composition of these droplets may be important for targeting treatment and/or identifying biomarkers

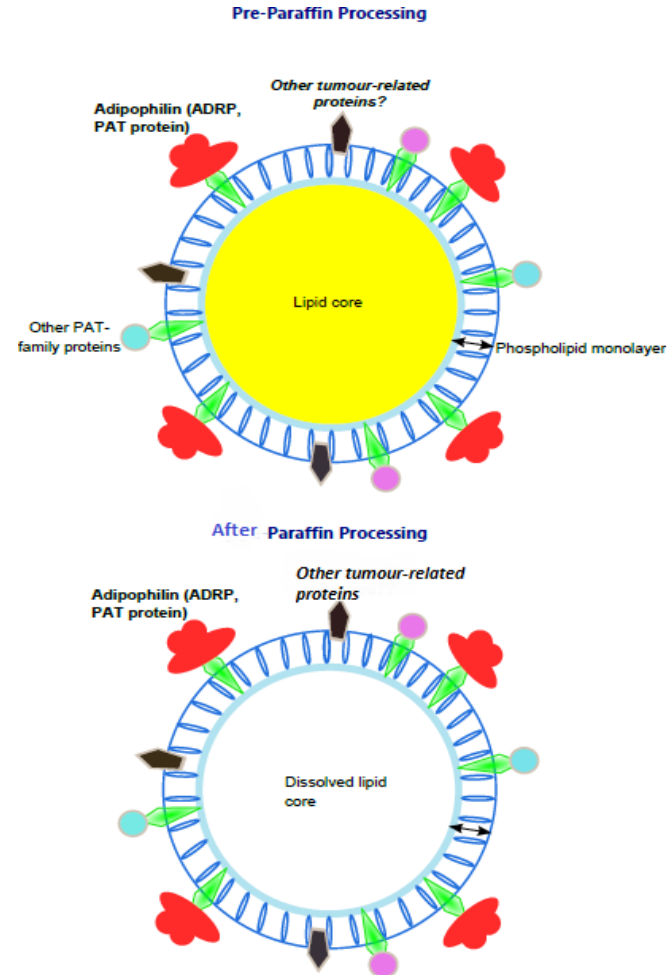
AIMS:

- **Investigate the proteins/markers expressed on lipid droplets in brain tumour cell lines using staining and microscopy**
- **Investigate proteins/markers expressed in LDs in response to treatment/s to see if the expression changes with the accumulation of LDs**

Part 1: Developing methods to stain lipid droplets in paraffin processed brain cancer cell lines and tumour tissue

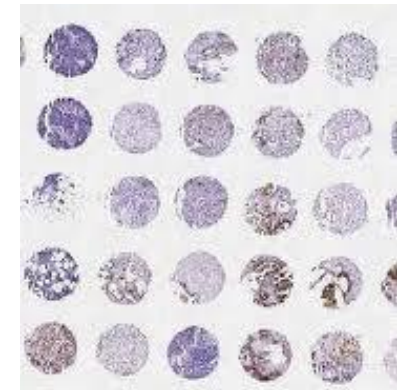
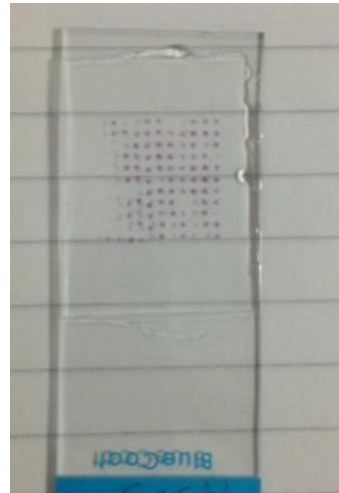
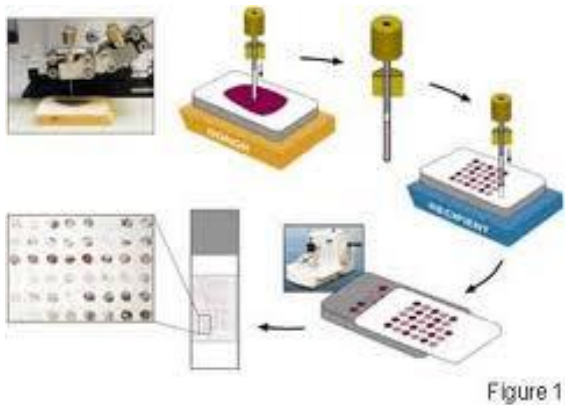
Immunohistochemistry:

- Stains parts of cells (like lipid droplets)
- Used routinely in clinical biopsies



Part 2: Using this method of staining to investigate lipid droplets in different types of brain tumours

- Use tissue microarrays to test method and gather information on lipid droplets in brain tumours



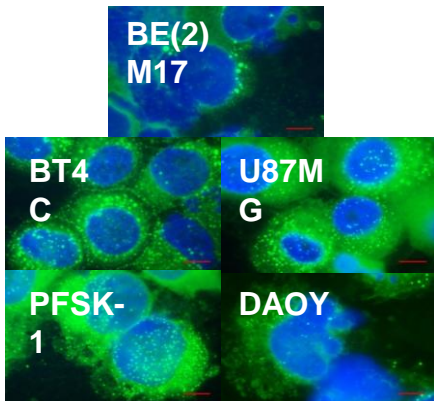
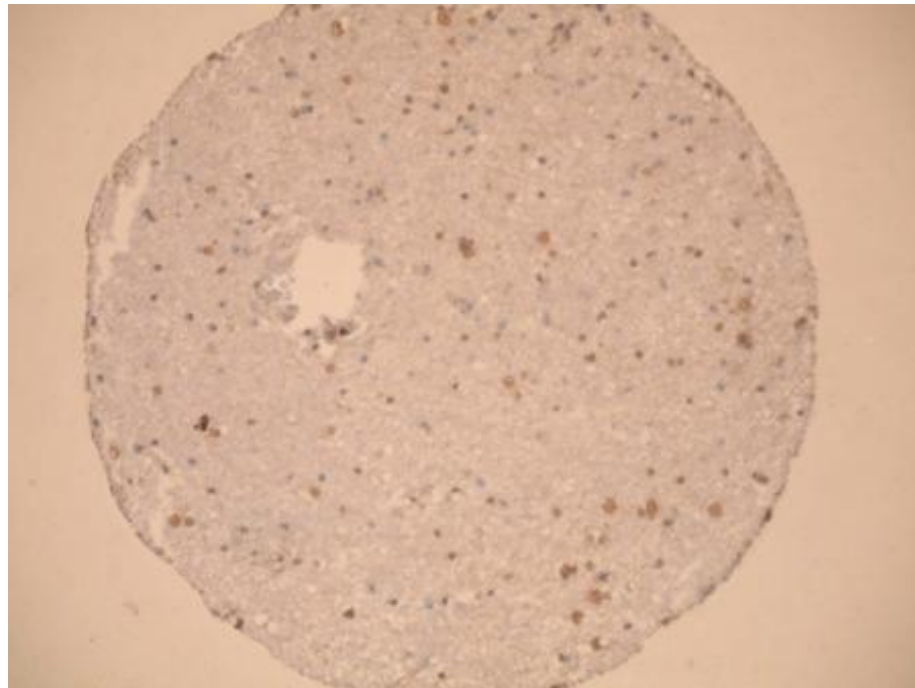
Different types of brain tumour:

Adult: glioblastoma, astrocytoma, oligodendroglioma, meningioma, benign tumours

Paediatric: medulloblastoma, pilocytic astrocytoma, ependymoma

Part 3: Perform this staining in cell lines with fluorescent markers:

- To improve the way we see lipid droplets with higher visual resolution
- allows us to use methods to stain for other proteins on the surface of lipid droplets
- these proteins may tell us more about why lipids are so important in cancer



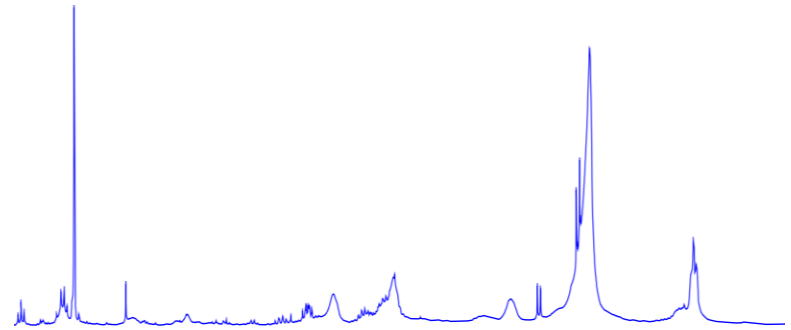
Clinical benefit:

Develop methods to investigate lipid droplets in archival clinical brain tumour tissue

- This will give information on lipids in cases where no frozen tissue is available
- May provide useful clinical information using existing histology methods.
- Could be implemented routinely in biopsied tissue

Further work:

Perform lipid staining on research cases at BCH that already have MRI spectroscopy to compare tumour tissue lipids with lipids found on MRI, and lipids found using NMR in tumour tissue



Use this lipid droplet staining method to research lipids in other projects