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Mechanisms of Seizure Generation in a Mouse Model of Tumour-Associated Epilepsy

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Introduction

Glioma is the most common form of adult brain cancer, representing 81% of all cases.

29-75% of glioma patients suffer seizures which greatly affect their daily lives. Despite this there is little known about the mechanism behind the seizure onset.

Figure A. The project used a mouse model of the tumour which allowed us to explore the potential mechanisms of seizure generation. I investigated changes in the cell populations present around the tumour and whether or not these were different in seizure and non-seizure groups.

Aims

- To investigate and image cell populations present around the tumour and in the normal hemisphere
- To analyse cell populations present in the seizure vs non seizure groups
- To analyse cell populations present around the tumour vs in the 'normal' cortex

B

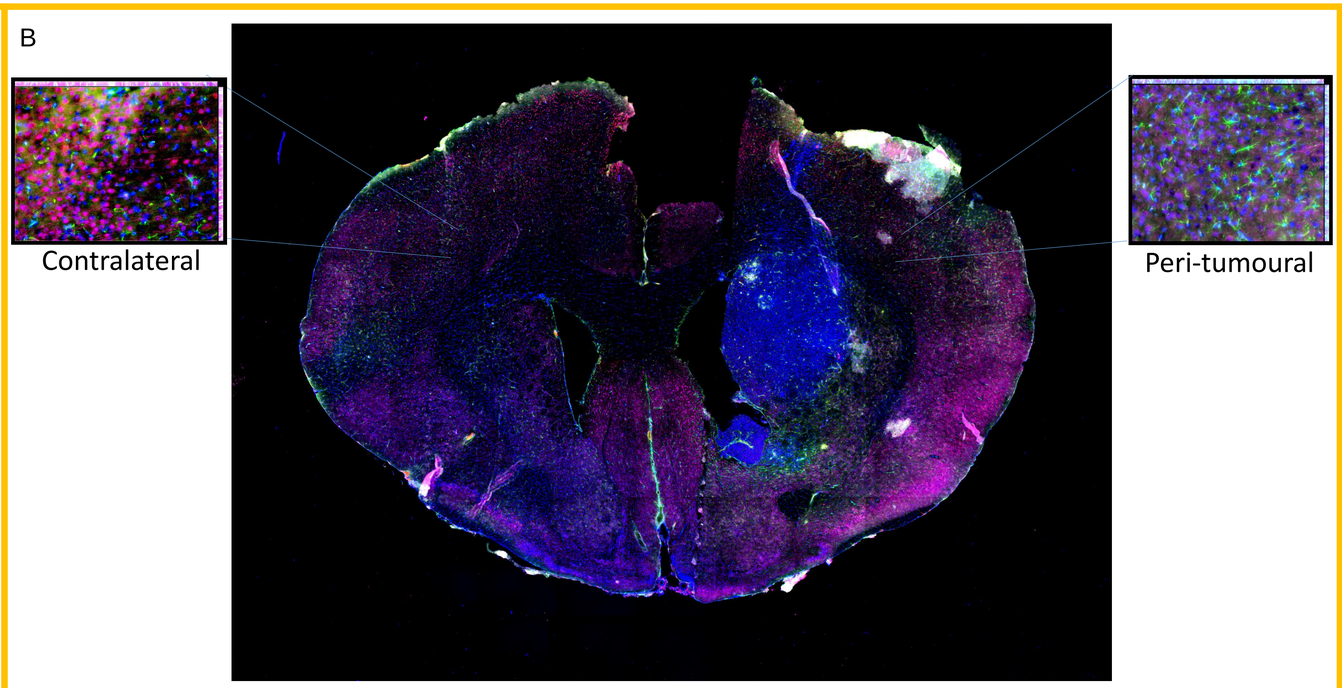


Figure B. After slicing the brains were stained by the attachment of fluorescent proteins specific to the cell types under investigation. 8 randomly sampled sections were taken from the area around the tumour (peri-tumoural) and the opposing cortex (contralateral) as shown above.

C

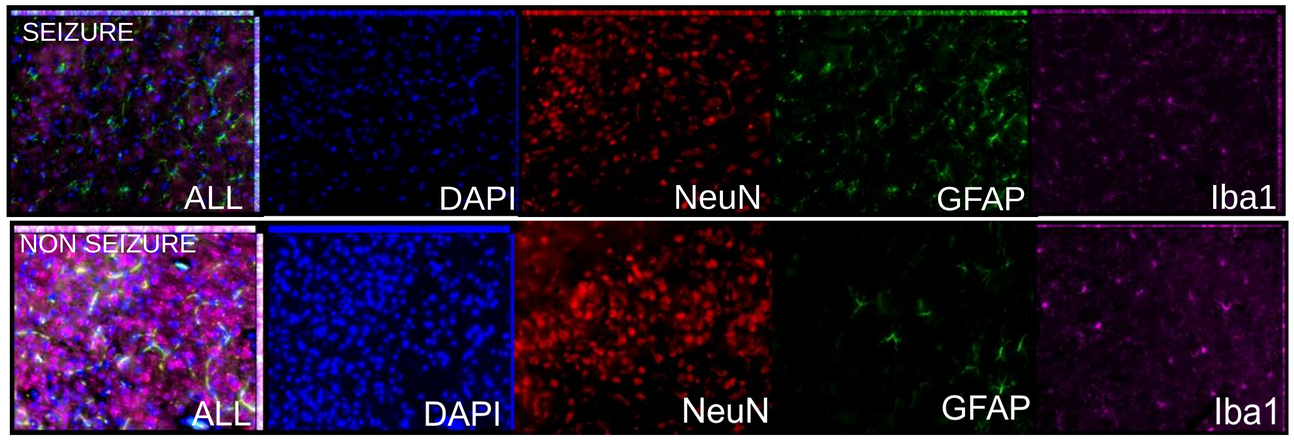
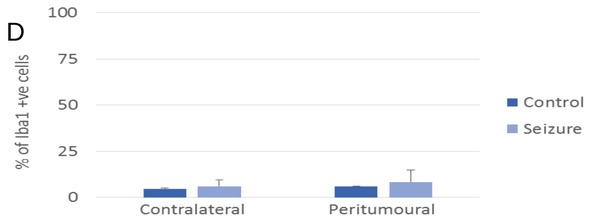


Figure C. Photographs were obtained at 20x and stained with the following dyes: DAPI for all cells, NeuN for neurons, GFAP for astroglia and Iba1 for microglia. The cell types were then analysed by a combination of cell counting software and by eye.

Results

The results show that there were no significant differences between seizure and non seizure groups in the following areas: microglia levels (Iba1 figure D), astrocyte levels (GFAP figure E), neuron count (NeuN figure F).

D



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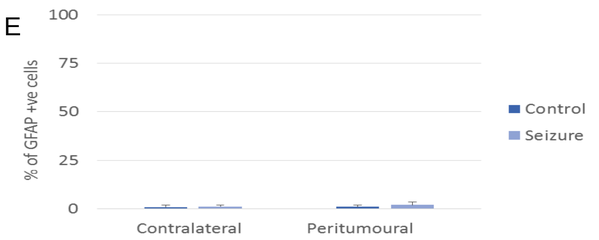

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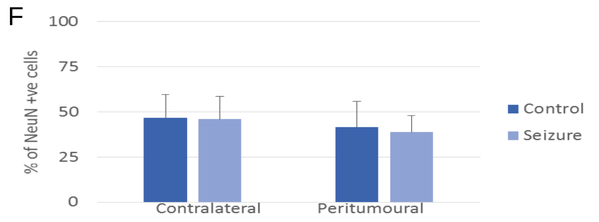

Discussion

These results provide valuable insight into the potential mechanism of tumour-associated epilepsy. While they show that there is no significant difference between these cell populations in seizure and non-seizure mice, it brings the scientific community a step closer to understanding the basis of these seizures.

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