

Lay Summary

BRAIN UK Ref: 23/001

Investigating the expression of BACE1 in human astrocytoma

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The BACE1 and BACE2 family of proteins have important role in development of several diseases including Alzheimer's disease and diabetes. Studies have looked at the involvement of BACE1 and BACE2 in cancer, but sometimes results contradict.

To better understand the effect of BACE1 and BACE2 in cancer, we used online platforms that collect information from databases of patient data worldwide. We looked at the gene expression of these two proteins in several cancers, and at whether the level of expression of either protein could predict better prognosis.

We found that if there is a lower amount of BACE1, it is associated with a better prognosis in a specific brain cancer: astrocytoma, the most common and aggressive type of brain cancer. Our end goal is to add to what scientists currently know about BACE1 and BACE2 but also add to the field of oncology.

Using tissue samples from BRAIN UK we will measure the expression and cellular location of BACE1 and 2 to determine where these proteins are expressed in the tissue. Moreover, we will use the additional patient information to see if there is a similar pattern to the data produced with the online platforms.

In the long term, we want to fully understand the role of BACE1 and BACE2 in cancer development and establish whether drugs which target BACE1 and BACE2 could be used as therapies for patients with astrocytomas.

Abbreviations

- Beta-secretase 1 (BACE1), also known as beta-site amyloid precursor protein cleaving enzyme 1
- Beta-secretase 2 (BACE2), also known as beta-site amyloid precursor protein cleaving enzyme 2
- APP (amyloid precursor protein)
- GEPIA (Gene Expression Profiling Interactive Analysis)
- GTEX (genotype tissue expression)
- TCGA (The Cancer Genome Atlas)