Scientists identify childhood brain cancer genes

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Scientists at The University of Nottingham have isolated three important genes involved in the development of a type of childhood brain cancer. The breakthrough is revealed in a study published in the *British Journal of Cancer* today.

Researchers from the Children's Brain Tumour Research Centre at The University of Nottingham, on behalf of the Children's Cancer and Leukaemia Group (CCLG), have found three genes associated with specific characteristics of ependymoma — the third most common form of childhood brain cancer.

Before now, relatively little was known about the underlying biology of this disease. The results of this study provide a more detailed understanding of the genetics behind ependymoma, which could help scientists develop targeted drugs to treat the disease more successfully, and with fewer side effects.

Around 35 children are diagnosed with ependymoma each year in the UK, and around half of these will be under three years old. In total, around 300 children under 15 are diagnosed with a brain tumour each year in the UK.

Overall, three quarters of children with cancer in the UK can be successfully treated, but survival for ependymoma is just 50 per cent. And around half the children who are initially successfully treated will suffer a relapse of the disease.

Lead author Professor Richard Grundy from the Children's Brain Tumour Research Centre at The University of Nottingham, said: "Understanding the biological causes of cancer is vitally important as it will help us to develop drugs that target abnormal genes in cancer cells but not in healthy cells, which is what traditional chemotherapy treatments do. More accurately targeted treatments will cause fewer side-effects than conventional chemotherapy and be more effective. So this is an important finding which we hope will lead to the development of new treatments for ependymoma."

The team analysed the genome wide expression pattern of ependymoma identifying three genes with distinct profiles. They confirmed the involvement of these different genes in 74 samples of ependymoma. From this they discovered that a gene called SI00A4 was strongly associated with tumours in very young children. SI00A6 was a marker of a tumour in a specific part of the brain and high levels of CHI3L1 was common in cancers showing a larger degree of cell death.

The genes discovered are all located on a section of Chromosome 1 that this research group had previously linked to poor survival for ependymomas.

Professor Grundy added: "We hope our findings will lead to a more detailed understanding of ependymoma. This is crucial if we are to ensure each child receives the most appropriate treatment for their disease and that we reduce the number of children in which their cancer recurs."

Kate Law, director of clinical trials at Cancer Research UK, which is the major funding provider of the CCLG, said: "Relatively little is known about the causes of childhood cancer, so this is an important study. Overall survival rates for children's cancers have been rapidly improving — thanks in part to international clinical trials — but it's crucial that

research like this takes place to improve treatments even further."

Source: University of Nottingham