

NEWS RELEASE

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New Study Could Lead to More Effective Treatments for Common Childhood Brain Tumours

Scientists have found evidence to suggest that certain genetic mutations play a key role in determining how children with brain tumours will respond to chemotherapy – reveals research published today in peer-reviewed science journal *Cell Death & Disease*.

Samantha Dickson Brain Tumour Trust believes the development will improve treatment options for children affected by the medulloblastoma tumour type and might go some way to increasing survival rates in the UK.

The research conducted by University of Liverpool and funded by Samantha Dickson Brain Tumour Trust, has identified specific mutations within tumour cells that make them less sensitive or even completely resistant to the chemotherapeutic drug etoposide.

Scientists say the study is significant because it has depicted a new molecular mechanism activated by etoposide that has clear implications for future clinical treatments. It demonstrates that the genetic background of brain tumour cells determines their sensitivity to chemotherapy and this has to be taken into account for efficient therapeutic intervention.

Medulloblastoma is the most common malignant brain tumour in childhood, and affects about 90 children each year in the UK. Current treatments include surgery, radiotherapy and chemotherapy. Survival rates are around 60% but there is great variation in this, depending for example on the exact type of tumour and its spread.

The research team was led by Dr Violaine Sée, of the University of Liverpool, and Dr Barry Pizer of Alder Hey Children's NHS Foundation Trust, Liverpool. They analysed how medulloblastoma cells reacted in the laboratory in the presence of etoposide, which is used in the clinic. They have shown that etoposide induces the activation of specific proteins that are responsible for switching some genes on. When these proteins are mutated or not functional, the genes are not activated and the cells cannot be killed by the drug.

Dr Sée said: "The new study marks an exciting development in the quest to improve the treatment of brain tumours. It is very important and offers the potential to help healthcare professionals give the most appropriate type of chemotherapy based on the molecular profile of an individual's tumour. By focusing on the characteristics of individual tumours, we may soon be able to offer the treatment that will work best for each individual patient, significantly improving prognosis."

Paul Carbury, CEO of Samantha Dickson Brain Tumour Trust, said: “We are committed to collaborative funding of research that will lead to a better prognosis for this devastating disease; this study marks an advance in our understanding and we hope that it will lead to the development of more effective treatments for brain tumours.”

Samantha Dickson Brain Tumour Trust is the biggest brain tumour charity in the UK, and currently spends around £1m per year on much-needed research in this field. The Trust was set up in 1996 by Neil and Angela Dickson, whose daughter died from a brain tumour at the age of 16.

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For media enquiries, please contact Louise Evans or Charlotte Maule on 01252 725346 or 07891 242476

Notes to editors

Dr Violaine Sée is a BBSRC David Phillips Research Fellow at University of Liverpool and Dr Barry Pizer is Consultant Paediatric Oncologist at Alder Hey Children’s NHS Trust, Liverpool, and both specialise in brain tumours.

About Medulloblastomas

Medulloblastoma is a rapidly-growing tumour of the cerebellum — the lower, rear portion of the brain. Medulloblastoma is the most common malignant brain tumour in childhood and accounts for 15–20% of central nervous system (CNS) cancers. The large majority of medulloblastomas occur within the first decade of life with a peak incidence between 4 and 7 years of age.

About Samantha Dickson Brain Tumour Trust (SDBTT)

Samantha Dickson Brain Tumour Trust is the leading adult and childhood brain tumour charity dedicated to research in the UK. The charity’s aim is to raise awareness, support and funds for brain tumour research to help fight this devastating disease and give hope to brain tumour patients in the future. It also offers support and information to patients and their carers.

The charity has been working to find a cure for brain tumours since it was set up in 1996 by Samantha’s parents, Neil and Angela Dickson. Since then millions of pounds have been raised for brain tumour research and support services for patients and carers, and the charity has become the largest dedicated funder of brain tumour research in the UK.

More information on Samantha Dickson Brain Tumour Trust is available by calling 0845 130 9733 or visiting www.braintumourtrust.co.uk

General Statistics

Out of the £420million spent on cancer research in the UK per year, less than 1% is spent on brain tumour research.

6,500 people are diagnosed each year with a primary brain tumour.

3,400 people lose their lives to a brain tumour each year.

Despite being the biggest childhood cancer killer and causing more deaths among the under 40s than any other cancer statistics show that brain cancer has received only a fraction of the funding of higher profile

cancers. Statistics also show that high profile cancers have received up to 20 times the investment of brain cancer and have seen survival rates almost double in 30 years.

Often dubbed the 'forgotten cancer', the UK's brain cancer survival rates have barely changed in 30 years whereas other cancer types have seen clear improvements.

Brain tumours cause the greatest reduction in life expectancy of any cancer - at over 20 years of life lost on average - and are the biggest killer of adults under 40.

People affected by brain tumours can suffer long-term adverse effects as a result of the tumour and treatment they receive – this adds 12,000 disabled life years in the UK each year.

SDBTT Statistics

Record year from 1st April 2008 – 31st March 2009

Record income of £1.3m for the year

Record research expenditure of £1m

Three major research breakthroughs:

University of Newcastle – our research team have pinpointed characteristics of medulloblastoma tumours that could help to determine the severity of an individual child's cancer. A new project is now trialling a UK-wide system for testing tumour samples and will assess whether this could be used routinely to improve diagnosis and tailor treatment for individual patients.

Queen Mary University, London – our research team has made a major breakthrough with regard to the childhood brain tumour pilocytic astrocytoma. Research has identified certain genetic changes that are frequently found in these tumours, and which relate to a pathway that is likely to be involved in the development of the tumour.

National Hospital University College London – for the first time in the UK adult high grade brain tumour patients are having a chromosome test on their tumour samples. The test identifies approximately one in three patients whose tumour is far more reactive to chemotherapy

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About University of Liverpool

The University of Liverpool is a member of the Russell Group of leading research-intensive institutions in the UK. It attracts collaborative and contract research commissions from a wide range of national and international organisations valued at more than £98 million annually.

About the research paper

The full citation of this paper is: D Meley, DG Spiller, MRH White, H McDowell, B Pizer and V Sée. P53-mediated delayed NF- κ B activity enhances etoposide-induced cell death in Medulloblastoma. *Cell Death and Disease* (2010) 1, e41; doi:10.1038/cddis.2010.16