



**SAMANTHA DICKSON
BRAIN TUMOUR TRUST**

Head to head with brain tumours

Research update August 2011

Research into brain tumours in children and teenagers

Thanks to the donations from all of our supporters, the past year has seen significant advances in our understanding of brain tumours in children and young adults, much of which has been achieved through our award-winning research programme.

SDBTT-funded researchers at Queen Mary, University of London and the University of Cambridge have uncovered key genetic changes in low-grade tumours in children, while new projects at the University of Nottingham and Institute of Cancer Research in London are expanding our understanding of ependymoma and high-grade brain tumours. Research at Newcastle University into medulloblastoma tumours is translating into European clinical trials for new treatment schedules. Meanwhile, researchers at Cambridge, Southampton and Bristol Universities have been looking into disease and treatment-associated disability experienced by survivors of childhood brain tumours.

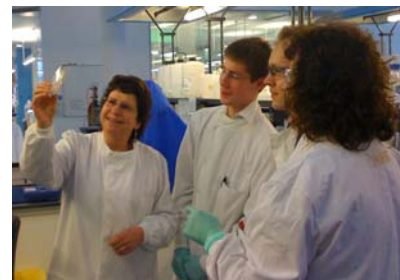
We examine three of these research projects in more detail here.

Analysing genetic changes in pilocytic astrocytoma tumours in children

Professor Denise Sheer & Professor David Ellison, Queen Mary, University of London

Researchers have recently completed a study into genetic changes in low-grade astrocytomas, the most common group of brain tumours in children. They found that most pilocytic astrocytoma tumours have a particular rearrangement of DNA involving a gene called BRAF, triggering a key cancer pathway.

In 2010 the team was awarded the prestigious Jeremy Jass Prize by the Journal of Pathology, in recognition of the significance of this work. They have also found that the DNA sequences flanking the breakpoints in the genes have a particular pattern called 'microhomology'. This provides information on how these important rearrangements in DNA arise.



Prof. Sheer and team at QMUL



QMUL team awarded Jass Prize

Developing a system for testing tumour samples for medulloblastoma clinical trials in children

Professor Steven Clifford, Newcastle University

Researchers are establishing systems to rapidly consent, collect, store, transport and analyse tumour samples from children diagnosed with medulloblastoma. Samples are tested in the lab for molecular 'biomarkers' to help doctors gauge the aggressiveness of an individual's tumour. Tumours are categorised as high or low risk, allowing children to be selected for one of two pan-European clinical trials.



Prof. Steven Clifford in his lab

The trials aim to improve survival in 'high-risk' patients, whilst minimising side-effects in those carrying reduced risk. 50 patients from 12 UK treatment centres have been registered onto the study so far, tumour samples from the majority of whom have been successfully tested and reported on, ready for the trials to commence in late 2011 / early 2012.

Psychiatric illness in adult survivors of childhood brain tumours

Dr Howard Ring, University of Cambridge

This study looks at the rates of psychiatric illness in adult survivors of childhood brain tumours, with the aim of helping both doctors and families to be better informed about the possible long-term outcomes when making decisions about treatments for children with brain tumours. It is assessing what psychiatric conditions are present in brain-tumour survivors compared to the general population to determine how much brain tumours and their treatments contribute to the development of psychiatric disease later on.

Results so far show higher rates of clinical apathy in brain tumour survivors, which could significantly interfere with their progress in rehabilitation, education and employment. There is a range of treatments available that can be used to minimise this, however, but only if the condition is identified correctly.

A list of all our current and recent research projects into brain tumours in children and teenagers with scientific and lay titles is included overleaf.

More information on our current research projects can be found at:
www.braintumourtrust.co.uk/research

Or please contact us:

Email: enquiries@sdbtt.co.uk

Call: **01252 749990**

Paediatric projects funded this year

Institute of Cancer Research, Royal Marsden NHS Foundation Trust (Dr Nada Al-Saffar) (2009 – 2012), Establishing non-invasive biomarkers of the efficacy of novel phosphoinositide 3-kinase inhibitors in paediatric high-grade glioma by magnetic resonance spectroscopy: Researching alternatives to invasive monitoring procedures for children with brain tumours

Institute of Cancer Research, Royal Marsden NHS Foundation Trust (Dr Louis Chesler) (2010 – 2012), Systematic analysis of the role of MYCN in the formation and progression of high-grade, anaplastic medulloblastoma: Analysing the role of 'MYCN' in medulloblastoma

Institute of Cancer Research, Royal Marsden NHS Foundation Trust (Dr Chris Jones) (2010 – 2012), Systematic characterisation and functional assessment of amplified genes in paediatric glioblastoma: Identifying and studying the role of key genes in high-grade brain tumours in children

University of Cambridge (Professor Peter Collins) (2010 - 2013), Molecular-Genetic and Epigenetic Analysis of Pilocytic & Piloxyoid Astrocytomas and Ependymomas: Investigating the genetics of pilocytic astrocytoma, pilomyxoid astrocytoma and ependymoma

University of Cambridge (Dr Howard Ring) (2008 – 2011), Rates of psychiatric illness in long-term survivors of early childhood brain tumours: Psychiatric illness in adult survivors of childhood brain tumours

University of Nottingham (Professor Richard Grundy) (2008 – 2011), Genome-wide molecular characterisation of supratentorial PNET (sPNET) – II: Investigating the genetics of CNS PNET brain tumours in children

University of Nottingham (Professor Richard Grundy) (2011 – 2014), The role of histone deacetylase inhibition in malignant childhood ependymoma: Investigating new drugs for the treatment of childhood ependymoma
Jointly funded with the Joseph Foote Charitable Trust

Newcastle University (Professor Steven Clifford) (2008 – 2011), A feasibility study of real-time biological characterisation of medulloblastoma: Developing a system for testing biopsies in childhood clinical trials

Newcastle University (Professor Steven Clifford) (2010 – 2013), Biomarker discovery for improved disease risk assessment and therapy of childhood medulloblastoma: Biomarker discovery for childhood medulloblastoma

Royal Victoria Infirmary, Newcastle (Dr Simon Bailey) (2010 - 2012) – A phase II multi-centre study of the concomitant and prolonged adjuvant temozolomide with radiotherapy in diffuse pontine gliomas: A phase II study of temozolomide with radiotherapy for diffuse pontine gliomas in children
Jointly funded with Cancer Research UK

Recently completed paediatric projects

University of Cambridge (Professor Peter Collins) (2006 – 2009) Genome-wide analysis of ependymomas and pilocytic astrocytomas: Identifying genetic changes found in childhood pilocytic astrocytoma and ependymoma tumours

Institute of Neurology, London (Dr Tracy Warr) (2008 – 2009) Epigenetic silencing of gene expression in paediatric intracranial ependymoma: Understanding the genetic factors that contribute to ependymoma tumours

University of Nottingham (Dr Elizabeth Coyle) (2007 – 2009) The contribution of drug-resistant cancer stem cells to paediatric brain tumours: Investigating drug resistance in childhood brain tumours

University of Nottingham (Professor Richard Grundy) (2007 – 2009) Comprehensive mapping of gene expression and genomic gains and losses in paediatric high-grade gliomas: Identifying important molecular abnormalities in high grade gliomas

University of Nottingham (Professor Richard Grundy) (2007 – 2010) Advanced magnetic resonance imaging and metabolic studies of low grade gliomas of childhood: Researching the use of magnetic resonance spectroscopy in the treatment of low-grade gliomas in children

Institute of Neurology, London (Professor Sebastian Brandner) (2007 – 2009) Wnt signalling in neural stem cell differentiation and tumourigenesis of the central nervous system: Understanding the origins of medulloblastoma tumours in children

University of Leicester (Professor Sue Ablett) (2005 – 2009) Two trial co-ordinators for Children's Cancer and Leukaemia Group Clinical Trials Unit: Supporting international clinical trials for children with brain tumours

Universities of Leeds and Manchester (Professor Patricia McKinney and Professor Jillian Birch) (2007 – 2010) UK Case control study of possible causes of brain tumours in children, teenagers and young adults - A pilot study: Studying the environmental causes of brain tumours in children and young people

University of Southampton (Professor Colin Kennedy) (2007 – 2010): An in depth study over time on the effect of child and parent factors on perceived quality of life of children treated for brain tumour: Studying the effect of child and parent factors on the quality of life of children treated for a brain tumour