



**Dr Kieran Breen**  
is Director of Research at Brain Tumour Research which supports four dedicated centres of excellence across the UK.

**Correspondence to:**  
E: Kieran@braintumourresearch.org

## Brain Tumour Research – the Research Centre Model

**W**hen it was established as a research-funding charity, Brain Tumour Research made a strategic decision to support Centres of Research Excellence within the UK rather than funding individual project and programme grants. These Centres were chosen following a strict peer review by international research experts. At the current time, the charity supports four Centres at the University of Portsmouth, Queen Mary University of London, Imperial College Healthcare NHS Trust (London) and Plymouth University Peninsula Schools of Medicine and Dentistry.

The charity is dedicated to funding scientific research into all types of brain tumour. The establishment of a secure long-term funding partnership underpin the key salaried positions within the centres. The researchers are thus freed from the limitations and frustrations of applying for one research project grant after another. Instead they are allowed to pursue the sustainable and continuous research so desperately needed if we are to achieve our vision of finding a cure for brain tumours. The establishment of the centres also stimulates the interaction between both basic scientists and clinicians which is vital for the translation of lab-based discoveries into new cutting edge treatments, technologies, diagnostics and other interventions and bring them forward into a clinical setting. In order to be effective the centres require substantial levels of sustained funding in order that they can thrive, attract the foremost talent and ultimately produce world-class research outputs.

One of the key challenges within the current UK research infrastructure is the sparsity of opportunities for new researchers to join the “academic ladder”. Too often, we support promising postgraduate and postdoctoral researchers at the beginning of their careers. Because of the shortage of further opportunities in the area of brain tumour research, they are likely either to leave the country or exit from the neuro-oncology research space to other research areas for which more opportunities and support funding exist. The development of Brain Tumour Research-funded Research Centres of Excellence provides an infrastructure within which promising young scientists are provided with an opportunity to develop specialist brain tumour research expertise and knowledge. This will ultimately help them to realise their full

potential including through the application for personal research Fellowships and ultimately for tenured positions. Another key component of the research Centre model is to stimulate more junior researchers to move between centres within the network and thus encourage and facilitate the cross-pollination of the very best thinking at the cutting-edge of brain tumour research.

The funding of Centres of Excellence stimulates the development of outstanding teams of collaborative researchers within both the academic and medical communities. This facilitates the development of long-term multidisciplinary strategic plans to explore new research avenues, that will bring us closer to that key breakthrough which the brain tumour world so desperately needs. This contrasts with, but also complements, the approach of developing one discrete project after another. Sometimes a long-term goal or a new field of research needs to be broken down into smaller parts, but that greater vision must be free to be held in the knowledge that it will be achieved.

Our Centres collaborate to form a powerful network with each other as well as with other research facilities, both within the UK and internationally. This stimulates the acceleration of brain tumour research development and it will have a real clinical impact for those suffering from brain tumours, both in the shorter and the longer terms.

But, there is a stark lack of funding available for research into the area of neuro-oncology. A recent report by the House of Commons Petitions Committee on “Funding for research into brain tumours” highlighted the real impact of a general lack of support for research in this area by successive Governments. The Governments have maintained the opinion that they have no role in making a decision of the specific areas of research that are funded but rather just to agree on an overall budget. The Committee however concluded that the Governments have “failed [brain] tumour patients” and “must put this right”.

One of the key problems associated with the development of new and more effective therapies for brain tumours is the ability of drugs and other therapeutic agents to cross into the brain through the blood brain barrier. While some very effective drugs have been developed for the treatment of the more common cancers, these have not been demonstrated to be effective

for brain tumours. Therefore, while the five-year survival rates for breast and prostate cancers are over 80%, this rate is less than 20% for brain tumours. It is no coincidence that there is a correlation between clinical outcome and long-term research investment and this underlines neuro-oncology as an area of great unmet clinical need. The report concluded that the Government “should use its powerful influence on funding levels to send a clear message that brain tumour research is a major priority for the UK”. This can be achieved by ensuring that there is “adequate support for young people who wish to pursue a career in brain tumour research”. This is very much in keeping with Brain Tumour Research’s aim of establishing and nurturing new research talent. The report also highlights that the fact that the majority of research funding in this area is derived from the voluntary sector, such as Brain Tumour Research. The Government must now play its role as long term research cannot be dependent purely on public fundraising.

The development of a research centre model can also help to overcome other research barriers that exist to prevent the development of a world-class neuro-oncology infrastructure within the UK. One obstacle is associated with tumour tissue collection and biobanking. It is vital that we obtain a better understanding of the process of tumour formation at a cellular level in order to be able to identify new drug targets and ultimately develop new and more effective drugs. Therefore, it is particularly important that the appropriate infrastructure is in place to make optimal use of the tissue samples as they become available, primarily following surgery. It has been reported that while 90% of patients would be keen for their tissue to be used for research following surgery, only 30% of patients have been given this opportunity. Some local procedures, and particularly those associated with ethical permission requirements, can have a significant impact on the process. An “opt in” approach, where patients are asked whether they would be willing to donate tissue following surgery, is currently used in the vast majority of centres. However, the introduction of an “opt-out” approach would simplify the process and lead to provision of more tissue for research and thus to acquisition of new knowledge to benefit patients. This would be particularly beneficial for the study of rarer tumours for which only a small number of samples

exist and it is essential that we maximize their collection. So, the development of a harmonised process is required with local ethics approval mirroring that obtained at a national level through the National Research Ethics Service. It is agreed that the process of tissue donation is a sensitive one and the appropriate staff, including research nurses, should be available to provide advice and support. This model, funded by the National Institute for Health Research, is already in existence for whole brain donation.

A further barrier is the implementation of an appropriate technical framework in order to ensure consistency between collection centres. In some, for example, the tissue is used to derive cell lines that can be cultured and stored over a longer term. This requires very specific treatment of the tissue samples. The cell

is available to researchers in order to identify both the format and location of the samples. They can request these for research use. However, this is largely supported locally by existing staff and facilities, many of whom are already overstretched due to a general increase in routine clinical requirements. In order to maintain the BATON research model, it is important to develop the appropriate infrastructure which will require investment at a national level. This will include the appropriate local pathology and clinical support. This is another area where the Government can invest into an infrastructural element that will facilitate additional research into brain tumours. A model for the development of a brain bank network has been developed within the UK and this could be used as a model for brain tumour biobanking.

*“While the five-year survival rates for breast and prostate cancer are over 80%, this rate is less than 20% for brain tumours”*

lines generated by Brain Tumour Research Centres of Excellence are available to other research centres throughout the country, again highlighting how the coordination of research centres at a national level can play a key role in the biobanking process. There is currently a coordinating centre (BRAIN UK Neurosurgical biopsy extension, BATON) which is hosted by the University of Southampton and funded by three charities Brain Tumour Research, Charlie’s Challenge and Braintrust ([www.brain-uk.org](http://www.brain-uk.org)). To date, 26 (out of a possible 30) Neuropathology Centres throughout the UK have opted to be part of this virtual centre. For each of the samples, a pathology report can be provided. Although the tissue samples are held locally at the point of collection, the national database held at Southampton

While a chronic underinvestment in the area brain tumour research has been highlighted by the House of Commons Petitions Committee, this increased awareness has provided a window of opportunity within which the issue can be addressed. The support of the Brain Tumour Research Centres of Excellence play a key role in the development of a national network which will share research expertise and best practice. The Centres can also play a key role in the establishment and maintenance of national structures such as biobanking. But the Government must also appreciate that it has its role to play by consolidating the appropriate clinical, scientific and academic infrastructure which will allow brain tumour research to develop its full potential.