ICR The Institute of Cancer Research

How we are seeking new and kinder treatments for Gliomatosis Cerebri

Prepared for The AYJ Fund
March 2016

The Institute of Cancer Research, London, is one of the world's most influential cancer research institutes

Introduction

Thank you once again to The AYJ Fund and your supporters for the incredibly generous donation of $20,000 towards our research here at The Institute of Cancer Research (ICR).

Your gift has been put towards Professor Chris Jones' research into the causes of Gliomatosis Cerebri, with the ultimate aim of curing the disease.

We hope you enjoy reading about recent progress made in our labs and our international collaborations, as well as Professor Jones' exciting plans for the future.

Our research is mission-driven

The Institute of Cancer Research (ICR) is one of the world's most influential cancer research institutes. We are passionate about our mission to make the discoveries that defeat cancer. The Institute of Cancer Research, London, has been driving scientific discoveries on cancer and its treatment for more than 100 years. We are internationally renowned for our work and are the top-ranking academic research centre in the UK.

Our aim is to deliver excellent research for the benefit of patients, high-quality training for the next generation of cancer researchers and clinicians, and a sustainable organisation. Our scientific strategy focuses on the genetics and epidemiology of cancer risk, the biology of tumours and the discovery of new therapeutics, as key elements of an overall quest to improve outcomes for cancer patients.

"Our ambitions within the laboratory are to turn some of our laboratory-based hypotheses into real, molecularly-based treatments for malignant gliomas, and to see, at last, real progress being made in the survival of children and young people with these dreadful cancers."

Professor Jones

Professor Chris Jones

Professor Chris Jones leads a research team whose aim is to find the genes that are driving development of brain tumours, and then identify ways to translate these findings into new treatments for patients with these tumours.

The team focus on high grade gliomas. Professor Jones has forged collaborations with other international organisations in order to collect samples that cover the spectrum of potential variations, and to conduct the most comprehensive possible analysis. Professor Jones' work has already revealed some significant genetic differences between the adult and child tumours, and has highlighted potential new drug targets.

An update from Professor Chris Jones on his research

Since the inaugural International Gliomatosis Cerebri (GC) meeting in Paris in March 2015, there have been two papers published on the molecular characterisation of GC, both of which support the message we presented at the conference. The German study of 23 adult GC patients, and the US study of 18 childhood GC patients both used profiling techniques as a means to classify brain tumours, and discovered that rather than forming a distinct entity, individual GC samples in fact looked like numerous other previously recognised subgroups of high grade glioma in children and adults. There were examples of GC patients with key genetic defects which mark these subgroups – IDH1, H3F3A, and PDGFRA mutations, for example. Thus it appears that rather than GC being a completely unique type of brain tumour in its own right, it seems to represent an extremely diffusely infiltrating variant of existing high grade glioma subgroups.

In addition to the profiling described above, we have also been carrying out exome sequencing in order to look for novel mutations which may explain how GC end up behaving so differently to other gliomas. We have to date sequenced 12 paediatric and young adult cases (with a further 10 in progress) and are aiming to collaborate with German, Dutch and French paediatric oncology groups to increase this number, as it seems likely that to identify "GC genes" we will need to look at differences between GC and other high grade gliomas within the individual subgroups described above, which means collecting ever more cases.

If the genetic studies are not able by themselves to answer the questions of how GC becomes so infiltrative, there is an urgent need to develop models of the disease so we can study these processes directly in the laboratory. To this end we are fortunate to collaborate with a group in Pamplona who has kindly shared with us what appears to be the first GC cells taken directly from a patient's tumour sample which we are able to grow successfully in the lab. We are currently setting up experiments to study how these cells migrate in order to look for clues as to how we may develop treatments to halt their spread. This potentially represents a major advance in the study of the disease, though of course we need to develop more of these models.

There will be further discussion of these data, and we will aim to have submitted our own first study on GC patients, at the International Society for Paediatric Oncology (SIOP) Europe Brain Tumour Working Group meeting in Liverpool, England this coming June. This will also provide the impetus to increase the sharing of samples, models and data across Europe.

I would like to take this opportunity to thank The AYJ Fund and their supporters for their generosity. Your funds will enable my team and I to build upon our knowledge, ultimately improving the outlook for Gliomatosis Cerebri patients.

Looking to a brighter future

Moving forwards, Professor Jones and his team will continue to uncover “GC genes” linked to its development and test promising drug compounds against them.

Exciting developments and international collaborations make this a very promising time in GC research. As our knowledge of the disease grows we look forward to sharing our new understanding with you.

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