Nearly 15,000 men, women, and children are diagnosed with a glioblastoma multiforme (GBM) each year. GBM is a highly aggressive tumor type and the deadliest form of brain cancer. Only 5%-10% of all diagnosed will live beyond 5 years. Brain tumors are often deadly, impact quality of life, and change everything for patients and their loved ones. Brain tumors cannot be prevented, and no cure exists today.
Now, in its second year the Defeat GBM Research Collaborative, a subsidiary of the National Brain Tumor Society, is a multifaceted and concentrated effort, which aims to double the percentage of GBM patients who survive at least 5 years.

Through research collaboration, multiple synergistic projects will be combined and driven by investigator teams to accelerate the pace of discovery and improve patient survival.

BACKGROUND

<table>
<thead>
<tr>
<th>March 2013</th>
<th>August 2013</th>
<th>November 2013</th>
<th>January 2015</th>
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<tbody>
<tr>
<td>Defeat GBM Research Collaborative launches</td>
<td>Initiative goals defined</td>
<td>Investigator teams selected</td>
<td>Launch of Scientific Studies</td>
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RECENT NEWS

Earlier this year, the Discovery team, led by Dr. Webster Cavenee and Dr. Frank Furnari at Ludwig Cancer Research in San Diego, reported a potential finding, which may explain why glioblastoma multiforme (GBM) cells become resistant to treatments. “Acquired resistance” refers to tumor cells’ ability to learn to dodge the effects of treatment. Once a tumor develops resistance, current treatments stop working and the tumor can resume growing. This is one of the biggest challenges in the successful treatment of brain tumors today.

Cavenee and Furnari found that in the drug resistant tumors (i.e. no longer responding to treatment with EGFR inhibitors), a molecule called uPA appeared frequently at abnormally high levels. They were able to determine that high-levels of uPA in the tumor cells caused a decrease in the levels of an important protein, which helps block tumor re-growth called Bim. Thus, when you treat GBM tumors with EGFR inhibitors, the tumor subsequently increases its level of uPA, which triggers a process that results in the decrease of Bim.

With this knowledge, the Drug Development team can now find combinations of EGFR inhibitors and other therapies that promote tumor cell death, such as a PARP inhibitor, in hopes of more successfully treating GBM patients with these mutations in their tumor. The accelerated transfer of findings from the Discovery to Drug Development teams is a testament to the enhanced collaboration and progress made possible by the Defeat GBM Research Collaborative and is believed to have decreased the length of the process by 1-2 years.

In addition, research funded through the Defeat GBM Research Collaborative has already yielded nine (9) publications.

“By using drugs that mimic the activity of Bim, or block the pathway initiated by uPA activity, we feel there is an opportunity to overcome EGFR inhibitor resistance.”

- Dr. Frank Furnari, Ludwig Cancer Research

National Brain Tumor Society

www.DefeatGBM.org
GBM research remains on the cusp of genetic and molecular discoveries that will forever alter current diagnostic, prognostic, and therapeutic achievements. Like the Bim discovery from Ludwig Cancer Research, the project teams within the Defeat GBM Research Collaborative are already delivering impressive results to date. By the design, the Defeat GBM Research Collaborative provides the optimal structure for enhanced collaboration including data sharing among investigator teams, access to other drug compounds for testing and evaluation, and the ability to accept additional research partners to increase the overall effort and/or pace of future success.

Continued success of the Defeat GBM Research Collaborative relies on the generosity of our community and supporters like you. To support the overall effort, National Brain Tumor Society has committed approximately $6.5 million for work in 2015 and 2016. Each of the three (3) founding research partner organizations match this level of support to provide a total of more than $25 million in designated resources to the Defeat GBM Research Collaborative. This level of commitment is truly unprecedented for GBM-specific programs. Resources allocated for the research program will fund the ongoing (core) project work of all investigator teams. Each investigator team will receive $1 million annually in both 2015 and 2016 for their work.

A highly aggressive and complex brain tumor type, GBM tumors are also one of the most devastating forms of cancer, effecting thousands of Americans each day. As such, we believe it is our duty to drive the advancement of this research area to understand how to combat its resistance and adaptability, and deliver new and effective therapies to improve patient survival. Our commitment to the Defeat GBM Research Collaborative is an investment in a major paradigm change in brain tumor and cancer research.

"...doctors and researchers involved in this Initiative all have the same level of understanding and enthusiasm for finding a solution for this disease. And we all share the same sense of urgency to do better for patients."

- Dr. W.K. Alfred Yung, MD Anderson
2015 SCHEDULE OF EVENTS

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<th>Event</th>
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<tr>
<td>Orange County Brain Tumor Walk</td>
<td>September 12, 2015</td>
<td>Boston Brain Tumor Walk</td>
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<td>Long Island Brain Tumor Walk</td>
<td>September 19, 2015</td>
<td>Race for Hope - Philadelphia</td>
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<td>Silicon Valley Brain Tumor Walk</td>
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<td>Dallas Ft. Worth Brain Tumor Walk</td>
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<td>Charlotte Brain Tumor Race</td>
<td>October 10, 2015</td>
<td>Los Angeles Brain Tumor Walk</td>
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<td>Annual Summit- Research Symposium</td>
<td>October 15, 2015</td>
<td>Phoenix Brain Tumor Walk</td>
<td>December 12, 2015</td>
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SAVE THE DATE!

National Gala
Boston, MA
October 14, 2015

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OUR MISSION

National Brain Tumor Society is fiercely committed to finding better treatments, and ultimately a cure, for people living with a brain tumor today and those who will be diagnosed tomorrow. This means effecting change in the system at all levels. It’s time to build on progress and transform tomorrow, today.

Visit www.braintumor.org/takeaction to support our critical work.