Medulloblastoma Advanced Genomics International Consortium

Research Areas

- Biomarker Research
  Diagnostic, Genomic Biomarker
- Basic Research

At a Glance

- Status: Active Consortium
- Year Launched: 2012
- Initiating Organization: BC Cancer Agency
- Initiator Type: Health-care organization
- Location: International

Abstract

Cancer is the leading cause of nonaccidental death in children, and brain tumors (medulloblastoma) are the leading cause of pediatric cancer deaths in Canada. Those children who do manage to survive usually have a severely impaired quality of life because of the aggressive treatment for the disease. Strategies are needed to improve the quality of life for families of children with brain tumors, increase survival rates, and minimize the impact on healthcare systems.

Mission

In this project, genomic analyses of pediatric medulloblastoma samples, obtained through the international medulloblastoma consortium, will be performed. Messenger ribonucleic acid (mRNA) and microRNA (miRNA) expression profiles of 1,000 samples, representing all four subgroups (Wnt, Shh, Group C, and D), will be studied to identify novel subtypes within each subgroup. The resulting subtype-specific expression profiles will support the development of reliable and robust biomarkers to more accurately and reliably classify medulloblastomas for treatment in clinical trials. For that purpose, two assays will be developed: an antibody-based immunohistochemical assay and an orthogonal nucleic
acid-based hybridization assay.

Additional genomic deoxyribonucleic acid (DNA) analysis of the 300 high-risk subgroup cases will support the discovery of subgroup-specific somatic mutations in order to inform current clinical trials of targeted therapies and to identify genes and pathways already targeted in other diseases. Such therapies could be rapidly transitioned to Phase II trials in medulloblastoma. Furthermore, the discovery of somatic mutations could be used for developing as well as validating specific biomarkers.

The project team will also try to identify risk factors that predispose children to this type of cancer. Subgroups of children with medulloblastoma who have poor quality of life will be prioritized, and the team will work with families to quantify the additional risks they are willing to assume in reducing therapy to improve quality of life. The results of these experiments can very quickly inform global childhood clinical trials consortia to initiate trials of therapy-sparing treatment of medulloblastoma. It is anticipated that these studies will transform the way that children with medulloblastoma are treated and will have an immediate and lasting positive impact on both the survival and quality of life of children with this disease.

Financing

The project is funded by Genome Canada, Genome BC, Terry Fox Research Institute, Hospital for Sick Children (Sonia and Arthur Labatt Brain Tumor Research Centre), Ontario Institute for Cancer Research, Hospital for Sick Children (Chief of Research Fund), Pediatric Oncology Group Ontario, Hospital for Sick Children (Garron Family Cancer Center), Hospital for Sick Children (Cancer Genetics Program), Funds from “The Family of Kathleen Lorette” and the Clark H. Smith Brain Tumor Centre, Montreal Children’s Hospital Foundation, and Hospital for Sick Children (B.R.A.I.N. Child).

Impact/Accomplishment

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Homepage  http://www.bcgsc.ca/project/magic

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