

**Research Symposium**  
**&**  
**The Pam and Rolando Del Maestro Family**  
**Undergraduate Student Research Competition**  
**Awards**



**braintumour**  
**foundation**  

---

**OF CANADA**

**Saturday, September 30, 2023**  
**11:00 am - 1:15 pm EST**

## The Pam and Rolando Del Maestro Family Undergraduate Student Research Competition Awards



Pam & Rolando  
Del Maestro

In 2017, *The Pam and Rolando Del Maestro Family Undergraduate Student Research Competition Awards* were established to promote scientific innovation among Canadian undergraduate students.

41 years ago, Pam and Rolando Del Maestro and Steve Northey co-founded Brain Tumour Foundation of Canada over the years Pam and Rolando have fostered students in the field of brain tumour research by providing them with varied opportunities to present their ideas and engage with physicians and researchers in the field of neuro-oncology and neuroscience.

Brain Tumour Foundation of Canada thanks our co-founders Pam and Rolando Del Maestro for supporting this opportunity.

## Overview:

This undergraduate research competition is an opportunity to showcase your work to other scientists, researchers, and professionals attending the Research Symposium. The top three (3) winning teams receive monetary prizes. Presentations will be relevant to the brain tumour research community. This competition provides students an opportunity to create a research proposal, practice presentation skills and receive constructive feedback from a panel that includes physicians and researchers. This competition allows students time to network and create awareness while engaging the brain tumour community in brain tumour research.

## Process:

Brain Tumour Foundation of Canada's Research Committee has created a standardized clinical case study relevant to brain tumours. A letter of intent to participate is due no later than **Friday August 11, 2023 at 4:30pm (EST). No exceptions.**

Those participating will be asked to work in groups ranging from **2-4 group members**. Grant proposals will be assessed via a two-step mechanism by the judging committee.

### 1) Letter of Intent- Please follow the format below using the **Case provided**.

The Letter of Intent (LOI) must include the following:

- **Background of the field**  
-Describe any background information on the research topic. This must include key principles to understanding the proposal.
- **Research problem**  
-This should clearly state an unresolved concern in the scholarly literature that needs to be improved or eliminated. The significance of your proposal should be illustrated here.
- **Hypothesis**  
-State the hypothesis of the proposed study in the context of the research problem.
- **Specific aims**  
-Present up to three specific aims. These should be the narrower and more specific objectives of the proposed study in relation to the hypothesis. Under each specific aim, elaborate on the methodologies. Where applicable, describe theoretical results.
- **Methodologies**  
-This section should elaborate on the experimental procedures that will allow any other scientist to replicate your experiments. Data collection and analysis protocol must be included.
- **Hypothesized results**
- **Rationale for proposed research/therapeutic relevance**

-The following questions should be addressed in this section: How is the proposed study innovative and supportive on the goals of brain tumour research? Why should this project be done? How is it therapeutically relevant?

- Key references
- Maximum of 30 references

**Additional Information:**

- All necessary information above required
- Letters of Intent should be no more than 2 pages single spaced.
- Font should be Arial and at least 12 points
- To submit your Letter of Intent, please email as a PDF attachment to [sruypers@braintumour.ca](mailto:sruypers@braintumour.ca)

**Deadline:** Friday August 11, 2023

**Results to be provided by:** August 21, 2023

(all those who submitted LOI's will be notified regardless of results)

**2) Oral Presentation**

After reviewing the full research grant applications, teams will be invited to deliver an oral presentation to the selection committee at the Brain Tumour Foundation of Canada Research Symposium on **Saturday September 30, 2023**. This presentation will be given through ZOOM.

Participants will be given the opportunity to select their own specific topic of interest relating to the case provided and encouraged to form a research proposal that is experimental and not an observational study nor a clinical survey.

Visual Aids (i.e. illustrative slides) and lay language must be used where possible, to make the presentation easy for judges and the audience to understand the research proposed. Presentations will be scored based on how well the panel of judges believes your presentation meets each of the above criteria.

**NOTE:** Please respect copyright and academic citation standards when using images and data from text books and academic journals.

**What we do not expect:**

The goal for this competition is not "ready for the lab projects."

The competition is not meant to be based on student thesis projects.

The basic idea is "If you were attempting to get funding for a whole project what would you present to a panel of scientists to convince them?"

## **Possible Topics (yet can deviate from below list)**

### **Surgery**

Recent evidence casts doubt on whole brain radiation therapy as a main treatment option for brain metastases. Tumour bed directed stereotactic surgery may be a promising alternative for its localized therapy approach.

Endoscopic procedures permit precise observation of the surface of the tumour while avoiding vessels during resections, creating the possibility for almost complete resections of deep-seated tumours.

### **Pharmacology**

Systemic drug therapy is a management option for meningioma that cannot be completely resected. Antiangiogenic agents that interfere with tumour-induced angiogenesis may serve as rational novel treatments in such cases.

The blood-brain barrier hinders drug delivery to the brain due to its selective nature. Increasing the blood-brain barrier permeability without disturbing other brain cells can be an innovative approach to increasing the success of targeted cancer therapies.

### **Palliative & End-of-Life Care**

Discussing palliative and end-of-life care with parents of children with a brain tumour remains a challenge to healthcare providers. This study examines training procedures to prepare medical professionals to deliver Communication Plan: Early Through End of Life (COMPLETE) intervention to parents.

### **Stem Cells**

One emerging topic of research focuses on cancer stem cells that may contribute to tumour growth via their self-renewal capacity. Therapies that selectively target cancer stem cells may help eradicate cancer and prevent reoccurrence.

### **Patient Selection**

Responses to one treatment may vary from patient to patient. For instance, age can largely influence treatment consequences for patients with medulloblastoma. Novel methods of risk stratification will be necessary to personalize approaches per case.

### **Molecular Biology**

MicroRNAs are implicated in the regulation of gene expression at the post-transcriptional level. It is hypothesized that they may alter key tumour suppressor activity to result in brain cancer development. MicroRNAs may thus be potential biomarkers and/or therapeutic targets for embryonal tumours.

**Day of Conference:**

Day of Conference, each team will be provided 8 minutes to present proposals with 5 minutes of feedback. Three winning teams will be selected and awarded monetary prizes at the end of the competition. Rankings are based on presentation performance and content of abstract and full proposal scores previously earned. This will be conducted via ZOOM for all participants.

Monetary Prizes as follows:

1<sup>st</sup> Place- \$1000

2<sup>nd</sup> Place- \$750

3<sup>rd</sup> Place- \$500

**Ranking Committee/Case Study Development:** Dr. Joseph Megyesi, Dr. Adrianna Ranger and Dr. Adam Mutsaers

**Moderator of Event:** Sue Ruypers

## Case Study:

### Case Study:

Jayden is a 9 year old boy, who presented with a two week history of daily vomiting, blurred vision, intermittent headaches and unsteadiness on his feet. On examination in the emergency department, he had gait ataxia and some double vision. He had magnetic resonance imaging (MRI) of the head on the same day which revealed a lesion in the 4th ventricle of the brain associated with obstructive hydrocephalus. The neuro-radiologist strongly favoured the lesion to be a medulloblastoma. He had imaging of his spine, showing no evidence of drop metastasis.

Jayden and his family met with a pediatric neuro-oncologist, pediatric neurosurgeon and a radiation oncologist. The likely diagnosis of medulloblastoma was discussed. Management options were discussed. The family was given the Brain Tumour Foundation of Canada Patient Handbook about pediatric brain tumours.

Jayden was admitted to the hospital and underwent surgery on an urgent basis for resection of the tumour. During his operation, a frozen-section evaluation of the tissue showed a “small round blue cell” neoplasm. Finalized pathology was reported 7 days later, confirming a medulloblastoma, WHO Grade IV (“classic” by histomorphology, “Group 4” by nanoString). His surgeon felt that a total resection was achieved, and his postoperative MRI showed no evidence of residual tumour or hydrocephalus. He had a lumbar puncture 2 weeks after surgery showing no evidence of tumour cells. He was discharged at 3 weeks following surgery, with a plan to see his oncologist and surgeon for a follow up visit. Most of the symptoms he presented with had resolved by the time of discharge home. He was troubled by a new symptom, however, which was identified 3 days after surgery, characterized by a language disorder, with difficulty initiating speech, accompanied by some drooling and emotional lability. His parents were concerned that shortly after surgery he stopped speaking to them and responded to questions only with nodding or shaking his head. They also observed that he could be calm at one moment, but then tearful and upset very abruptly, without anything obviously having changed. Speech therapy was put in place to help with his new expressive language disturbance in the community.

Consider the following issues:

1. What is the next best step for management of this child’s medulloblastoma – chemotherapy, radiation therapy or some combination? What is the supporting evidence?
2. What factors might impact how Jayden responds to treatment? What is their relative importance? What is being done to identify other factors?

3. How has our understanding of medulloblastoma changed over the years, and what recent advancements have been made in the field?
4. What role do genetics play in the development of medulloblastoma, and how do specific genetic mutations impact the prognosis and treatment of the disease?
5. Jayden and his family want to know if there are any experimental therapies for a patient with medulloblastoma. They want to know what a clinical trial is and if there might be any current clinical trials for which he might be eligible.
6. Jayden's parents are concerned that having a brain tumour is going to negatively impact his quality of life. They want to know if there is any evidence to support this concern and, if so, is there anything being done to minimize this.
7. How can the healthcare system better support children and their families with this disease?
8. How can public education and awareness campaigns help to improve outcome?
9. Jayden's family are distressed by his speech difficulties and mood swings after surgery and want to understand better what might be causing this and how to help him.

The Brain Tumour Foundation of Canada is inviting students to devise a proposal for scientific research that addresses one or more of the above issues surrounding Jayden's brain tumour (Group 4 medulloblastoma).

