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# Proceedings of the 2026 Queen's University Undergraduate Bladder Cancer Case Competition

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**Abstract**
The Queen's University Undergraduate Bladder Cancer Research Case Competition, organized by the nonprofit organization Queen's Awareness of Bladder Cancer Club (QABC), provides university students with the opportunity to conduct research and raise awareness of bladder cancer. Guided by university student mentors with prior research experience, participants are introduced to the fundamentals of scientific analysis and academic writing while receiving personalized mentorship fostering both professional and personal growth. The 2026 program brought together students with interests in bladder cancer to learn from notable oncologists like Dr. Charles Graham and Dr. D. Robert Siemens, allowing students to pursue projects in bladder cancer. During the case competition, participants proposed research projects, which are presented in this abstract book as a reflection of their intellectual curiosity. Following the competition, a panel of professionals evaluated the student projects, providing expert feedback and selecting only the top-tier submissions for final recognition. By creating accessible and supportive pathways into research, QABC aims to bridge the gap between youth and scientific engagement, inspiring the next generation of researchers, healthcare providers, and innovators. Moving forward, the Research Case Competition will continue to grow and adapt, incorporating feedback from participants and mentors to strengthen its impact.

**Keywords:** bladder cancer; undergraduate research; mentorship; case competition; scientific literacy; clinical oncology; research training; Queen's University; advocacy; education

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**Conference Abstracts**

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## QABC Research Case Competition Abstracts

### Evaluating Multilingual Performance of Large Language Models for Patient in Education in English and French

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**Introduction:** Large language models (LLMs) such as ChatGPT are increasingly explored for patient education and clinical communication. Early studies suggest these systems generate medically accurate explanations and simplify complex medical information. Because patient education materials influence treatment decisions, comprehension, and health outcomes, clarity and accessibility are critical in multilingual healthcare systems. However, the linguistic quality of AI-generated patient education across languages remains unclear. This study evaluates the multilingual performance of LLMs in education materials in English and French.
**Methods:** A bilingual dataset of patient education questions will be constructed with linguistic tasks (reading comprehension, contextual errors, etc.). Questions will be prepared in English and French. Responses generated by LLMs will be analyzed with established reading metrics, linguistic accuracy assessments and coherence by the reviewers.
**Results:** Based on previous studies, LLM-generated responses are expected to produce coherent and understandable patient education explanations in both English and French. However, prior research on multilingual large language models suggests performance may be stronger in English. English responses are expected to show higher linguistic accuracy and fewer grammatical or contextual errors.
**Conclusion:** The study will be evaluating language specific differences in LLM's performances to inform the responsible use of AI education in multilingual healthcare settings.

### Enhancing BCG Efficacy in BCG-resistant NMIBC Through STING Pathway Agonism

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**Introduction:** Intravesical Bacillus Calmette-Guérin (BCG) is a vaccine commonly used for treating non-muscle invasive bladder cancer (NMIBC). However, about 30-40% of NMIBC cases do not respond adequately to BCG or develop recurrence. STING signalling has been implicated in determining BCG responsiveness. When compared to BCG non-responders, baseline STING expression is shown to be higher in BCG responders. STING activation induces several immune-stimulatory mechanisms in NMIBC models that amplify both innate and adaptive immune responses. These findings suggest that activation of the STING pathway may enhance BCG-induced antitumour property.
**Methods:** Orthotopic NMIBC murine model will be randomized to experimental groups including vehicle control (saline injection), STING agonist alone, BCG alone, and BCG and STING agonist combined. Intratumoral CD8+ T-cell activation/infiltration will be evaluated for immune response, with secondary evaluation of tumour burden and STING-associated cytokine signalling.
**Results:** We expect that BCG and STING agonist combined treatment would increase CD8+ T-cell activation/infiltration and STING-associated cytokine signalling, while reducing tumour burden when compared to BCG alone. This supports improved antitumour immune responses in NMIBC.
**Conclusion:** Combining BCG with STING agonism is a promising strategy for BCG-resistant NMIBC by strengthening antitumour immune activation and warrants further investigation.

**Conflicts of Interest**
The authors declare that they have no conflicts of interest.

**Authors' Contributions**
DJ: Founded the 1st annual Queen's Undergraduate Bladder Cancer Case Competition; planned and oversaw the entire program, providing feedback across multiple phases; conceptualized and organized the research conference; assisted in recruiting guest judges and speakers for the conference; mentored select teams and delivered research training; drafted the conference abstract booklet; and gave final approval of the version to be published.
AM: Served on the planning committee for the conference; assisted with event logistics; assisted in recruiting guest judges and speakers for the conference; and gave final approval of the version to be published.
GZ: Served on the planning committee for the conference; reviewed the abstract submissions and ensured that they adhered to correct formatting standards; prepared the case competition topic; and gave final approval of the version to be published.
MK: Served on the planning committee for the conference; reviewed the abstract submissions and ensured that they adhered to correct formatting standards; and gave final approval of the version to be published.

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