

9-5-2013

# Exploring New Chemotherapeutic Strategies Against Brain Cancer

Seol Kim  
*Cleveland State University*

Anthony J. Berdis  
*Cleveland State University, A.BERDIS@csuohio.edu*

Follow this and additional works at: [https://engagedscholarship.csuohio.edu/u\\_poster\\_2013](https://engagedscholarship.csuohio.edu/u_poster_2013)

 Part of the [Cancer Biology Commons](#), and the [Pharmacology, Toxicology and Environmental Health Commons](#)

**How does access to this work benefit you? Let us know!**

---

## Recommended Citation

Kim, Seol and Berdis, Anthony J., "Exploring New Chemotherapeutic Strategies Against Brain Cancer" (2013). *Undergraduate Research Posters 2013*. 8.

[https://engagedscholarship.csuohio.edu/u\\_poster\\_2013/8](https://engagedscholarship.csuohio.edu/u_poster_2013/8)

This Article is brought to you for free and open access by the Undergraduate Research Posters at EngagedScholarship@CSU. It has been accepted for inclusion in Undergraduate Research Posters 2013 by an authorized administrator of EngagedScholarship@CSU. For more information, please contact [library.es@csuohio.edu](mailto:library.es@csuohio.edu).



This digital edition was prepared by MSL Academic Endeavors, the imprint of the Michael Schwartz Library at Cleveland State University.

# **Exploring New Chemotherapeutic Strategies Against Brain Cancer**

College of Science and Health Professions

Departments of Chemistry and Biology

**Student Researcher:** Seol Kim

**Faculty Advisor:** Anthony J. Berdis, Ph.D.

## **Abstract**

Approximately 4,000 children in the United States are diagnosed each year with a brain tumor. Brain cancers are the deadliest of all pediatric cancers as they have survival rates of less than 20%. Typical treatments include surgery and radiation therapy. However, chemotherapy is the primary therapeutic option for children, especially against aggressive brain tumors. An important chemotherapeutic agent is temozolomide, an alkylating agent that causes cell death by damaging DNA. In this project, we tested the ability of non-natural nucleosides developed in our lab in order to increase the ability of temozolomide to kill brain cancer cells. Our results show that combining low doses of our nucleoside with temozolomide kills more cells compared to treatment with either compound individually. The increase in efficacy is specific for temozolomide as similar effects are not observed in cells treated with other chemotherapeutic agents such as cisplatin, 5-fluorouracil, and taxol. High-field microscopy techniques demonstrate that the combination of our nucleoside and temozolomide causes cell death via apoptosis as opposed to necrosis. A model is provided describing how our novel nucleoside analog increases the cell-killing effects of temozolomide by inhibiting the misreplication of damaged DNA created by this agent. Collectively, these studies provide pharmacological evidence for a new treatment strategy to more effectively treat patients with brain cancers.