



## **Hyundai Hope on Wheels Hyundai Scholar Research**

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Neuroblastoma is the third most common cancer affecting children. Over the past two decades, many advances have been made in improving treatment of many childhood cancers. Unfortunately, children with advanced-stage neuroblastoma continue to do poorly, with approximately two-thirds succumbing to their disease, despite very intense treatments. Often, children will go into remission only to have their neuroblastoma tumors return, resistant to all currently available treatments. To improve the outcome of children with neuroblastoma, new therapies need to be developed. The best way to accomplish this is through a better understanding of neuroblastoma pathophysiology and the mechanisms it uses to circumvent treatments.

My research involves understanding the signaling pathways used by chemotherapy to kill neuroblastoma cells, with the goal of determining ways by which these cells alter the pathways to survive through treatment. The *MYCN* gene plays a vital role in the outcome of children with neuroblastoma: the presence of extra copies of *MYCN* in the neuroblastoma cells (called *MYCN* amplification) portends a bad prognosis in these patients. However, how *MYCN* impacts the physiology of the neuroblastoma cell and leads to resistance to therapy is currently unknown. My research will examine the interactions of the MycN protein with its antagonists such as Mxi1, and how these interactions are involved in the development of resistance to treatment with chemotherapeutic agents. We will examine how these proteins interact with known cell death pathways and what they do to modulate responses to therapy. By elucidating these interactions, we hope to develop targeted therapies that bypass blockades, thereby resulting in improved outcomes for children with advanced-stage neuroblastoma.