Nanoengineering May Hold the Key to Developing More Effective, Safer Treatments for a Deadly Childhood Cancer

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Neuroblastoma is one of the most common—and lethal—forms of childhood cancer, accounting for 15 percent of pediatric cancer deaths each year. (Despite the name, neuroblastoma is not a form of brain cancer; it typically consists of tumors found in the abdomen, chest, neck, pelvis and bones.)

Currently, children with neuroblastoma are treated with aggressive forms of chemotherapy, radiation and high-risk surgeries. In adults, safer immunotherapy treatments have proven successful in treating solid tumors similar to those that form with neuroblastoma. Yet, for reasons that remains unclear, these more promising treatments are not nearly as effective in children.

John T. Wilson, associate professor of chemical and biomolecular engineering and a 2022 Chancellor Faculty Fellow, wants to change that.

A new grant Wilson received from the National Institutes of Health will allow him to explore ways to use recently developed nanoparticles to stimulate immunity pathways in children, with the aim of making immunotherapy treatments for neuroblastoma more effective.

“This work builds on previous evidence from our lab that these nanoparticles are successful in activating the necessary pathways to help the immune system detect and destroy tumors. Now, the question becomes, what strategies can we design for the pediatric population and in particular children with high-risk neuroblastoma,” Wilson said.

The goal of the grant, he added, would be to find ways in the lab that could ultimately be used to boost the effectiveness of new immunotherapy treatments currently in clinical trials

and developed by researchers at the Children's Hospital of Philadelphia, who are co-investigators on the project.

"We want to push this evolving neuroblastoma treatment as far as we can," Wilson said. "And we believe that nanotechnology can play a critical role in achieving better outcomes for this devastating disease."

Read the original article on Vanderbilt University.