Memorial Sloan Kettering Cancer Center | GIVING

Kylie Rowand Foundation | Impact Summary

Understanding Neuroblastoma

The generous support of the Kylie Rowand Foundation drives advances into the understanding of neuroblastoma, one of the most challenging childhood cancers. At Memorial Sloan Kettering Cancer Center (MSK), pediatric oncologist Stephen Roberts, MD, has been collaborating with the University of Ghent's Frank Speleman, PhD, as well as with Alex Kentsis MD, PhD, the Director of the new Tow Center for Developmental Oncology at MSK. In addition to studies into the transformation of healthy cells into neuroblastoma cells, they are investigating whether those changes lead to weaknesses in neuroblastoma cells that can potentially be targeted by new drugs or whether existing drugs can be deployed to treat this cancer in ways not previously considered. Using cutting-edge technologies such as single-cell sequencing, the team has examined these changes at a level of detail never before possible. They have created new cell culture lines from the tumors of children with familial neuroblastoma, including one with mutations in the *ALK* gene, which is commonly found in neuroblastoma. The new cell lines — resources created using funding from the Kylie Rowand Foundation — are allowing the researchers to assess how common neuroblastoma genes work together to cause the disease. Next: testing the models in animal systems and screening new drug candidates to see if overlooked drugs can be used to treat neuroblastoma.

Kylie's Legacy Continued

Dr. Roberts is joined in research based on Kylie's tumors, which were donated by the Rowand family, by Elli Papaemmanuil, PhD, a molecular geneticist, and research fellow Gunes Gundem, PhD. During Kylie's treatment, her tumors developed in unexpected ways, prompting several studies of genetic evolution as neuroblastoma progresses and the disease's response to therapy over time. A study that began with Kylie has now expanded to over 50 patients, including some with aggressive, high-risk, and indolent, low-risk disease. Well over 150 tumor samples have been generated from these patients during therapy and relapse. Comparative analysis of all these tumors established the following:

- Indolent disease is associated with genetic changes that accumulate in later stages of neuroblastoma. If more comprehensive and sensitive tests are used when patients are diagnosed, doctors can better predict who is at a higher risk of relapse, and if those patients could potentially benefit from therapies that target the genetic mutations that cause disease evolution.
- Complex chemotherapeutic regimens are toxic to cancer cells, resulting in effective treatment for some patients. However, if patients relapse after receiving these therapies, their tumors can contain new genetic changes that cause resistance to that therapy. This increased mutational burden might suggest new treatment opportunities for people with neuroblastoma, such as immunotherapy drugs. These results will be published in 2021.

Additionally, based on clinical insights gained while caring for Kylie, MSK doctors were able to help another child like Kylie with high-risk neuroblastoma and VIP syndrome. The team plans to publish the results of this experience in 2021 so other pediatric oncologists will have a resource to guide them in the proper management of patients with the same disease features.

As leading philanthropists, activists, and our partners, the Kylie Rowand Foundation supports innovation and investigations at MSK that directly impact advances in the understanding of neuroblastoma, bringing hope to patients and families everywhere. We thank you for your kind consideration in continuing to champion MSK in our efforts against neuroblastoma.