Neuroblastoma researcher reviews progress versus challenging childhood cancer

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Pediatric oncologist John M. Maris, M.D., describes the current state of the science in combating neuroblastoma, the most common solid cancer of early childhood. In his article in the June 10, 2010 *New England Journal of Medicine*, "Recent Advances in Neuroblastoma," Maris reviews the field's latest research knowledge -- much of it based on efforts by Maris and his colleagues at The Children's Hospital of Philadelphia. Maris directs a laboratory at CHOP in collaboration with the multicenter Children's Oncology Group (COG) using tissue samples from 5,000 patients -- the world's largest sample collection for neuroblastoma.

A cancer of the sympathetic nervous system, neuroblastoma most commonly occurs as a solid tumor arising from the adrenal gland in the abdomen. Neuroblastoma remains one of the most puzzling of childhood cancers—ranging from cases of widespread but benign tumors in infants that spontaneously and completely disappear, to high-risk subtypes in older children that are relentlessly aggressive.

Maris is the chief of Oncology at Children's Hospital and director of the Hospital's Center for Childhood Cancer Research. Just three years ago, he wrote a review article on neuroblastoma for The Lancet. Since that time, a stream of discoveries from his lab has explored the genetic landscape of neuroblastoma. In 2008, Maris led the team that identified common DNA variations on chromosome 6, the first time researchers found the cancer's genetic origin. Later that year, Yael Mosse, M.D., collaborating at CHOP with Maris, reported that mutations in the ALK gene were the main cause of inherited neuroblastoma, and also played a role in many cases of non-inherited neuroblastoma. In 2009, Maris published two more gene studies, identifying common variants in the gene BARD1 and copy number variants on chromosome 1 that raised the risk of neuroblastoma. The latter study was the first ever to find a specific copy number variant that predisposes to a human cancer.

The ultimate goal of basic research at CHOP is to translate findings into more effective treatments for children. To that end, the Cancer Center at CHOP is currently leading a clinical trial of an ALK inhibitor for children who have relapsed after neuroblastoma treatments. In his review, Maris describes other innovative therapies, such as a national immunotherapy trial by the COG, using monoclonal antibodies and cytokines to selectively target neuroblastoma cells. Another experimental treatment, developed at CHOP and other centers, uses MIBG, a radioactive isotope that zeroes in on neuroblastoma cells. Maris also cites federally sponsored collaborative programs designed to identify new drugs that will interrupt the key cell signaling pathways that drive neuroblastoma.

Provided by Children's Hospital of Philadelphia