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Young DKFZ Researcher Receives Sponsorship Award by the German Society of Hematology and Oncology

Marc Remke, a scientist working at the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) in Heidelberg, has been awarded a sponsorship award for doctoral students by the German Society of Hematology and Oncology (Deutsche Gesellschaft für Hämatologie und Onkologie, DGHO) for his research into the molecular foundations of cancer in children. The award comprises an award sum of 2,500 euros and was presented at the joint annual conference of the German, Austrian and Swiss Societies of Hematology and Oncology, which took place October 2-6 in Heidelberg and Mannheim.

Children who are affected by brain tumors or leukemias have a much better chance of survival today than they had only a couple of years ago. Nevertheless, many young patients still succumb to these diseases. So far, only clinical criteria such as patient age, type of malignant growth, stage and localization were used for assessing the prognosis and choosing a treatment. New insights into specific genetic and biological characteristics of these tumors provide chances of individualizing treatment and promoting development of new treatment approaches.

With the aim of finding previously unknown alterations in the hereditary material of cancer cells and identifying genes that are important for onset and progress of these diseases, Marc Remke investigated tissue samples of 156 brain tumors and 73 leukemias.

In more than half of all low grade astrocytomas, a common type of childhood brain tumor, Remke found a defect in the genetic blueprint of the BRAF oncogene. BRAF is also frequently altered in other cancers such as thyroid cancer, melanoma and bowel cancer. As a result, BRAF pushes the cells to grow and divide in an uncontrolled manner. In embryonic development, this function plays an important role. However, if it is active in mature cells, it leads to tumor development. This finding facilitates a new treatment approach, since the alteration in the BRAF gene is a promising target for targeted chemotherapy.

In another project on medulloblastoma, the most common childhood brain tumor, Marc Remke is working to assess the disease progression on the basis of typical molecular changes of cancer cells. Jointly with Dr. Stefan Pfister, head of his working group at DKFZ, and his colleagues, he showed that the severity of the disease depends on the activity of specific genes in the cancer cells. This enables doctors to predict disease progression and to adjust the intensity of treatment to the individual patient's risk. "For example, when there are indications of good treatment response, the intensity of treatment may be reduced such as by reducing the radiation dose," the young researcher explains. "Thus, we are trying to minimize side effects and dangerous late effects for the young patients." On the other hand, for patients with a high risk, he added, a more intensive treatment from the beginning may improve the chances of cure.

When examining the leukemia samples, Marc Remke found out that the loss of a specific chromosomal section in the affected white blood cells is associated with poorer treatment response. As a result of this loss, affected leukemia cells evade programmed cell death and are able to stay alive longer than their natural lifespan – one of the typical characteristics of leukemia.

Marc Remke was born in Bonn and studied medicine at the Universities of Bonn, Freiburg, Cádiz (Spain) and lastly Heidelberg. For the past three years, he has been studying childhood cancers and their molecular causes in the Research Group “Molecular Genetics of Pediatric Brain Tumors”. Remke is currently working to utilize his findings. Thus, he is testing the effectiveness of his proposed therapy strategies for treating astrocytomas in the mouse model and is developing processes for low-cost and efficient determination of the molecular risk factors identified by him in the clinical routine. The research group headed by Dr. Stefan Pfister is a collaborative project of the Department of Pediatric Oncology at the Center for Pediatrics of Heidelberg University Hospitals and the Division of Molecular Genetics at the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ).

The annually awarded sponsorship award for doctoral students of the German Society of Hematology and Oncology recognizes outstanding student research works and doctoral theses in the areas of hematology and internal medicine oncology.